

# Phase 1 Draft EIS Comment Record Report Part 2

March 25, 2016

## How you can make your comments most effective



Check out the Department of Ecology Citizen's Guide to SEPA Review and Commenting at [EnergizeEastsideEIS.org/sepa-review](http://EnergizeEastsideEIS.org/sepa-review).

**Be clear, concise, and organized.** Decide what you need to say before you begin. If you have a number of points, group your comments in a logical order.

**Be specific.** Give support to your comments by including factual information. For instance, compare how things *were*, to how they *are*, to how you believe they *will be* in the future—and why.

Refer to Comprehensive Plans, development regulations, information on similar projects or situations, and other environmental laws or documents. Be as accurate as possible.

**Identify possible solutions.** Suggestions on reasonable mitigation—conditions to avoid, minimize, or reduce adverse impacts—can help influence how a project is ultimately built. After identifying your concern, suggest possible solutions.

—fold here—

## Comments on the Phase 1 Draft EIS of PSE's Energize Eastside Project

Name Ms. Cynthia Rezabek Address\* 12144 SE 14<sup>th</sup> St.  
Bellevue, WA 98005

\* You must provide your physical mailing address to be considered a "party of record," eligible to appeal the adequacy of the EIS.

Energize Eastside is a "Forever Project" that would be built with technology that will soon be easily eclipsed by newer energy delivery methods. Please wait for the technology; there is time. I attended a neighborhood EE presentation. There was no mention then @ alternatives. It seemed to pit neighborhoods against each other to see who would be impacted by the inevitable. Contest the treaty!

The maps then and now are difficult to follow, especially if you know an area. Suggest more detailed maps, showing parks, neighborhoods etc. There was no mention of the width of needed right-of-ways, tree effects, extent of eminent domain, and ways to visualize the height of the proposed towers. I recommended a PLD, attention to the alternative study, and conservation.

February 1, 2016

Janna - please scan

and to: Heidi Bedwell  
Carol Helland  
Nicholas Matz.

Don Marsh, CENSE

original back  
to me. Thx  
-Kate

Dear Councilmembers,

CENSE appreciates being invited to comment on the Draft EIS for Energize Eastside.

Tonight let's look at the broad picture. The Draft EIS presents three alternatives for our energy future.

The first alternative is a 230 kV transmission line through the Eastside. Four variations are studied: two different overhead lines, an underground line, and a line submerged in Lake Washington. Let us be clear. Because of the state tariff on undergrounding enforced by the Washington Utilities and Transportation Commission, only the overhead lines operated by PSE or Seattle City Light are economically feasible. Since Seattle City Light removed their line from consideration, PSE's transmission line is the only serious option under Alternative 1.

Alternative 2 uses innovative technology and policy solutions to address the peak load problem PSE says we have. This is the smart way to grow our electric system.

Alternative 3 would build three times as many transmission lines all over the Eastside. No one considers this to be a realistic option, and it is included just to make the first alternative look less horrific. Gamesmanship like this makes residents cynical about the EIS process.

Having identified the red herrings in the EIS, let's look at the two remaining options: Alternative 1, PSE's transmission line, and Alternative 2, the smart technology solution.

PSE's transmission line is a solution that is vastly bigger than we need. The line will have a capacity exceeding 1,000 megawatts when only 70 megawatts are required in the foreseeable future, according to PSE's graphs. CENSE has reason to believe even this figure has been exaggerated to justify the project. The transmission line option would put all our eggs in one basket. Ratepayers would finance a huge upfront cost of more than a quarter billion dollars to build a transmission line that has reliability and security risks. The transmission line would be vulnerable to extreme weather, fires, landslides, terrorism, solar flares, pipeline accidents, and errors of human judgment. If only one power pole falls, a big piece of our electricity supply would be out of service.

Alternative 2, the smart solution, envisions a 21<sup>st</sup> century distributed energy network that is much more flexible and adaptive. It's more reliable, because multiple elements can fail without impacting overall reliability.

It's also more attractive financially, because it can be built incrementally. We can make smart decisions about how much additional infrastructure we need each year. For example, if the economy slows down and electricity demand plummets like it did in 2009, the level of investment could be adjusted to match the new consumption pattern. If a new kind of battery comes along that solves our problems more efficiently, it could be incorporated into the energy grid. This strategy would better support local companies like Mukilteo-based UniEnergy, which is developing batteries that will be used by utilities all over the country. By contrast, there is no local company that makes the steel monopoles used in PSE's transmission line.

Be ready for PSE's arguments against the smart solution. PSE prefers building transmission lines because it is more profitable for them. The company has disparaged Demand Response, a proven way to handle peak loads. The power plan about to be released by the Northwest Power and Conservation Council says, "Under a wide range of future conditions, energy efficiency consistently proved the least expensive and least economically risky resource. In more than 90 percent of future conditions, cost-effective efficiency met *all* electricity load growth through 2035. It's not only the single largest contributor to meeting the region's future electricity needs, it's also the single largest source of new winter peaking capacity."

Energize Eastside is all about winter peaking capacity, but PSE argues that the Eastside is an anomaly in its service area, that growth has brought us to the brink of a crisis, and a larger transmission line is our only solution.

Citizens do not want a solution that despoils our neighborhoods, cuts down our trees, and increases risk of devastating pipeline fires. Instead we want an energy solution that is forward-looking, reliable, safe, cost-effective, and environmentally sound. The only alternative in this EIS that fills these criteria is Alternative 2.

Thank you.

# Comments for Bellevue Draft EIS Comment Meeting

March 1, 2016

I'm Don Marsh, president of CENSE, the Coalition of Eastside Neighborhoods for Sensible Energy. I live at 4411 137<sup>th</sup> Ave. SE in Bellevue.

On behalf of CENSE, I am submitting documents supporting our concerns about the Energize Eastside project. Tonight we focus on four topics:

1. The need and purpose that motivate the project.
2. Pipeline safety concerns.
3. Feasibility of Alternative 2.
4. A petition signed by members of the community.

To address the need and purpose of the project, we submit the *Lauckhart-Schiffman Load Flow Study* by Richard Lauckhart, the former VP of transmission planning for PSE, and Roger Schiffman, a transmission analyst with a long career in this field. Their conclusion is that the conditions PSE stipulates to overload transformers in Redmond and Renton would, in fact, risk widespread blackouts throughout the Puget Sound region. Grid operators would never allow the system to run in this irresponsible manner. Using reasonable assumptions, the study shows that we have plenty of capacity to serve Eastside growth for more than a decade.

PSE does not contest any fact in this study, but says the Lauckhart-Schiffman report does not comply with federal reliability standards. However, this *ColumbiaGrid 2013 System Assessment* describes a theoretical study which exports 1500 MW to Canada and turns off local generation plants. These are the same assumptions PSE uses to establish the need for Energize Eastside. ColumbiaGrid states: "This case is being studied for information purposes ... it goes beyond what is required in the NERC Reliability Standards."

These two documents unequivocally contradict PSE's rationale for building Energize Eastside. That is why CENSE is requesting that the EIS process stop at Phase 1 and be judged by a Hearing Examiner to resolve these fundamental questions about need and reliability. Answers are needed now to avoid costly legal challenges in the future.

Next, we submit two documents that address the safety of co-locating the pipeline and transmission lines. The first document lists five criteria that determine the risk of accelerated

corrosion when pipelines and transmission lines are located in close proximity. When the Olympic pipeline is paired with PSE's proposed transmission line, at least 4 of the 5 risk criteria are raised to the highest level of risk.

The second document includes analysis by Dr. Frank Cheng, an internationally recognized pipeline safety expert. He questions Olympic Pipeline's cathodic protection program, and his concerns are reinforced by the Office of Pipeline Safety, which only six weeks ago determined that the Olympic Pipeline Company is violating federal safety standards and failing to adequately protect the public from electrically induced corrosion of their pipelines. When one considers the fact that these pipelines pass close by the Tyee and Rose Hill middle schools, the coverage of safety issues in the Draft EIS is woefully inadequate.

The next document, entitled *The Best Alternative*, examines Draft EIS Alternative 2. Industry consultant EQL Energy identifies many errors and obsolete data that make Alternative 2 appear unattractive in terms of risk, reliability, and cost. However, Alternative 2 was not developed or reviewed by experts who are experienced with distributed energy resources. EQL presents feasible and cost efficient alternatives that would have minimal impact on our communities and environment. For the EIS, these proposals should be carefully analyzed by consultants like EQL who have a proven track record in smart grid solutions.

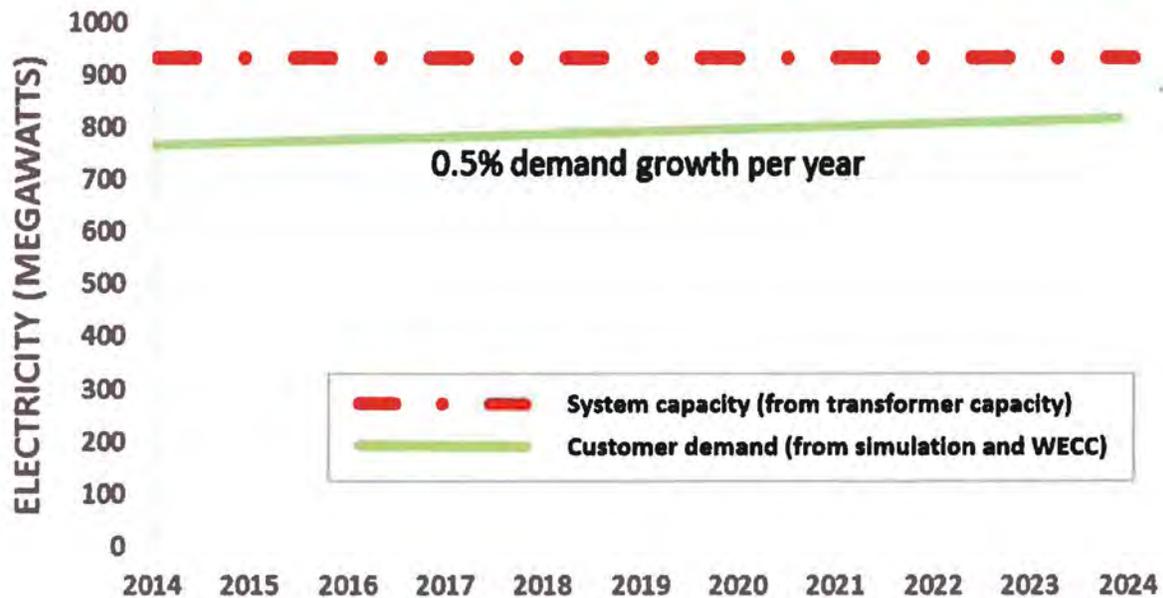
Finally, we submit a simple form letter with the names and addresses of 372 residents who wished to comment on the Draft EIS, but felt they did not have the time or expertise to scrutinize the 715-page document. Some of these residents submitted brief comments along with their signatures, but all of them wanted to help save their communities from a dangerous, expensive, unnecessary project. We ask that each be entered as an individual participant in the comment process entitled to a response.

Thank you.

#### References

- [Lauckhart-Schliffling Load Flow Study](#)
- [ColumbiaGrid 2013 System Assessment](#)
- [Criteria for Pipelines Co-Existing with Electric Power Lines](#)
- [CPNSR concerns about pipeline safety for Draft EIS](#)
- [Olympic Pipeline Final Order](#)
- [Bellevue Fire Department Standards of Response Coverage](#)
- [The Best Alternative](#)
- [EIS Comment Letter](#)

## LAUCKHART-SCHIFFMAN DEMAND FORECAST



# Load Flow modeling for "Energize Eastside"

Richard Lauckhart

Roger Schiffman

February 18, 2016



# Executive Summary

In November 2015, the citizen group CENSE asked Richard Lauckhart and Roger Schiffman to study the scenario that motivates Puget Sound Energy's transmission project known as "Energize Eastside." We (Lauckhart and Schiffman) are nationally recognized power and transmission planners with specific knowledge of the Northwest power grid.

It is standard industry practice to use a "load flow model" to determine the need for a transmission project like Energize Eastside. In order to assess the reliability of the grid, analysts use specialized computer software to simulate failure of one or two major components while serving peak load conditions. For Energize Eastside, PSE simulates the failure of two major transformers during a peak winter usage scenario (temperature below 23° F and peak hours between 7-10 AM and 5-8 PM).

We ran our own load flow simulations based on data that PSE provided to the Western Electricity Coordinating Council (WECC). We used a "Base Case" for winter peak load projected for 2017-2018. PSE confirms this is the same data used as the basis for the company's "Eastside Needs Assessment."

Our findings differ from PSE's as follows:

1. PSE modified the Base Case to increase transmission of electricity to Canada from 500 MW to 1,500 MW. This level of energy transfer occurring simultaneously with winter peak loads creates instability in the regional grid. Transmission lines connecting the Puget Sound area to sources in central Washington do not have enough capacity to maintain this level of demand.
2. PSE assumed that six local generation plants were out of service, adding 1,400 MW of demand for transmission. This assumption also causes problems for the regional grid.
3. Even if the regional grid could sustain this level of demand, it is unlikely that regional grid coordinators would continue to deliver 1,500 MW to Canada while emergency conditions were occurring on the Eastside.
4. We found that the WECC Base Case contains a default assumption that PSE may not have corrected. The ratings for critical transformers are based on "summer normal" conditions, but the simulation should use significantly higher "winter emergency" ratings. The default value could cause PSE to underestimate System Capacity and overstate urgency to build the project.
5. The Base Case shows a demand growth rate of 0.5% per year for the Eastside. This is much lower than the 2.4% growth rate that PSE cites as motivation for Energize Eastside.

**Our study finds critical transformers operating at only 85% of their winter emergency rating, providing enough capacity margin to serve growth on the Eastside for 20 to 40 years.**



# Qualifications

**Richard Lauckhart** served as a high level decision maker at Puget Sound Power & Light (the predecessor of Puget Sound Energy). His employment with the company spanned 22 years as a financial and transmission planner as well as power planning. He served as the company's Vice President of Power Planning for four years.

Richard took a voluntary leave package when Puget Power merged with Washington Energy Company in 1997. He provided additional contract services to PSE for more than a year following the merger. After leaving PSE, Richard worked as an energy consultant, providing extensive testimony on transmission system load flow modeling before the California Public Utility Commission.

**Roger Schiffman** has 23 years of energy industry experience covering utility resource planning, electricity market evaluation, market assessment and simulation modeling, regulatory policy development, economic and financial analysis, and contract evaluation. Roger has led a large number of consulting engagements for many clients. He has extensive knowledge of industry standard modeling software used for power market analysis and transmission planning.

We are well acquainted with the physical layout and function of the Northwest power grid and the tools used to analyze its performance. Our resumes can be found in Appendix H.

Richard has provided pro bono consultation to CENSE since April 2015. He has received no financial compensation other than reimbursement of travel expenses. Roger had no relationship with CENSE prior to this report.

# Methodology

The power grid is a complex interconnected system with behaviors that cannot be easily understood without computer modeling software. We acquired a license to run the industry standard simulation software known as “GE PSLF”<sup>1</sup> to perform our studies.

The PSLF software uses a database that is supplied by the operator. We had hoped to use the same database that PSE used in its studies, but PSE refused to share it after months of negotiations. Instead, we received clearance from the Federal Energy Regulatory Commission (FERC) to access the database PSE submitted to the Western Electricity Coordinating Council (WECC). FERC determined that we presented no security threat and had a legitimate need to access the database (see FERC’s letter in Appendix A).

We used the WECC Base Case for the winter of 2017–18, which PSE confirms is the database the company used for that time period. We and PSE have made subsequent changes to the Base Case model in order to incorporate various assumptions. We don’t know exactly what changes PSE made to the database, but we will be explicit about the changes we made.

## **N-0 base scenario**

To ensure that everything was set up correctly, we ran a simulation using the unmodified Base Case and checked to see if the results aligned with those reported by WECC. This is referred to as an “N-0” scenario, meaning that zero major components of the grid are offline and the system is operating normally. The outputs of this simulation matched reported results.

The WECC Base Case assumes that the Energize Eastside project has been built. In order to determine the need for the project, we needed to study the performance of the grid without it. We reset the transmission configuration using parameters from an earlier WECC case that did not include the project.

## **N-1-1 contingency scenario**

An “N-1-1” scenario models what would happen if two major grid components fail in quick succession. Utilities are generally required

<sup>1</sup> <http://www.geenergyconsulting.com/pslf-re-envisioned>

to serve electricity without overloads or outages in this scenario to meet federal reliability standards.

PSE determined that the two most critical parts of the Eastside grid are two large transformers that convert electricity at 230,000 volts to 115,000 volts, the voltage used by all existing transmission lines within the Eastside. To simulate the N-1-1 scenario, the Base Case is modified to remove these two transformers from service.

PSE apparently made two additional modifications to the WECC Base Case. First, the amount of electricity flowing to Canada was increased from 500 MW to 1,500 MW. Next, the company reduced the amount of power being produced by local generation plants from 1,654 MW to 259 MW. The rationale behind these modifications isn't obvious, and we were concerned how the regional grid (not just the Eastside) would perform with these assumptions in place.

To our surprise, simply increasing the flow to Canada to 1,500 MW while also serving peak winter power demand in the Puget Sound region was enough to create problems for the regional grid. The simulation software could not resolve these problems (Appendix E describes the problems in greater detail). While it's possible that PSE and Utility System Efficiencies found ways to work around these challenges by making additional changes to the Base Case, we do not know what these changes were. We are confident that prudent grid operators would reduce flows to Canada if an N-1-1 contingency occurs on the Eastside during heavy winter consumption. PSE would turn on every local generation plant. These responses resolve the problems. This is the more realistic scenario we modeled in our N-1-1 simulation.

The WECC Base Case uses default values for transformer capacity ratings that correspond to a "summer normal" scenario. The summer rating is reduced in order to protect transformers from overheating during hot summer weather. The "winter emergency" rating would be consistent with best engineering practice for equipment outages during very cold conditions (less than 23° F) that produce peak winter demand. We used this higher rating in our simulation.

# Results

## N-0 results

To compare the N-1-1 results with normal operation of the grid serving peak winter demand, we ran an N-0 study using the WECC Base Case for winter 2017-18 with the following modifications:

1. Energize Eastside transmission lines are reverted to present capacity.
2. Flow to Canada is reduced from 500 MW to 0 MW.
3. Transformers run at “winter normal” capacity.

Figure 1 shows load as a percentage of “winter normal” capacity on each of the four transformers.

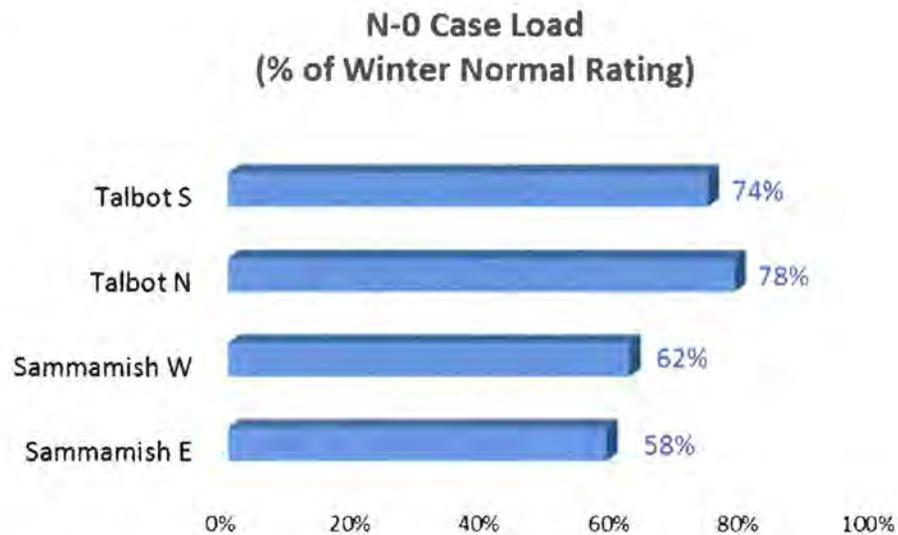


Figure 1: With all transformers in service, winter peak load causes no overloads.

### N-1-1 results

The N-1-1 results are based on the WECC Base Case for winter 2017-18 with the following modifications:

1. Two transformers are out of service.
2. Energize Eastside transmission lines are reverted to present capacity.
3. Flow to Canada is reduced from 500 MW to 0 MW.
4. Transformers run at “winter emergency” capacity.

Figure 2 shows that the remaining two transformers, Talbot N and Sammamish W, remain within “winter emergency” capacity ratings.

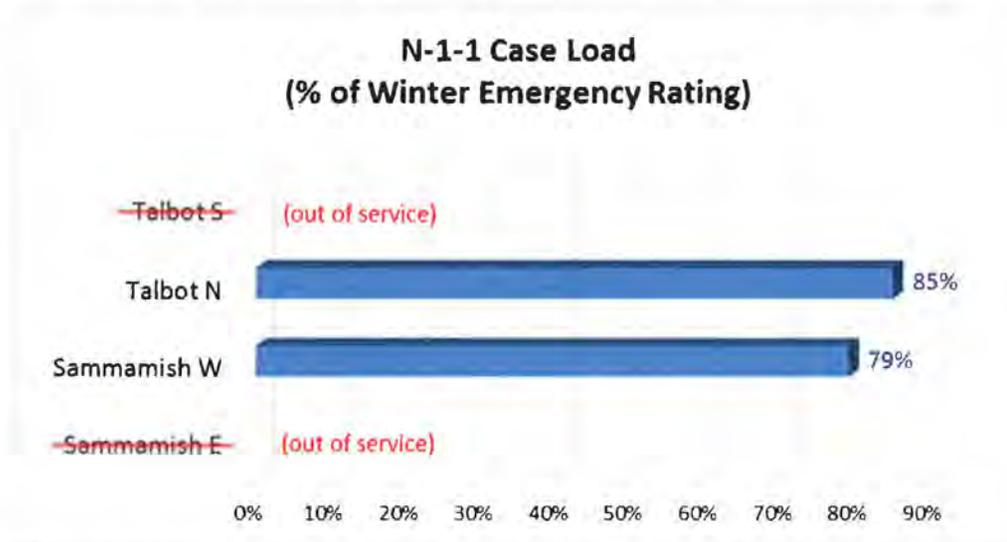


Figure 2: Loads on two remaining transformers are in a safe range.

# Analysis

We carefully analyzed the results of the N-1-1 simulation to get a broader view of how the grid is behaving in this scenario. Electricity is served by a combination of high-voltage transformers (transforming 230,000 volts to 115,000 volts) and low-voltage transformers (115,000 volts to 12,500 volts).

When we simulated failure of two high-voltage transformers located at Sammamish and Talbot Hill, as PSE did, we discovered that some of the load is redistributed to other high-voltage transformers in the Puget Sound area (see Figure 3). This is a natural adaptation of the networked grid that occurs without active management by PSE or other utilities. The regional grid has enough redundant capacity to balance the load without causing overloads on any transformer or transmission line in the region.

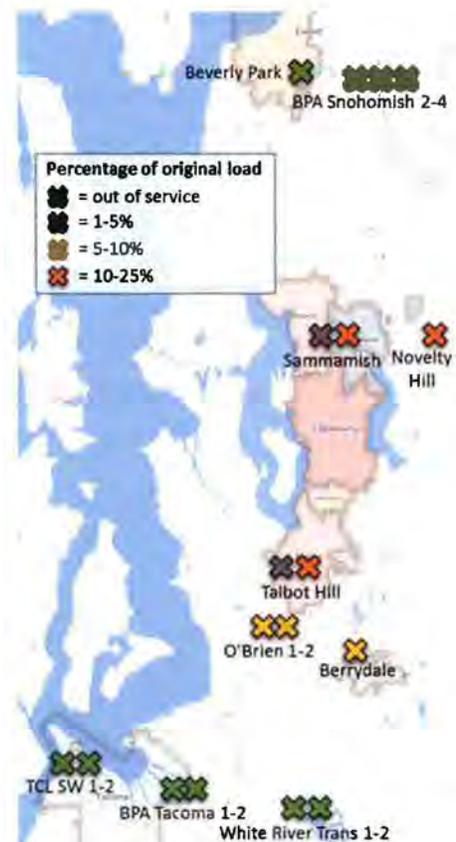


Figure 3: Load is distributed among other transformers after two transformers fail.

We conclude that the grid is capable of meeting demand in emergency circumstances in the winter of 2017–18. How soon after that will system capacity become strained?

Concerns about future capacity are illustrated in Figure 5, PSE’s demand forecast graph.<sup>2</sup> This graph raises several questions. For example, it’s not clear how PSE determined the “System capacity range” of approximately 700 MW. If this value is derived from the transformer capacities listed in the WECC Base Case, these capacities are set to default values corresponding to “summer normal” conditions.

PSE’s graph shows Customer Demand growing at an average rate of 2.7% per year. However, data submitted by PSE to WECC shows a growth rate of only 0.5% per year. An explanation of this discrepancy is necessary to understand this graph.

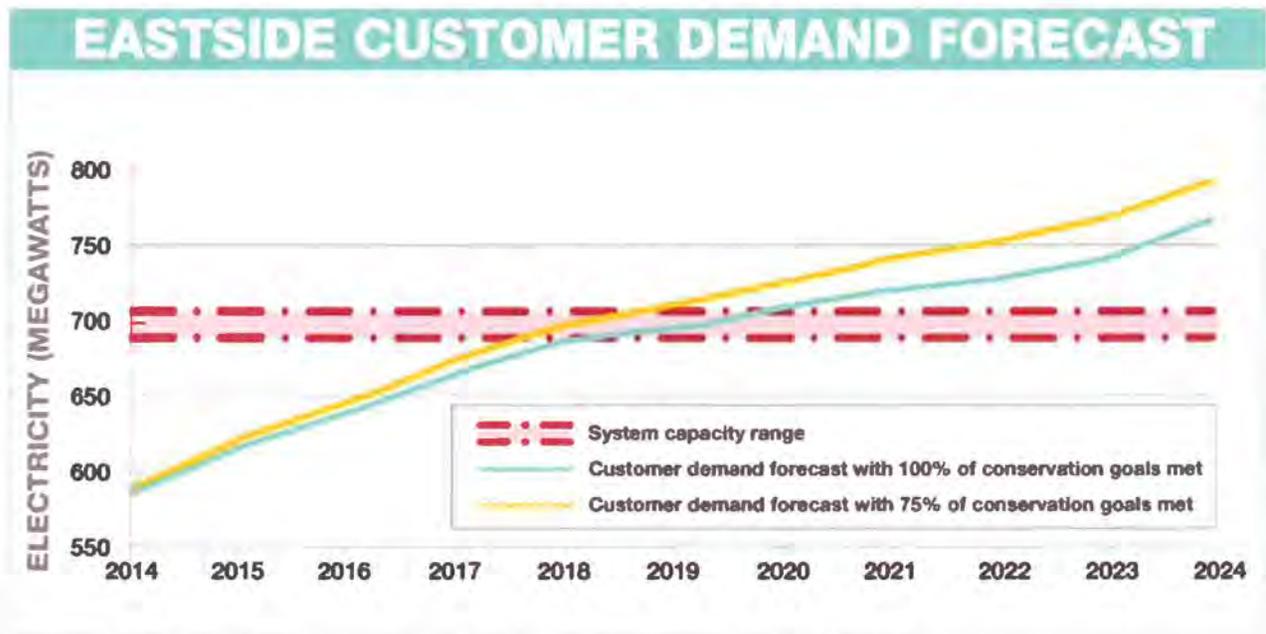


Figure 4: PSE’s graph shows customer demand exceeding system capacity in 2018.<sup>2</sup>

<sup>2</sup> <http://www.energizeeastside.com/need>

Although we don't have enough information to create a graph suitable for long-term planning, we feel Figure 5 is a better approximation of system capacity and demand growth on the Eastside.

The "System capacity" is based on "winter emergency" transformer ratings, which are more appropriate than summer ratings for this scenario. The higher ratings raise the overall capacity to approximately 930 MW.

The "Customer demand" line shown in Figure 5 is based on loads reported in the load flow simulation for the two remaining Eastside transformers. The 2014 value is higher than in PSE's graph, because these transformers serve loads outside the Eastside area. The growth rate matches the 0.5% rate observed in WECC Base Cases.

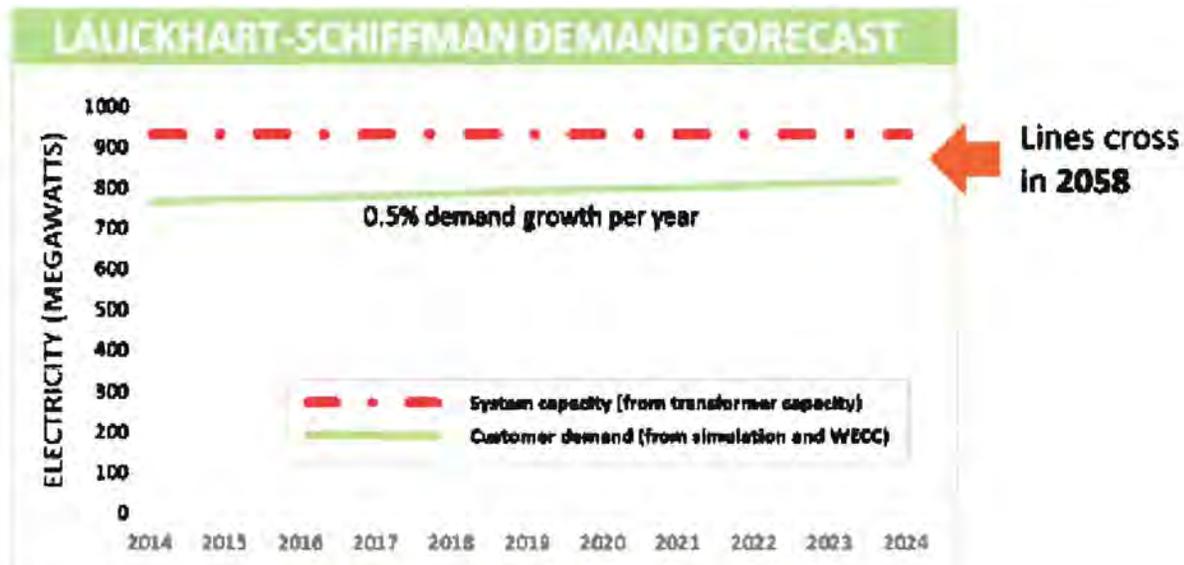


Figure 5: Alternative Demand Forecast shows slower demand growth and higher system capacity (based on "winter emergency" transformer ratings).

# Comparison with other studies

The conclusions of the Lauckhart–Schiffman study differ from previous studies. We stand by our conclusions and will share our models and results with anyone who has clearance from FERC.

Here we review the other studies and explain why their conclusions might differ from ours.

## **PSE/Quanta**

Two different load flow simulations were performed by PSE and Quanta, a consultant employed by PSE. We have the following concerns with both studies:

1. An unrealistic level of electricity is transmitted to Canada.
2. Nearly all of the local generation plants are turned off.
3. The appropriate seasonal ratings for the critical transformers were not used.
4. It's not clear how the customer demand forecast was developed, but there is an unexplained discrepancy between the forecast used for Energize Eastside (2.4% annual growth) and the forecast reported to WECC (0.5% annual growth).

The first two assumptions cause regional reliability problems for the WECC Base Case that must have required additional adjustments by PSE/Quanta. We don't know what those adjustments were.

## **Utility System Efficiencies**

The City of Bellevue hired an independent analyst, Utility System Efficiencies (USE), to validate the need for Energize Eastside. USE ran one load flow simulation that stopped electricity flow to Canada. According to USE, 4 of the 5 overloads described in the PSE/Quanta studies were eliminated, and the remaining overload was minor.

Our load flow simulation studied the same scenario (N–1–1 contingency with no flow to Canada and local generators running), but we did not find any overloads. We believe three assumptions explain the different outcomes:

1. USE does not specify what level of generation was assumed for local generation plants. In verbal testimony before the Bellevue

City Council, USE consultants said that they did not assume all of the capability of local generation was operating. Our study assumes these plants will run at their normal capacity.

2. USE says emergency ratings were used for the critical transformers, but it isn't clear if USE used "winter emergency" ratings. Our study assumes winter emergency ratings.
3. USE does not independently evaluate the customer demand forecast (2.4% annual growth is assumed). Our study assumes the load growth forecast that PSE provided to WECC.

We believe our assumptions more accurately reflect the actual conditions that would occur in this scenario.

### **Stantec Consulting Services**

In July 2015, the independent consulting firm Stantec was asked to review the studies done by PSE and USE. Stantec issued its professional opinion without performing any independent analysis or load flow simulations. Stantec says PSE's methodology was "thorough" and "industry standard." However, Stantec does not address the shortcomings we have identified with previous studies.

# Appendix A

## Clearance from FERC

Federal Energy Regulatory Commission  
Washington, DC 20426

SEP 01 2015

Letter of Release,  
Re: CEII No. CE15-130

**VIA CERTIFIED MAIL**

Richard Lauckhart



Dear Mr. Lauckhart:

This is in response to the July 15, 2015 request you submitted under the Federal Energy Regulatory Commission's (Commission or FERC) Critical Energy Infrastructure Information (CEII) regulations at 18 C.F.R. § 388.113(d)(4) (2015). Specifically, you requested a copy of the Puget Sound Energy, Inc. FERC Form No. 715, *Annual Transmission Planning and Evaluation Report*.

By letter dated August 21, 2015, the Commission issued a finding that you are a legitimate requester with a need for the information. In accordance with 18 C.F.R. § 388.112(e), the enclosed DVD contains the information requested and is being released to you subject to the non-disclosure agreement executed by you concerning this matter.

As provided by 18 C.F.R. § 388.113(d)(4)(iv) of the Commission's regulations, you may appeal this determination pursuant to 18 C.F.R. § 388.110. Any appeal from this determination must be filed within 45 days of the date of this letter. The appeal must be in writing, addressed to David L. Morenoff, General Counsel, Federal Energy Regulatory Commission, 888 First Street, NE, Washington, DC 20426. Please include a copy to Charles A. Beamon, Associate General Counsel, General and Administrative Law, at the same address.

Sincerely,

A handwritten signature in cursive script that reads "Leonard M. Tao".

Leonard M. Tao  
Director  
Office of External Affairs

Enclosure

## Appendix B

# Choice of Base Case

To perform a load flow study, one needs a database reflecting the physical characteristics of the power grid. FERC has recognized that stakeholders need to have access to a Base Case that reflects the system. Each utility or a designated agent is required to file power flow base cases with FERC on an annual basis.<sup>3</sup> WECC acts as a designated agent for most of the utilities operating in the western U.S. In an email dated November 19, 2015 Jens Nedrud, the Senior Program Manager for Energize Eastside, confirmed that PSE uses Base Cases filed by WECC as its Base Cases.

For the purposes of this study, Lauckhart and Schiffman obtained the 2014 WECC Base Cases from FERC.<sup>4</sup> These included 13 Base Case runs, four of which are Heavy Winter scenarios. In order to evaluate the need for the EE project, the heavy winter 2017–18 Base Case was modified so that the Energize Eastside project was not included.<sup>5</sup>

We do not know if this modified 2017–18 Base Case is identical to the one used by PSE to justify the project, because PSE has refused to share their 2017–18 Base Cases for independent review. The WECC Base Case assumes 500 MW is transmitted to Canada. PSE apparently increased that amount to 1,500 MW. The WECC Base Case assumes local generation in the Puget Sound Area is running at normal capacity. PSE appears to have reduced those contributions by 1,395 MW. Our PSLF modeling suggests that PSE's modifications are not feasible and grid operators would not allow these conditions to occur on a heavy winter load day.<sup>6</sup>

Load data from the WECC Heavy Winter Load 2017–18 Base Case is chosen as the basis for this study. This is the latest data provided by FERC/WECC for the winter of 2018. PSE was involved in the development of this Base Case along with other utilities including BPA and Seattle City Light (SCL). All utilities use these Base Cases to determine if the grid is capable of moving power from sources to loads. Further, it is the only data available in which there are identified loads on specific substations.

The loads on the main Eastside substations in the WECC Heavy Winter 2013–14 and 2017–18 Base Cases have been examined and analyzed. All of the Eastside substations were included:

Medina	Overlake	South Bellevue
Clyde Hill	Lochleven	Factoria
Bridle Trails	North Bellevue	College
Evergreen	Center	Phantom Lake
Ardmore	Midlakes	Eastgate
Kenilworth	Lake Hills	Somerset

The total load on these substations in the 2013–14 Base Case was 394.6 MW. The total load on these substations in the 2017–18 Base Case was 402.4 MW. This is a peak load growth of 2.0% over the 4 year period (an average increase of 0.5% per year). This is in line with predicted growth of energy and peak in King County.

PSE and USE appear to be extrapolating the higher growth rate of a few substations due to “block loads” and applying it uniformly to 600 MW of existing substation load. This simplification overestimates the overall growth rate. Furthermore, the total load on the substations listed above is only 400 MW. It is not clear how PSE arrived at a 600 MW load.

<sup>3</sup> <http://www.ferc.gov/docs-filing/forms/form-715/instructions.asp#General%20Instructions>

<sup>4</sup> On July 9, 2015 FERC provided Lauckhart the most recent WECC Base Cases that it had available to send to requesters. Those Base Cases were ones filed in 2014 by WECC.

<sup>5</sup> On Dec. 4, 2015 Lauckhart also received from FERC a copy of the 2015 WECC FERC Form 715 filing. In that filing there was no Base Case filed for the winter of 2018. However, there was a Base Case filed for the winter of 2020. A review of that 2020 Base Case showed very little growth on the Eastside from the 2018 Base Case. It also showed that the rest of the Northwest actually reduced their load forecast for the year 2020 over their forecast for 2018. In total, the loading on the eastside 230/115 KV transformers in the 2020 case were lower than the loading on the Eastside 230/115 KV transformers in the 2018 case. The trend is that the situation is not getting worse since the load forecasts for the northwest are dropping overall which also reduces loading on the Eastside 230/115 KV transformers.

<sup>6</sup> With no other changes to the WECC Base Case for the winter of 2018, increasing PNW to BC transfers to 1,500 causes the system to need to import more power across the Cascades from Central Washington. This causes the PSLF model run to fail to find a solution. When we say no solution, we mean the voltage in the Puget Sound region gets too low and the model cannot find a way to correct that.

# Appendix C

## Generation pattern used

PSE's gas-fired generation plants located in the Puget Sound area have a total rated capacity of 1,654 MW. How much of this capacity should be used to serve peak demand during a heavy winter load event? There are three choices:

1. The Eastside Needs Assessment prepared for PSE by Quanta assumed generation of only 259 MW, without explaining why such a low level was used.
2. The load flow study performed by USE also ran the plants at a reduced rate, but the study did not specify the exact amount.
3. Three of the four WECC heavy winter Base Cases assume the plants are running at their rated capacity of 1,654 MW. One of the Base Cases turns off one plant for reasons that are not clear, resulting in a lower level of generation at 1,414 MW.

The 1,654 MW capacity used by WECC in 3 of its 4 heavy winter Base Cases is a prudent choice for several reasons. First, PSE built and/or acquired these plants for the explicit purpose of meeting its load obligations during cold winter events. Second, PSE has a well-documented shortfall of generation capacity to serve peak demand, and it will be less risky and less expensive to run these plants than to buy power on the spot market. Third, because these plants generate electricity at 115 kV, the strain on PSE's overloaded 230/115 kV transformers would be reduced by increasing the supply of 115 kV electricity.

## Appendix D

# Exports to Canada

PSE and USE assume that 1,500 MW of power must be delivered to Canada, even if PSE is experiencing failure of two critical system components (an N-1-1 contingency) during heavy winter load conditions (temperatures less than 23° F in the Puget Sound region).

The WECC Base Cases assume otherwise. In the WECC Base Case for heavy winter 2013-14, 500 MW of power is flowing south from Canada to the U.S. In the WECC Base Case for heavy winter 2017-18, with the Energize Eastside project in place, 500 MW of power is flowing north to Canada, not 1,500 MW.

PSE and USE imply that it is the Columbia River Treaty that provides a Firm Commitment to deliver 1,500 MW of power to Canada. It is clear from reading numerous Treaty documents (e.g. the original treaty, the amendment to the treaty in 1999, and related documents) that the Treaty itself imposes no obligation on the United States to deliver Treaty Power to Canada. To the contrary, Canada has stated they do not want the Treaty Power delivered to Canada. Instead, PowerEx takes delivery of Canada's share of Treaty Power at the point of generation in the U.S. and delivers it for sale to U.S. entities. Canada finds it preferable to receive money for their share of Treaty Power rather than having the power delivered to Canada.

The reasonable assumption for this study is that no power will flow from the U.S. to Canada during a major winter weather event and simultaneous facility outages in the Eastside.

## Appendix E

# Regional grid capacity limitations

Most of the electrical generation facilities that serve the Puget Sound region are located east of the Cascade Mountains. The electricity they produce is transmitted to customers in the Puget Sound area through eleven major transmission lines known collectively as the “West of Cascades - North” (WOCN) transmission path.

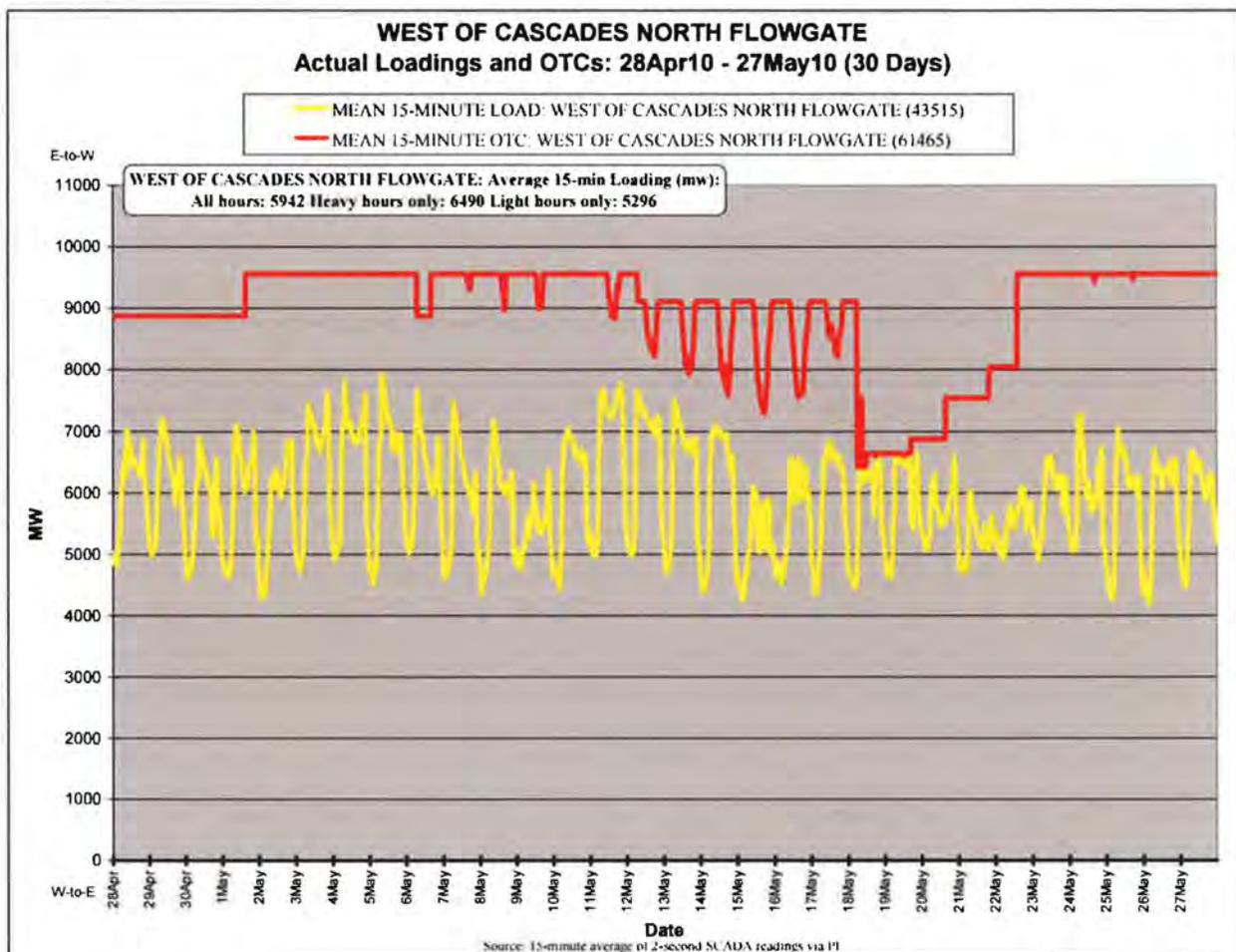


Figure 6: Chart from BPA shows load (in yellow) and maximum capacity (in red) for the WOCN path.

The exact transmission capacity of the WOCN path is confidential information which cannot be discussed in detail here. However, there is a report available on the web from the Bonneville Power Administration that discusses a problem that occurred on the WOCN path in May 2010.<sup>7</sup> On page 31, the report includes a chart showing loads and capacities

of the WOCN path over a 30-day period. The load (shown in yellow) varies from 5000–7000 MW and the path capacity (in red) varies from 7000–9000 MW.

During a heavy winter usage scenario, the loads are likely to be higher than during relatively mild weather conditions in May. PSE's assumptions for Energize Eastside would further increase the load. To deliver 1,500 MW to Canada, loads on the WOCN path would need to increase by approximately 1,000 MW. To make up for the loss of electricity that could have been generated by six local generation plants, an additional 1,400 MW must be transmitted on the WOCN path. In total, loads would increase by approximately 2,400 MW.

If the increased load exceeds the capacity of the WOCN path, grid operators and utilities would have to make adjustments like they did in May 2010. Some of these steps and consequences are described on page 40 of the BPA report:

“Many customers (e.g., TransAlta, Calpine, PSE, PGE) were not able to use low cost power purchases, and instead had to operate higher cost thermal projects that otherwise were idled or were out or planned for maintenance. Although there were multiple complaints regarding the ability to serve load, the basis for the complaints appeared to be economic or financial impacts.”

We feel that WOCN path capacity limits explain why the simulation software could not find a way to maintain voltage levels in the Eastside given PSE's assumptions. We conclude that it is not reasonable to build local infrastructure to support these conditions if regional infrastructure cannot reliably serve the implied loads.

<sup>7</sup> <http://pnucc.org/sites/default/files/BPAWOCNLessonsLearned.pdf>

# Appendix F

## Equipment ratings

Ambient temperature affects the capacity of electrical transmission facilities. Colder temperatures help avoid overheating. For this reason, it is industry standard practice to provide different ratings for summer and winter seasons.

It is also industry standard practice to allow higher loading of equipment, including transformers, during emergency events due to the fact that emergencies do not last long. Utilities can take advantage of the fact that transformers can safely handle brief over-peak conditions to reduce installation costs and maintain system reliability.

The WECC Data Preparation Manual requires transmission owners to provide the following ratings for its transformers:

- Summer Normal Rating
- Summer Emergency Rating
- Winter Normal Rating
- Winter Emergency Rating

### Relative transformer capacities



*Figure 7: Ratings for different scenarios, normalized to Summer Normal rating.*

PSE has indicated that the rating on the Sammamish and Talbot Hill transformers are approximately 352 MVA (Mega-volt amperes). According to the data that PSE provided to WECC, this is the Summer Normal Rating of these transformers. PSE has advised WECC that (a) its Winter Normal ratings are about 9% higher than Summer Normal, and (b) Winter Emergency Ratings are about 21% higher than Winter Normal Ratings.

When running the PSLF model, the run parameters must be set to point to the correct rating that has been provided in the data base. <sup>8</sup>

In the N-0 analysis, our load flow studies used the winter normal rating which is 9% higher than the 352 MVA summer normal rating.

In the N-1-1 analysis, our load flow studies used the winter emergency rating that is 21% higher than the winter normal rating.

## **Appendix G**

# **Summer load scenario**

Most of the load flow modeling done by PSE and USE to justify Energize Eastside has been focused on a winter peak load scenario. Recently, PSE has mentioned reliability concerns in the summer to provide additional motivation to build Energize Eastside. So far, PSE has refused to provide input data and results for both winter and summer scenarios.

We briefly reviewed the WECC Base Case for heavy summer demand in 2019. The peak load on Eastside substations is 281 MW in this scenario. This is 30% lower than the total load for heavy winter demand in 2017–18 (402 MW). The drop in transformer ratings due to summer heat is only 9%, so this scenario should be significantly less stressful on PSE's infrastructure than the winter scenario. Rapid growth in air conditioning is a concern, but if there is a summer need, then rooftop solar in Bellevue and other cities will be helpful and should be encouraged. Further study is warranted.

# **Appendix H**

## **Resumes**

## **J. Richard Lauckhart Energy Consulting**

J. Richard Lauckhart has 40 years of experience in power supply planning, electricity price forecasting and asset valuation. He began his career as a distribution engineer with Pacific Gas & Electric Co., and held various positions at Puget Sound Power & Light Co. (now Puget Sound Energy) in power supply planning, culminating as vice president of power planning.

For the last 12 years Mr. Lauckhart has performed consulting assignments related to power market analyses, price forecasting services, asset market valuation, integrated resource planning, transmission line congestion analysis, and management of strategic consulting engagements for clients in North America, including investor-owned and municipal utilities, independent power producers, and lenders.

Mr. Lauckhart received a bachelor of science degree in electrical engineering from Washington State University in 1971 and a masters degree in business administration from the University of Washington in 1975

### **Representative Project Experience**

#### *Black & Veatch September 2008 to October 2011 Managing Director*

Mr. Lauckhart oversees wholesale electricity price forecasting, project revenue analysis, consults regarding wind integration matters electric interconnection and transmission arrangements for new power projects, and other related matters in the electric power industry. In addition, he heads Black & Veatch's WECC regional power markets analysis team.

#### *WECC Power Market Analysis and Transmission Analysis, Henwood/Global Energy Decisions/Ventyx 2000 - 2008 Senior Executive*

Mr. Lauckhart oversaw wholesale electricity price forecasting, project revenue analysis, consulted regarding electric interconnection and transmission arrangements for new power projects, and other related matters in the electric power industry. In addition, he headed Global Energy's WECC regional power markets analysis team.

#### *Lauckhart Consulting, Inc. 1996 - 2000 President*

Primary client - Puget Sound Energy (formerly Puget Sound Power & Light Company): Involved in power contract restructuring, market power analysis, FERC 888 transmission tariffs, and other matters. Testified at FERC regarding Puget's 888 tariff. Testified for Puget in June, 1999 arbitration with BPA regarding transmission capability on the Northern Intertie.

#### *Northwest IPP*

Under retainer with IPP from July 1996 through December 31, 1999. Involved primarily in merchant power plant development activities including permitting activity, owner's engineer identification, environmental consultant identification, water supply

arrangement, transmission interconnection and wheeling arrangements, gas pipeline arrangements, economic analysis, forward price forecasting, marketing, and related issues.

### ***Levitan & Associates (Boston)***

Participated in teams involved in electric system acquisition activities. Performed preliminary analysis for a major retail corporation regarding possible participation as an aggregator in the California deregulated electric market. Involved in the evolving discussions about deregulation in the state of Washington including participant in HB 2831 report and ESSB 6560 report.

Member of advisory task force for Northwest Power Planning Council study of generation reliability in the Pacific Northwest. Participating writer in a newsletter advocating electric deregulation in the state of Washington.

### ***Puget Sound Power & Light Company***

***1991 – 1996***

#### ***Vice President, Power Planning***

Involved in all aspects of a \$700 million per year power supply for a hydro/thermal utility with a 4,600 MW peak and 2,200 aMW energy retail electric load. Included responsibility for a 22 person department involved in power scheduling (for both retail and wholesale power activity), power and transmission contract negotiation and administration, regulatory and NERC compliance, forward price forecasting, power cost accounting, and retail rate activity related to power costs. Activity included matters related to 650 MW of existing gas-fired, simple cycle combustion turbines. In addition, 660 MW of combined cycle cogeneration “qualifying facilities” were developed by others for Puget during this time frame. Detailed understandings of the projects were developed both for initial contractual needs and later for economic restructuring negotiations. Mr. Lauckhart was the primary person involved in developing Puget’s Open Access transmission tariff in accordance with FERC Order 888.

### ***Puget Sound Power & Light Company***

***1986 – 1991***

#### ***Manager, Power Planning***

The company’s key person in developing (1) a WUTC approved competitive bidding process for administering PURPA obligations, and (2) a WUTC approved regulatory mechanism for recovery of power costs called the Periodic Rate Adjustment Mechanism (PRAM).

### ***Puget Sound Power & Light Company***

***1981 – 1986***

#### ***Director, Power Planning***

The company’s key person in developing a power cost forecasting model that was customized to take into account the unique nature of the hydro generation system that exists in the Pacific Northwest.

### ***Puget Sound Power & Light Company***

***1979 – 1981***

#### ***Manager, Corporate Planning***

Responsible for administering the corporate goals and objectives program.

### ***Puget Sound Power & Light Company***

*1976 – 1979*

*Financial Planning*

Improved and ran a computerized corporate financial forecasting model for the company that was used by the CFO.

*Puget Sound Power & Light Company*

*1974 – 1976*

*Transmission Planner*

Performed transmission engineering to assure a reliable transmission system.

*Pacific Gas & Electric Company*

*1971 – 1974*

*Distribution Engineer*

Performed distribution engineering to assure a reliable distribution system.

## **Other Relevant Experience**

- Expert testimony for Montana Independent Renewable Generators related to avoided cost regulations and pricing filed February 2009 at the Montana PSC
- Expert Testimony for LS Power in the SDG&E Sunrise Proceeding regarding economics of in-area generation vs. the cost of transmission and imported power Spring 2007
- Expert Testimony for BC Hydro in the Long Term Resource Plan, February 2009 dealing with natural gas price forecasts and REC price forecasting
- Expert Testimony for John Deere Wind in a proceeding in Texas in November 2008 related to avoided costs and wind effective load carrying capability
- Expert Testimony for Two Dot Wind before the Montana commission regarding wind integration costs Spring 2008
- Expert Testimony in the BC Hydro Integrated Electricity Plan proceeding regarding WECC Power Markets. November 2006.
- Expert Testimony for Colstrip Energy Limited Partnership before Montana PUC regarding administration of QF contract prices. July 2006.
- Expert Testimony for Pacific Gas & Electric regarding current PURPA implementation in each of the 50 states. January 2006.
- Expert Testimony in CPUC proceeding regarding modeling procedures and methodologies to justify new transmission based on reduction of congestion costs (Transmission Economic Analysis Methodology – TEAM). Summer 2006.
- Expert Testimony for BC Hydro regarding the expected operation of the proposed Duke Point Power Project on Vancouver Island, January 2005
- Expert Testimony for PG&E regarding the cost alternative generation to the proposed replacement of steam generators for Diablo Canyon, Summer of 2004.
- Expert Testimony in an arbitration over a dispute about failure to deliver power under a Power Purchase Agreement, Fall 2004.
- Integrated Resource Plan Development. For a large investor-owned utility in the Pacific Northwest, Global Energy provided advanced analytics support for the development of a risk-adjusted integrated resource plan using RISKSYSM to provide a stochastic analysis of the real cost of alternative portfolios.
- Expert Testimony for SDG&E, Southern California Edison, and PG&E regarding IRPs, WECC markets and LOLP matters before the California PUC, 2003.

## **RICHARD LAUCKHART**

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- Miguel-Mission Transmission Market Analysis-San Diego Gas & Electric. San Diego Gas & Electric retained Global Energy to oversee an analysis of the economic benefits associated with building the Mission-Miguel transmission line and the Imperial Valley transformer. Global Energy performed an analysis of the economic benefits of the Mission-Miguel line, prepared a report, sponsored testimony at the CPUC, and testified at the CPUC regarding the report.
- Valley-Rainbow Transmission Market Analysis-San Diego Gas & Electric. San Diego Gas & Electric also engaged Global Energy to analyze the economic benefits associated with building the Valley-Rainbow transmission line and to respond to the CPUC scoping memo that “SDG&E should describe its assessment of how a 500 kV interconnect, like Valley-Rainbow, will impact electricity markets locally, regionally, and statewide.” Global Energy analyzed the economic benefits of the Valley-Rainbow line, prepared a report, sponsored testimony at the CPUC, and testified at the CPUC regarding the report.
- Damages Assessment Litigation Support. Global Energy was engaged by Stoel Rives to provide damages analysis, expert testimony and litigation support in for its client in a power contract damages lawsuit. Global Energy quantified the range of potential damages, assessed power market conditions at the time, and provided expert testimony to enable Stoel Rives’ client to prevail in a jury trial.
- Expert Testimony, Concerning the Economic Benefits Associated with Transmission Line Expansion. Testimony prepared on behalf of San Diego Gas & Electric Company, September 2001.
- Expert Testimony, Concerning market price forecast in support of Pacific Gas and Electric hydro divestiture case, December 2000.
- Expert Testimony, Prepared on behalf of AES Pacific regarding value of sale for Mohave Coal project to AES Pacific for Southern California Edison, December 2000.
- Expert Testimony, Prepared on behalf of a coalition of 12 entities regarding the impact of Direct Access of utility costs in California. June 2002.

Mr. Lauckhart was Puget’s primary witness on power supply matters in eight different proceedings before the Washington Utilities and Transportation Commission.

Mr. Lauckhart was Puget’s chief witness at FERC in hearings involving Puget’s Open Access Transmission Tariff and testified for Puget in BPA rate case and court proceedings.

# ROGER SCHIFFMAN

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## SUMMARY OF QUALIFICATIONS

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Mr. Schiffman has 23 years of energy industry experience covering utility resource planning, electricity market evaluation, market assessment and simulation modeling; regulatory policy development; economic and financial analysis, and contract evaluation. Mr. Schiffman has worked with public and private utility companies on resource planning decisions, power plant retirement decisions, avoided cost determinations, and on power supply procurement activity. Mr. Schiffman has worked extensively with electric utility staff, power plant developers, regulatory personnel, investment bankers and other industry participants in both consulting and regulatory environments. Mr. Schiffman possesses extensive financial analysis skills, supported by thorough knowledge of financial, economic and accounting principles. He has a strong technical understanding of the electric utility industry and excellent analytical problem-solving skills, including quantitative analysis and computer modeling techniques.

## EXPERIENCE

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*Principal, Black and Veatch Corporation, Inc., Sacramento, CA. March 2009 to October, 2015*

- Initiated Integrated Resource Plan for the Virgin Islands Water & Power Authority. This project is a multi-faceted IRP, where detailed planning and potential siting impacts must be considered in the overall planning, due to geographic and topology limitations on the islands. Mr. Schiffman directed the analysis and playing the lead analytic role in assessing resource needs. This included directing the data gathering efforts, taking technical lead in completing production cost and financial modeling, and managing Black & Veatch's team of technical experts. Mr. Schiffman also developed a stakeholder process and gave multiple presentations before stakeholder and customer groups.
- Completed nodal market simulation and congestion study for a concentrating solar plant in Northern Nevada. This engagement includes a review of transmission system impact studies, power flow data and development of a PROMOD nodal simulation database to assess congestion likelihood for the project.
- Completed economic assessment of a large pumped storage project in Southern California, including development of energy market arbitrage, capacity market and ancillary services market revenue forecasts. Developed pro forma financial statements examining economics of project under different ownership and off-take agreement structures.
- Completed Integrated Resource Plan for Azusa Light & Water, a municipal utility in southern California. This project involved using Black & Veatch's EMP database and price forecast, specifying thermal and renewable resource options, and completing detailed market simulation and financial modeling to determine a preferred power supply plan for Azusa. A key focus of the study is to identify resource options to replace output from the San Juan 3 coal plant, which is scheduled to retire.
- Completed Integrated Resource Plan for Pasadena Water & Power, a municipal utility in southern California. This project involved using Black & Veatch's EMP database and price forecast, specifying thermal and renewable resource options, and completing detailed market simulation and financial modeling to determine a preferred power supply plan for Pasadena. The project also included reflection of key stakeholder input, and testing stakeholder driven

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policy proposals for advancing renewable resource procurement beyond state-mandated RPS levels. A key focus of the study is to identify resource options to replace output from the Intermountain coal plant, which is scheduled to retire.

- Completed generation reliability study for the Brownsville Public Utility Board. This study included directing the completion of detailed reliability modeling using GE-MARS, and evaluating loss-of-load probabilities for BPUB based on its existing system and based on the addition of a 200 MW ownership share in the combined cycle power plant being developed in Brownsville by Tenaska. The study also included detailed pro forma modeling of partial ownership of the combined cycle plant, and a financial and risk assessment presented to BPUB's Board of Directors, and also used to address rating agency questions about credit impacts of the new power plant. On behalf of Southern California Edison, completed nodal power price forecast and assessment of high voltage transmission upgrades and additions in Southern California. This project included an assessment of congestion, locational marginal pricing, transmission system losses, and economic impacts of adding new transmission facilities in WECC, with particular focus on Southern California. PROMOD IV was used to complete the nodal market analysis, and PROMOD simulation results were translated into GE-PSLF for more detailed transmission system modeling of power flow cases under a variety of supply and demand conditions throughout the year.
- Completed four projects focused on nodal market modeling in California, Arizona and Southern Nevada. These studies were used to assess congestion risk faced by solar and wind generation projects at the sites where each is being developed. Completed PROMOD IV dispatch and nodal analyses for each project, and developed risk assessments for generation curtailment risk. Also developed analyses of transmission system congestion along delivery paths for each project, and on key economic transmission paths in Northern and Southern California, transmission import paths into Southern California, and transmission paths in Southern Nevada.
- Completed resource and power supply planning/procurement project for confidential SPP energy supplier. Completed a competitiveness assessment of major electricity supplier in Nebraska, examining cost structure, net resource position, generation asset characteristics, transmission access and delivery options, and overall competitive positioning of SPP, MISO and MRO entities that have potential to provide wholesale electricity service in Nebraska. Worked collaboratively with client and a wholesale customer task force
- Completed due diligence analysis of portfolio of power supply assets to support bid development. The generators being sold were located in SPP, WECC, and the Northeast. The WECC asset is a qualifying facility, which required detailed representation and modeling of the California PUC Short-Run Avoided Cost tariff and pricing formula. One of the SPP assets is also a qualifying facility, which required detailed analysis of the steam load and interaction between joint power and steam production. Completed modeling analysis and risk assessment of power supply agreements, developed revenue forecasts for each power plant, and completed merchant plant analysis of plant operations after PPA expiration.
- On behalf of a municipal utility client, developed database of renewable energy resource bids solicited through an RFP process, developed assessment of delivery terms and transmission tariffs associated with power delivery from distant resources, and completed bid screening analysis of 240 separate bids/pricing options.
- Completed PROMOD IV dispatch analysis and economic assessment of 6,000 MW portfolio of coal and natural gas-fueled resources operating in the Midwest ISO market region. Developed expected operations, cost, market sales and revenue forecasts for portfolio assets,

under several market scenarios. Prepared Independent Market Report for potential use in Offering Memorandum.

- Completed detailed review of California ISO ancillary services markets, and opportunity for renewable energy and energy storage markets to participate in those markets. Analysis included assessment of day-ahead, hour-ahead, and real-time market operation.
- Completed dispatch modeling and power supply planning study examining construction of a pumped storage hydro project in Hawaii. The evaluation included assessments of project revenue in energy, ancillary services, and capacity markets in Hawaii, expected dispatch and operation of the pumped storage project, and comparison of long-term power supply plans with and without addition of the pumped storage project.
- Completed deliverability and congestion analysis of wind energy resources being located in California. Developed nodal market simulations, and examined locational marginal price differences, congestion components, and transmission line loadings of facilities impacted by the wind assets being studied.
- Completed detailed financial and dispatch modeling (deterministic and stochastic) of energy storage project being developed in Southern California, to create dispatch profile and estimated long-term project value of the facility. The evaluation included assessments of project revenue in energy, ancillary services, and capacity markets in Southern California.
- Completed dispatch analysis and financial modeling of pumped storage hydro project in Colorado, for use in regulatory proceedings. The evaluation included assessments of project revenue in energy, ancillary services, and capacity markets in Colorado.
- Completed nodal power price forecast and assessment of high voltage transmission upgrades and additions in Southern California. This project included an assessment of congestion, locational marginal pricing, transmission system losses, and economic impacts of adding new transmission facilities in WECC, with particular focus on Southern California. PROMOD IV was used to complete the nodal market analysis, and PROMOD simulation results were translated into GE-PSLF for more detailed transmission system modeling of power flow cases under a variety of supply and demand conditions throughout the year.
- Completed PROMOD IV dispatch and economic analysis of Lodi Energy Center, with focus upon expected dispatch of the project, and its fit into the overall power supply portfolio of a Southern California Municipal Utility.
- Completed PROMOD IV dispatch analysis of a 100 MW biomass project in Florida, with focus upon expected dispatch and market revenue for the project in Florida wholesale power markets. Prepared Independent Market Report for use in financing construction of this project.
- Completed PROMOD IV market price forecasts and detailed analyses of power markets in all North American regions, including hourly energy price forecasts, annual capacity price forecasts, and detailed assessment of supply/demand conditions and generator dispatch. The assessments included forecasts of renewable energy development in each region/submarket, forecast greenhouse gas regulation, and economic assessment of fossil and renewable energy technologies.

*Vice President, Ventus, Inc., Sacramento, CA, June 2007 to March 2009*

- Managed project and led analysis for consortium of upper Midwest utilities focused on developing plans for long-term transmission expansion to ensure reliability in the region and to accommodate economic transfer of large-scale wind-based electricity generation. This project examined congestion, reliability and economic benefits associated with large-scale wind generation expansion in the upper Midwest, and accompanying needs for transmission system expansion. Evaluation was completed on both nodal and zonal basis.
- Assisted investor-owned utility in the upper Midwest in completing an economic transmission planning study consistent with FERC requirements. Provided guidance to client in establishing study framework, and in completing detailed technical evaluation of transmission upgrade projects. Provided assistance with stakeholder group interactions and debriefing.
- Conducted study for Western Area Power Administration examining economic impacts of wind project integration from new wind projects located on Native American lands. Worked with multi-party stakeholder group in completing study. Specific focus was upon power system modeling and economic evaluation of long-term costs and benefits of wind energy integration into the WAPA system.
- Developed projections of expected dispatch, revenue, and operating costs for new combined-cycle power plant under development in Southern California. Prepared financial projections under merchant plant and other likely economic scenarios. Completed evaluation of tolling agreement terms and conditions.
- Assisted Southern California energy supplier in completing due diligence analysis for investment and development of 300-500 MW wind generation project located in Central/Southern California. Reviewed due diligence documents and completed economic evaluation of expected revenue, operating costs and investment cash flows for the project at a range of capacities varying from 100 MW to 500 MW.

*Director, Navigant Consulting, Inc., Sacramento, CA, April, 2000 to June, 2007*

- Responsible for managing the price forecasting subpractice within Navigant Consulting's Energy Market Assessment group. Responsibilities included a wide variety of engagements focused on evaluating wholesale power market conditions. Completed market assessment and simulation studies of all North American regional power markets, including Canada and Mexico.
- Created and Developed NCI's PROSYM market simulation practice and capabilities in modeling WECC and Eastern Interconnected markets. Completed numerous market simulation and assessment engagements throughout the U.S. covering all North American market regions.
- With a team of consultants, assisting the California Energy Commission in defining and evaluating scenarios for its 2007 Integrated Energy Plan. Reviewing market simulation results from each of the scenarios and completing analysis of industry and consumer risks likely to be faced in California over the next decade (ongoing).
- Directed NCI's market simulation efforts as independent consultant to the State of California Department of Water Resources, leading to the successful underwriting of \$11 billion in bond financing and supporting the execution of power supply agreements aggregating to over 13,000 MW.

- Developed projections of lost revenue and operating profits due to construction delays at a large combined-cycle project in the Desert Southwest. Prepared evaluation of WECC power market conditions during the construction period for this project, and completed power market simulations used to measure likely dispatch, revenue and operating profits of the project during the construction delay period. Successfully presented and defended those estimates before an Arbitration Panel, resulting in a significant financial award for our client.
- Completed PJM Market simulations and led analytical support for recent financing of a large coal plant in PJM-West. Worked closely with investment banks and rating agencies in identifying and assessing cash flow risks to the project.
- Prepared carbon regulation risk assessment of a new coal plant being developed in Nevada, to evaluate long-term potential impacts on project costs. Evaluated ratepayer risks associated with this new project.
- Developed and maintained power market simulations to evaluate likely dispatch, costs, and spot market purchases and sales associated with the California Department of Water Resources purchased power contract portfolio. Results from these simulations have been used in each of the last five years to support CDWR's annual revenue requirement filing before the California Public Utilities Commission. Provide ongoing regulatory support to CDWR, including consultation and limited training of CPUC staff in power market modeling.
- Directed a number of nationwide market simulation and valuation engagements examining current market value of power plant portfolios owned by Calpine, Mirant, NRG and other independent power producers. Worked with bond investors to develop refined valuation estimates for subsets of each portfolio.
- Served on WECC's Power Simulation Task Force which was formed to assess available options for the WECC to procure, maintain and use a power market simulation database and model in its generation and transmission planning efforts. Participated in task force meetings where criteria were developed for selecting a simulation database and model, and assisted in evaluating proposals submitted to the WECC task force
- Performed power market simulations of Mexico, using NewEnergy Associates' MarketPower simulation model. Developed market price forecast and dispatch analysis of the Altamira II project under a variety of projected fuel market conditions. Results from these analyses were used by Senior Lenders to evaluate ongoing feasibility of the project under its financing terms. Annual updates were provided to the lenders.
- Assisted a California investor-owned utility in conducting RFP and in evaluating bids received for short-term and medium-term power supply contracts. Developed cost rankings, economic screening, risk assessment and preferred bid evaluations, and assisted the utility's planning and bid evaluation staff in presenting results to the company's senior management.
- Developed WECC market simulations and assessment of investment conditions for numerous clients used in feasibility analysis and financing support of new generation projects being developed in WECC markets. These analyses included separate evaluation of power market conditions in California, Mexico (Baja), Arizona, Colorado, Nevada, Oregon, Washington, British Columbia, and Alberta.
- Reviewed and verified long-term resource plans of a major investor-owned utility located in the Desert Southwest region. Conducted power market simulations of preferred and competing resource plans and developed relative ranking of results.

*Senior Consultant, Henwood Energy Services, Inc., Sacramento, CA, 1998 to 2000*

- Prepared numerous forecasts of wholesale market electricity prices using Henwood's proprietary market simulation tools. Drafted reports presenting price forecasts to consulting clients. Worked closely with clients and sponsors of new merchant power plants to provide customized market price forecasts and to serve individual client needs. Presented study results to clients and their constituents.
- Directed project evaluation and revenue forecast for major merchant power plant in Texas. Presented revenue forecast to investment bankers, and to several potential equity investors. Advised and worked with project developer to successfully obtain debt and equity financing for the project, which is currently under construction.
- Conducted economic study of market rules and entry barriers faced by developers of new merchant power plants in domestic electricity markets. Applied study results to specific conditions in Texas. Met with a variety of industry representatives in Texas including project developers, transmission service providers, power marketers, utility regulators and environmental regulators to gather market intelligence and develop study conclusions.
- Advised and worked with PricewaterhouseCoopers to perform economic evaluation and market simulations of proposed Purchase Power Arrangements under development in Alberta, Canada. The Power Purchase Arrangements are to be sold at auction in coming months. Prepared economic study of market power held by incumbent electricity suppliers in Alberta.
- Developed software and modeling tools to estimate investment cash flows and pro forma financial results for new merchant power plants. Developed Henwood approach for evaluating profitability of new market entrants and incorporating equilibrium amounts of new entry in its market studies.

*Senior Financial Analyst, Public Service Commission of Wisconsin, Madison, WI, 1990 to 1998*

- Developed policy proposals for restructuring wholesale and retail electricity markets. Evaluated competing policy proposals for impacts upon consumers and upon electrical system operation. Drafted formal electricity industry restructuring policy adopted by the Wisconsin Commission.
- Developed policies for addressing wholesale and retail market power in Primergy and Interstate Energy Corporation merger cases. Evaluated feasibility and corporate finance implications of asset divestiture and spin-off options for mitigating market power.
- Presented evaluation of proposed electric utility merger legislation to subcommittee of Wisconsin legislature. Advised individual legislators on merger policy.
- Developed policy proposal and draft legislation for reforming power plant siting law and for allowing development of new merchant power plants in Wisconsin.
- Directed industry-wide efforts to revise the PSCW generation competitive bidding procedures. Conducted workshops on proposed revisions for utility and other industry participants. Drafted policy reforms adopted by the Wisconsin Commission.
- Conducted primary economic and engineering analysis of power plant proposals submitted in generation competitive bidding cases. Prepared financial analyses of key contract terms and risks. Evaluated economic and engineering characteristics of bid proposals using production

cost and system expansion computer modeling. Recommended preferred projects to Wisconsin Commission.

- Completed numerous financial analyses of new stock and bond issuances by Wisconsin investor-owned utilities to evaluate investment risks and impacts upon the corporation. Drafted formal administrative orders authorizing each issuance.

*Research Assistant, University of Wisconsin, Madison, WI, 1989-1990*

- Co-authored and provided research support for study of consolidation and mergers in the electric utility industry.

## EDUCATION

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*University of Wisconsin-Madison*

- Graduate Studies toward MS-Finance, September 1988 - May 1990.
- Bachelor of Business Administration, Finance, Investment and Banking, May 1988.
- Curriculum concentrated heavily upon financial economics, with additional emphasis upon economics, mathematics, and accounting.

## PUBLICATIONS

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*Electric Utility Mergers and Regulatory Policy*, Ray, Stevenson, Schiffman, Thompson. National Regulatory Research Institute, 1992.

*The Future of Wisconsin's Electric Power Industry: Environmental Impact Statement*, co-author, Public Service Commission of Wisconsin, October 1995, Docket 05-EI-114.

*Report to the Governor on Electric Reliability*, co-author, Public Service Commission of Wisconsin, Summer 1997.

TESTIMONY

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Public Service Commission of Wisconsin, Docket 6630-UR-104, Wisconsin Electric Power Company Rate Case, 1990, "Rate of Return on Equity, Cost of Capital and Financial Condition."

Public Service Commission of Wisconsin, Docket 6690-UR-106, Wisconsin Public Service Corporation Rate Case, 1991, "Rate of Return on Equity, Cost of Capital and Financial Condition."

Public Service Commission of Wisconsin, Docket 4220-UR-105, Northern States Power Company (Wisconsin) Rate Case, 1991, "Rate of Return on Equity, Cost of Capital and Financial Condition."

Public Service Commission of Wisconsin, Rate of Return on Equity, Cost of Capital and Financial Condition, Wisconsin Electric Power Company, Docket 6630-UR-105, Public Service Commission of Wisconsin, 1991

Public Service Commission of Wisconsin, Docket 05-EP-6, Advance Plan 6, 1992, "Alignment of Managerial Interests and Incentives with Integrated Resource Planning Goals" (with Paul Newman).

Public Service Commission of Wisconsin, Docket 6680-UR-107, Wisconsin Power & Light Company Rate Case, 1992, "Rate of Return on Equity, Cost of Capital and Financial Condition."

Public Service Commission of Wisconsin, Docket 4220-UR-106, Northern States Power Company (Wisconsin) Rate Case, 1992, "Rate of Return on Equity, Cost of Capital and Financial Condition."

Public Service Commission of Wisconsin, Docket 6630-UR-106, Wisconsin Electric Power Company Rate Case, 1992, "Rate of Return on Equity, Cost of Capital and Financial Condition."

Public Service Commission of Wisconsin, Docket 05-EI-112, Investigation on the Commission's Own Motion Into Barriers to Contracts Between Electric Utilities and Non-Utility Cogenerators and Certain Related Policy Issues, 1992, "Contract Risk in Long-Term Purchase Power Arrangements."

Public Service Commission of Wisconsin, Docket 3270-UR-106, Madison Gas and Electric Company Rate Case, 1993, "Rate of Return on Equity, Cost of Capital and Financial Condition."

## TESTIMONY (CONTINUED)

Public Service Commission of Wisconsin, Docket 6630-CE-187, Wisconsin Electric Power Company, 1993, "Memorandum to Commission Presenting Economic Analysis of Competitively Bid Proposals for New Power Plants" (co-authored).

Public Service Commission of Wisconsin, Docket 6680-UR-108, Wisconsin Power & Light Company Rate Case, 1993, "Rate of Return on Equity, Cost of Capital and Financial Condition."

Public Service Commission of Wisconsin, Docket 4220-UR-107, Northern States Power Company (Wisconsin) Rate Case, 1993, "Rate of Return on Equity, Cost of Capital and Financial Condition."

Public Service Commission of Wisconsin, Docket 6630-CE-202, Wisconsin Electric Power Company Auburn to Butternut Transmission Line Case, 1994, "Economic Cost Comparison of Transmission Upgrade and Distributed Generation Wind Turbine Project."

Public Service Commission of Wisconsin, Docket 3270-UR-107, Madison Gas and Electric Company, 1994 "Rate of Return on Equity, Cost of Capital and Financial Condition."

Public Service Commission of Wisconsin, Docket 6690-CE-156, Application of Wisconsin Public Service Corporation for Authority to Increase Electric Generating Capacity (Stage One Competition Among Alternative Suppliers), 1994 & 1995, "Economic Analysis of Competitively Bid Power Plant Proposals" (with Paul Newman), "Contract Risk in Purchased Power Arrangements," "Accounting Treatment for Long-Term Purchased Power Contracts," "Contract Risk and Analysis of True-Up Mechanisms and Balancing Accounts."

Public Service Commission of Wisconsin, Docket 6630-UM-100/4220-UM-101, Wisconsin Electric Power Company/Northern States Power Company Merger Case, 1996, "Market Power Remedies; State/Federal Jurisdictional Issues."

Public Service Commission of Wisconsin, Docket 05-EP-7, Advance Plan 7, 1996, "Risk-Adjusted Discount Rates."

TESTIMONY (CONTINUED)

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Public Service Commission of Wisconsin, Docket 6680-UM-100, WPL Holdings/IES Industries/Interstate Power Merger Case, 1997, "Market Power Remedies; State/Federal Jurisdictional Issues."

Public Service Commission of Wisconsin, Docket 6630-UR-110, Wisconsin Electric Power Company Rate Case, 1997, "Rate of Return on Equity, Cost of Capital and Financial Condition."

Public Service Commission of Wisconsin, Docket 05-EP-8, Advance Plan 8, 1997, "Purchased Power Costs, Supply Planning Risks and Supply Planning Parameters."

North Dakota Public Service Commission, Docket No. PU-399-01-186, Montana-Dakota Utilities Co., 2000 Electric Operations Annual Report (Commission Investigation of Excess Earnings), February, 2002, "Wholesale power market conditions in the upper midwest, and the impact on the level and profitability of off-system sales for Montana-Dakota Utilities Co."

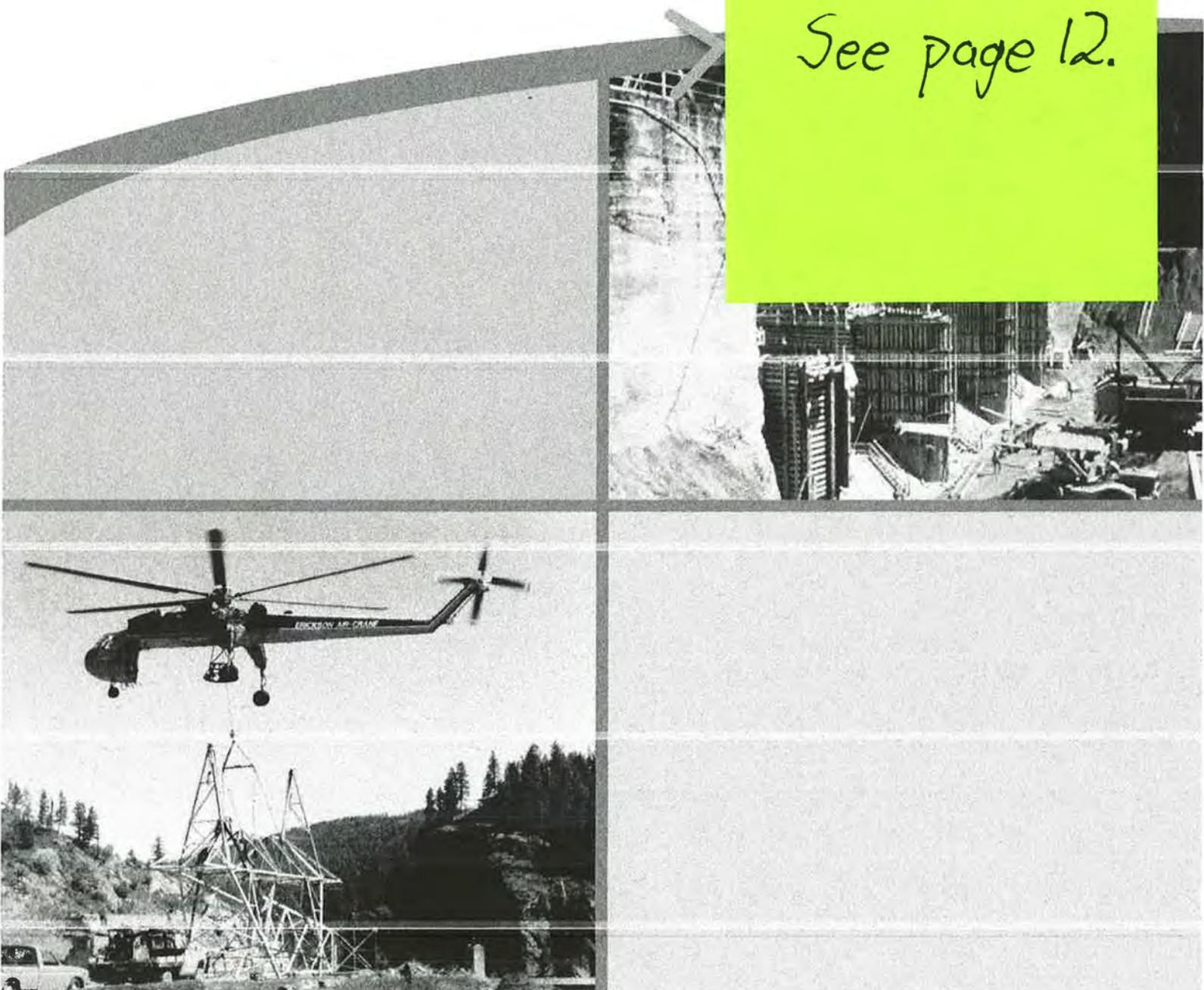
California Public Utilities Commission, Rulemaking 02-01-011 Implementation of the Suspension of Direct Access Pursuant to Assembly Bill 1X and Decision 01-09-0. June, 2002. "Rebuttal Testimony of Roger Schiffman on behalf of the California Department of Water Resources: Market modeling issues."

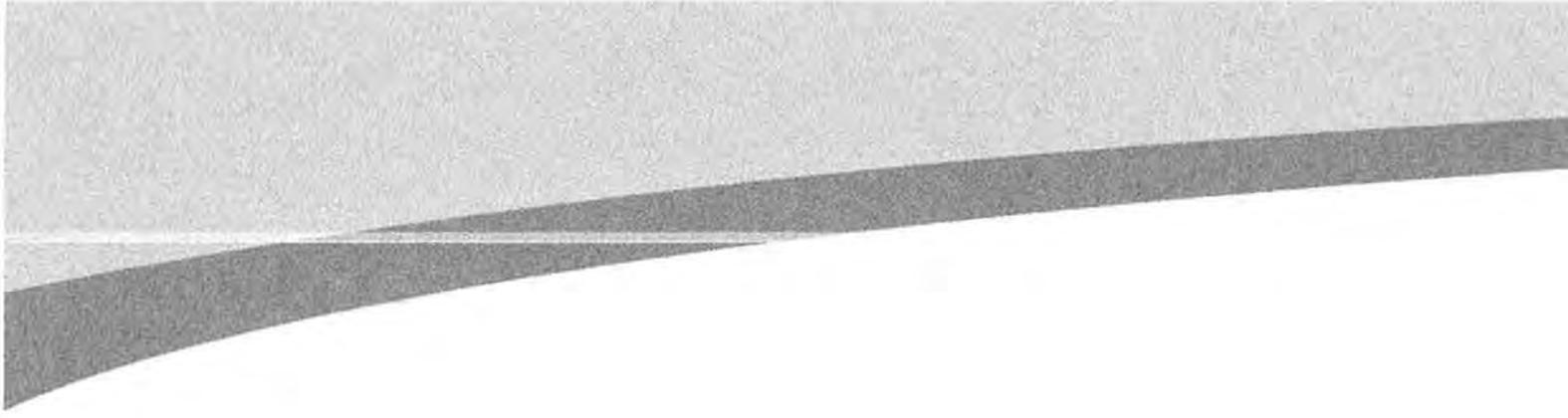
Washington DC Arbitration Panel, "Estimate of lost energy sales and lost revenue due to construction delay" for two new combined cycle projects that were built in Michigan and Arizona markets, January-February, 2006.



# 2013 System Assessment

See page 12.





Copies of this report are available from:  
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July 2013

*Photos provided by: Bonneville Power Administration, Grant County PUD, NW Power and Conservation Council, Seattle City Light, Chelan County PUD, iStock Photo, Douglas County PUD, Cowlitz County PUD*



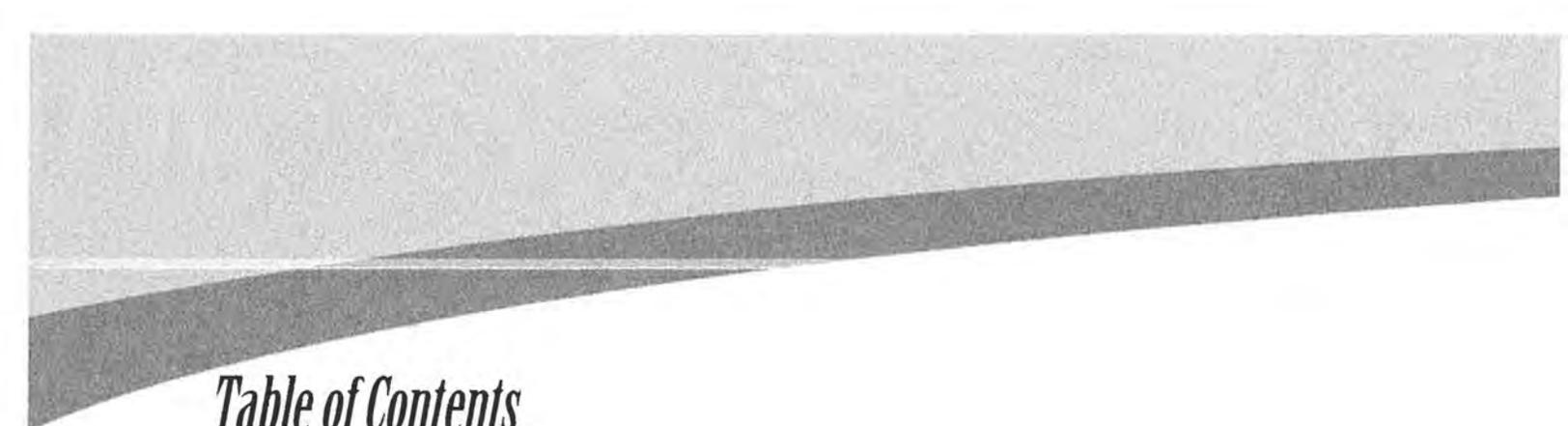
# *Acknowledgements*

## **ColumbiaGrid Members & Participants**

Avista Corporation  
Bonneville Power Administration  
Chelan County PUD  
Cowlitz County PUD  
Douglas County PUD  
Grant County PUD  
Puget Sound Energy  
Seattle City Light  
Snohomish County PUD  
Tacoma Power  
Enbridge (MATL LLP)

## **Other Contributors**

Idaho Power Company  
Northern Tier Transmission Group  
Northwest Power and Conservation Council  
Northwest Power Pool  
NorthWestern Energy  
PacifiCorp  
Portland General Electric



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*\*\*Critical Electrical Infrastructure Information (CEII) protected documents are available upon request in accordance with ColumbiaGrid CEII policies at (<http://www.columbiagrid.org/basecases-results-documents.cfm>)*

## *Executive Summary*

ColumbiaGrid was formed in 2006 to improve the operational efficiency, reliability, and planned expansion of the Northwest transmission grid. ColumbiaGrid's Planning and Expansion Functional Agreement (PEFA) was developed to support and facilitate multi-system transmission planning through an open and transparent process. The Federal Energy Regulatory Commission (FERC) accepted the agreement April 3, 2007, noting support for ColumbiaGrid's effort to coordinate planning on a regional basis and to implement a single utility planning process for both public utility and non-public utility transmission providers. Eleven parties have signed the PEFA. Any interested person can participate in ColumbiaGrid's open planning process.

A significant feature of ColumbiaGrid's planning process is its single utility planning approach. The plan is developed as if the region's transmission grid were owned and operated by a single entity. This approach results in a more comprehensive, efficient, and coordinated plan than would otherwise be possible if each transmission owner completed a separate independent analysis.

The primary product of the ColumbiaGrid Planning process is the ColumbiaGrid Biennial Transmission Expansion Plan that looks out over a ten-year planning horizon and identifies projected transmission needs. ColumbiaGrid has produced three Biennial Transmission Expansion Plans that were approved by the ColumbiaGrid Board of Directors in February 2009, February 2011 and February 2013. Updates to the 2009 and 2011 plans were also produced and approved by the ColumbiaGrid Board of Directors in February 2010 and 2012, respectively.

The foundation for the Biennial Transmission Expansion Plan is the ColumbiaGrid System Assessment, which is an evaluation of whether or not the planned transmission grid can meet established reliability standards. Any deficiencies in meeting these standards are noted in the System Assessment and then addressed either by the Transmission Owners themselves or through ColumbiaGrid Study Teams.

A ColumbiaGrid System Assessment is completed each year. In completing the assessment, ColumbiaGrid develops comprehensive computer models to test the adequacy of the grid under a wide variety of future system conditions. The



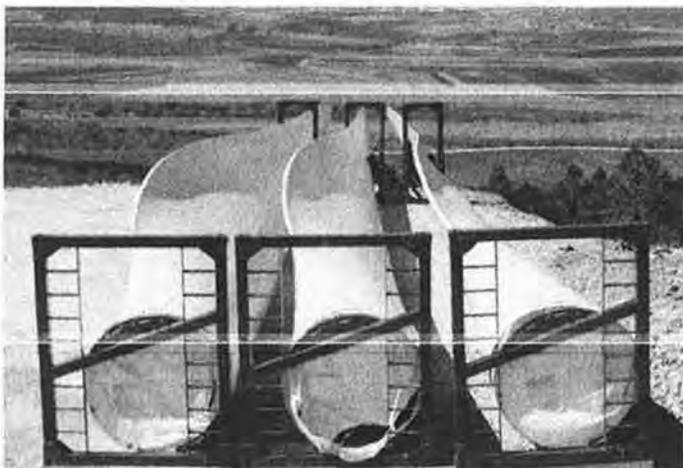
work also entails compiling forecasts for loads, resources, and transmission facilities, which are key assumptions that form the basis for the power flow models studied. ColumbiaGrid used the output of the modeling to gauge the performance of the transmission system. The results were compared to standards adopted by the North American Electric Reliability Corporation (NERC), the Western Electricity Coordinating Council (WECC), and the individual transmission system owners.

In completing this assessment, the study participants held numerous full-day meetings and conference calls. A typical meeting had 30 or more participants. ColumbiaGrid planning engineers developed the series of power flow models that were used in the assessment from standard WECC base cases. These cases were modified to correct errors, update the system topology, and to more precisely model the system conditions of interest. The transmission system modeled in these studies is based on the ColumbiaGrid Ten-Year

Plan which is shown in Table C-1. The projects in this list include only those that utilities have made a firm commitment to build in the planning horizon. This typically means that they are under construction or the utilities have, or soon will have, budget approval. Some of these projects may be pending permitting approval.

Using these cases, the planning engineers simulated contingencies, documented cases where the system performance did not meet the standards, coordinated the review of each of these potential violations, and recommended further analysis and/or formation of a ColumbiaGrid Study Team to develop plans to mitigate the problems identified. ColumbiaGrid included a high-level assessment of non-transmission alternatives where viable to address potential violations such as load tripping, redispatch, etc.

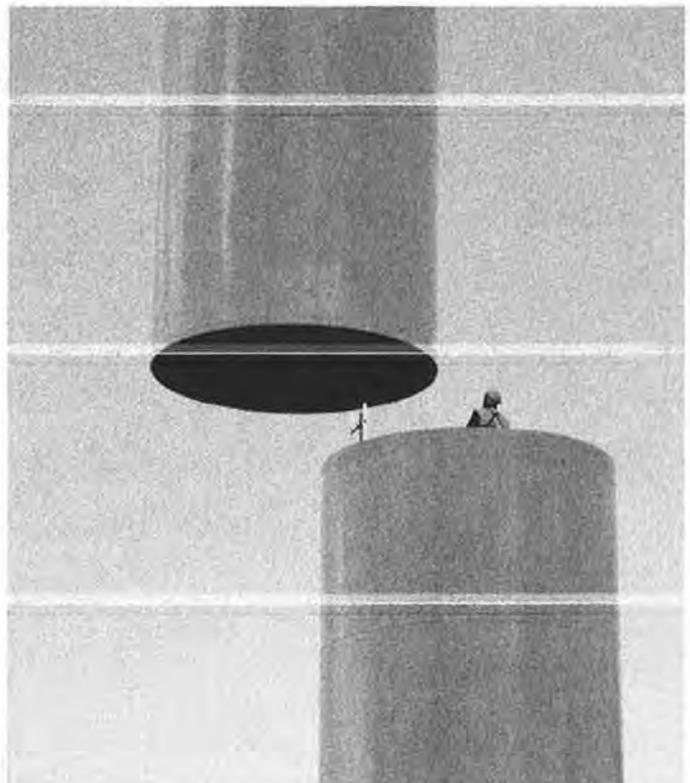
All of the facility overloading conditions on 115 kV and above facilities were identified for

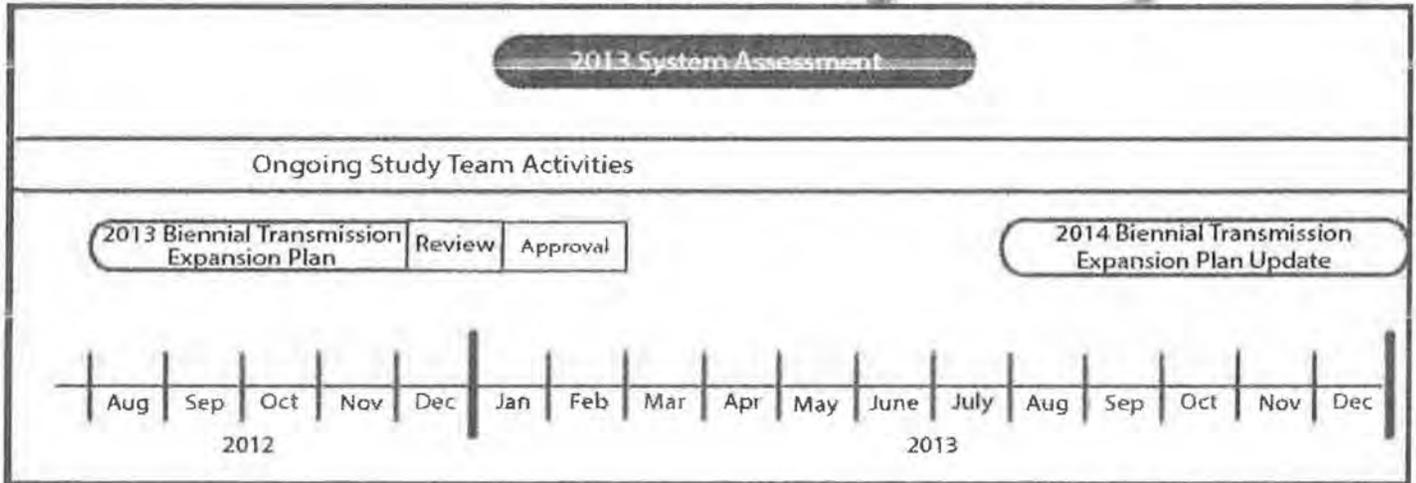


resolution. All 230 kV and above stations with voltage excursions following contingencies that exceeded the WECC criteria of a 5% change for a Category B contingency (single contingency) or 10% for a Category C contingency (double contingency) were identified and mitigation was proposed. Voltage violations on lower voltage facilities were left to the individual facility owners to mitigate. Table G-1 shows the interim mitigation for addressing the voltage violations identified at 230 kV and above.

3 The initial assessment results identified several areas of concern. Areas of concern were identified for those areas that would require planning decisions within the next planning cycle. For areas that only affect a single transmission owner, it is left to that owner to develop the final mitigation plans. For violations that affect more than one ColumbiaGrid member, a ColumbiaGrid study team may be formed to develop the final mitigation. The final mitigation for these areas of concern will be included in the next Biennial Transmission Expansion Plan Update, which will be completed in early 2014.

As discussed in the Study Results section of this report, 12 areas of concern were identified that affect more than one utility system. One of the areas is related to Northern Intertie transfer issues and can be addressed through the existing Puget Sound Area Study Team. The remaining areas have ongoing study efforts among the utilities or involve only one ColumbiaGrid member. These study efforts will be monitored to determine if a ColumbiaGrid Study Team is needed for resolution.





**Figure B-1: Process Timeline**

## ***Introduction***

ColumbiaGrid was formed with seven founding members in 2006 to improve the operational efficiency, reliability, and planned expansion of the Northwest transmission grid. Eleven parties have signed ColumbiaGrid’s Planning and Expansion Functional Agreement (PEFA) to support and facilitate multi-system transmission planning through an open and transparent process.

One of the primary activities outlined under PEFA is the development of a Biennial Transmission Expansion Plan that looks out over a ten-year planning horizon and identifies projected long-term firm transmission needs on the systems of parties to the agreement.

A significant feature of the ColumbiaGrid Biennial Transmission Expansion Plan is its single-utility planning approach. The Biennial Transmission Expansion Plan is being developed as if the region’s transmission grid were owned and operated by

a single entity. This approach results in a more comprehensive, efficient, and coordinated plan than would otherwise be developed if each transmission owner completed a separate independent analysis.

PEFA requires that “ColumbiaGrid, in coordination with the Planning Parties and Interested Persons, shall perform a System Assessment through screening studies of the Regional Interconnected Systems using the Planning Criteria to determine the ability of each (Party’s system) to serve, consistent with the Planning Criteria, its network load and native load obligations, if any, and other existing long-term firm transmission service commitments that are anticipated to occur during the Planning Horizon.” The assessment is required to be completed annually.

The ColumbiaGrid System Assessment described in this report was designed to meet those requirements. It is the first phase of the Biennial

Transmission Expansion Planning process. The System Assessment process timeline is shown in Figure B-1. As with other ColumbiaGrid activities, the assessment was conducted in an open process. (See the sidebar below for further information.)

This ColumbiaGrid 2013 System Assessment Report describes an evaluation of the transmission grid. The assessment began with developing comprehensive computer models to test the adequacy of the planned grid under a wide variety of system conditions. This included forecasts for loads, resources, and transmission facilities, which are key assumptions and the building blocks for the cases that were analyzed.

For the assessment, ColumbiaGrid Planning engineers gauged the performance of the system using these models, and the results were compared to standards adopted by the North American Electric Reliability Corporation (NERC), the Western Electricity Coordinating Council (WECC), and individual transmission system owners.

The NERC, WECC, and owner-adopted standards require that the system be able to continue to function within a specific range of voltages and with transmission loading below facility ratings under a wide variety of operating conditions. These operating conditions include events such as a loss of a transmission line and/or substation facility and various weather patterns.

ColumbiaGrid's planning engineers studied thousands of contingencies using computer simulations for each of the base case models to complete the System Assessment. In cases where the system performance did not meet NERC, WECC, and owner standards, ColumbiaGrid recommended a strategy to resolve the problem. These strategies include further analysis, sensitivity studies or the formation of a ColumbiaGrid Study Team charged with developing plans to mitigate the identified system performance concern.

\*\*\*\*\*

5 At the outset, notice of the System Assessment was sent to the ColumbiaGrid 'Interested Persons' list. The process for the assessment was developed and implemented in an open and transparent manner, and meetings were open to all interested participants. The results of the assessment studies were analyzed in a joint effort by all participating entities.

Meeting materials were posted on the ColumbiaGrid website, except when information was determined to be Critical Energy Infrastructure Information (CEII). CEII was made available through a password protected area on the website and access was granted to participants upon request. To acquire a password and access CEII data, entities were required to sign and comply with ColumbiaGrid Non-disclosure and Risk of Use Agreements. In compliance with WECC requirements, WECC base cases were only available to WECC members through the password-protected portion of the ColumbiaGrid website.



## Ten-year Plan

The ColumbiaGrid Ten-Year Plan comprises a list of projects planning participants are committed to build in the coming years to address known transmission deficiencies. The projects in the ten-year plan fill a variety of needs such as serving load, integrating new resources, or facilitating economic transfers. To be included in the plan, the projects need to be committed projects that are typically in the permitting, design, or construction phases. The projects in the plan may have been generated in a variety of forums such as earlier System Assessments, studies completed by the study teams, or individual planning participant studies. ColumbiaGrid's Ten-Year Plan is shown in Figure C-1 and Table C-1. More detailed information for each of the projects is provided in Attachment B of this report. Changes in this Plan from the prior plan are also noted along with estimated costs for the ColumbiaGrid member projects.

The following are the major projects that comprise the Ten-year Plan:

- Big Eddy-Knight 500 kV line which provides additional transmission capability to move renewable resources in the Gorge area to load centers.
- Ponderosa 500/230 kV transformer which provides additional transformer capacity for the Central Oregon area.
- Raver 500/230 kV transformer which provides additional transformer capacity for the greater Puget Sound area.
- Douglas-Rapids-Columbia 230 kV line which provides additional transformation in the east Wenatchee area along with additional transmission capability.
- Columbia-Larson 230 kV line which provides addition transmission capability to the Moses Lake area.
- Lakeside 230/115 kV transformer and conversion of Sammamish-Lakeside-Talbot line to 230 kV which provides additional transformer capacity for the Bellevue area and additional transmission capability through the Puget Sound area.
- Beverly Park 230/115 kV transformer which provides additional transformer capacity for the Everett area.
- The Montana-Alberta Transmission Line (MATL) which provides transmission capability between Montana and Alberta to move renewable resources.
- Moscow 230 kV Substation Rebuild and Transformer Replacement which upgrades an aging substation and provides additional transformer capacity.
- Westside 230 kV Substation Rebuild and Transformer Replacement which upgrades an aging substation and provides additional transformer capacity in the Spokane area.
- Castle Rock-Troutdale 500 kV line (I-5 Corridor) which provides additional transmission capability between the Puget Sound and Portland load areas.

**Table C-1: ColumbiaGrid Ten-Year Plan**

	<b>Project Name</b>	<b>Sponsor</b>	<b>Date</b>	<b>Change from Last Plan</b>	<b>Estimated Cost</b>
A1	Moscow 230 kV Substation Rebuild and Transformer Replacement	Avista		Delayed	\$10 Million
A2	Benton-Othello 115 kV Line Upgrade	Avista		Delayed	\$10 Million
A3	Westside 230 kV Rebuild and Transformer Upgrades	Avista		Delayed	\$15 Million
A4	Irvin Project - Spokane Valley Transmission Reinforcements	Avista		Delayed	\$5 Million
A5	Lancaster Combustion Turbine Project Integration	Avista	2013		\$3 Million
A6	Bronx - Cabinet 115 kV Line Rebuild	Avista	2016	Delayed from 2015	\$10 Million
B1	Big Eddy - Knight 500 kV line and Knight Substation	Bonneville Power	2014-15		\$124 Million
B2	Fairmount Backtripping Scheme	Bonneville Power	2013		\$0.9 Million
B3	Ponderosa 500/230 kV #2 Transformer Addition	Bonneville Power	2013		\$19.5 Million
B4	Ostrander Breaker Addition	Bonneville Power	2014		\$2.4 Million
B5	Cascade Rock - Troutdale 500 kV line (1.5 Conductor Reinforcement Project)	Bonneville Power	2018		\$342 Million
B6	Lower Valley Reinforcement - Hooper Springs	Bonneville Power	2015	Delayed from 2014	\$48 Million
B7	Pearl 500 kV Breaker Addition	Bonneville Power	2016		\$17 Million
B7	Pearl 230 kV Bus Section Breaker	Bonneville Power	2017		\$1.5 Million
B8	Franklin 115 kV Capacitors (52 MVAR)	Bonneville Power	2014		\$3.7 Million
B9	Monroe 500 kV Capacitors	Bonneville Power	2014		\$5.6 Million
B10	Columbia Falls 230 Bus Reliability Improvements	Bonneville Power	2013		\$1 Million
B11	Alvey 500 kV Shunt Reactor	Bonneville Power	2014		
B12	John Day - Big Eddy 500 kV #1 line reconductor	Bonneville Power	2016		\$6 Million
B13	Keeler 230 kV Bus Reliability Improvements	Bonneville Power	2014		\$2.6 Million
B14	Raver 500/230 kV Transformer, 230 kV line to Covington Substation	Bonneville Power	2016		\$45 Million
B15	Longview - Lexington 230 kV Line Retermination into Longview Annex	Bonneville Power	2015		\$2 Million
B15	Longview 115 kV Bus Section Breaker	Bonneville Power	2013	New project	\$1 Million
B16	East Omak 115 kV Shunt Capacitors (28 MVARs)	Bonneville Power	2013	New project	\$0.9 Million
B17	Big Eddy 230/115 kV Transformer #1 Replacement	Bonneville Power	2015		
B17	Leila Terminal Replacement (PLC) upgrade (320 MW)	Bonneville Power	2016		\$450 Million
B18	McNary 230 kV Shunt Capacitors (2x150 MVAR banks)	Bonneville Power	2013		\$5.7 Million
B19	Rogue Static VAR Compensator	Bonneville Power	2013	Completed	\$9 Million
B20	Paul 500 kV Shunt Reactor	Bonneville Power	2017	Delayed from 2016	\$6 Million
B21	Split Pearl-Sherwood 230 kV Line Upgrade	Bonneville Power	2017-18		\$1.5 Million
B22	Split McLoughlin-Pearl-Sherwood 230 kV Lines	Bonneville Power	2017-18		\$1.5 Million
B23	Salem - Chemawa 230 kV Line Upgrade	Bonneville Power	2014-15	Moved up from 2016	\$1 Million
B24	Tussock River 115 kV Shunt Capacitors (2x15 MVARs)	Bonneville Power	2013		\$2 Million
B25	Troutdale 230 kV Bus Section Breaker	Bonneville Power	2018		\$1 Million
B25	North Bonneville - Troutdale 230 kV #2 Line Retermination	Bonneville Power	2015		\$2 Million
B26	Walla Walla - Pendleton 69 kV Line Upgrade	Bonneville Power	2014	New project	\$2.1 Million
B27	LaPine Reactive (19 MVAR Cap, 40 MVAR reactor)	Bonneville Power	2014		\$3.3 Million
B28	Bell 230 kV Bus Section Breaker	Bonneville Power	2015		\$1 Million
B29	Kaispell 115 kV Shunt Capacitors (2x16 MVARs)	Bonneville Power	2014		\$3.1 Million
B30	Schultz - Raver 500 kV Series Capacitors	Bonneville Power	2017-18		\$35 Million
B31	White Bluffs 115 kV Shunt Capacitors (39 MVARs)	Bonneville Power	2013		\$2 Million
B32	Tacoma 230 kV Bus Section Breaker	Bonneville Power	2016		\$1.5 Million
B33	Sappho 69 kV Shunt Capacitors (10 MVARs)	Bonneville Power	2017	New project	\$0.6 Million
CH1	McKenzie - Andrew York 115 kV #1 and #2 line Rating	Cheban County PUD	2013		\$0.5 Million
CO1	Longview - Lexington #2 upgrade from 69 kV to 115 kV	Cowlitz County PUD	2014-16		\$4.9 Million
CO1	Longview - Lexington - Cardwell upgrade from 69 kV to 115 kV	Cowlitz County PUD	2015-17		\$10.1 Million
CO2	South Cowlitz County Project	Cowlitz County PUD	2017-19	New project	\$7.7 Million
D1	Douglas - Rapids 230 kV line and Rapids 230/115 kV Substation	Douglas County PUD	2013		\$17 Million
D2	Rapids - Columbia 230 kV line and Columbia Terminal	Douglas County PUD	2015		\$14 Million
G1	Columbia - Larson 230 kV line	Grant County PUD	2014		\$42 Million
G2	Rocky Ford - Dover 115 kV line	Grant County PUD	2016		\$5 Million
I1	Hemingway - Boardman 500 kV line	Idaho Power/BPA	2018		\$820 Million

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PG1	Blue Lake - Gresham 230 kV line	Portland General Electric	2017		
PS1	Alderton 230/115 kV transformer in Pierce County	Puget Sound Energy	2015		\$28 Million
PS2	St. Clair 230/115 kV Transformer in Thurston County	Puget Sound Energy	2013		\$30 Million
PS3	Lakeside 230/115 kV Transformer and Sammamish-Lakeside-Talbot line rebuild to 230 kV	Puget Sound Energy	2017		\$70 Million
PS4	Starwood Autotransformer Removal	Puget Sound Energy	2013		\$1 Million
PS5	Woodland - Gravelly Lake 115 kV Line	Puget Sound Energy	2015		\$13 Million
PS6	Portal Way 230/115 kV Transformer #2 and Line Upgrades	Puget Sound Energy/BPA	2018	Delayed from 2016	\$25 Million
SC1	Bothell - Snoking 230 kV Double Circuit Line Reconductor	Seattle City Light/BPA	2016		\$3 Million
SC2	Series Inductors on Massachusetts - Union - Broad and Denny - Broad 115 kV Underground Cables	Seattle City Light	2016		\$13 Million
SC2	Denny Substation - Phase 1	Seattle City Light	2016		\$120 Million
SC2	Upgrade Denny Substation Transmission - Phase 2	Seattle City Light	2020		\$50 Million
SC3	Delridge - Duwamish 230 kV Line Reconductor	Seattle City Light	2016		\$2 Million
SN1	Bervery Park 230/115 kV Transformer	Snohomish County PUD	2016		\$25 Million
SN2	Greenie Falls 115 kV Transmission Loop	Snohomish County PUD	2013	Completed	\$7 Million
SN3	Swamp Creek 115 kV Switching Station	Snohomish County PUD	2019	New project	\$6 Million
T1	Cowlitz 230 kV Line Retermination Project	Tacoma Power	2012-13		\$1 Million
T1	Cowlitz 230 kV Substation Reliability Improvement Project	Tacoma Power	2015-16		\$3 Million
T2	Southwest Substation 230 kV Bus Reliability Improvement Project	Tacoma Power	2013-14		\$3 Million
TB1	Montana Alberta Tie - Line (MATL) Project	Enbridge/MATL LLP	2013		\$209 Million
<b>Total of all ColumbiaGrid Projects</b>					<b>\$2,719 Million</b>

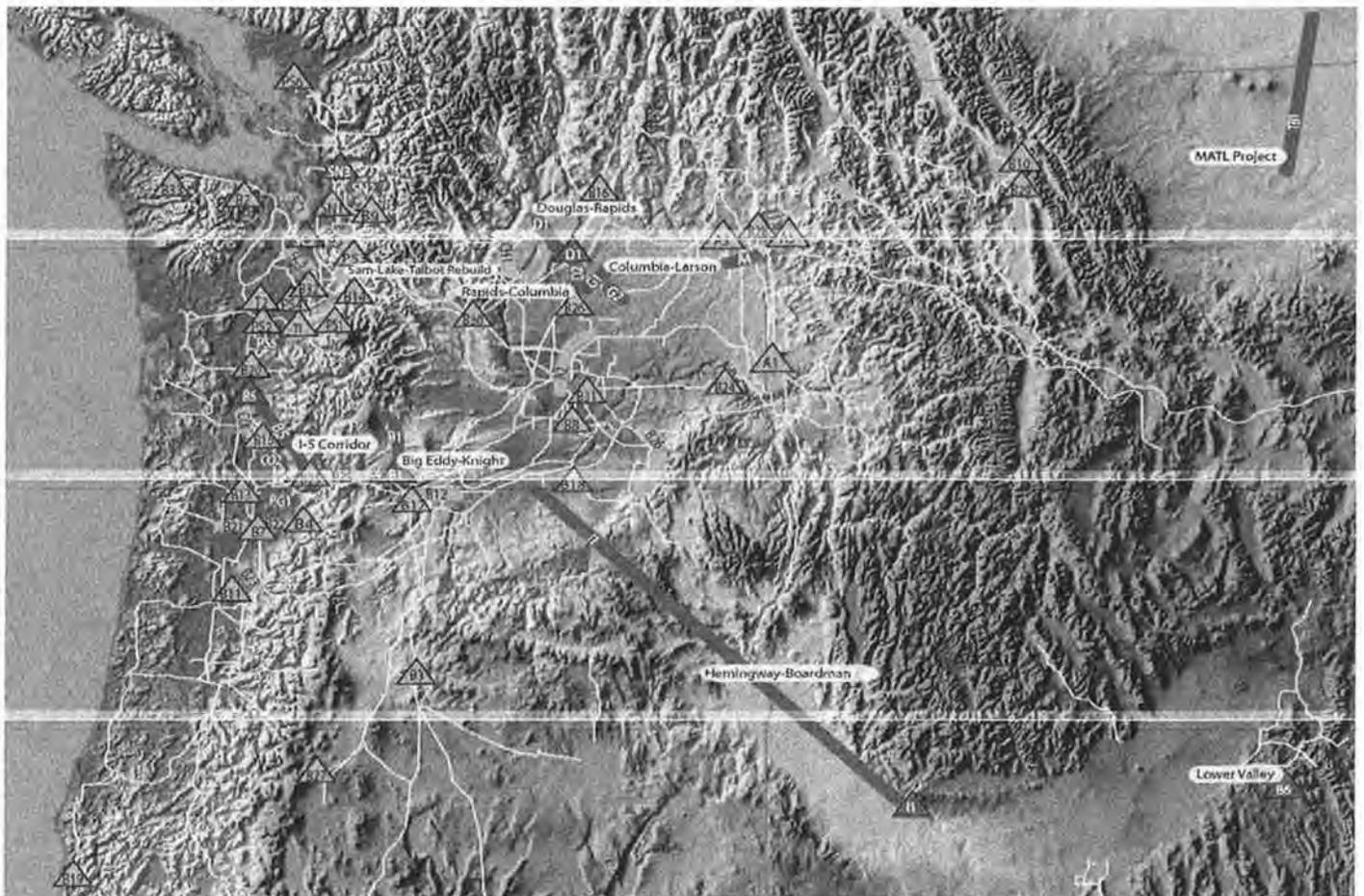


Figure C-1: Location of Committed Projects

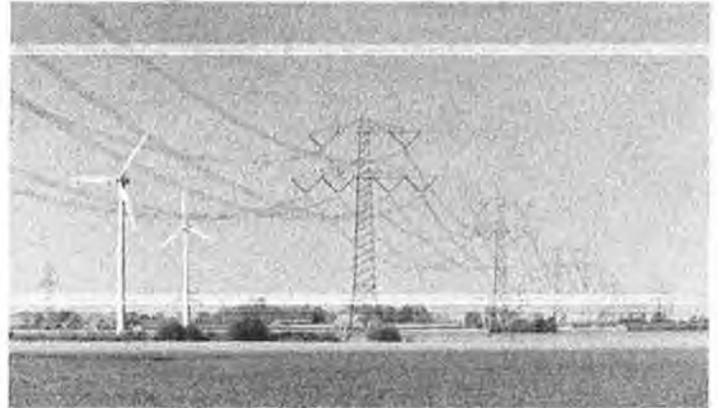
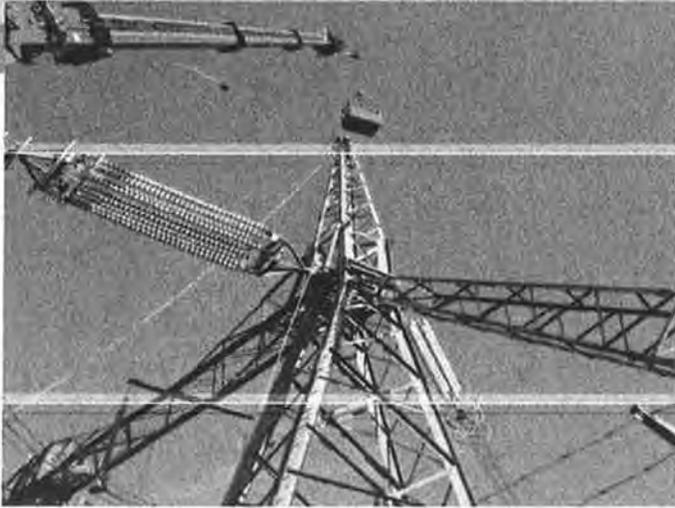
- Schultz-Raver Series Capacitors which enhances transmission capability to move east side resources to the west side load centers.
- Alvey 500 kV Shunt Reactor which provides voltage control in the southern Willamette area.
- Hemingway-Boardman 500 kV Line which increases transmission capability between the Northwest and Idaho.
- Blue Lake-Gresham 230 kV line which increases transmission capability in the Gresham/Troutdale area.
- Portal Way 230/115 kV transformer #2 which provides additional transformation in the Bellingham area
- Denny Substation Phase 1 and Phase 2 Projects which create a new substation for load service in the Seattle area.
- Bothell-SnoKing double circuit reconductor and Duwamish-Delridge reconductor of 230 kV transmission lines and Massachusetts-Union-Broad and Denny-Broad 115 kV transmission line inductors to increase transmission capability in the Puget Sound Area.

The ColumbiaGrid ten-year plan has been coordinated directly with other regional planning groups (e.g., the Northern Tier Transmission Group) and with the rest of the Western Interconnection through the Western Electricity Coordinating Council. During 2013, WECC will be developing an overall plan for the Western Interconnection. The ColumbiaGrid Ten-Year plan will be part of the foundation for this interconnection-wide plan.

Several projects were removed from the Ten-year Plan this year. The main reason for this change is due to a reduction in the commitment level from the project sponsor or project requestors. The project may have been delayed or the sponsor is investigating other options to satisfy the need. The projects removed from the Ten-year Plan include:

- Central Ferry-Lower Monumental 500 kV line
- Montana to Washington Project
- Monroe-Novely 230 kV Upgrade
- Lane 230 kV bus sectionalizing breaker
- Olympia-Shelton 230 kV line #5 Upgrade
- Northern Intertie RAS extension
- Hatwai 230 kV Bus Reliability Improvements
- Talbot 230 kV Bus improvements
- Cascade Crossing Project

The projects in the ten-year plan primarily address issues that occur in the first five years of the ten-year planning horizon. Additional projects will be required to meet the needs in the latter part of the ten-year planning horizon. These additional projects are still being developed as there is sufficient time to study these areas and refine the projects that will address those needs. This System Assessment is one part of those ongoing studies. As additional projects mature into committed plans to meet these long-range needs, they will be incorporated into future ColumbiaGrid ten-year plans.



## ***System Assessment Process***

The parties to ColumbiaGrid's PEFA are: Avista Corporation, Bonneville Power Administration, Chelan County PUD, Cowlitz County PUD, Douglas County PUD, Enbridge, Grant County PUD, Puget Sound Energy, Seattle City Light, Snohomish County PUD, and Tacoma Power. The combined facilities of these participants are shown in Figure D-1 (on the next page).

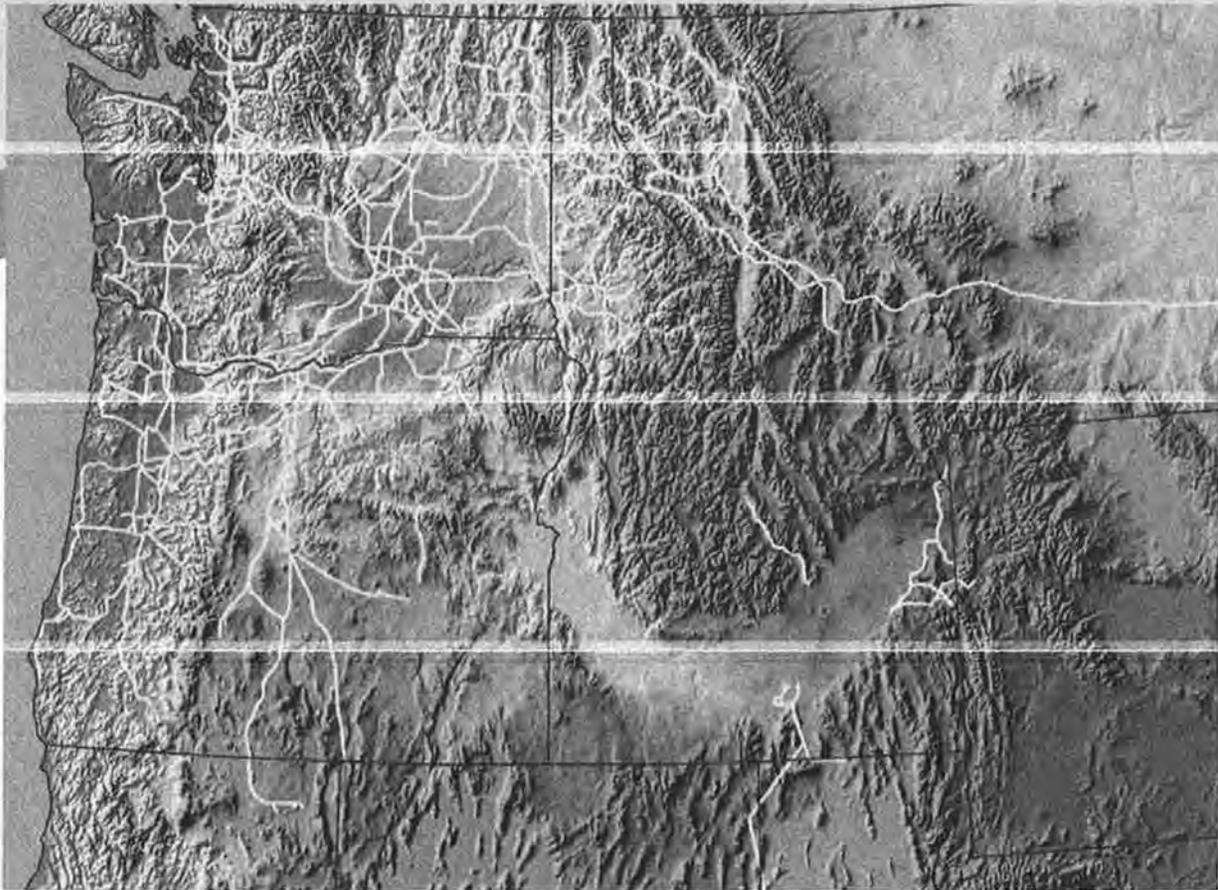
The Northwest transmission grid is interconnected and as result, it is necessary for all Northwest entities to participate in the System Assessment whether or not they are parties to the ColumbiaGrid PEFA. Major transmission owners in the Northwest were notified individually and encouraged to participate in the System Assessment process. Northern Tier, PacifiCorp and Portland General Electric were all very active in the System Assessment process. All participants in the System Assessment who provided input to the study or helped to screen results, had access to the same information, whether or not they were parties to PEFA.

## ***Study Assumptions***

The major assumptions that form the basis of the System Assessment are load, generation, external path flows, and planned transmission additions. These assumptions were used to develop the cases that were studied in the System Assessment. The approach used for developing each of these assumptions is summarized below.

### **Base Case Development**

Standard five-year and ten-year base cases for winter peak load, summer peak load and light load conditions were used for this System Assessment. The five-year cases used were based on the recent heavy winter case 2017-18HW2, the heavy summer case 2018HS2 and light load case 2016LSP1-5. The ten-year summer case was based on 23HS1. A recent ten-year winter peak load case was not available and one was created by using the five-year winter case with loads increased to reflect expected load growth in the ten-year timeframe. A ten-year extreme winter peak load case (with 5% probability loads) was also



**Figure D-1: Combined Facilities of Participants**

created from this ten-year winter case and studied for informational purposes (ie, no mitigation was required for areas that did not meet reliability standards for this case as these system conditions are beyond those required in the Planning Standards). Ten-year light load studies were run on 2022LSP1B which included high renewable generation in the Western Interconnection and light spring loads. More detail on each of the cases is provided below:

**Five-year cases**

- Five-year heavy summer: 2018HS2 case with no alterations to transfers or generation.
- Five-year heavy winter: 2017-18HW2 case with no alterations to transfers or generation except for

increasing Northwest to British Columbia transfers to 1500 MW.

- Five-year light load: 2016 LSP1-S case with no alterations to transfers or generation.

**Ten-year cases**

- Ten-year heavy summer: 2023HS1 case with Boardman and Centralia #1 removed from service and new Centralia CT was added (250 MW). Transfers to California were adjusted to make up for the difference in generation.
- Ten-year heavy winter: 2017-18HW2 case with loads increased to model an additional five years of growth, Boardman and Centralia #1 were removed and new Centralia and Port Westward CTs added as in the heavy summer case as well

as a Boardman gas turbine (430 MW). The Northwest to British Columbia transfer was increased to 1500 MW. Transfers from California were increased to make up for the changes made in load, generation and transfers.

- Ten-year extra heavy winter: 2017-18HW2 with loads increased to model five years of load growth plus approximately 12% addition to load represent an extra heavy (5% probability of occurrence) load for 2023, Boardman and Centralia #1 were removed, Centralia and Port Westward CTs were added as in the heavy summer case, transfers from California were increased to make up the difference in load and generation. The Northwest to British Columbia transfer was increased to 1500 MW and the West of Cascades North transfer was increased to near its limit (10,200 MW) by reducing local west side gas generation. This case is being studied for information purposes and mitigation is not required as it goes beyond what is required in the NERC Reliability Standards

- Ten-year light load: 22LSP1B with no alterations to transfers or generation. This case models high wind and high hydro generation with heavy exports to California. All local coal generation was modeled as out of service along with the new CT's modeled in the other cases at Centralia and Port Westward (no changes were required as these assumptions were already included in the WECC base case).

The transmission configuration in each of the cases was updated to include the committed projects listed in Table E2.

The same philosophy that was used for resource assumptions in the 2012 System Assessment was used again this year. In earlier years, resources were modeled in the base cases based on firm commitments. Those assumptions have been tested for several years now. The actual system may encounter a variety of different dispatches depending upon load outages and possibly other System Assessment, the WECC used in each case possible dispatches. Imports from Canada to the Northwest would still be loaded to the desired level. Some generation changes to the desired intertie flows are modeled more fully in this section.

*Energize Eastside is based on assumptions that go "beyond what is required in the NERC Reliability Standards."*

All of the base case assumptions, such as the load levels and the transmission projects, were selected by the ColumbiaGrid Planning participants during open meetings. Corrections and updates to the transmission system were made to all of the cases to ensure consistency. Each case was analyzed under pre-outage and outage conditions and any deficient areas were noted and corrections or updates were made as appropriate.

### **Load Modeling Assumptions**

As required in the NERC Reliability Standards, the transmission system is planned for expected peak load conditions. Normal summer and winter peak loads were based on a probability of 50

percent not to exceed the target load. The loads in the extreme winter peak case were based on a probability of 5 percent not to exceed the target load. The loads in the WECC light load case were to reflect typical loads in the target timeframe and were not changed.

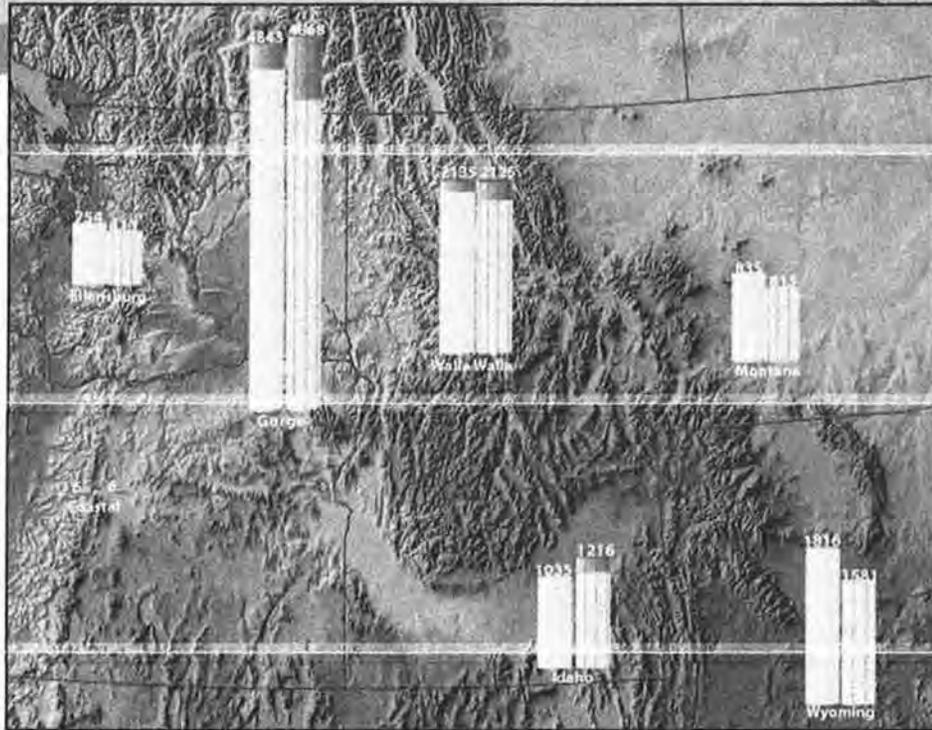
As modeled in the base cases, the total winter peak load for the Northwest system is forecasted to be 32,716 MW in the five-year case (this is down from the 32,913 MW in the five-year case in last year's System Assessment) and 34,324 MW in the ten-year winter case, 37,999 MW in extreme winter. The forecast summer peak load is 26,393 MW in the five-year case (this is up from the 26,268 MW modeled in last year's case) and 27,884 MW in the ten-year case (27,450 MW was modeled in last year's ten-year case). The five-year light spring case includes 17,386 MW of load in the Northwest while the ten-year light spring case includes 19,692 MW of load.

Although the Northwest system as a whole peaks in the winter, this does not mean that summer conditions require less attention. The capacity of electrical equipment is often limited by high temperatures, which means the equipment has lower capacity in summer than in winter. As a result, it is possible that a lower summer load can be more limiting than a higher winter load due to the ambient temperature differences and the impact on equipment.

### **Resource Modeling Assumptions**

Resource additions ten years into the future are much more difficult to forecast than loads. Although there are numerous potential generating projects in the region in various stages of development, there is much uncertainty for a variety of reasons about whether and when they will come into service. Many of the variables are outside the control of the transmission providers. Adding to the complexity, these resource assumptions are particularly important. Depending upon their location, some resources can mask transmission problems while others can create new problems.

Previous System Assessments modeled the firm transfer commitments on Northwest paths and this dispatch has been studied numerous times. There are a variety of feasible dispatches within these firm commitment levels that could impact the transmission system. The WECC base cases are not developed with these firm commitments specifically modeled. To study other feasible dispatches, planning participants agreed that the System Assessment base cases would use the generation dispatch within each WECC base case to test other dispatches. Only changes to include known generation retirements, changes to load and adjustments to selected external paths to obtain desired levels were made. The resource assumptions for each base case are listed in Attachment A.



**Wind Resources as of June 2013**

-  Under Construction
-  Operating
-  Previous Year (2012)

**Figure E-1: Wind Resources**

While the existing Northwest resources are adequate to meet summer loads, they are not adequate to meet winter peak loads. Northwest utilities rely on seasonal diversity in resource needs with other regions to meet winter load obligations by importing from California and the Southwest. For this reason, imports into the Northwest from California were used to meet the shortfall of new resource additions in the Northwest. However, there are many indicators, such as the number of requests for interconnection that transmission providers have received, to suggest that other resources will be developed in the region during this ten-year planning horizon. The addition of proposed generation projects, especially thermal projects on the west-side of the Cascades, could have a significant impact on the performance of the transmission system and reduce the reliance on California imports that was assumed in the winter cases. Planned transmission projects will be reviewed periodically to determine whether

changes in resource additions would impact the need for, or scope of, these projects.

Two generation retirements were included in the assessment. The state of Washington has come to an agreement with the owner of the Centralia Power Plant that one 700 MW coal-fired unit will be retired in 2020 and the second unit in 2025. To match these system conditions, the base cases were run with one unit on (the transmission impacts of the retirement of both units was studied in 2011 and this study report is posted on the ColumbiaGrid website). A new combustion turbine was added at Centralia to provide the replacement power members thought was needed. The state of Oregon has reached agreement with Portland General Electric to retire the Boardman Coal Power Plant in 2020. Portland General Electric plans to replace the coal generation with gas-fired generation



(an additional unit was added at Port Westward and adjacent to Boardman). These changes are modeled in the Ten-Year cases.

There is a significant amount of new wind generation proposed in the ColumbiaGrid footprint. Figure E-1 shows the existing wind resources, along with projects under construction and projects proposed as of June 2013. The development of new wind projects has slowed. The amount of total wind in service or under construction is similar to previous years especially in Oregon and Washington. However, more of this generation is now in service and less is in the construction phase. The significant wind generation potential in Idaho, Montana, and Wyoming has been slower to develop primarily due to the transmission additions required to deliver those remote resources to major load areas.

Although there are several thousand MWs of wind generation in the Northwest, none is usually modeled during peak load conditions in the System Assessment. Historical operation has shown there is often little wind generation during

either winter or summer peak load conditions. Operation without wind generation results in increased reliance on local gas generation and/or increased imports from California and the southwest.

The ten-year light spring base case used this year has significant wind generation in operation. This is typical operation since wind generation is usually highest during off peak conditions. The five-year light load case has no wind generation. These cases will be used to investigate transmission problems that may occur for these types of conditions.

To balance the load and generation in the Northwest, ColumbiaGrid assumed 1,522 MW was exported to California from the Northwest over the California-Oregon and Pacific DC Interties in the five-year winter study. For the ten-year winter study, ColumbiaGrid assumed 421 MW was imported into the Northwest on the combined Interties.

A list of all the resources used in the base cases is included in Attachment A.



### **Transmission Modeling Assumptions**

As required by the NERC Reliability Standards and PEFA, it was necessary to model firm transmission service commitments in the System Assessment. PEFA requires that plans be developed to address any projected inability of the PEFA planning parties' systems to serve the existing long-term firm transmission service commitments during the planning horizon, consistent with the planning criteria. The NERC Reliability Standards do not allow any loss of demand or curtailed firm transfers for Level B contingencies (single elements) and allow only planned and controlled loss of demand or curtailment of firm transfers for Level C contingencies (multiple elements).

The ColumbiaGrid planning process assumes that all ColumbiaGrid members' transmission service and native load customer obligations represented in WECC and ColumbiaGrid base cases are firm, unless specifically identified otherwise (such as interruptible loads).

The firm transmission service commitments between the Northwest and British Columbia are scheduled. The other external paths (Montana-Northwest and Idaho-Northwest) were modeled at loading levels used in the original WECC base cases.

Of the external paths, the British Columbia-Northwest and the two California Interties are most crucial during peak load conditions. These paths are bi-directional and there are often different stresses during winter and summer conditions. The Montana-Northwest and Idaho-Northwest paths are stressed more during off-peak load conditions and are less important during peak load conditions. The adequacy of these latter paths is verified annually through operational and light load studies.

Conversely, the transmission paths internal to the Northwest are not scheduled. The flows on internal paths are a result of flows on the external paths, internal resource dispatch, internal load level, and the transmission facilities that are in service.

During the winter, returning the firm Canadian Entitlement to British Columbia is the predominant stress on the Puget Sound area and the British Columbia-Northwest path. In the winter, the California interties were used to balance the load and generation modeled in the studies. This results in moderate imports which is not uncommon in winter.

In the summer, transfers on the British Columbia-Northwest and California Interties are typically in the opposite direction as in winter. Surplus power resources from Canada and the Northwest are often sent south to California and the Southwest.

	<b>18HS</b>	<b>17-18HW</b>	<b>23HS</b>	<b>22-23HW</b>	<b>22-23EHW</b>	<b>16LSP</b>	<b>22LSP</b>
Northwest Load	26,393	32,716	27,884	34,324	37,999	17,386	19,692
Northwest Generation	30,852	35,809	33,511	35,198	35,400	18,171	22,985
Northwest - BC Hydro Flow	-2,300	1,500	-2,278	1,477	1,501	1,247	-295
Idaho - Northwest Flow	-293	164	-962	433	756	1,133	527
Montana - Northwest Flow	1,051	1,060	806	1,114	1,185	2,173	1,426
PDCI Flow	2,801	789	2,604	192	-912	1,400	2,200
COI Flow	3,512	723	3,860	-613	-2,856	779	2,353
North of John Day Flow	6,308	2,835	7,157	2,353	998	1,254	3,141
South of Allston Flow	3,305	1,314	2,774	750	279	893	-253
West of Cascades North Flow	3,825	8,829	4,557	9,042	9,785	4,363	6,272
West of Cascades South Flow	4,272	5,769	5,232	6,407	7,113	2,996	4,866
West of Hatwai Flow	533	590	395	548	314	2,534	937

**Table E-1: Base Case Summary**

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The path flows in the assessment were within their limits. The West of Hatwai and West of McNary flows are quite low in these cases but that is expected, as these paths typically experience stress only during off-peak conditions.

The path flows modeled in the System Assessment is shown in Table E-1. The background for the specific existing firm transmission service commitments on members' paths that were modeled in the Transmission Expansion Plan is as follows:

**1. Canada to Northwest Path**

The capacity of this path in the north to south direction is 2,850 MW on the west-side and 400 MW on the east-side with a combined total transfer capability limit of 3,150 MW. The total capacity of the path in the south to north direction

is now 3,000 MW, with a limit of 400 MW on the east-side (this path has recently been upgraded in this direction). Both of these directional flows can impact the ability of the system to serve loads in the Puget Sound area.

The Canadian Entitlement return is the predominant south to north commitment on this path and is critical during winter conditions. Although the total amount of commitment varies somewhat, 1,350 MW of firm transmission service commitments are projected for the ten-year studies. Puget Sound Energy also has a 200 MW share at full transfer capability into British Columbia, which translates to a 130 MW allocation at the 1,350 MW level. Bonneville has committed to maintaining this pro-rata share of the Northern Intertie above its firm transmission service commitments. Both of these firm transmission service commitments



are on the west-side of the path so 1,500 MW of transfers are modeled in the south to north direction in winter.

With reduced loads in the Puget Sound area in the summer, the return of the Canadian Entitlement is not typically a problem. The most significant stressed condition in the summer is north to south flows of Canadian resources to meet loads south of the border.

Powerex has long-term firm rights for about 242 MW for their Skagit contract, plus 193 MW to Big Eddy and 450 MW to John Day, for a total of 885 MW in the north-to-south direction. Powerex also owns 200 MW of transmission rights for the Cherry Point Project which is just south of the Canadian border and can be reassigned to the border. Puget Sound Energy has long-term firm contracts for 150 MW and Snohomish has firm contracts for 100 MW. The total of all of these contracts is 1,335 MW.

The Puget Sound Area Study Team has been planning the system in the Puget Sound area to maintain 1,500 MW in the north to south direction to cover these firm transfers. Bonneville is making commitments to increase the firm transactions to 2300 MW through the Network Open Season that will show up in the five-year time frame. 200 MW of this new commitment is planned to be scheduled on the east side of

the Northern Intertie at Nelway. Therefore the summer cases will model 2300 MW to cover the additional commitments that are being made on the Northern Intertie including the 200 MW on the east side of the tie at Nelway.

## **2. Montana to Northwest Path**

This path is rated at 2,200 MW east to west and 1,350 MW west to east. The predominant flow direction is east to west. The path can only reach its east to west rating during light load conditions. Imports into Montana usually only occur when the Colstrip Power Plant facilities are out of service.

The firm commitments on this path exceed 1,400 MW east to west. There are also some counter-schedules that reduce the actual flows on the system. For the five-year studies, flow was modeled as 1,060 MW in normal winter and 1,051 MW in summer. Flows are similar in the outer-year cases. Flows are highest in the five-year light load case at 2,173 MW

## **3. Northwest to California/Nevada Path**

The combined COI and Pacific DC Intertie are rated at 7,900 MW in the north to south direction, although the combined operating limit can be lower due to the North of John Day nomogram. The COI is individually rated at 4,800 MW and the Pacific DC Intertie is rated at 3,100 MW. The 300 MW Alturas tie from Southern Oregon into Nevada utilizes a portion of the 4,800 MW COI

capacity. In the south to north direction, the COI is rated at 3,675 MW and the Pacific DC Intertie is rated at 3,100 MW.

Bonneville has constructed upgrades to these paths to increase the potential to use these paths at their full capability. With these upgrades, the long-term firm transmission service commitments on these paths are increasing to total about 7,700 MW. To investigate the stress that results from these commitments, these two interties were loaded close to their combined limit of 7,900 MW in the summer cases used in the System Assessment.

Bonneville is also planning a major equipment replacement at the Cellilo terminal of the Pacific DC Intertie to replace the aging equipment there. These replacements are planned for 2016 at which time the rating of the PDCI will increase from 3,100 MW to 3,220 MW.

There are some firm transmission service commitments on this path in the south-to-north direction but not a significant amount. Non-firm sales are relied on by many parties in the winter, especially during very cold weather, when there are insufficient resources within the Northwest to meet the load level. For the base cases, Northwest resources were dispatched first,

and firm transmission service commitments were modeled on external paths. Additional resources needed to meet the remaining load obligations in the Northwest were imported from the south, split between the COI and Pacific DC Intertie.

In the five-year heavy winter base case, the exports into California totaled 1,512 MW with 723 MW on the COI and 789 MW on the PDCI. Previous system assessments have mostly had imports from California during winter peak conditions, which are more typical of early winter conditions. Conditions with exports to California during peak Northwest winter load are more typical of late winter conditions when more hydro is available in the northwest. The ten-year peak winter case has a total of 421 MW import on the combined COI and PDCI paths while the extra heavy case has 3,768 MW import on the combined interties. In the five-year peak summer cases, the combined exports were modeled at about 6,300 MW. In the ten-year peak summer cases, the combined exports were modeled at about 6,400 MW. The five-year light load case has 2,179 MW export on the two interties and the ten-year case has 4,553 MW.

#### **4. Idaho to Northwest Path**

The Idaho to Northwest path is rated at 2,400 MW east to west and 1,200 MW west to east. This



path has about 300 MW of firm schedules into Idaho to meet firm transfer loads, in addition to a 100 MW point-to-point service contract. Summer conditions with flows at these levels are typical as there are few surplus resources to export from the east. In the winter, these transfer loads are reduced and PacifiCorp typically exports its east-side resources into the Northwest to meet its west-side load obligations. Due to the nature of the flows from Idaho, they are not expected to cause significant system problems in the Northwest during peak load periods. With the addition of the Hemingway-Boardman project, the rating of this path is expected to increase by 800 MW in the east to west direction and 1,300 MW west to east.

For the five-year winter cases, 164 MW is modeled flowing into the Northwest. In summer, 293 MW was modeled flowing into Idaho. Flows increased in the ten-year summer case to 962 MW flow into Idaho. The five- and ten-year light load cases had 1,133 MW and 527 MW respectively flowing into the Northwest from Idaho.

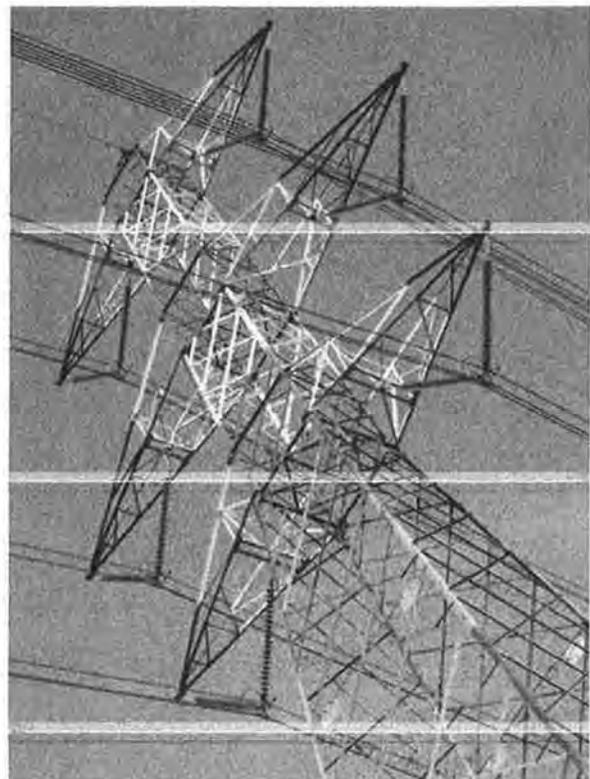
### **5. West of Hatwai Path**

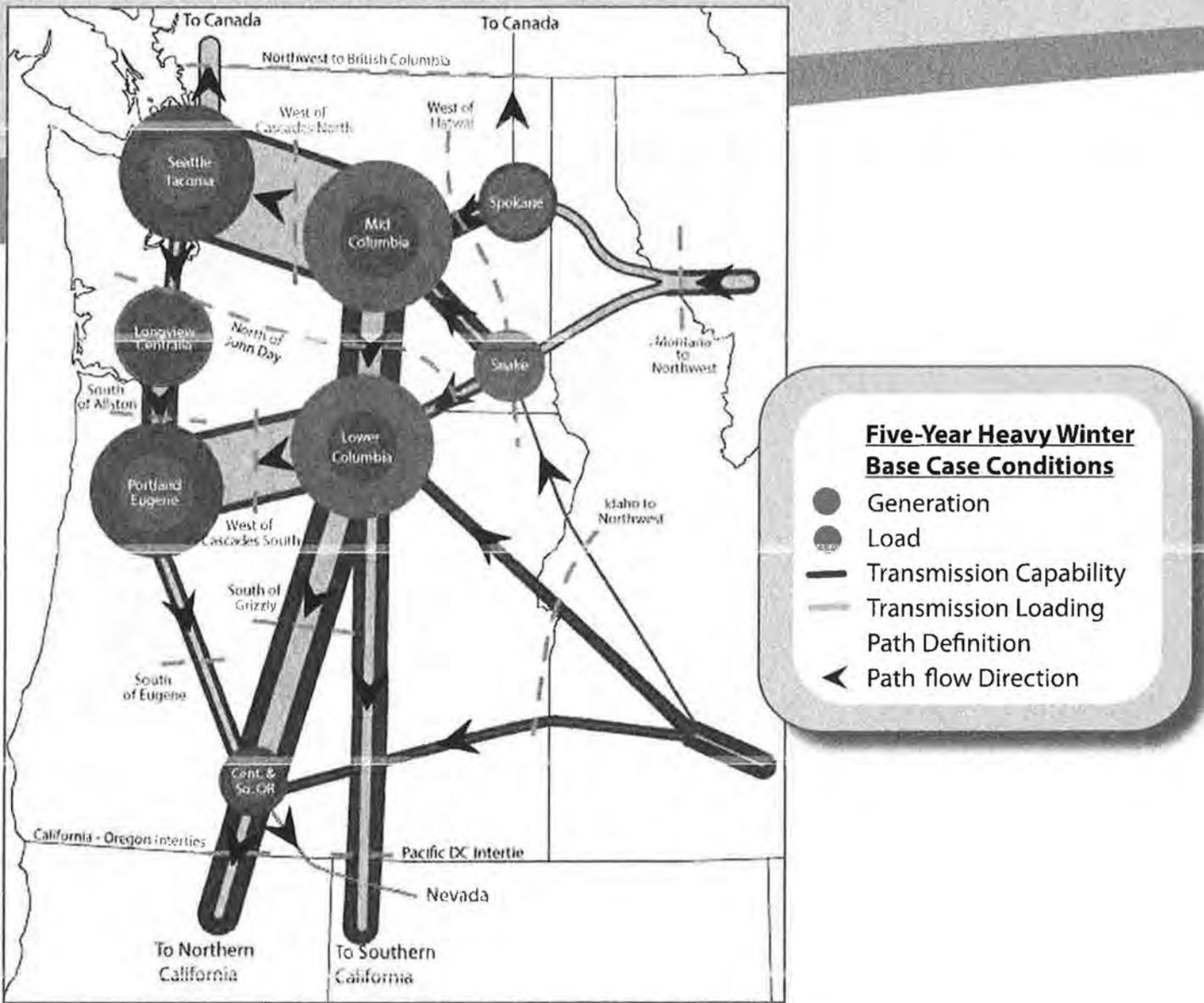
The West of Hatwai path is rated at 4,277 MW in the east to west direction but it is not a scheduled path. This path is stressed most during light-

load conditions when eastern loads are down and the excess resources from the east flow into Washington. This path is loaded to 533 MW in the summer and 590 MW in winter in the five-year cases. In the outer-year cases, the path is loaded to 395 MW in the summer and 548 MW in winter. In the light load cases with high wind, the West of Hatwai path is loaded to 2,534 MW in the five-year case and 937 MW in the ten-year case.

### **6. West of Cascades North and South Paths**

The West of Cascades North path is rated at 10,200 MW and the West of Cascades South path is rated



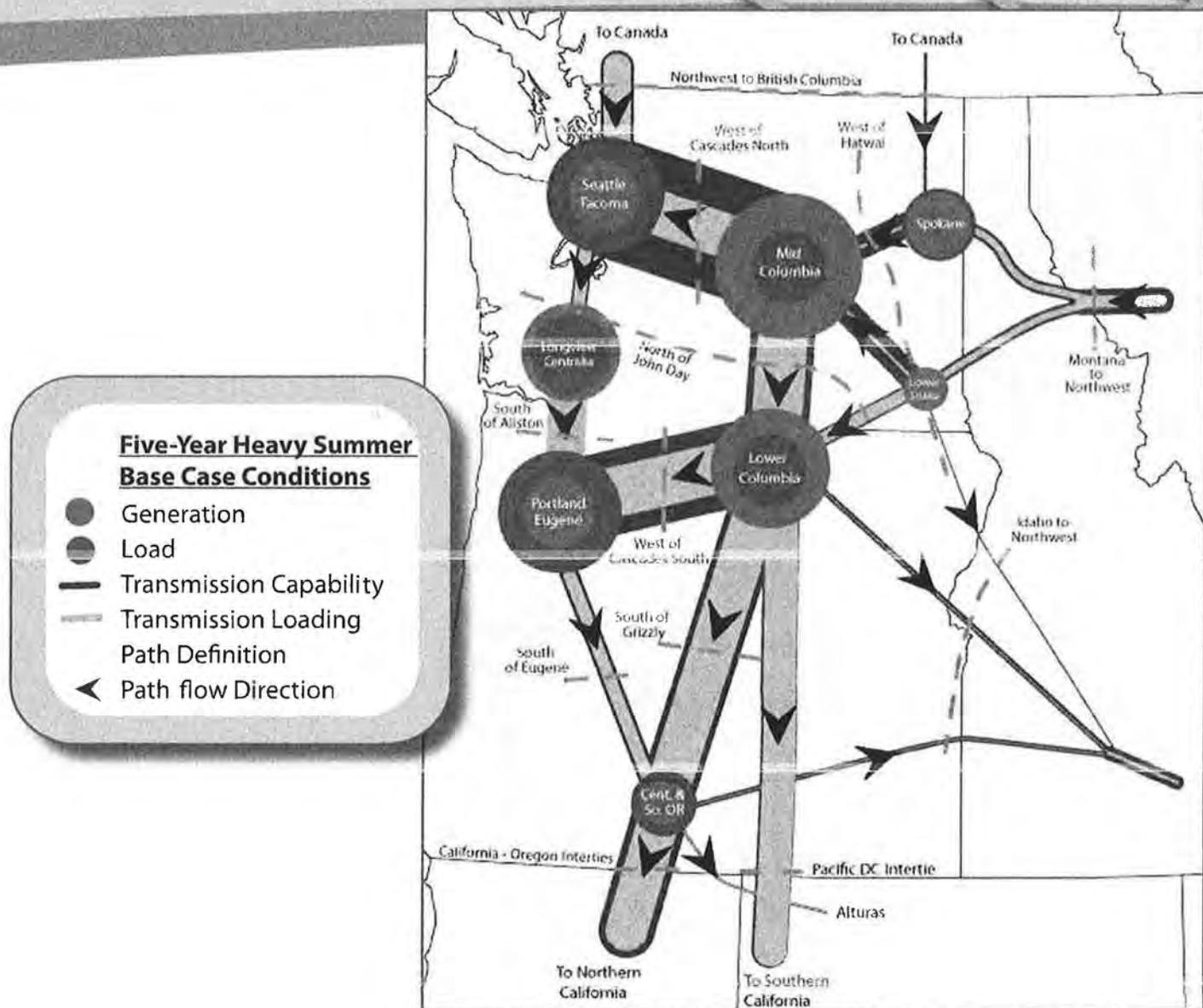


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**Figure E-2: Flows Modeled for Five-Year Winter Peak Conditions**

at 7,200 MW, both in the east to west direction. These paths are not scheduled paths but transfer east-side resources to the west-side loads. These paths are most stressed during winter load conditions, especially when west-side generation is low. The north path was loaded to 3,825 MW in the five-year summer base case and 8,829 MW in the winter base case. These loadings are 4,557 MW in summer and 9,042 MW in heavy winter and 9,785 MW in extreme winter in the outer-year cases. In the five-year cases, the south path was

loaded to 4,272 MW in the summer base case and 5,769 MW in the winter base case. These loadings increase to 5,232 MW in summer, 6,407 MW in heavy winter and 7,113 MW in extreme winter in the outer-year cases. For the five-year light load case, the north path is loaded to 4,363 MW and the south path is loaded to 2,996 MW. For the ten-year light load case, the north path is loaded to 6,272 MW and the south path is loaded to 4,886 MW.

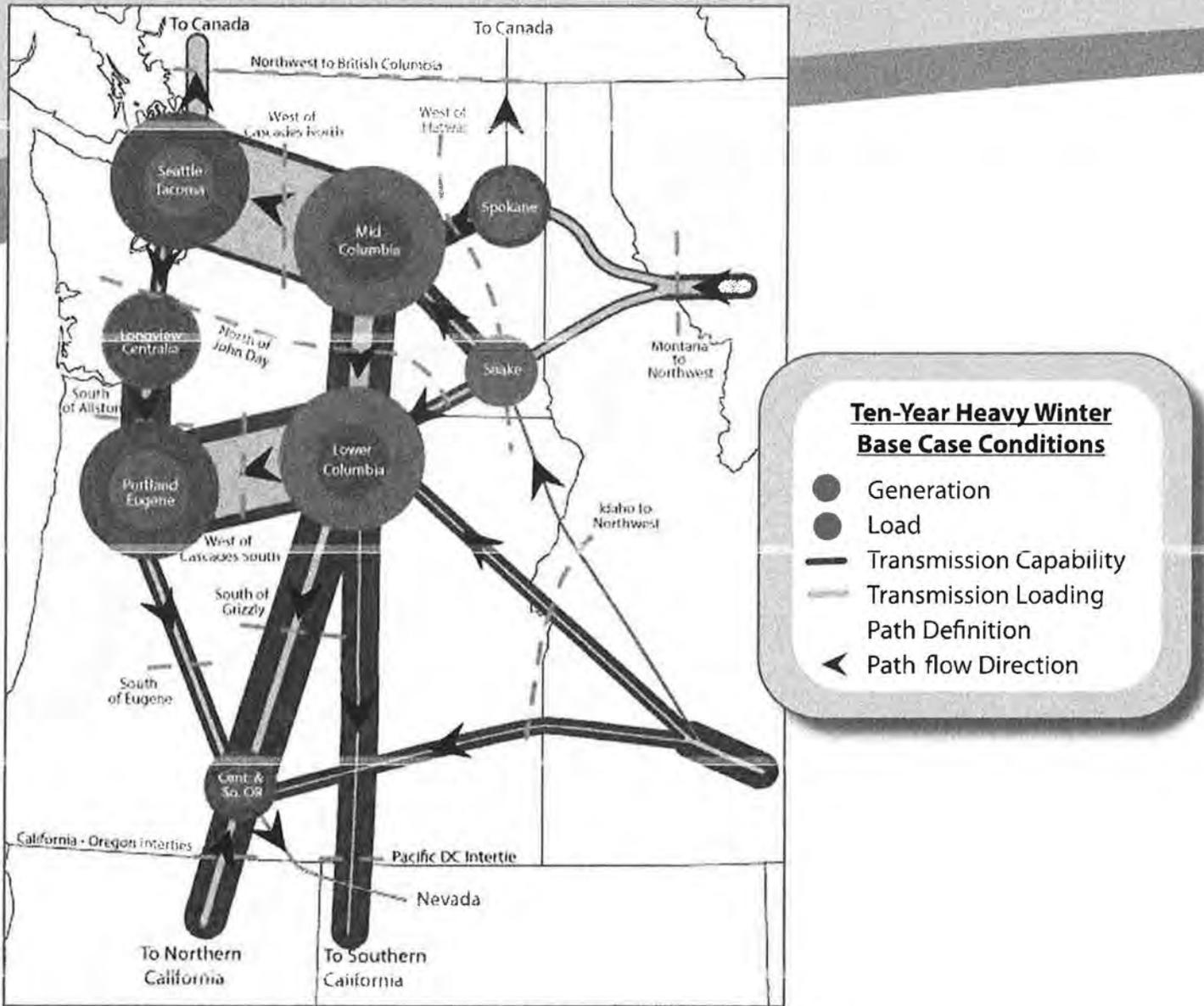


**Figure E-3: Flows Modeled for Five-Year Summer Peak Conditions**

### Flow Diagrams

The loads, generation and flows modeled in the base cases are shown in Figures E-2, E-3, E-4, E-5, E-6, E-7 and E-8. The Seattle-Tacoma area includes the area west of the cascades from the Canadian border south through Tacoma. The Longview/Centralia bubble includes the areas south of Tacoma through Longview and west to include the Olympic Peninsula. The Portland/Eugene area includes the Willamette Valley and Vancouver, Washington area. The Southern/

Central Oregon bubble includes the Roseburg area down to the California border and east to the Bend-Redmond area. The Mid-Columbia Area includes load in the Washington area east of the Cascades, west of Spokane, south of the Canadian border and north of the Columbia River. The Lower Columbia bubble includes loads to the south of Mid-Columbia to Central Oregon. The Spokane area includes loads to the east in Western Montana, north to the Canadian border and south to the Oregon border. The Lower

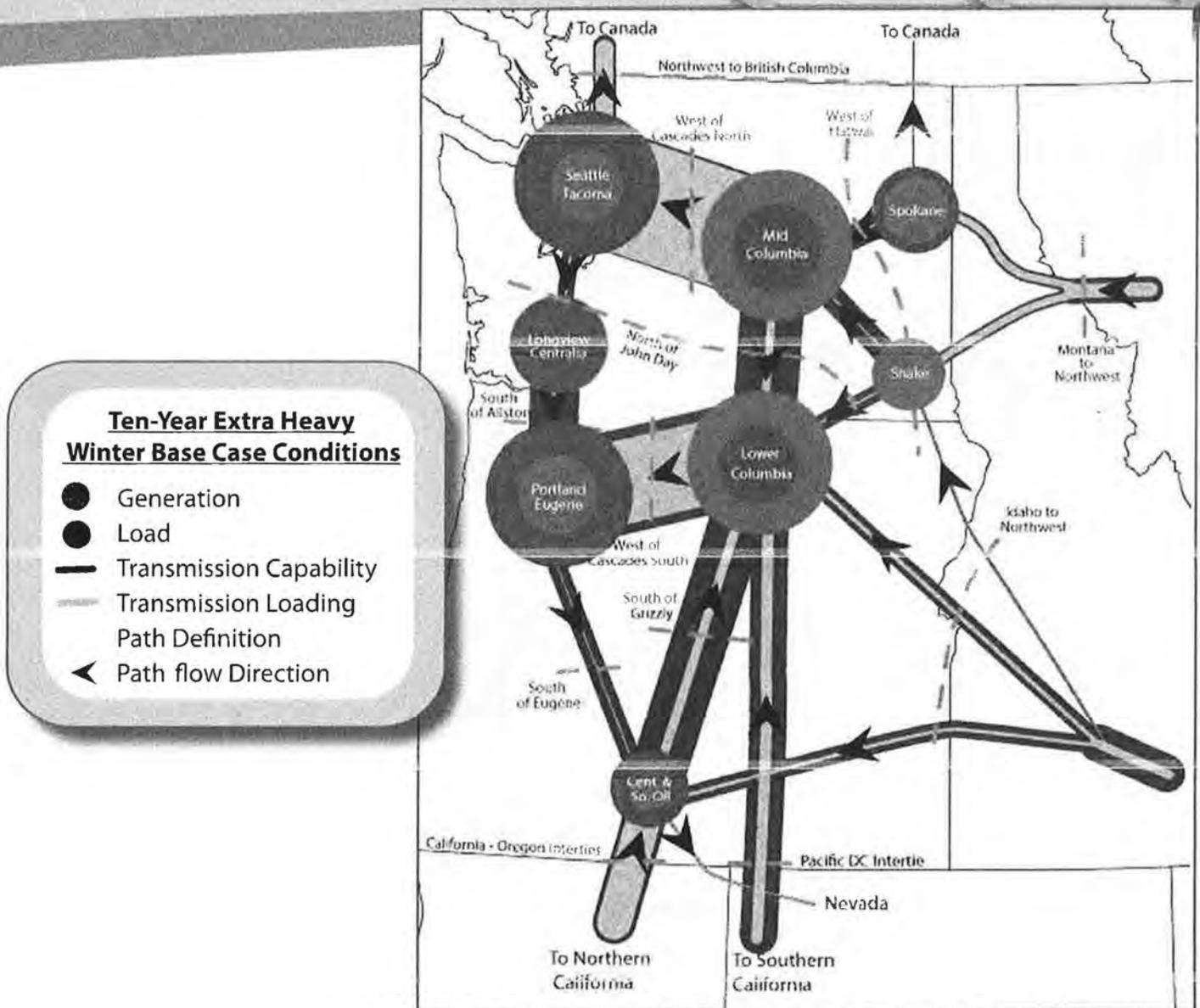


**Figure E-4: Flows Modeled for Ten-Year Heavy Winter Peak Conditions**

Snake bubble includes the major generation in the area. Figures E-2 and E-3 show the five-year peak winter and summer peak conditions. Figures E-4, E-5 and E-6 show the ten-year peak winter, ten-year extreme winter peak and summer peak conditions. Figure E-7 and E-8 shows the five and ten-year light load spring conditions.

The red circles in the figures represent the load levels in the identified areas; the load level is proportional to the area of the circle. The two

major west-side load areas, Seattle/Tacoma and Portland/Eugene, each have approximately 10,000 MW of load in the five-year peak winter case as shown in Figure E-2. The area of the green circles represents the amount of generation in that area. The Seattle/Tacoma and Portland/Eugene load areas have more load than generation and rely on other areas to supply the load resource balance. The Mid-Columbia, Lower Columbia and Lower Snake areas have surplus generation that is used in other areas. The Mid-

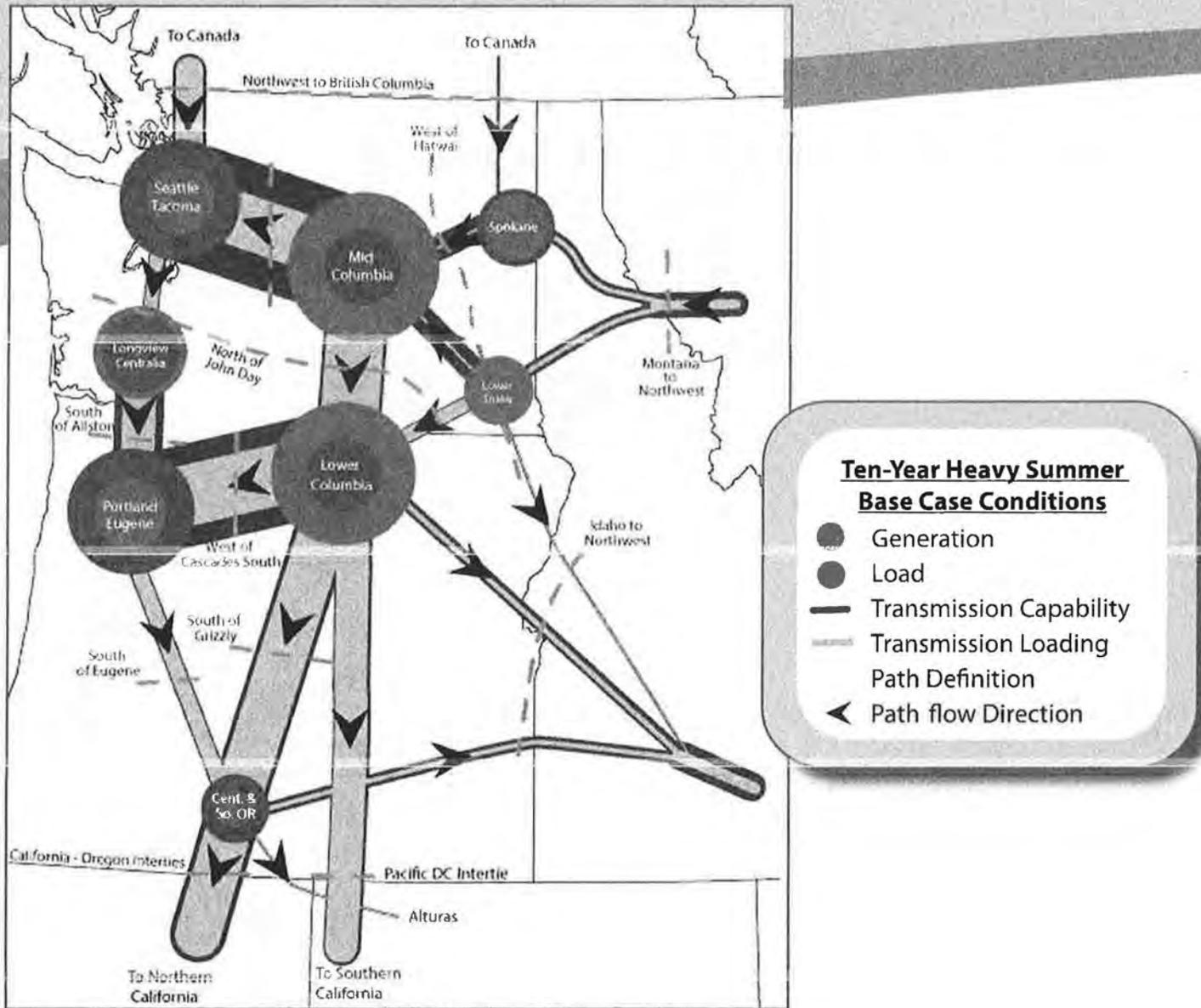


**Figure E-5: Flows Modeled for Ten-Year Extreme Winter Peak Conditions**

Columbia area has about 11,000 to 12,000 MW of generation represented in the peak load cases. The load/resource ratios in the Spokane, Central/Southern Oregon and Longview/Centralia areas have greater balance.

The dark blue lines between the areas represent the major transmission paths that connect the areas. The width of the dark blue lines represents the relative capacity of the paths. For example, the West of Cascades North path is rated at

10,200 MW. The light blue lines within these paths represent the capacity that is used in the studies. In the winter cases, the West of Cascades paths are heavily used to meet the load levels in the west-side areas while the North of John Day and West of Hatwai paths are lightly loaded. The external path to Canada is loaded to the firm obligations on the path as discussed earlier which is mostly the downstream benefit return. Power is exchanged with California to provide overall load resource balance in the Northwest in the winter.



**Figure E-6: Flows Modeled for Ten-Year Summer Peak Conditions**

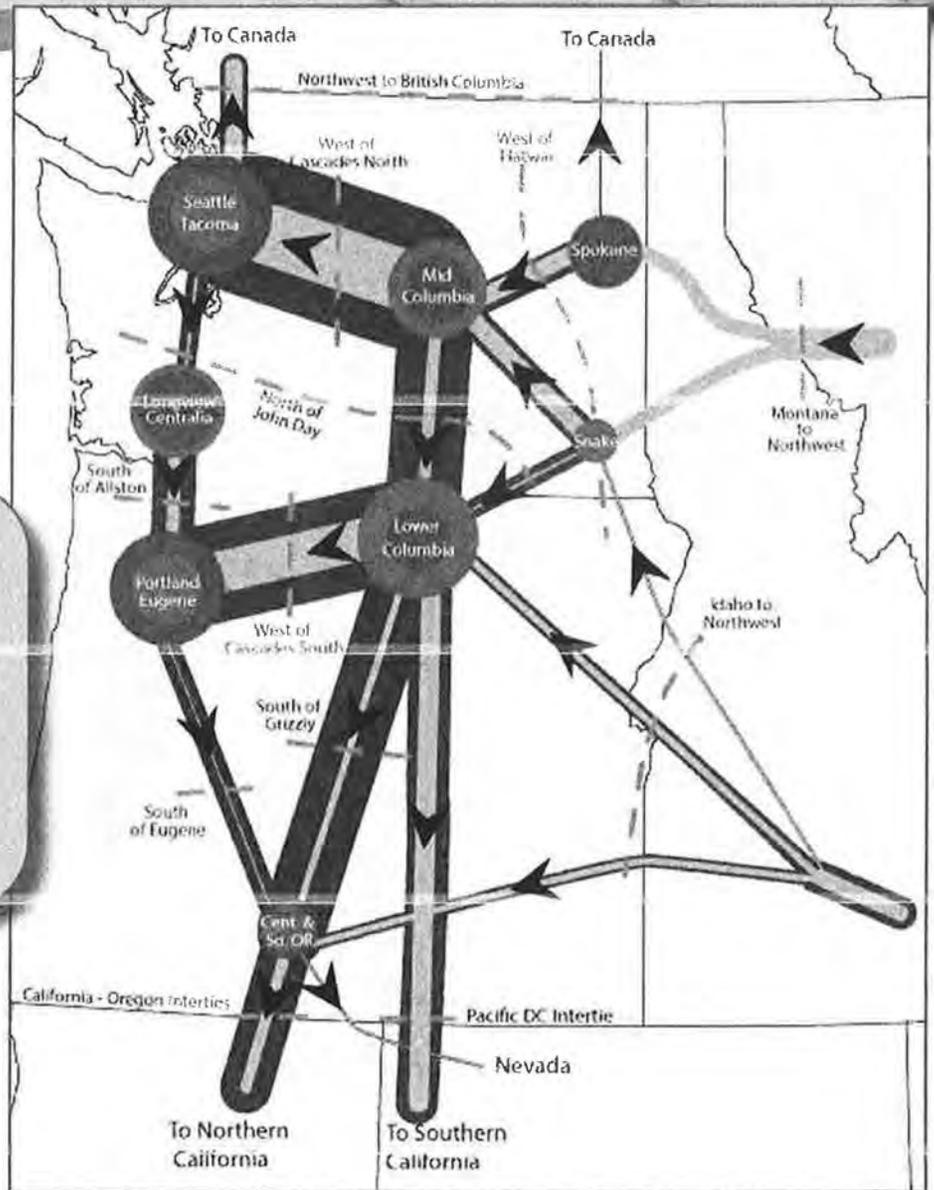
The five-year peak summer conditions modeled in the base cases are shown in Figure E-3. The load levels are typically lower in summer than in winter in the west-side areas, and are shown here with proportionally smaller bubbles. Also note that the Portland/Eugene area load level is greater than Seattle/Tacoma in the summer. These two areas had similar load levels in the winter case. This difference is due to a greater use of air conditioning. The Mid-Columbia and Lower

Columbia areas have higher levels of generation in the summer as compared to the winter.

The path usage levels change significantly between summer and winter. In the summer, Canadian hydro generation exceeds the internal loads in British Columbia and excess generation is exported to the Northwest and California. The Northwest load levels are also lower in summer and there are available resources to export to

**Five-Year Light Spring Base Case Conditions**

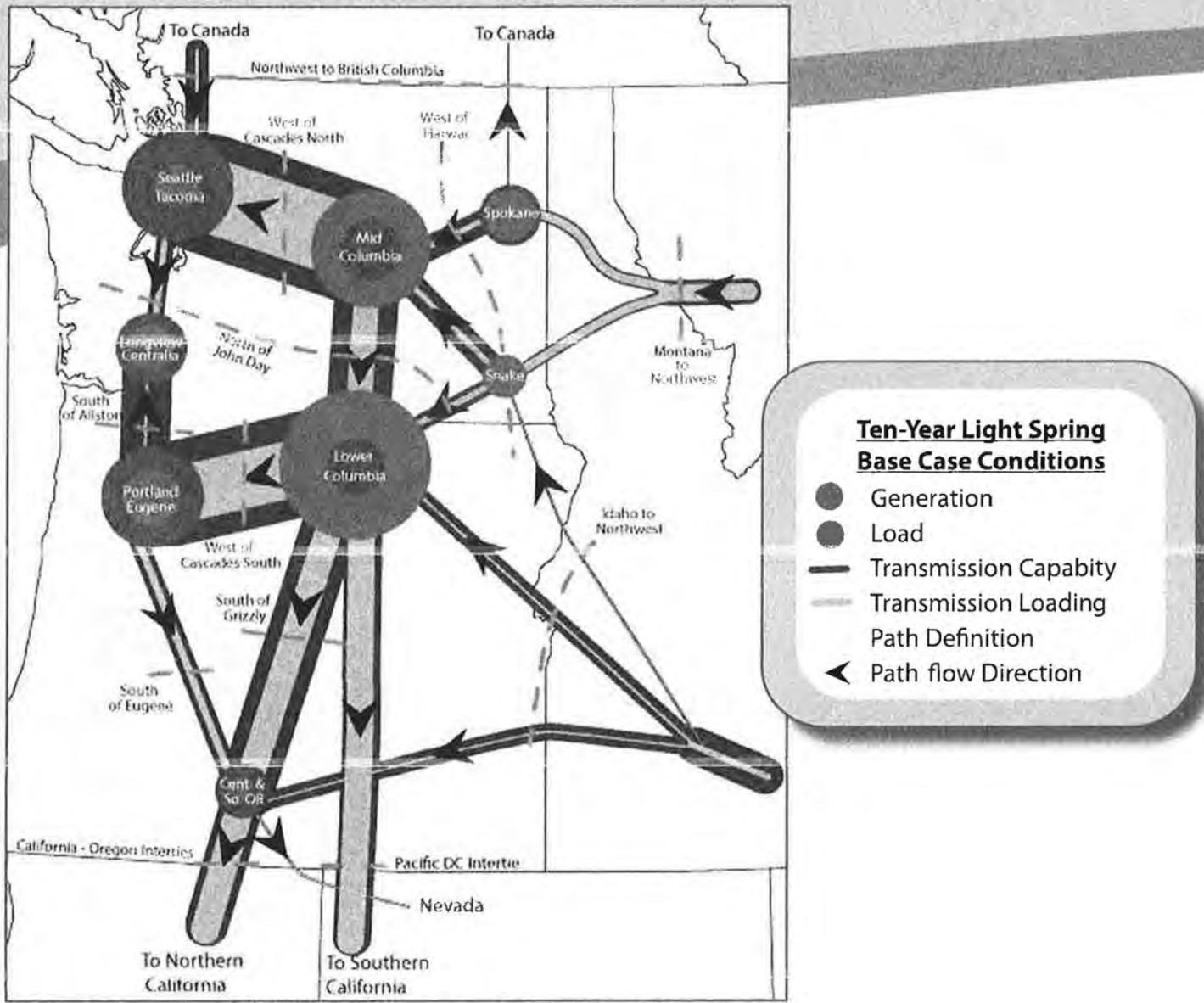
-  Generation
-  Load
-  Transmission Capability
-  Transmission Loading
-  Path Definition
-  Path flow Direction



**Figure E-7: Flows Modeled for Five-Year Light Spring Peak Conditions**

the south. All of the north-to-south paths load much heavier in the summer due to these flows. The interties to California are loaded to their limit in the summer peak cases to represent the firm commitments on those paths. The loading on the west of Cascades paths is reduced in summer due to the reduced load level in the west-side. The ties to Idaho are mostly floating with little power moving on that path.

The pattern modeled in the light spring, high wind cases are unique for those conditions. The cross cascades flows are even lighter than the summer cases described above due to the reduced westside load. The majority of the Northwest wind is located in the Gorge which is within the Lower Columbia bubble. During this high wind condition, the generation in the Mid-Columbia area is reduced significantly to accommodate the high wind level. The north to south flow is still high.



**Figure E-8: Flows Modeled for Ten-Year Light Spring Peak Conditions**

**Special Protection System Assumptions**

At the transfer levels modeled in the base cases, existing Special Protection Systems are required for reliable operation of the transmission system. Some of these Special Protection Systems will trigger tripping or ramping of generation (some of which have firm transmission rights) for specified single and double line outages. This Special Protection System generation dropping relies on the use of operating reserves to meet firm

transfer requirements (no schedule adjustments are made until the next scheduling period and no firm transfers are curtailed). If the outages are permanent, firm transfers might then need to be curtailed during the next scheduling period to meet the new operating conditions. Firm transmission service commitments are met with this use of Special Protection Systems consistent with NERC and WECC standards.



### **Transmission Additions Modeled**

Since the last System Assessment, the following projects have been placed in service:

1. Longview-Bakers Corner-Lexington 115 kV line
2. Sammamish Bus Reliability Improvements
3. Sedro Woolley Substation 230/115 kV Transformer #2 Addition
4. North Bonneville-Ross/North Bonneville-Troutdale 230 kV Line Swap
5. Cowlitz 230 kV Substation Line Re-termination Phase 1
6. Ostrander 500/230 kV Transformer Addition
7. Longview-Cowlitz #2 Upgrade from 69 kV to 115 kV
8. Keeler-Horizon 230 kV line and Horizon 230/115 kV Transformer
9. The Rogue 115 kV Static VAR Compensator.
10. Granite Falls 115 kV Transmission Loop

The Montana - Alberta Tie Line (MATL) project is expected to be completed in August.

These transmission additions and the future committed projects listed in Table E-2 were modeled in the base cases used in this System Assessment. These projects are more fully described in Attachment B entitled Transmission Expansion Projects.

### **Major Additions in the Five-Year Case**

The following projects were included in all System Assessment base cases.

### **West of McNary Area Reinforcement**

#### **Project – Big Eddy-Knight 500 kV Line**

This Bonneville project includes two new lines (McNary-John Day 500 kV line and a Big Eddy-Knight 500 kV line) and miscellaneous upgrades. The project in its entirety includes about 110 miles of new line construction and is proposed to increase the capacity of the West of McNary, West of Slatt, West of John Day and West of Cascades South transmission paths. This project provides additional transmission capability to accommodate transmission service requests in eastern Oregon that are being addressed in the Bonneville Network Open Season process. The McNary-John Day line has been completed and energized. The Big Eddy-Knight line is expected to be completed in 2014 or 2015 pending environmental review.

#### **Montana Alberta Tie Line**

Enbridge is constructing the Montana Alberta Tie Ltd (MATL) project that is a 200 mile, 300 MW, 230 kV line connecting Lethbridge, Alberta and Great Falls, Montana going through Cutbank, Montana which has significant wind generation potential. This project is fully permitted with construction underway. Energization is expected in August of this year. The WECC rating process for this line has been completed.

#### **Mid-Columbia Area Reinforcements**

The plan for the Northern Mid-C area that has been developed in the ColumbiaGrid Northern

**Table E-2: Transmission Projects included in the Base Cases**

<b>Committed Projects Included in All Cases</b>	<b>Sponsor</b>	<b>Date</b>
Lancaster Combustion Turbine Project Integration	Avista	2013
Bronx-Cabinet 115 kV Line Rebuild	Avista	2016
Big Eddy - Knight 500 kV Line	Bonneville Power	2014-15
Fairmount Backtripping Scheme	Bonneville Power	2013
Ponderosa 500/230 kV #2 Transformer Addition	Bonneville Power	2013
Ostrander Breaker Addition	Bonneville Power	2014
Lower Valley Reinforcement - Hooper Springs	Bonneville Power	2015
Pearl 500 kV Breaker Addition	Bonneville Power	2016
Franklin 115 kV Capacitors (52 MVAR)	Bonneville Power	2014
Monroe 500 kV Capacitors (316 MVARs)	Bonneville Power	2014
Columbia Falls 230 Bus Reliability Improvements	Bonneville Power	2013
Alvey 500 kV Shunt Reactor	Bonneville Power	2014
Keeler 230 kV Bus Reliability Improvements	Bonneville Power	2014
Raver 500/230 kV Transformer, 230 kV Line to Covington Substation	Bonneville Power	2016
Longview - Lexington 230 kV Line Retermination into Longview Annex	Bonneville Power	2015
Celilo Terminal Replacement (PDCI upgrade 3220 MW)	Bonneville Power	2016
McNary 230 kV Shunt Capacitors (2x150 MVAR banks)	Bonneville Power	2013
Rogue Static VAR Compensator	Bonneville Power	2013
Tucannon River 115 kV Shunt Capacitors (2x6.5 MVARs)	Bonneville Power	2013
North Bonneville - Troutdale 230 kV #2 Line Retermination	Bonneville Power	2015
Columbia 230 kV Bus Section Breaker	Bonneville Power	2016
LaPine Reactive (19 MVAR Capacitors 40 MVAR reactor)	Bonneville Power	2014
Bell 230 kV Bus Section Breaker	Bonneville Power	2015
Kalispell 115 kV Shunt Capacitors (2x16 MVARs)	Bonneville Power	2014
White Bluffs 115 kV Shunt Capacitors (39 MVARs)	Bonneville Power	2013
Tacoma 230 kV Bus Section Breaker	Bonneville Power	2016
McKenzie - Andrew York 115 kV #1 and #2 Line Rerating	Chelan County PUD	2013
Longview - Lexington #2 upgrade from 69 kV to 115 kV	Cowlitz County PUD	2014-16
Longview - Lexington - Cardwell upgrade from 69 kV to 115 kV	Cowlitz County PUD	2015-2017
South Cowlitz County Project	Cowlitz County PUD	2017-2019
Douglas - Rapids 230 kV Line and Rapids 230/115 kV Substation	Douglas County PUD	2013
Rapids - Columbia 230 kV Line and Columbia Terminal	Douglas County PUD	2015
Columbia - Larson 230 kV Line	Grant County PUD	2014
Rocky Ford - Dover 115 kV Line	Grant County PUD	2016
Whetstone 230/115 kV Transformer	PacifiCorp	
Alderton 230/115 kV Transformer in Pierce County	Puget Sound Energy	2015
St. Clair 230/115 kV Transformer in Thurston County	Puget Sound Energy	2013



<b>Committed Projects Included in All Cases</b>	<b>Sponsor</b>	<b>Date</b>
Lakeside 230/115 kV Transformer and Sammamish-Lakeside-Talbot Line Rebuild to 230 kV	Puget Sound Energy	2017
Starwood Autotransformer Removal	Puget Sound Energy	2013
Woodland - Gravelly Lake 115 kV Line	Puget Sound Energy	2015
Bothell - SnoKing 230 kV Double Circuit Line Reconductor	Seattle City Light/BPA	2016
Series Inductors on Massachusetts - Union - Broad and Denny - Broad 115 kV Underground Cables	Seattle City Light	2016
Denny Substation - Phase 1	Seattle City Light	2016
Delridge - Duwamish 230 kV Line Reconductor	Seattle City Light	2016
Beverly Park 230/115 kV Transformer	Snohomish County PUD	2014-16
Granite Falls 115 kV Transmission Loop	Snohomish County PUD	2014
Swamp Creek 115 kV Switching Station	Snohomish County PUD	2018
Cowlitz 230 kV Line Retermination Project	Tacoma Power	2012-2013
Cowlitz 230 kV Substation Reliability Improvement Project	Tacoma Power	2015-2016
Southwest Substation 230 kV Bus Reliability Improvement Project	Tacoma Power	2013-2014
Montana Alberta Tie - Line (MATL) Project	Enbridge/MATL LLP	2013
<b>Committed Projects in 10 Year Cases Only</b>		
Moscow 230 kV Substation Rebuild and Transformer Replacement	Avista	
Benton - Othello 115 kV Line Upgrade	Avista	
Westside 230 kV Rebuild and Transformer Upgrades	Avista	
Irwin Project - Spokane Valley Transmission Reinforcements	Avista	
Castle Rock - Troutdale 500 kV Line (I-5 Corridor Reinforcement Project)	Bonneville Power	2018
Pearl 230 kV Bus Section Breaker	Bonneville Power	2017
Split Pearl - Sherwood 230 kV Lines	Bonneville Power	2017-18
Split McLoughlin - Pearl - Sherwood 230 kV Lines	Bonneville Power	2017-18
Troutdale 230 kV Bus Section Breaker	Bonneville Power	2018
Sappho 69 kV Shunt Capacitors (10 MVARs)	Bonneville Power	2017
Hemingway - Boardman 500 kV Line	Idaho Power/BPA	2018
Cascade Crossing (Coyote - Boardman - Bethel 500 kV Line)	Portland General Electric	2017
Blue Lake - Gresham 230 kV Line	Portland General Electric	2017
Trojan - Horizon 230 kV Line and Horizon 230/115 kV Transformer #2	Portland General Electric	2017
Portal Way 230/115 kV Transformer #2 and Line Upgrades	Puget Sound Energy/BPA	2018
Upgrade Denny Substation Transmission - Phase 2	Seattle City Light	2020

Mid-C Study Team was included. It includes a Grant County PUD Columbia-Larson 230 kV line; the Douglas PUD Douglas-Rapids-Columbia 230 kV line, Rapids Substation and a 230/115 kV transformer; and upgrades to the Chelan County PUD's McKenzie-Wenatchee Tap line and line re-terminations at Chelan's Andrew York Substation. These projects are planned to be energized by 2015 or earlier. Cost allocation for the Rapids-Columbia 230 kV line has been agreed to by the impacted parties and Douglas is proceeding with construction of this project.

### **Puget Sound Area Transmission Expansion Plan Reinforcements**

Six of the recommended projects in the expansion plan developed in the Puget Sound Area Study Team are planned to be energized by 2017 or before. These projects include reconductoring the Bothell-SnoKing 230 kV double circuit line, reconductoring the Delridge – Duwamish 230 kV line, installing a Raver 500/230 kV transformer, a Lakeside Substation 230/115 kV transformer, Northern Intertie RAS extension to include the combined loss of Monroe-SnoKing-Echo Lake and Chief Joseph-Monroe 500 kV lines (not modeled in this Assessment), and adding series inductors to the Massachusetts-Union-Broad and Denny-Broad 115 kV underground cables. The Raver 500/230 kV transformer project would add a new 500/230 kV transformer at Raver Substation and

would utilize an existing transmission line to create a new Raver-Covington 230 kV line. The Lakeside Substation 230/115 kV Transformer Project would add a 230/115 kV transformer at Lakeside Substation and rebuild both Sammamish-Lakeside-Talbot 115 kV lines to 230 kV. Only one line will be initially operated at 230 kV and the other line will remain operated at 115 kV. These projects support south to north transfer capability on the northern intertie and load service reliability in the Puget Sound Area. Cost allocation for these projects has been agreed to by the impacted parties and they are proceeding with the projects.

### **Denny Substation Phase 1 Project**

Phase 1 of the Denny Substation project creates a new 115/13 kV Denny Substation looped into the East Pine-Broad 115 kV underground cable. Some load would be transferred to this substation from Broad Street Substation.

### **Ponderosa Reinforcements**

Bonneville and PacifiCorp have developed a plan to provide additional transformation in the Bend/Redmond area with a transformer added at Ponderosa connected to the Grizzly-Captain Jack 500 kV line. This project is planned for a 2013 energization.



### **Whetstone 230/115 kV Transformer**

There were considerable low voltages in the Grants Pass area in the winter cases. The Whetstone project is PacifiCorp's preferred project to solve these area problems but this project has not moved into the construction phase in a timely manner. Originally PacifiCorp elected not to model this project as committed but in order to address the low voltage needs in the Grants Pass area (which can affect power flow solutions throughout the system), the PacifiCorp Whetstone Substation project was added to all cases.

### **Major Additions in the Ten-year cases**

The ten-year System Assessment cases also included some additional projects beyond those in the five-year cases. There were a few projects that utilities have committed to build, however, due to significant lead times they are not expected to be completed until the latter part of the ten-year planning horizon. These additional projects were only included in the ten-year cases and are listed below:

### **Hemingway - Boardman 500 kV Project**

This Idaho Power project includes a 300-mile 500 kV line from the Boise Idaho area to Boardman Substation. This project is intended to provide 1,300 MW of capacity in the west to east directions and 800 MW in the east to west direction. Idaho Power would like to have this project energized by 2016 but to obtain all siting, permitting and regulatory approvals, energization before 2018 is unlikely.

### **I-5 Corridor Reinforcement Project**

This Bonneville project consists of a 70-90 mile 500 kV line from a new Castle Rock Substation north of Longview to Troutdale Substation east of Portland. The project is scheduled to be energized in the 2018 timeframe and is planned to remove the most limiting bottleneck along the I-5 corridor, the South of Allston Cutplane.

### **Cascade Crossing Project**

The Portland General Electric Cascade Crossing Project is a new transmission line to bring power into the Salem area. Originally, PGE proposed a 200-mile 500 kV line starting at the Coyote Springs

Generation Plant and terminating into a new 500/230 kV transformer at Bethel Substation. This line would also interconnect at a new Grassland Substation connecting to the Boardman Power Plant and a new Cedar Spring Substation approximately 36 miles southwest of Boardman where it interconnects with new wind generation. The proposed rating of the initial project is 1,500 MW and it is scheduled for energization in 2017.

PacifiCorp and Bonneville have partnered with Portland General to study this project and may participate in a modified project. Since the System Assessment was started, new options were developed that minimize line construction and PGE is no longer pursuing the transmission project. A study of these new options will be done in future system assessments when they are more fully developed.

#### **Blue Lake-Gresham Project**

The Portland General Electric Blue Lake-Gresham project is planned for 2017 in east Portland and consists of a new 4 mile 230 kV line.

#### **Trojan - Sewell - Horizon Project**

This Portland General Electric Project is planned for 2017 in west Portland and consists of a 40 mile 230 kV line and a 230/115 kV transformer at Sewell. (PGE has recently decided not to pursue this project at this time).

#### **Portal Way 230/115 kV Transformer Project**

Puget Sound Energy and Bonneville are planning to add a second 230/115 kV transformer in north Skagit County, Washington. This project is part of the Puget Sound Area Transmission Expansion Plan and is planned to be energized in 2018. The project will help improve north to south transfer capability on the Northern Intertie.

#### **Denny Substation Phase 2 Project**

Seattle City Light is planning the second phase of the Denny Substation project for 2020. This project expands on Phase 1 of the Denny Substation project. Phase 2 adds a new 115 kV transmission line from Massachusetts Street Substation to Denny Substation.

#### **Celilo/PDCI Replacement/Upgrade Project**

This Bonneville project will replace the aging equipment at the northern Celilo terminal of the PDCI (the southern terminal at Sylmar has already been replaced). This project is planned to be completed in 2016 and will increase the capacity of the PDCI from 3,100 MW to 3,220 MW.

All transmission facility ratings included in this study were determined by the owner of the facility.

## Major Project Changes

Two utilities took a slightly different approach in deciding which projects should be modeled in this year's System Assessment. Once preferred projects are selected and committed by utilities, they are usually modeled in the base cases so the focus can then be on subsequent needs of the system. However, if utilities are having difficulty obtaining support for projects, or the projects are not moving to the construction phase in a timely manner, they can remove these projects to demonstrate the system problems without those projects and highlight the need again. Projects can also be delayed and only modeled in the ten-year cases. These are the approaches Avista and PacifiCorp took this year for the following projects:

1. Moscow 230 kV Substation Rebuild and Transformer Replacement (only modeled in ten-year cases),
2. Benton-Othello 115 kV Line Upgrade (only modeled in ten-year cases),
3. Westside 230 kV Substation Rebuild and Transformer Replacement (only modeled in ten-year cases),
4. Irvin Project – Spokane Valley Transmission Reinforcement Project (only modeled in ten-year cases),
5. Union Gap 230/115 kV Transformer #3 (not modeled),
6. Vantage-Pomona Heights 230 kV Line (not modeled),
7. Wallula-McNary 230 kV Line (not modeled)
8. Whetstone 230/115 kV Transformer

(originally the intent was to not model this project but it was included in the base cases due to voltage problems that occurred in the area that impacted power flow solutions).

The projects in the Ten-year Plan are very similar to the projects modeled in the base cases. There are a few exceptions such as the Whetstone transformer described above. Also, the following five projects from the Ten-year Plan were not modeled in the base cases because project information was not available at the time the studies were run. Future System Assessments will include these projects:

1. Schultz-Raver 500 kV Series capacitors
2. Paul 500 kV Shunt Reactor
3. Saiteri-Chienawa 230 kV Line Upgrade
4. Big Eddy 230/115 kV transformer #1 Replacement
5. John Day-Big Eddy 500 kV #1 Line Reconductor



## ***Study Methodology***

The system was analyzed for all base cases without outages (N-0 conditions) and tuned to be within required voltage limits. Any voltage violations or facility overloads that could not be resolved through this tuning were noted.

All single element (N-1 or NERC Category B) outages down to 115 kV were studied on each base case (at Portland General's and PacifiCorp's request; only outages at voltages greater than or equal to 230 kV were studied). Participants in the System Assessment provided ColumbiaGrid with information on the multiple contingencies that they wanted to be studied. These included common mode outages, which are plausible outages of multiple facilities caused by a single event, also called Category C events. These common-mode outages are listed in Attachment C (Cell protected and available upon request). Included in this System Assessment were inadvertent breaker openings, which are especially important on multi-terminal lines. The System Assessment also included known automatic and manual actions associated with each contingency. Loadings greater than 98% were identified in the results along with voltage violations.

As of April 1, 2012, the WECC Planning Criteria for adjacent circuits changed to include only circuits within 250 feet of each other if both circuits are greater than 300 kV. The older criteria did not specify a voltage level and the minimum circuit spacing was based on the maximum span length between towers which was typically in the order of 1000 feet or more. Although most of the adjacent circuits by the old criteria were studied, only those now required to meet the new criteria need to be mitigated.

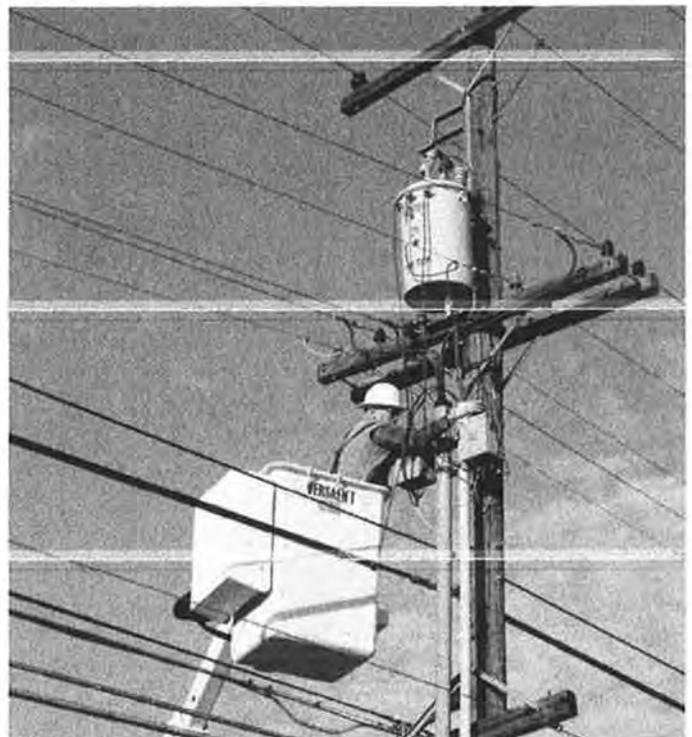
Chelan, Douglas and Grant requested that numerous N-1-1 outages be studied as part of the System Assessment. These outages were studied for information and shared with all participants but no mitigation was suggested for these outages.

In identifying the voltage violations, the WECC criteria of no more than a 5% voltage drop following a Category B (single) contingency or a 10% voltage drop following a credible Category C (multiple) contingency was used. Outages that did not solve were noted for further exploration.

Participants were not only asked to review outages of their facilities that caused problems, but also to review any violation of limits on their facilities that were caused by any owner's outage. ColumbiaGrid staff also reviewed the results. Participants were also encouraged to provide a peer review of all results regardless of ownership.

Although the focus of this System Assessment is the facilities of the PEFA planning parties, the interconnected nature of the system requires that neighboring facilities also are modeled to determine if there are any interactions between the systems. As mentioned earlier, ColumbiaGrid invited the owners of systems neighboring PEFA parties to participate in the System Assessment.

All study results were available to the planning participants. Single system issues (events where the outage facility and the overloaded facilities were owned by the same utility) were assumed to be the responsibility of that utility to mitigate. The focus of this report is the joint issues where the outages and associated overloads were owned by multiple utilities and joint transmission planning may be needed.



## *Study Results*

### **Five-Year Study Results**

There were no loading violations on ColumbiaGrid planning participant facilities in the five-year base cases with all facilities in-service. All outages that resulted in loadings or voltages outside of criteria were listed in spreadsheets and individually reviewed. Some of the more severe outages did not converge during the initial power flow simulations. Unsolved solutions are an indicator that the voltage stability limit may be exceeded. The Assessment resulted in 17 failed solutions in the summer, 53 failed solutions in the winter and 9 failed solutions in the spring. ColumbiaGrid has studied all of these unsolved outages to more fully understand these issues. (page 39)

The System Assessment identified 65 line sections in the 2018 heavy winter case operated at 115 kV and above that overloaded during various outage conditions where mitigation was not identified. Of these overloaded lines, 36 are owned by ColumbiaGrid planning participants. A total of 112 line sections overloaded in the 2018 heavy summer case where mitigation was not identified; of these overloaded lines, 66 are owned by ColumbiaGrid planning participants. A total of 20 line sections operated at 115 kV and

above were identified in the 2016 light spring cases that overloaded during outage conditions where mitigation was not identified. Of these overloaded lines, 12 are owned by ColumbiaGrid planning participants. No specific mitigation was identified in the five-year studies.

Although many types of mitigation would be possible in that timeframe, this study concentrated on mitigation for the ten-year studies (below).

### **Ten-Year Study Results**

Contingencies were studied on the ten-year peak summer, peak winter, extra heavy peak winter and light spring cases in the same manner as the five-year cases. Additional problems were noted in these studies. As noted above, the ten-year studies also included the Hemingway – Boardman 500 kV Project, I-5 Corridor Reinforcement Project, Cascade Crossing Project, Blue Lake-Gresham Project, Portal Way 230/115 kV Transformer Project, Denny Substation Phase 2 Project, and the Celilo Replacement/Upgrade. There were no loading violations on ColumbiaGrid planning participant facilities in the ten-year base cases with all facilities in-service.

**Table G-1: Potential Reactive Mitigation Projects**

<b>Substation</b>	<b>MVARs</b>	<b>Owner</b>
Albany	55	Bonneville
Chiquin	20	PacifiCorp
Dixonville	55	PacifiCorp
East Omak	10	Bonneville
Flathead	15	Bonneville
Garrison	30	Bonneville
Martin Creek	10	Bonneville
McKenzie W	60	Eugene Water & Elec Bd
Pilot Butte	90	PacifiCorp
Roundup	30	Bonneville
Tahkenich	20	Bonneville
Tillamook	30	Bonneville
Troutdale	10	PacifiCorp
Union Gap	60	PacifiCorp

The System Assessment identified 84 line sections in the 2023 heavy winter case operated at 115 kV and above that overloaded during various outage conditions where mitigation was not identified. Of these overloaded lines, 48 are owned by ColumbiaGrid planning participants. A total of 122 line sections operated at 115 kV and above overloaded in the 2023 extra heavy winter case where mitigation was not identified; 73 are owned by ColumbiaGrid planning participants. A total of 150 line sections operated at 115 kV and above overloaded in the 2023 heavy summer case where mitigation was not identified; 92 of these overloaded lines are owned by ColumbiaGrid planning participants. A total of 23 line sections operated at 115 kV and above overloaded in the 2022 light spring case where mitigation was not identified; 16 of these overloaded lines are owned by ColumbiaGrid planning participants. It was assumed that these line sections could be rerated, reconducted, or rebuilt as mitigation and these

types of projects are considered “placeholder” projects until more thorough reviews can be completed by the affected parties and specific transmission projects can be identified. These assessment cases also resulted in 17 failed solutions in the heavy summer, 67 failed solutions in the heavy winter, and 35 failed solutions in the light spring. ColumbiaGrid has analyzed these failed solutions further (see page 39).

### **Voltage Problems**

In this report, voltage problems were addressed similarly to the overload issues and consistent with the practices that were conducted in the previous System Assessment. In general, when potential reactive issues were identified, interim corrective action was proposed by assuming capacitor additions will be used rather than rerating, reconductoring, or rebuilding transmission lines. In order to identify the locations where additional reactive power might be needed, WECC criteria

which require no more than 5% voltage drop following a credible category B contingency or a 10% voltage drop following credible category C (multiple) contingency were used. The reactive requirements to prevent voltage violations were studied for the 230 and 500 kV buses. For this assessment, the total reactive additions necessary to mitigate voltage problems for the ten-year planning horizon totaled 495 MVARs of shunt capacitors in 14 locations, all at the 230 kV level. These additions are listed in table G-1 (at the top of the previous page).

### **Voltage Stability Issues and Unsolved Outages**

The unsolved outages listed in Attachment C of the 2013 System Assessment (CEll protected) required further investigation to determine the cause and mitigation of the failed solutions. Outages involving several areas of the system were investigated:

- Redmond-Bend area in central Oregon.
- Grays Harbor area in western Washington
- McNary-Santiam area in north central Oregon
- Northern Mid-Columbia area in Central Washington
- The Centralia/Olympic Peninsula area in northwestern Washington.
- The Palouse area in southeastern Washington
- Sandpoint-Libby area in northwestern Montana/Northern Idaho

- The Klamath Falls/Grants Pass area in south central Oregon
- The Southern Oregon Coast
- The Yakima area in Central Washington
- The Wasco area in north central Oregon

All unsolved outages were tested with the WECC post transient power flow solution methodology, which eliminated simulation of manual and slow automatic actions. Failed solutions are often caused by the modeled conditions exceeding voltage stability or angular stability solution limits. As a screening tool, the voltage threshold for voltage sensitive loads was set to 0.90 per unit voltage. During the power flow solution iterations, if the voltage at a load is below 0.90 per unit, the load is no longer constant power and it decreases with voltage. The decrease is nonlinear to facilitate the solution. The sections below provide more details of unsolved cases and potential mitigation plans in each geographical area.

For the Redmond-Bend area, there are three sub-areas that have potential to cause voltage instability. First, under heavy winter conditions, voltage instability may occur following an N-2 outage of Pilot Butte – Ponderosa 230 kV and Pilot Butte – Redmond 230 kV lines. This can be mitigated with a new 150 MVAR SVC at Pilot Butte or nearby substations. Second, breaker failures at Redmond West 230 kV substation can cause voltage instability due to low voltage

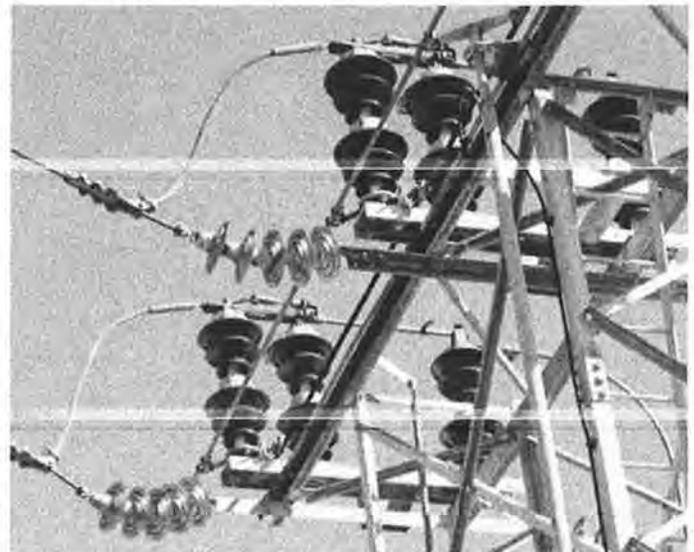
in the area which can be mitigated by installing approximately 75 MVAR of reactive support around Redmond 69 kV system. Third, bus fault at Round Butte 230 kV disconnects the Cove 230 kV bus from other 230 kV network which results in voltage instability. Approximately 100 MVAR of additional reactive support around Cove area or tripping local load can be used to mitigate this problem.

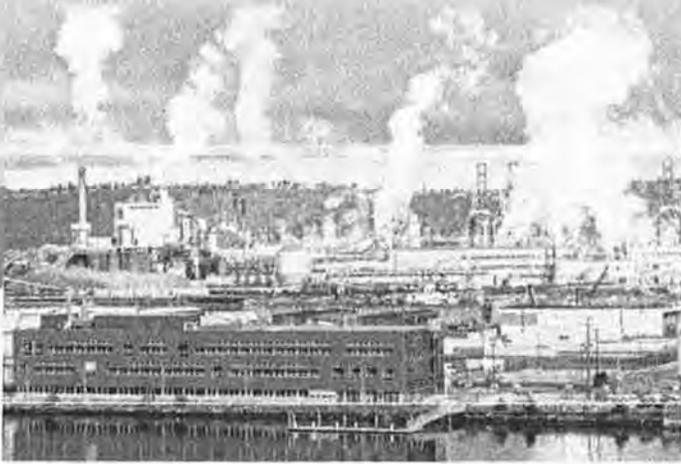
In the Grays Harbor area, under heavy winter loading conditions, a number of N-1 line outages, bus faults, and breaker outages around Satsop substation could result in voltage instability due to loss of the connection between the Satsop 230 kV system from its 500 kV bus which resulted in low voltages. However, the investigation showed that these instability incidents were likely to be caused by modeling issues which result in very high VAR flow between 500kV and 230 kV system around Satsop in the base case which are not realistic. Correction of the VAR flow mitigates the problem.

In McNary area, there are potential voltage instability problems under light spring conditions in two sub-areas. First, loss of McNary 500/230 kV transformer and a number of 230 kV breaker failures can result in instability due to insufficient transmission capability to export the amount of power from generators in the area to the 500 kV system. This problem can be addressed by BPA plans to add the second McNary Transformer.

Similar incidents were observed in the McNary-Santiam subarea following various N-1 and N-2 line outages that disconnect the 230 kV transmission facilities between Tumble Creek and McNary substations. In this case, instability incidents were identified due to insufficient transmission capability to accommodate the output from generators that connected to Jones Canyon. In order to mitigate this problem, the total output from generators at Jones Canyon should not exceed 280 MW under these study conditions or additional transmission facilities must be added to increase system capability.

The study results also showed potential system instability in Northern Mid-Columbia area triggered by two contingencies. First, a breaker failure at Andrew York 115 kV bus (category C) may cause voltage instability under heavy winter loading conditions. Opening the 115 kV tie





line to Summit mitigated this problem (which is functionally similar to Chelan's under voltage relay at Anderson Canyon that is used to mitigate this problem). Second, the outages of Wells 230 kV bus and Wells – Douglas 230 kV lines can cause an instability problem due to insufficient transmission capability to accommodate generators in the area. In order to mitigate this problem, the total output from generators that are connected to Wells Bus 2 should not exceed 300 MW. There is a run back scheme in place to do this but it was not modeled.

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In the Olympic Peninsula, a number of contingencies consisting of bus faults, breaker failures, and line outages along the transmission corridor between Olympia to Port Angeles may cause voltage instability. Investigation showed these instability incidents were caused by modeling issues which involve initial voltage setting and insufficient reactive support in the area. Once the modeling issues are corrected, in order to mitigate the remaining problems, approximately 40 MVAR of reactive support around Port Angeles is needed.

In Palouse area under light spring loading conditions, instability due to insufficient transmission capability to accommodate generation output following a number of contingencies such as breaker failure at North Lewiston 115 kV bus and various N-1 line outages on the 115 kV transmission corridor between Walla Walla and North Lewiston were identified. The investigation showed that these problems may be caused by modeling issues where some reactive devices may not be set properly or too slow to react to voltage decline after contingencies. In order to mitigate this problem, the addition of approximately 10 MVAR of reactive support is needed. Alternatively, the amount of total output from generators that are connected to this 115 kV transmission corridor could be limited to 110 MW under the study conditions.

Potential instability in Sandpoint/Libby area was identified from the study under heavy summer, winter and light spring conditions due to the N-2 outages of Libby – Noxon and Libby – Conkelly 230 kV lines which removes the major transmission out of Libby powerhouse from service. The investigation results showed that a possible mitigation plan to this problem is to limit the amount of Libby generation to approximately 110 MW under these conditions (a tripping scheme similar to this is in place but not modeled.)



Instability in the Santiam area was also identified due to Marion – Alvey 500 kV and Marion – Lane 500 kV double line outage under heavy winter conditions. This potential problem can be mitigated with a new 35 MVAR reactive addition at Tahkenich (along the coast near Florence, Oregon). There may also be local RAS that addresses this issue.

In the Southern Oregon area, potential instability incidents were identified in two sub-areas. First, the outage of LaPine 230/115 kV transformer results in voltage collapse around LaPine 115 kV system under heavy winter and heavy summer conditions. The investigation results show that this may be caused by a modeling issue around LaPine substation where the second LaPine 230/115 kV transformer was mistakenly taken offline in the base case. Consequently, this problem can be mitigated if the second transformer is placed into service. Second, two n-1 line outages and breaker failure outages in Meridian and Klamath Falls area can cause voltage instability due to low voltages around the Meridian 230 kV bus. In order to mitigate these problems, approximately 100 MVAR of additional reactive support would be needed at this location.

Potential voltage instability incidents in the Southern Oregon Coast area were also identified under heavy winter, heavy summer, and light spring conditions due to breaker failure and bus outage at Fairview 230 kV bus (Category C).

In general these contingencies disconnect the Fairview 115 kV system from its 230 kV source which could trigger voltage instability. Possible mitigation plans for this area include installing additional reactive support or other alternatives such as load dropping.

In the Yakima area, under heavy winter conditions, breaker failures at the Wanapum 230 kV bus has resulted in potential voltage instability. In order to address this issue, approximately 80 MVAR of additional reactive support at Union Gap or Pomona Heights in the Yakima area is needed.

In addition, in the Wasco area, a breaker failure at the Big Eddy 115 kV bus could result in voltage instability under heavy winter conditions. The addition of approximately 10 MVAR of reactive support around the Demoss 115 kV bus can mitigate this problem.

### **Joint Areas of Concern**

Joint areas of concern (those that occurred between systems or that involve the bulk grid) are the primary focus of ColumbiaGrid's System Assessment. These areas were identified when multiple planning parties had outages that caused overloads and/or had facilities that overloaded as a result of such outages. ColumbiaGrid will organize study teams as necessary to resolve these system deficiencies between ColumbiaGrid members.

If a problem did not involve multiple utilities, it was considered to be a single-system issue and remained the responsibility of the individual owner. In this instance the owner is obligated through PEFA to report back to the ColumbiaGrid process on the measures they have planned to mitigate the single-system problem. ColumbiaGrid will use these mitigation plans to update its future base cases.

The following areas were identified in the System Assessment in the ten-year planning horizon and involve more than one system. Several of these will require further study over the remainder of the year to determine the extent of the system problems and to develop mitigation.

Twelve problem areas were noted in this assessment while seventeen problem areas were noted in last year's assessment. Problem areas that were resolved from last year's System Assessment include:

### **1. Longview Area**

In the 2012 System Assessment, overloads were seen in the Longview area due to increased load forecast for Cowlitz County PUD. The ten year forecast has decreased this year and these overloads were not seen in the 2013 System Assessment.

### **2. Tacoma Area**

In the 2012 System Assessment, a bus section breaker outage at the Tacoma 230 kV bus caused a number of overloads. This issue was not present this year, as Bonneville has made a commitment to add a series bus section breaker in 2016 that will resolve the issue.

### **3. South of Allston**

Problems identified in previous System Assessments for the South of Allston area were not flagged in this year's system assessment. Better RAS modeling may have helped eliminate these issues.

### **4. SnoKing/Everett Area**

In the 2012 System Assessment, outages of the SnoKing 115 kV bus caused overloads in the area which did not show up in 2013. Improved modeling of the Swamp Creek Switching Station project and other area facilities appears to have resolved those issues.

### **5. Spokane Reliability**

In the 2012 System Assessment, the outage of the Bell 230 kV bus section breaker overloaded the Beacon 230/115 kV transformers. These facilities are owned by Bonneville and Avista and BPA has committed to a project to add a series bus section breaker at Bell, which has resolved this problem.

Problem areas identified in prior System Assessment that were also identified in this System Assessment.

### **1. The Olympia – Shelton Area**

In the winter cases, several 230 kV bus outages at Shelton did not solve. These problems were identified in previous system Assessments. Bonneville and Puget Sound Energy own facilities in this area. Load shedding is a possible mitigation measure for these outages.

### **2. Orofino Area in Northern Idaho**

In five-year and ten-year summer cases, the outage of the Dworshak-Hatwai 500 kV line or the Hatwai 500/230 kV transformer overloads the Ahsahka-Orofino 115 kV line and the Dworshak 115/13.8 kV transformer. Avista and Bonneville have operating procedures and RAS in place to sectionalize the system and redispatch generation for these outages. No further study team effort is needed.

### **3. McNary Area**

In the summer five and ten-year cases, an outage of the McNary 230 kV Bus 2 and 3 overloads the Badger-Nine Canyon Wind-H2F-Berrian 115 kV lines. An outage of McNary 230 kV bus section #3 overloads the Cold Springs 230/69 kV transformer. Redispatch of generation at McNary could relieve these problems. This problem appears

to be confined to the local area. These are joint problems between Bonneville and PacifiCorp. Since there is only one ColumbiaGrid member, no study team will be formed. In last year's biennial plan, high loadings of the Cold Springs 230/69 kV transformer were investigated to determine the impact if the transformer were to trip before operators could re-adjust the system. This analysis showed that the McNary bus outage removes all generation and voltage support from the McNary 230 kV bus and the Cold Springs substation tries to provide voltage support to McNary. Tripping the Cold Springs transformer removes the parallel 69 kV systems and improves the flows in the area although there were still low voltages. There is also a proposed project to add a second McNary 500/230 kV transformer, which would provide generation and voltage support to the McNary 230 kV bus during the problem outages.



#### **4. Okanogan Area**

In the five and ten-year winter cases, a breaker failure at Wells 230 kV bus would overload the Okanogan-Ophir Tap 115 kV line. These facilities are owned by Douglas County PUD and Okanogan. Since there is only one ColumbiaGrid member involved, these issues will be the responsibility of affected parties and no study team is proposed. Possible solutions include bus sectionalizing or line upgrades.

#### **5. Pearl-Sherwood Area**

In the summer, the N-2 outage of the double circuit Carlton-Sherwood 230 kV and Newberg-Sherwood 115 kV lines overloads the Sherwood-Springbrook 115 kV line for both the five and ten-year cases; this same outage overloads the Forest Grove-McMinnville 115 kV line in both the summer and winter five and ten-year cases. BPA and PGE are working on a solution to this double circuit outage problem.

A bus section breaker failure at the Pearl 230 kV bus could overload the Canemah-Sullivan 115 kV line in the ten-year winter case, but this issue will be resolved by the planned Bonneville 230 kV bus section breaker at Pearl. These system issues in the Pearl-Sherwood area have been identified in previous system assessments and involve Bonneville and Portland General Electric facilities. Since there is only one ColumbiaGrid member

involved, these issues will be the responsibility of the affected parties and no study team is proposed.

#### **6. Bend Area Voltage Stability**

In the ten-year winter case, bus outages at Pilot Butte 230 kV overload the Pilot Butte 230/69 kV transformers. In the ten-year summer case, breaker failures at Redmond West 230 kV bus overload the Cove 230/69 kV transformers. Breaker failures at Pilot Butte 230 kV and Redmond 230 kV buses did not solve which may be a symptom of voltage instability.

These facilities are owned by PacifiCorp and Bonneville and these problems were identified in previous system assessments. The unsolved outages could cause voltage stability issues in the Bend-Redmond area. Since there is only one ColumbiaGrid member involved, these issues will be the responsibility of affected parties and no study team is proposed. Bonneville has plans to build an additional 230/115 kV station in the area (Bonanza) that could help mitigate these problems.

#### **7. Yakima/Wanapum Area**

In the summer, breaker failures and bus outages at Wanapum 230 kV cause overloads on the Outlook-Punkin Center, Moxee-Hopland, Union Gap-Voelker and Ringold-Mesa 115 kV lines, as well as the Outlook 230/115 kV transformer. An



outage of the Midway-Wine Country 230 kV line overloads the Outlook 230/115 kV transformer and the Outlook-Sunnyside 115 kV line.

In the winter a Wanapum 230 kV bus outage overloads the Outlook-Punkin Center 115 kV line. These issues were identified in previous System Assessments, however overloads on DOE and Avista lines that were previously identified have been resolved. The remaining overloaded facilities are owned by Bonneville and PacifiCorp, with outage ownership by Grant County PUD. PacifiCorp has identified a project to build a Vantage-Pomona 230 kV line to mitigate this problem but they have not made a firm commitment to this project. Since there is essentially only one ColumbiaGrid member involved (Bonneville) and the worst overloads are on PacifiCorp's system for outages of PacifiCorp facilities, final resolution of these issues will be the responsibility of those parties and no study team is proposed, but these issues will continue to be monitored for resolution.

### **8. Clark County/Troutdale Area**

In the summer ten-year case, a breaker failure outage of the Troutdale west 230 kV bus overloads the Troutdale-Linneman 230 kV line, Lacamas-Sifton 115 kV and the St John-Bloss 115 kV line. Loss of the N-2 Ross-Rivergate and Ross-

St John lines overloads the Fruit Valley-Hayden-St John 115 kV line.

In the ten-year winter, a Ross 230 kV bus section breaker outage overloads the Troutdale 230/115 kV transformer. These system issues involve Bonneville, PacifiCorp and Clark County facilities. Since there is only one ColumbiaGrid member, these issues will be the responsibility of the affected parties and no study team is proposed. Possible mitigation includes line upgrades or redispatching generation at Merwin Dam.

### **9. Centralia Area**

In the ten-year winter case, the N-1 Paul-Satsop 500 kV line outage, the N-2 Paul-Olympia 500kV/ Paul-Satsop 500 kV, and Satsop breaker failures did not solve indicating a possible voltage stability issue. Failed solutions only occurred for the N-2 outage involving the Paul-Satsop and Olympia-Satsop 500 kV line outage in last year's assessment, but the failed solution for the N-1 outage is new this year which may indicate that the problem has



gotten worse. Load shedding may be a possible solution for this problem.

### **10. Salem-Eugene Area**

In both the five-year and ten-year summer cases, a breaker failure outage at the Albany 115 kV bus overloads the Fry-Oromet 115 kV line. This same outage also overloads the Bethel-Parish Gap line in the ten-year summer case. In the winter, there were failed solutions for an N-2 outage of the Marion-Alvey and Marion-Lane 500 kV lines. These problems were identified in previous system assessments, although the issues are less numerous and less severe than in previous years. The problems involve outages of Bonneville facilities and could cause problems on the PacifiCorp system.

### **11. Sandpoint, Idaho Area**

A Libby 115 kV bus outage causes minor overloads the Bronx-Sand Point line in the five and ten-year spring cases. These facilities are owned by Bonneville and Avista. Similar issues were identified in previous System Assessments for the summer season. Reconductoring the Bronx-Sand Point 115 kV line has eliminated these overloads for the summer, but is not sufficient to correct for the loading levels seen in the spring cases. Generation redispatch at Cabinet Gorge would resolve this remaining overload.

### **12. Northern Intertie Transfer Issues**

In the five and ten-year summer cases, the N-2 loss of Custer-Monroe 500 kV #1 and #2 lines overloads the Sedro-Murray, Sedro-Bellingham and Sedro-Horse Ranch 230 kV lines. These overloads are likely due to RAS arming levels. Additional generation tripping will eliminate this issue. In both summer cases, a breaker failure outage at the Bothell 230 kV bus overloads the Snohomish-Bothell 230 kV #1 line. This latter problem was noted in the 2012 System Assessment.

### **New issues from this System Assessment**

No new issues were identified in this System Assessment.

### **Proposed joint study efforts**

#### **Puget Sound Area Study Team**

One issue was identified in the Puget Sound area that relates to the operation of the Northern Intertie and the Puget Sound Transmission Expansion Plan that includes the N-2 Custer – Monroe #1 and #2 lines overloading the Sedro – Murray, Sedro – Bellingham and Sedro – Horse Ranch 230 kV lines. This issue is likely caused by RAS arming levels in the model that are calibrated for the near term system, while arming levels in the five and ten-year horizon may be different. This issue will be directed to the ongoing efforts of the Puget Sound Area Study Team for resolution.



## *Planned Sensitivity Studies for 2013*

The following sensitivities are proposed for analysis in 2013:

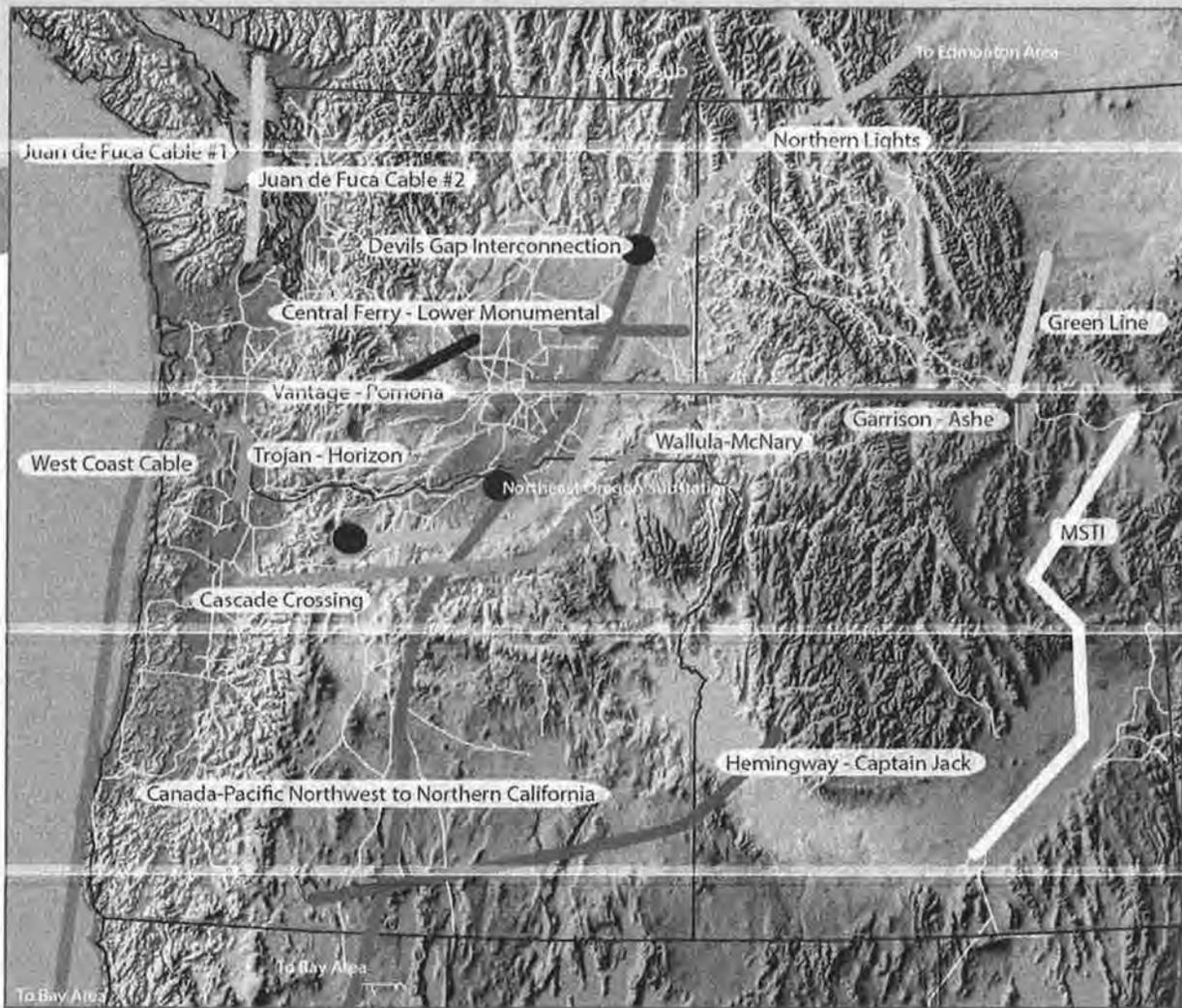
### **1. Production/Cost Studies**

This year production/cost studies will be run to test the impact of new California policies for internal Renewable Portfolio Standard (RPS) development on transmission paths into California especially from the northwest (COI and PDCI).

This study will be run using the WECC TEPPC data base in the ten-year timeframe for comparison both with and without the new policy.

### **2. Power flow analysis of reduced conservation**

A significant amount of conservation is included in the load forecasts that are used in the System Assessment. This conservation offsets load growth and consequently the need for some transmission projects. In other words, if the conservation were not included, or if the conservation targets are not met, some transmission projects may be needed sooner and additional transmission projects may also be needed. For this sensitivity, a comparison between the Heavy Winter and Extra Heavy Winter case results will be made to assess the impact of not meeting the conservation goals. The Extra Heavy Winter case is projected to be similar to the Heavy Winter case without conservation. The assessment will include evaluating the impact on project schedules and the possible need for additional projects. The focus of this study will be on facilities at or above 230 kV.



**Figure J-1: Major Transmission Projects**

## *Potential Major Transmission Projects*

Several large transmission projects have been proposed in the region to integrate new resources and accommodate economy transfers to access lower cost resources. There are firm commitments by sponsors to build several of these projects; Big Eddy - Knight, Hemingway - Boardman, Montana - Alberta Transmission Line (MATL), and the I-5 Corridor Reinforcement. These projects were included in the assessment cases but the projects without firm commitments were not (since the I-5 Corridor

project, and Boardman - Hemingway are not expected to be completed until at least 2017, they were only included in the ten-year studies). This approach avoids masking problems on the transmission systems that would need to be addressed if the more speculative projects are not built. Analysis of impacts that these major projects might have on the load service and firm transmission service commitments of the PEFA parties will be addressed later by the appropriate



ColumbiaGrid study teams.

The other major projects in the region that do not have commitment to be built are described below. See Figure J-1 for a map of these projects. If these projects are firmed up, they will be modeled in future system assessments. However, support for these projects has diminished over the last couple of years. These projects are electrically in parallel with ColumbiaGrid member facilities and could have impacts to the existing system.

#### **a. Garrison-Ashe Project**

The 2010 BPA Network Open Season included several requests that could not be accommodated by the Colstrip Upgrade Project. To gain additional capacity to fulfill these requests, a 430 mile series compensated Garrison-Ashe 500 kV line was proposed with an intermediate station between Taft and Hot Springs. Due to the high cost of this project, BPA has not made any commitment to pursue this project. No WECC Regional Planning or Rating studies have been started.

#### **b. Canada-Pacific Northwest to Northern California Project**

The Canada-Pacific Northwest-California (CNC) Project is a 1000 mile transmission line from British Columbia to northern California that was sponsored by Avista, BC Hydro and Pacific Gas and Electric. The plan of service involves a 500

kV AC transmission line from Selkirk Substation to Devils Gap Substation to NEO (Northeast Oregon) Substation (Northern Segment) and a +/-500 kV DC transmission line from NEO Substation to the San Francisco Bay Area (Southern Segment). The project has a Planned Rating of 3000 MW in the north-to-south direction.

Since developing this project, the sponsors have analyzed a scaled down, 2000 MW version of the project as their needs for renewable generation have changed. They also investigated aligning the Northern and Southern Segments of their project in a common corridor with existing facilities to reduce the Project's environmental impact. A study completed called the "Pacific Northwest-California New Transmission Feasibility Assessment" showed acceptable system performance for several options. An investigation was also made into the availability of existing capacity on COI in lieu of constructing the Southern Segment. This COI Utilization analysis indicated some unused transmission capacity from time-to-time, but such capacity would not be sufficient to meet the needs of the generation and load entities. These two reports were completed in April and May of 2011 and are available on the ColumbiaGrid website. The Project Sponsors have since put these projects on hold.

### **c. Northern Lights Project**

The Northern Lights project is a 970-mile high-voltage DC line (+/- 500 kV) beginning at Edmonton, Alberta and ending at a new substation near the existing Buckley Substation in north central Oregon. At least one intermediate terminal is planned in a location south of Calgary, near Alberta's largest wind development region. The project is planned to have bi-directional capacity as high as 3,000 MW. This project takes advantage of the diversities in load and generation between the two areas. The project is currently on hold.

### **d. Juan de Fuca Cable #1 Project**

Sea Breeze Pacific is proposing an underwater 550 MW high-voltage DC +/-150 kV cable across the Strait of Juan de Fuca from Pike Substation near Victoria on Vancouver Island Canada to the Port Angeles Substation in Port Angeles, Washington. This project rating is planned to be fully controllable and bi-directional. According to the Bonneville and BC Hydro interconnection studies completed to date, the project will also require existing system reinforcements, including 230 kV line upgrades from Satsop to Port Angeles Substations. This project was granted Phase 2 rating status on June 29, 2007.

### **e. Juan de Fuca Cable #2 Project**

Sea Breeze Pacific is proposing a Multi-terminal underwater 1,100 MW high-voltage DC cable (+/- 300 kV) across the Strait of Juan de Fuca from Ingledow Substation near Vancouver, British Columbia, Canada to Pike Substation near Victoria on Vancouver Island Canada, to either the Shelton or Olympia Substations on the Olympic Peninsula, Washington. The 1100 MW project rating is planned to be fully controllable and bi-directional.

### **f. West Coast Cable Project**

Sea Breeze Pacific is proposing an underwater high-voltage DC cable from Allston Substation in northwest Oregon near Rainier to the San Francisco Bay area. This project has a planned rating of 1,600 MW. This project is intended to bring renewable resources from the Northwest to California.

### **g. Green Line**

In conjunction with the MATL project, Enbridge is proposing the Green Line Project to provide access to the Mid-Columbia Hub. This project is a 100 mile extension of the MATL project to connect to the Colstrip Transmission system at Garrison or Townsend. This project is expected to provide up to 1000 MW capacity and is in the feasibility stage.

### **h. Hemingway-Captain Jack Line**

PacifiCorp had proposed to build a new 375-mile 500 kV line from Hemingway Substation in the Boise area to Captain Jack Substation in southern Oregon. PacifiCorp is no longer pursuing this project.

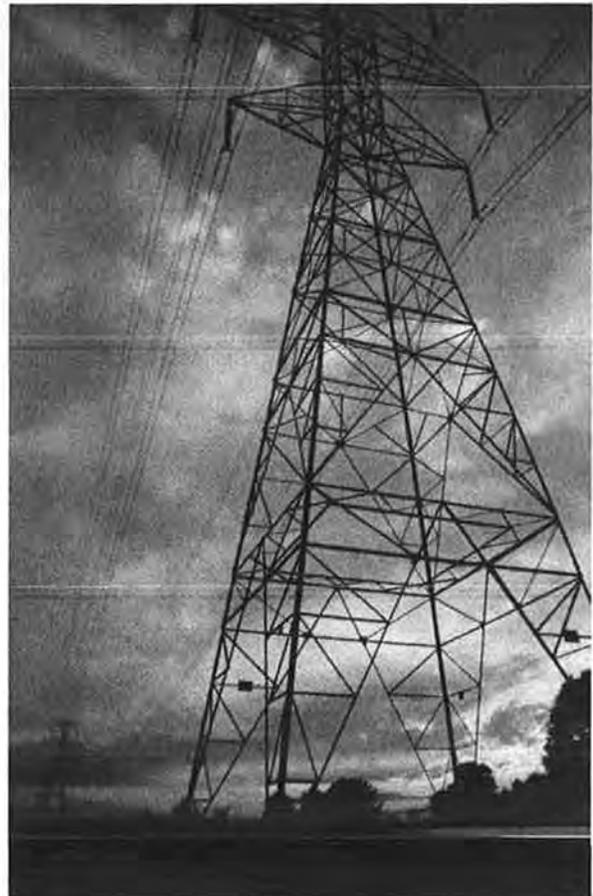
### **i. Mountain States Transmission Intertie**

NorthWestern Energy had been pursuing construction of the Mountain States Transmission Intertie (MSTI), a 500 kV single-circuit electric transmission line that would begin about five miles south of Townsend, Montana and proceed south to Jerome, Idaho. This project was expected to add about 1500 MW to Path 18, the Montana to Idaho Intertie. Due to lack of sponsorship, this project is currently on hold.



### **j. Central Ferry - Lower Monumental 500 kV line Project**

The 2010 BPA Network Open Season included this project to provide transmission capacity to serve identified requests. Although this project was included in past Ten-year Plans as a committed project, the requestors for this service are uncertain whether they want to proceed so this project is currently on hold.



#### **k. Wallula-McNary 230 kV Line Project**

In order to continue to provide reliable, safe and cost-effective electricity to customers, and support new renewable energy development, PacifiCorp had proposed a 230 kV line between Wallula and McNary Substation. Although PacifiCorp still supports this project, it was not making adequate progress so it was removed from the Ten-Year Plan.

#### **l. Vantage-Pomona Heights 230 kV Line Project**

In order to continue to provide reliable, safe and cost-effective electricity to customers, PacifiCorp had proposed a 230 kV line between Vantage and Pomona Heights Substations. Although PacifiCorp still supports this project, it was not making adequate progress so it was removed from the Ten-Year Plan.

#### **m. Trojan-Horizon Project**

The Portland General Electric Trojan-Horizon Project consists of a new 37-mile 230 kV transmission line from the existing Trojan Substation to Horizon through the new Sewell substation in NW Portland. A new 230/115 kV transformer will be added at Sewell. This project is the result of a merchant request and will provide capacity to integrate new generation at Port Westward. No commitment to the project has been made.





### **n. Cascade Crossing Project**

The Portland General Electric Cascade Crossing Project is a new transmission line proposed to bring power from Central Oregon into the Salem area. Originally, PGE proposed a 200-mile 500 kV line starting at the Coyote Springs Generation Plant and terminating into a new 500/230 kV transformer at Bethel Substation. This line would also interconnect at a new Grassland Substation connecting to the Boardman Power Plant and a new Cedar Spring Substation approximately 36 miles southwest of Boardman where it interconnects with new wind generation.

Bonneville and Portland General have found options to upgrade the existing system to obtain the additional transmission capacity they need so the Cascade Crossing Transmission Project has been canceled. This project remains a viable alternative once the capacity from optimizing the existing system is used up.

## Attachment A: Resource Assumptions for Base Cases (MW Output)

Name	5 Year Heavy Summer	10 Year Heavy Summer	5 Year Heavy Winter	10 Year Heavy & Extra Heavy Winter	5 Year Light Spring	10 Year Light Spring
Adair	6	6	6	6	6	6
Albeni Falls	28	28	28	28	28	28
Alder	20	22	30	30	15	15
Beaver	464	464	465	465	0	0
Big Cliff	0	0	0	0	16	0
Big Hanaford	252	255	255	255	0	0
Biomass	10	10	10	10	10	7
Boardman	612	430	612	430	612	0
Bonneville	835	941	1008	1008	197	544
Boulder	0	0	0	0	0	0
Boundary	486	191	357	357	0	66
Box Canyon	57	14	65	65	58	57
Boyle	79	61	61	61	61	30
Bull Run	3	3	13	13	11	3
Cabinet Gorge	185	185	120	120	240	185
Camas Mill	23	23	23	23	23	23
Carmen	81	47	50	50	25	81
Cedar Falls	4	4	6	6	4	0
Centralia	1420	947	1424	947	1424	0
Chandler	3	7	7	7	7	3
Chehalis	513	513	513	513	513	513
Chelan	62	62	62	62	62	62
Chemical	50	50	50	50	50	50
Chief Jo	2062	2090	2185	2185	153	1228
Clearwater AVA	50	50	50	50	50	50
Clearwater PAC	40	11	11	11	11	11
Coffin Rock	15	15	15	15	15	15
Columbia Generating Station	1139	1151	1151	1151	1150	1139
Copco	30	30	30	30	30	30
Cosmo SP Fiber	0	0	16	16	0	0
Cougar	12	12	12	12	12	12
Coulee	5311	5703	5703	5527	1386	1925
Covanta	12	12	12	12	12	5
Cowlitz Falls	17	40	40	40	20	17
Coyote Springs	480	480	508	508	480	0
Cushman	45	52	101	101	0	0
Detroit	103	104	104	104	52	51
Dexter	14	14	14	14	14	14
Diablo	80	80	99	99	65	48
Dworshak	181	408	408	408	316	181
Electron Heights	13	13	13	13	13	13
Enid Road	15	15	15	15	15	16
Enserch	155	155	187	187	173	0
Evergreen Bio	10	10	10	10	10	3
Faraday	11	11	32	32	37	11
Finley	28	0	28	28	0	28
Fish Creek	11	4	4	4	4	4

<b>Name</b>	<b>5 Year Heavy Summer</b>	<b>10 Year Heavy Summer</b>	<b>5 Year Heavy Winter</b>	<b>10 Year Heavy &amp; Extra Heavy Winter</b>	<b>5 Year Light Spring</b>	<b>10 Year Light Spring</b>
Foster	14	5	9	9	10	7
Frederickson	134	134	162	162	144	144
Frederickson CCCT	247	247	247	247	247	0
Fredonia	281	281	349	349	304	0
Glenoma	29	29	29	29	29	29
Goldendale Energy Center	247	247	247	247	247	0
Gorge	112	112	123	123	81	75
Grays Harbor	620	559	609	609	0	0
Green Peter	8	0	80	80	40	8
Green Spring	16	16	16	16	16	16
Harbor Paper	7	19	19	19	7	7
Headwork	25	25	0	0	20	11
Hermiston Gen Project	213	468	468	468	468	0
Hermiston Power Project	551	557	557	557	557	0
Hills Creek	30	30	30	30	15	15
Hungry Horse	281	381	380	380	190	94
Ice Harbor	284	498	498	498	295	154
Iron Gate	18	17	17	17	17	17
Jackson	43	38	54	54	35	35
John Day	1500	2077	2042	2042	831	554
Kettle Falls	45	45	45	45	45	15
Klamath	577	424	583	583	533	0
Lagrande	25	28	52	52	27	27
Lake Siskiyou	2	1	1	1	1	1
Lancaster	249	249	249	249	0	0
Leburgs	7	7	13	13	13	7
Lemolo	29	13	13	13	46	13
Libby Gen	320	323	539	539	323	213
Little Falls	16	16	32	32	32	16
Little Goose	310	694	694	694	139	274
Longlake	42	42	84	84	84	42
Longview Fiber	27	27	27	27	27	27
Lookout Point	74	40	120	120	40	49
Lost Creek	30	30	30	30	30	15
Lower Baker	74	74	75	75	71	71
Lower Granite	310	693	832	832	139	274
Lower Monumental	240	668	787	787	274	240
March Point	138	138	150	150	138	0
Mayfield	99	64	129	129	52	52
McNary	657	932	932	932	287	294
Merwin	84	129	129	129	43	45
Mint Farm	232	235	235	235	235	0
Monroe A	7	7	14	14	14	7
Morro	23	24	24	24	0	23
Mossy Rock	250	173	259	259	13	13
Nine Mile	7	7	9	9	16	2
North Fork	9	9	33	33	33	9
Northeast	0	0	0	0	0	0
Noxon	400	400	300	300	400	400

<b>Name</b>	<b>5 Year Heavy Summer</b>	<b>10 Year Heavy Summer</b>	<b>5 Year Heavy Winter</b>	<b>10 Heavy &amp; Extra Heavy Winter</b>	<b>5 Year Light Spring</b>	<b>10 Year Light Spring</b>
Oak Grove	20	20	32	32	34	20
Pelton	85	85	120	120	120	85
Port Westward	378	378	399	624	378	0
Post Falls	2	2	7	7	11	2
Priest Rapids	700	700	877	877	351	439
Prospect	42	27	27	27	26	27
Rathdrum	0	0	0	0	0	0
River Road	232	209	209	209	0	0
Rivermill	5	5	14	14	17	5
Rock Island	350	350	302	302	164	408
Rocky Reach	799	799	819	819	330	1014
Roseburg Lumber	0	0	0	0	0	3
Ross	60	60	128	128	52	2
Round Butte	161	161	270	270	241	161
Roza	8	8	8	8	8	8
Sawmill	25	25	25	25	25	25
Simpson	44	64	64	64	64	17
Slate Creek	2	1	1	1	1	1
Slide Creek	18	8	8	8	8	8
Smith Falls	0	36	36	36	0	0
Snoqualmie Falls	0	0	0	0	0	0
Soda Springs	11	5	5	5	5	5
Spokane Waste	18	18	18	18	18	18
Stone Creek	5	5	5	5	0	5
Sullivan	15	14	15	15	15	14
Sumas	124	124	138	138	134	0
Summer Falls	90	92	0	0	71	30
Swift	207	275	209	209	209	140
Tenaska	246	246	267	267	246	0
The Dalles	1295	1685	1610	1610	318	765
Tieton	6	6	6	6	6	6
Toketee	42	20	20	20	20	20
Tolt River	9	9	10	10	9	9
Twin Falls	0	0	0	0	0	0
Upper Baker	92	92	82	82	82	82
UpRiver	7	7	7	7	15	7
Wanapum	852	852	947	947	473	757
Wauna	31	32	32	32	32	0
Wells	576	576	576	576	432	576
Weyerhauser (EWEB)	36	25	25	25	37	0
White Creek	6	34	34	34	14	11
Whitehorn	134	134	162	162	144	0
Wynooche	2	3	2	2	2	2
Yale	120	35	35	35	35	72
<b>Wind Generation</b>						
Antelope R Wind	0	0	0	0	0	110
Big Horn Wind	0	0	0	0	0	244
Biglow Canyon Wind	0	0	0	0	0	440

<b>Name</b>	<b>5 Year Heavy Summer</b>	<b>10 Year Heavy Summer</b>	<b>5 Year Heavy Winter</b>	<b>10 Heavy &amp; Extra Heavy Winter</b>	<b>5 Year Light Spring</b>	<b>10 Year Light Spring</b>
Combine Hills Wind	0	0	0	0	0	103
Condon Wind	0	0	0	0	0	49
Dodge Jct Wind	0	0	0	0	0	0
Echans Wind	0	0	0	0	0	0
Echo Wind	0	0	0	0	0	57
FPL_IL_LT Wind	0	0	0	0	0	0
Goldendale Wind	0	0	0	0	0	201
Goodnoe Hills Wind	0	0	0	0	0	125
H Canyon Wind	0	0	0	0	0	98
Harvest Wind	0	0	0	0	0	64
Hopkins Ridge Wind	0	0	0	0	0	152
Jordan Butte Wind	0	0	0	0	0	204
Juniper Creek Wind	0	0	0	0	0	251
Kititas Valley Wind	0	0	0	0	0	107
Klondike Wind	0	0	0	0	0	297
Leaning Juniper Wind	0	0	0	0	0	286
Linden Wind	0	0	0	0	0	49
Marengo Wind	0	0	0	0	0	208
Miller Ranch	0	0	0	0	0	140
Montague Wind	0	0	0	0	0	393
Nine Canyon Wind	0	0	0	0	0	94
Nine Mile Wind	0	0	0	0	0	0
Palouse Wind	0	0	0	0	0	101
Patu Wind	0	0	0	0	0	10
Pebble Springs Wind	0	0	0	0	0	97
PHLNG Wind	0	0	0	0	0	727
Rattlesnake Wind	0	0	0	0	0	100
Saddleback Wind	0	0	0	0	0	68
Shepards Flat Wind	0	0	0	0	0	829
Simpson R Wind	0	0	0	0	0	10
Stateline Wind	0	0	0	0	0	208
STRPT Wind	0	0	0	0	0	97
TULMN Wind	0	0	0	0	0	134
Vansycle Wind	0	0	0	0	0	226
WDSTCLM Wind	0	0	0	0	0	160
WEBFT Wind	0	0	0	0	0	95
White Creek Wind	0	0	0	0	0	210
WHT F Wind	0	0	0	0	0	95
Wild Horse Wind	0	0	0	0	0	272
Willow Creek Wind	0	0	0	0	0	147
Windy Flat Wind	0	0	0	0	0	301
RPS Bio	0	0	0	0	0	12
RPS GeoThermal	0	0	0	0	0	49
RPS Solar	0	0	0	0	0	0
RPS Wind	0	0	0	0	0	794
<b>Totals</b>	<b>30,825</b>	<b>33,182</b>	<b>35,790</b>	<b>35,180</b>	<b>18,135</b>	<b>22,927</b>

# Attachment B: Transmission Expansion Projects

## Olympic Peninsula Projects

Project Name	Description	Sponsor	Parties Impacted by Project	Link to More Detail	Project Stage
Olympia 230/115 kV Transformer Bank No.3	Add a new 230/115 kV Transformer at Olympia Substation	BPA			Conceptual Project for future need
Shelton-Fairmount-Port Angeles Area	Construct a new double circuit 230 kV line (approximately 60 miles) between Shelton and Fairmount Substations, to create Shelton-Fairmount 230 kV line No. 4 & 5	BPA			Conceptual Project for future need
Fairmount-Port Angeles #2 230 kV line	Upgrade Fairmount-Port Angeles #2 230 kV line	BPA			Conceptual Project for future need
Port Angeles 230 kV bus and Transformer	Develop breaker and half 230 kV yard at Port Angeles and add second 230/69 kV transformer	BPA			Funded
North of Fairmount Back-tripping Safety Net	Back-Tripping scheme to open Fairmount-Port Angeles 230 kV lines for double line outage of Shelton-Fairmount 230 kV lines (non-wires solution)	BPA	PSE		Funded
Olympia-Shelton 230 kV line #5	Reconductor 7.25 miles of Olympia-Shelton #5 line from Olympia to Olympia-Satsop corridor with Deschutes conductor	BPA			Conceptual Project for future need
Kitsap-South Bremerton 115 kV line	Construct second Kitsap-South Bremerton 115 kV line or PSE Foss Corner options	BPA	PSE		Conceptual Project for future need
West Kitsap Transmission Project Phase II	Installation of 230/115 kV transformer at Foss Corner Substation along with a 230 kV line from Foss Corner to the future BPA Kitsap 230 kV Substation	PSE	BPA		Conceptual Project for future need
Kitsap 230 kV yard	Develop breaker and half 230 kV yard at Kitsap for Shelton-South Bremerton and Kitsap-Foss Corner lines.	BPA	PSE		Conceptual Project for future need
Sappho 69kV Shunt Cap Addition	Add 10 MVAR shunt capacitor to Sappho 69V	BPA			Plan of Service determined

Project Commitment Level	Scheduled Completion	Cost Estimate	Project Need/Driver & Other Notes	Changes from Previous Plan	Plan cross tribal lands	Type of Project	Study Team(s)
	2021	\$7 M	Load growth			Single System Project with possible impacts	
	2022	\$21.5 M	Load growth			Single System Project	
Only if non-wires project fails			Load growth			Single System Project	
Only if non-wires project fails	2014	\$15 M	Load growth and System Reliability			Single System Project	
	2013	\$0.9 M	Load growth	Project name was changed from "North of Shelton Back-tripping Scheme"		Single System Project	
			Load growth			Single System Project	
			Load growth			Single System Project	
	2018		Provide additional capacity to serve projected load growth in Kitsap County			Single System Project with possible impacts	
			Load growth			Single System Project	
Included in sponsors budget	2017		voltage support			Single System Project	

# Puget Sound Projects

Project Name	Description	Sponsor	Parties Impacted by Project	Link to More Detail	Project Stage	Project Commitment Level
Cowlitz Substation 230 kV Line Re-termination Project.	This project involves the re-termination of BPA's South Tacoma-Cowlitz (#1) 230 kV line from TPWR's Cowlitz 230 kV Bus into TPWR's Southwest (#4) line. It also includes the re-termination of TPWR's Cowlitz-Southwest (#3) and Cowlitz-Tacoma (#2) 230 kV lines to create a new Southwest-Tacoma 230 kV line.	Tacoma Power	BPA		Study completed by BPA in June 2008	
Pierce County transformer capacity (Alderton)	A new 230/115 kV transformer at Alderton Substation in central Pierce County with a new 230 kV line from White River.	PSE			Plan of Service determined	Included in sponsor's budget
Thurston County transformer capacity (St Clair)	A new 230/115 kV transformer at Saint Clair Substation in Thurston County with a looped transmission interconnection to BPA's Olympia - South Tacoma 230 kV line.	PSE			Plan of Service determined	Included in sponsor's budget
Denny Substation (Phase 1)	Proposed new 150 MVA substation in the north of downtown Seattle area. Loop existing Eastpine-Broad 115 kV line (additional capacity in future).	SCL			Preliminary Design	Budgeted
Denny Substation (Phase 2) -- Massachusetts-Denny Transmission Line	New transmission line from Massachusetts Substation to Denny substation (built at 230 kV, operated at 115 kV).	SCL			Preliminary Design	Project identified as future need
Southwest Substation 230 kV Bus Reliability Improvement Project	Modify bus section breaker arrangement at Southwest Substation to eliminate single point of failure of bus section breaker.	Tacoma Power				
Beverly Park 115 kV Bus Configuration and 230/115 kV Capacity Addition	Rebuild the existing 115 kV switching station and add one 230/115 kV 300 MVA transformer at Beverly Park. An existing 115 kV line from BPA Snohomish to the Glenwood Tap will be converted to 230 kV to provide the source for this substation. Add a new 115 kV line from Everett.	Snohomish County PUD	BPA		Project is in the design and construction Phase	
IP line conversion to 230 kV	Convert PSE's 115 kV "IP" line to 230 kV between Wind Ridge Substation and Lake Tradition Substation in King County to increase cross-Cascade capacity and interconnect Kittitas County wind projects	PSE	PSE		Conceptual Project for future need	
North Cross Cascades Reinforcement - Schultz-Raver Series Caps	This project includes adding 500 kV series capacitors (30-40%) to the Schultz-Raver 500 kV lines No.3 & 4 to serve growing loads in the Puget Sound area	BPA	PSE		Project under study	
Seattle Area 500/230 kV Transformer Bank (Raver)	Add a 500/230 kV transformer at Raver and a 230 kV terminal at Raver for a Raver-Covington 230 kV line.	BPA	PSE, SCL		Project identified in PAST Expansion Plan	Utilities have negotiated cost allocation

Scheduled Completion	Cost Estimate	Project Need/Driver & Other Notes	Changes from Previous Plan	Plan cross tribal lands	Type of Project	Study Team(s)
Phase 1: 2012 (completed) Phase 2: 2013	\$750K to \$1M	Reliability improvement			Single System Project, possible impacts	Puget Sound Area Study Team
2015	\$28 M	Load service, Capacity Increase, Reliability	Project delayed from 2014		Single System Project, possible impacts	Puget Sound Area Study Team
2013	\$30 M	Load service, Capacity Increase, Reliability			Single System Project, possible impacts	Puget Sound Area Study Team
2016	\$120 M	Load service and System Reliability			Single-System project possible impacts	Puget Sound Area Study Team
2020	\$50 M	Load service and System Reliability			Single-System project possible impacts	Puget Sound Area Study Team
2013-14	\$3 M	The purpose of this project is to improve system reliability by preventing any bus fault or a stuck breaker on one of the 230 kV buses from resulting in total loss of service to the substation.			Single System Project	Puget Sound Area Study Team
2016	\$20 M	Load growth and expected local reliability deficiency in Paine Field and Everett areas requires capacity increases to meet District level of service guidelines			Single System Project, possible impacts	Puget Sound Area Study Team
2020+		Load growth in Puget Sound and generation integration, related to North Cross Cascades Improvements			Capacity Increase Project	West of Cascades Study Team
2017/2018	\$35 M	Load growth in Puget Sound and Transmission Service Requests	Delayed from 2016		Existing Obligation Project	West of Cascades Study Team
2016	\$45 M	Load growth in Puget Sound area			Existing Obligation Project	Puget Sound Area Study Team

# Puget Sound Projects continued

Project Name	Description	Sponsor	Parties Impacted by Project	Link to More Detail	Project Stage	Project Commitment Level
Cowlitz Substation 230 kV Bus Reliability Improvement Project.	Modify the bus section breaker arrangement at Cowlitz Substation to eliminate single point of failure of bus section breaker.	Tacoma Power				
Swamp Creek 115 kV Switching Station	Construct a four breaker 115 kV switching station with a ring bus arrangement. This switching station will terminate 115 kV lines from SnoKing, Halls Lake, Brightwater and Beverly Park.	Snohomish County PUD				Committed
Paine Field 115 kV Switching Station	Construct a six 115 kV breaker ring bus adjacent to the existing Paine Field Substation. The switching station will terminate lines from Paine Field, Mukilteo, Olivia Park, Boeing, Gibson, Beverly Park via Casino (new), and Swamp Creek via Picnic Point tap (new).	Snohomish County PUD			Project under study	
Swamp Creek to Picnic Point Tap 115 kV Line	Construct a 115 kV line (2.9 miles) with 1272 kCM conductor from Swamp Creek Substation to the Picnic Point tap. A new 115 kV line position and breaker will be added to the Swamp Creek 115 kV Switching Station. The Picnic Point Tap to the Picnic Point Substation 115 kV Line will be operated normally opened.	Snohomish County PUD			Project under study	
North County 230/115 kV Transformer Addition	Add a new 230/115 kV 300 MVA transformer either in Stimson Crossing Switching Station or in BPA Murray substation. For the Stimson option, the existing BPA Murray-Snohomish 230 kV line will be looped into the station.	Snohomish County PUD	BPA		Project under study	
Beverly Park and South Snohomish County 115 kV Expansion	Beverly Park-Boeing 115 kV line reconductor and Beverly Park-Everett 115 kV line capacity increase.	Snohomish County PUD			Design and Construction	
East King County Transformer Capacity (Lake Tradition)	This project involves looping the Maple Valley-Sammamish #1 230 kV line into PSE's Lake Tradition Substation and installing a new 230/115 kV transformer.	PSE	BPA - loop through of BPA owned and PSE leased 230 kV line		Conceptual	
Skagit County Transformer Capacity	This project involves installing an additional 230/115 kV transformer into PSE's Sedro Woolley Substation.	PSE			Included in sponsor's budget	
Monroe Substation Improvements	Monroe 500 kV 316 MVAR Shunt capacitor bank	BPA				Committed
East King County Transformer Capacity	Rebuild the Sammamish-Lakeside-Talbot 115 kV lines and energize one at 230 kV and install a new 230/115 kV transformer at Lakeside.	PSE	BPA, SCL		Project identified in PSAST Expansion Plan	Utilities have negotiated cost allocation

Scheduled Completion	Cost Estimate	Project Need/Driver & Other Notes	Changes from Previous Plan	Plan cross tribal lands	Type of Project	Study Team(s)
2015-16	\$3 M	The purpose of this project is to increase system reliability and operational flexibility			Single System Project	
2018	\$6 M	South County area load growth and expected reliability deficiencies. This is part of a multi-project effort to provide three 115 kV ties between BPA SnoKing and BPA Snohomish Substations.			Single System Project	
2021		South County area load growth and expected reliability deficiencies. This is part of a multi-project effort to provide three 115 kV ties between BPA SnoKing and BPA Snohomish Substations.			Single System Project	
2020		South County area load growth and expected reliability deficiencies. This is part of a multi-project effort to provide three 115 kV ties between BPA SnoKing and BPA Snohomish Substations.			Single System Project	
2021	\$4 M	Marysville area load growth and expected North County reliability deficiencies			Single System Project, possible impacts	
2014		Beverly Park and South Everett area load growth and expected local reliability deficiencies			Single System Project	
2017+	\$13 M	Load service, Capacity Increase, Reliability			Single System Project, possible impacts	Puget Sound Area Study Teams
Project completed	\$9.4 M	Load service, Capacity Increase, Reliability	Project completed		Single System Project, possible impacts	Puget Sound Area Study Team
2014	\$5.6 M	Service to Puget Sound Load area and System Reliability	Delayed from 2013		Single System Project, possible impacts	
2017	\$65-\$80 M	Load service, Capacity Increase, Reliability, prevent curtailment of firm transfers			Single System Project	Puget Sound Area Study Team

# Puget Sound Projects continued

Project Name	Description	Sponsor	Parties Impacted by Project	Link to More Detail	Project Stage	Project Commitment Level
Expand Northern Intertie RAS	Extend the Northern Intertie RAS to trip for the combined outage of the Chief Joseph-Monroe and Monroe-SnoKing-Echo Lake 500 kV lines	BPA			Project identified in PSAST Expansion Plan	Utilities have negotiated cost allocation, other options being considered
Reconductor Delridge-Duwamish 230 kV line	Reconductor Delridge - Duwamish double circuit 230 kV Line with high temperature conductor	SCL	BPA, PSE		Project identified in PSAST Expansion Plan	Budgeted
Downtown Seattle 115 kV Series Inductors	Add 6 ohm inductors on Denny - Broad and Massachusetts - Union - Broad 115 kV underground cables	SCL	BPA, PSE		Project identified in PSAST Expansion Plan	Budgeted
Reconductor Bothell-SnoKing 230 kV lines	Reconductor Bothell-SnoKing 230 kV #1 and #2 with high temperature conductor	SCL, BPA	PSE		Project identified in PSAST Expansion Plan	Budgeted
Portal Way Substation - Install 2nd 230-115 kV Transformer	Construct a new 230 kV line from BPA Custer Substation to PSE Portal Way Substation. Install a 230-115 kV, 325 MVA transformer, and install another 115 kV bus section breaker in Portal Way Substation	PSE, BPA			Project identified in PSAST Expansion Plan	Utilities negotiating cost allocation
Sedro-Woolley-Bellingham #4 115 kV line	Reconducting Sedro-Woolley-Bellingham #4 115 kV line	PSE			Design and Construction	Included in sponsors budget
PSE Bellingham Substation Rebuild	Construct a new breaker and a half 115 kV substation	PSE			Project under study	Project identified as future need
Sammamish Reliability Improvements	Add 2nd 230 kV bus section breaker	PSE			Design and Construction	Funding approved by sponsor
Woodland-Gravelly Lake	Add new Woodland-Gravelly Lake 115 kV line	PSE			Design and Construction	Committed Project
White River Bus Improvements	Add 2nd 115 kV Bus Section breaker at White River (230 kV bus completed)	PSE			Design and Construction	Included in sponsors budget
Talbot 230 kV Bus Improvements	Improve 230 kV bus at Talbot: Terminate new 230 kV line from Lakeside. Revise 230 kV protection. This will be a phased process to construct a double bus double breaker configuration.	PSE	BPA - Talbot - Maple Valley #1 and #2 230 kV lines		Project under study	Included in sponsors budget
Berrydale 230 kV Transformer Addition	Install second 230/115 kV transformer at Berrydale Substation.	PSE			Conceptual Project for future need	Project identified as future need
Christopher 230 kV Substation	Develop Christopher 230 kV Substation: loop BPA Covington-Tacoma 230 kV line into Christopher, construct a 230 kV bus with the necessary breakers, and add 230/115 kV transformation and a 115 kV auxiliary bus.	PSE	BPA - Covington Tacoma #2,3,4 230 kV lines		Conceptual Project for future need	Project identified as future need
Starwood autotransformer removal	Remove 115-110 kV autotransformer at Starwood Substation	PSE	PSE, TPWR		Engineering Design	Included in sponsors budget

Scheduled Completion	Cost Estimate	Project Need/Driver & Other Notes	Changes from Previous Plan	Plan cross tribal lands	Type of Project	Study Team(s)
2018	\$3 M	Load service, Capacity Increase, Reliability, prevent curtailment of firm transfers				Puget Sound Area Study Team
2016	\$2 M	Load service, Capacity Increase, Reliability, prevent curtailment of firm transfers				Puget Sound Area Study Team
2016-2017	\$13 M	Load service, Capacity Increase, Reliability, prevent curtailment of firm transfers				Puget Sound Area Study Team
2017	\$3 M	Load service, Capacity Increase, Reliability, prevent curtailment of firm transfers				Puget Sound Area Study Team
2016	\$25 M	Capacity increase				Puget Sound Area Study Team
2015	\$14 M	Load service, Reliability			Single System Project	
2016	\$20 M	Replace aging infrastructure (existing Bellingham Sub) and increase system reliability			Single System Project	
Project completed	\$1 M	Load service, Capacity increase, Reliability	Project completed		Single System Project	
2015	\$13 M	Reliability			Single System Project	
2014	\$0.6 M	Reliability			Single System Project	
2015-2017 (to accommodate the new line to Lakeside)	\$11 M	Maintenance and/or repairs, Reliability			Single System Project	
2017+	\$8 M	Load service, Capacity increase, Reliability			Single System Project	
2017+	\$20 M	Load service, Capacity increase, Reliability			Single System Project	
2013	\$1 M	Load service, Capacity increase, Reliability	New Project		Single System Project, possible impacts	

## ***Puget Sound Projects continued***

Project Name	Description	Sponsor	Parties Impacted by Project	Link to More Detail	Project Stage	Project Commitment Level
Tacoma Bus Section Breaker	Add a series bus section breaker at Tacoma 230 kV substation	BPA	PSE, TPWR		Project under study	
Granite Falls 115kV Transmission Loop	Construct 4.8 miles of 115kV transmission line to improve service to Granite Falls Substation.	Snohomish County PUD	BPA		Plan of service determined	
Monroe-Novelty 230 kV line Upgrade	Increase capacity of Monroe-Novelty 230 kV line	BPA			under study	
Paul 500 kV Shunt Reactor	Add 500 kV 180 MVAR Shunt Reactor	BPA			Plan of Service determined	Committed

Scheduled Completion	Cost Estimate	Project Need/Driver & Other Notes	Changes from Previous Plan	Plan cross tribal lands	Type of Project	Study Team(s)
2016	\$1.0 M	Load service, Capacity increase, Reliability			Existing Obligation Project	
2014	\$7 M	Load service, System Reliability			Single System Project	
2016	\$6 M	Maintain voltage schedules			Single System Project	

# Central Washington Projects

Project Name	Description	Sponsor	Parties Impacted by Project	Link to More Detail	Project Stage
Mid-Columbia Area Reinforcement	Vantage-Pomona Heights 230 kV #2 Line in the Yakima area.	PAC	BPA, Grant		
Northern Mid-Columbia Area Support	Douglas-Rapids 230 kV line, Douglas 230/115 kV transformer, Rapids 115 kV Substation with terminations for Pangborn, South Nile and Hanna 115 kV lines	Douglas	Chelan, BPA, Grant		Under Construction
Northern Mid-Columbia Area Support	Build new Rapids-Columbia 230 kV line	Douglas, Grant, Chelan, BPA	Douglas, Grant, Chelan, BPA		Routing, design
Mid-Columbia Area Reinforcement, Phase 2	Upgrade Wanapum-Midway 230 kV line in central WA.	Grant County PUD			
Columbia - Larson 230 kV Line	Construct a new 230 kV line from Rocky Ford to Columbia, connect to existing Rocky Ford-Larson 230 kV line to form Columbia-Rocky Ford line.	Grant County PUD	Interconnect w/BPA at Columbia Sub		
Ashe 500/115 kV Transformer	Add a 500/115 kV transformer at Ashe with a line tapping the proposed Ashe-Benton 115 kV line	BPA			Conceptual Project for Future Need
Union Gap Transformation	Add third 230/115 kV transformer at Union Gap	PacifiCorp			
Okanogan Area	Add 26 MVAR capacitor at East Omak Substation	BPA			
Sacajawea 115 kV Tie Line	Construct a 115 kV line (0.5 mile) from Sacajawea Substation to tap the Ice Harbor-Franklin 115 kV #3 line	BPA			
McKenzie - Andrew York #1 Re-rate	Re-rate the existing McKenzie - Andrew York #1 115 kV line from 50 C MOT to 75 C MOT	Chelan County PUD			Plan of Service Determined
McKenzie - Andrew York #2 Re-rate	Re-rate the existing McKenzie - Andrew York #2 115 kV line from 50 C MOT to 75 C MOT	Chelan County PUD			Plan of Service Determined
Rocky Ford - Dover 115 kV line	Construct 115 kV Rocky Ford-Dover 115 kV line	Grant County PUD			
Tri-Cities Reinforcements	Franklin 115 kV 104 MVAR capacitor addition	BPA			
White Bluffs Capacitors	Add 39 MVAR shunt capacitor at White Bluffs Substation	BPA			
Columbia Bus Section Breaker	Add a series bus section breaker at Columbia 230 kV substation	BPA			Plan of Service Determined

Project Commitment Level	Scheduled Completion	Cost Estimate	Project Need/Driver & Other Notes	Changes from Previous Plan	Plan cross tribal lands	Type of Project	Study Team(s)
	2015		Load growth in Yakima area	Delayed from 2013		External Project	NTAC
Sponsor committed	2013	\$16.9 M	Load growth		No	Existing Obligation Project	Northern Mid Columbia Study Group
Sponsors committed, cost allocation complete	2015	\$14 M	Load growth and transfers		No	Existing Obligation Project	Northern Mid Columbia Study Group
Project identified as future need	2019		Load growth, new wind generation plants and transfers of generation out of the area	Delayed from 2017		Existing Obligation Project	
	2014	\$42 M	Load growth, increase transmission system reliability and improve voltage stability performance.			Single System Project with possible parallel impacts	Northern Mid Columbia Study Group
Project identified as future need						Single System	
	2016		Load growth	Delayed from 2013	No	Single System Project	
	2013	\$930,000	Load growth and system reliability			Single System Project	
Committed	2015	\$3 M	Load growth			Single System Project	
	2013	\$200,000	Increase transmission system reliability		No	Single System Project	
	2013	\$300,000	Increase transmission system reliability		No	Single System Project	
	2016	\$5 M	Increase transmission system reliability			Single System Project	
Committed	2014	\$3.1 M	Voltage Support and load growth	changed from 2016		Single System Project	
Committed	2013	\$2.0 M	Reliability for Columbia Generating Station			Single System	
	2016	\$1.0 M	Load service, Reliability			Single System Project	

# Northeastern Projects

Project Name	Description	Sponsor	Parties Impacted by Project	Link to More Detail	Project Stage
Spokane Area 230 kV Reinforcement	Add a 230/115 kV transformer in Garden Springs Substation with 230 kV lines to Westside and either Beacon/Boulder 230 kV switching stations	Avista			Project identified as future need
Benton-Othello 115 kV Rebuild	Rebuild Benton-Othello 115 kV line	Avista			Committed project
Westside Project	Westside 230 kV Substation rebuild and transformer upgrades	Avista			Committed project
Moscow 230/115 kV Upgrade	Increase Moscow transformer capacity to 250 MVA and rebuild 230 kV substation	Avista			Committed project
Spokane Valley Transmission Reinforcements	New Irvin-IEP 115 kV transmission line and reconductor Beacon-Boulder and Opportunity Tap 115 kV lines	Avista			Committed project
Lancaster CT Integration	Loop Boulder-Rathdrum 230 kV line into Lancaster	Avista			Committed project
Bronx-Cabinet 115 kV Rebuild	Rebuild/reconductor Bronx-Cabinet 115 kV line	Avista			Committed project
Lewiston 10 Year Plan	Second Hatwal-Lolo 230 kV line is one solution, long range study needed	Avista	BPA, IPCO, PAC		Project identified as long term need
Little Goose Area Reinforcement	Add 40 mile 500 kV line from new wind collection station called Central Ferry to Lower Monumental Substation	BPA			Funding for NEPA and preliminary engineering is Committed under NOS
Wallula-McNary 230 kV line	A new 230 kV line from Wallula to the McNary (BPA)	PAC	BPA		In WECC Rating Process
Hatwal 230 kV Bus Section Breaker	Add 230 kV bus section breaker at Hatwal Substation	BPA			Plan of Service determined
Tucannon Shunt Capacitors	Add two groups of 6.5 MVAR, 115 kV capacitors at Tucannon Substation	BPA			
Columbia Falls Bus Section Breakers	Add 230 kV and 115 kV bus section breaker at Columbia Falls	BPA			
MATL Project	The Montana Alberta Tie Ltd Project is a 200 mile, 300 MW, 230 kV line connecting Lethbridge, Alberta and Great Falls, Montana going through Cutbank, Montana which has significant wind generation potential.	Enbridge			Under Construction
Green Line Project	This project is a 100 mile extension of the MATL project to connect to the Colstrip Transmission. This project will provide access to the Mid-Columbia Hub (up to 1000 MW Capacity).	Enbridge	Colstrip Transmission Owners		Feasibility State

Project Commitment Level	Scheduled Completion	Cost Estimate	Project Need/Driver & Other Notes	Changes from Previous Plan	Plan cross tribal lands	Type of Project	Study Team(s)
	2015		Load Growth in the south Spokane area			Single System Project with possible impacts	
	2016	\$10 M				Single System Project with possible	
	2016	\$15 M				Single System Project	
	2014	\$10 M				Single System Project	
	2016	\$5 M				Single System Project	
	2013	\$3 M				Single System Project with possible impacts	
	2016	\$10 M				Single System Project with possible impacts	
	10 years		Loss of Hatwai-Lolo and Hatwai-North Lewiston 230 kV lines for heavy flows to Walla Walla and Idaho				Needed
Project on Hold	2014	\$99 M	To serve requests made under 2008 Network Open Season			Requested Service Project	
	2014		Transmission Service Requests	Delayed from 2013		Requested Service Project	
under study	2015	\$4.2 M	Load growth and system reliability			Single System	
Committed	2013	\$2 M	Voltage support and generation integration			Single System	
Committed	2013	\$1 M	Load growth and system reliability			Single System	
Permitted	August 2013	\$209 M	Transmission Service Requests	delayed until 2013			
			Transmission Service Requests				

# Northeastern Projects continued

Project Name	Description	Sponsor	Parties Impacted by Project	Link to More Detail	Project Stage
Montana to Washington Project	This project is proposed to meet a portion of the 2010 BPA NOS requests. Upgrades to the Montana to Northwest and West of Hatwai paths is proposed without any new line construction by upgrading existing and adding new series compensation in the lines. With the new project, the capability of the system will be increased between 550 and 700 MW.	BPA	AVA and other Colstrip Owners		
Garrison-Ashe Project	This project is proposed to meet the full capacity of the 2010 BPA NOS requests. A 430 mile series compensated Garrison-Ashe 500 kV line is proposed with an intermediate station between Taft and Hot Springs.	BPA	AVA		Conceptual Project
Kalispell Shunt Capacitors	Add 115 kV Shunt Capacitors (two groups of 16 MVARs)	BPA			Plan of Service determined
Bell 230 kV Bus sectionalizing breaker	Add series Bus section Breaker at Bell 230 S1-S2 to mitigate BSB failures	BPA	AVA		Plan of Service determined

Project Commitment Level	Scheduled Completion	Cost Estimate	Project Need/Driver & Other Notes	Changes from Previous Plan	Plan cross tribal lands	Type of Project	Study Team(s)
Project Under Study	2015	\$115 M	Committed under BPA NOS			Requested Service Project	
None			Meet 2010 NOS Requests			Requested Service Project	
Committed	2014	\$3.1 M	Local load growth and reliability	New Project		Single System Project	
Committed	2015/16	\$1 M	Local load growth and reliability	New Project		Existing Obligation Project	

# Western Projects

Project Name	Description	Sponsor	Parties Impacted by Project	Link to More Detail	Project Stage
Lebanon Area Reinforcement	Add a 19.6 MVAR, 115 kV shunt capacitor bank at Lebanon Substation	BPA			Plan of service determined
I-5 Corridor (SW Washington - NW Oregon Reinforcement)	Construct a new 500 kV line (approx. 70 miles) from Troutdale Substation to the new Castle Rock Substation located approximately 12 miles north of Allston Substation on the Paul-Allston No.1 500 kV line.	BPA	PGE, PAC, CCP, Clark		Funding for NEPA and preliminary engineering is committed under NOS
Pearl – Sherwood and McLoughlin-Pearl-Sherwood 230 kV Line Reconfiguration	PGE and BPA plan to re-terminate the existing double circuit operating in parallel between BPA's Pearl Substation and PGE's Sherwood Substation. In addition, PGE will re-terminate at Sherwood the existing double circuit operating in parallel as the McLoughlin-Pearl-Sherwood 230kV circuit. This will require two new circuit breakers at Sherwood and two new circuit breakers at Pearl. When the project is completed, there will be a Pearl-Sherwood #1 230 kV circuit, a Pearl-Sherwood #2 230 kV circuit, a Pearl-Sherwood #3 230kV circuit, and a McLoughlin-Pearl-Sherwood 230kV circuit.	PGE and BPA			Plan of service determined
Cross-Cascades South	Station K development connecting Ashe-Marion, Buckley-Marion and both John Day-Grizzly lines together at a new station where the lines cross.	BPA	PGE, PAC		
Cascade Crossing Project	The Cascade Crossing Project is a 200 mile 500 kV line from PGE's Coyote Springs generation plant in the town of Boardman, Oregon west to PGE's Bethel Substation in Salem, Oregon where the line will be terminated into a new 500/230 kV transformer bank. The new line will interconnect at a new Grassland Substation adjacent to the existing Boardman power plant and a new Cedar Spring Substation approximately 26 miles southwest of the Boardman power plant. BPA and PGE have recently signed a MOU to explore and evaluate a proposed change to this project. PGE would build Cascade Crossing beginning at Boardman, but would terminate the dual circuit, 500 kV transmission line at a new substation near Maupin, Oregon, called Pine Grove. PGE would invest in several enhancements to BPA's system (series compensation).	PGE, PAC, BPA		<a href="http://cascadecrossingproject.com/">http://cascadecrossingproject.com/</a>	In WECC Rating Process
Trojan - Sewell 230 kV Line	This project consists of a new Trojan-Sewell 230 kV line and Sewell 230/115 kV transformer. This project is the result of a merchant request and will provide the capacity needed to integrate proposed generation near Port Westward and provide local load service.	PGE	Impacts to South of Allston		Plan of service determined
Blue Lake-Gresham 230 kV Line	Construct a transmission line from Blue Lake Substation (Troutdale, Oregon) to Gresham Substation (Gresham, Oregon). This project requires 4.2 miles of new 230 kV transmission line.	PGE	BPA		Plan of service determined
Longview-Bakers Corner-Lexington 115 kV Line	Create a connection between BPA Longview and Lexington Substations through Cowlitz Substations (Bakers Corner, Olive Way, and Mint Farm), creating a 3-Terminal Line.	Cowlitz	BPA		Longview BKR B331, new BKR at Bakers Corner, Lexington BKR B1468

Project Commitment Level	Scheduled Completion	Cost Estimate	Project Need/Driver & Other Notes	Changes from Previous Plan	Plan cross tribal lands	Type of Project	Study Team(s)
Funding approved by sponsor	Energized	\$3 M	Load growth	Energized		Single System	
Depends upon NEPA	2016-2018	\$342 M	Transmission Service Requests			Requested Service Project	I-S Corridor Regional Planning Study Team
Committed	2017	\$2.7M	Reliability			Multi-system EOP with only one ColGrid participant	
Conceptual project for future need	2020		Load growth			Multi-system EOP with only one ColGrid participant	West of Cascades Study Team
Cancelled	2017	\$610-825 M	Transmission service request	New options being considered			
Cancelled	2017		A strategic investment to increase transmission capacity for future generation projects and local load-service.	Formerly called Horizon Phase II		Single System Project	
Included in sponsors budget	2017		Reliability			External Project	
Funding approved by sponsor & BPA	2008-12 Construction scheduled for 2012		Reliability and load growth	Project Energized Dec 2012		Single System Project	

# Western Projects continued

Project Name	Description	Sponsor	Parties Impacted by Project	Link to More Detail	Project Stage	Project Commitment Level
Cowlitz-Lexington-Cardwell 115 kV Line	Create a connection between BPA Cowlitz, East Kelso, Lexington, and Cardwell Substations through Cowlitz Substations (with a connection by rebuilding old 69kV Lines for 115kV with 1272 AAC from 7th Avenue to East Kelso).	Cowlitz			New BKR at East Kelso, New BKR at 7th Ave	Funding approved by sponsor
Longview-Lexington 115 kV line #2	Create a connection between BPA Longview and Lexington Substations through Cowlitz Substations (Mint Farm, Olive Way, 20th and Ocean Beach and West Kelso).	Cowlitz	BPA will replace 115 kV Breaker			Funding approved by sponsor
Longview-Lexington-Cardwell 115 kV line	Create a connection between BPA Longview, Lexington, East Kelso and Cardwell Substations through Cowlitz Substations (with a connection by rebuilding old 69kV Lines for 115kV with 1272 AAC from East Kelso to West Kelso to the 115kV Line feeding Olson Rd to Lexington BKR B1466).	Cowlitz	BPA will replace 115 kV Breaker			Funding approved by sponsor
Kalama Energy	Construct new 230 kV line from BPA Longview to Kalama.	Cowlitz	BPA		Project under study	Conceptual project for future need
Rogue SVC (South Oregon Coast)	Add a -45 to +50 MVAR, Static VAR Compensator (SVC) at Rogue Substation connected to the 115 kV bus	BPA			Construction	
South Oregon Coast Transmission Reinforcement	Rebuild Bandon-Rogue 115 kV line or construct a new 115 kV transmission line to provide a new source to the South Oregon Coast load area	BPA				Project under study
Whetstone 230/115 kV Transformer addition	Add a 230/115 kV substation in the Medford area fed from the Grants Pass-Meridian 230 kV line	PAC				
Lookingglass Substation	New Lookingglass Substation on Dixonville-Reston 230 kV line	PAC				
North Bonneville-Ross and North Bonneville-Troutdale Line Swap	This line swap places the North Bonneville-Troutdale #2 230 kV line on the double circuit towers with the North Bonneville-Ross #2 line to prevent thermal overloads which could result from the existing double circuit line outage.	BPA			Energized	
Forest Grove Loop-in of the Tillamook-Keeler 115 kV line	Loop the Keeler-Tillamook 115 kV line into Forest Grove Substation and upgrade the Keeler-Forest Grove section of the Keeler-Tillamook 115 kV line.	BPA				Committed
Pearl 500 kV Bay Addition	Construct a new Pearl 500 kV bay #6 and reterminate the Ostrander-Pearl 500 kV line into the new bay (double breaker, double bus)	BPA				Committed
Keeler 230 kV Bus Section Breaker	Install a 230 kV bus sectionalizing break at Keeler between bays #4 and #5 to balance the sources and loads at Keeler.	BPA				Committed
Ostrander Additions	Add a new 500 kV breaker in bay 5 at Ostrander for the Troutdale #1 line	BPA	PGE			Committed
Longview-Lexington 230 kV Re-termination	This project involves re-terminating the Longview-Lexington 230 kV line to the Longview Annex	BPA				Committed

Project Commitment Level	Scheduled Completion	Cost Estimate	Project Need/Driver & Other Notes	Changes from Previous Plan	Plan cross tribal lands	Type of Project	Study Team(s)
Funding approved by sponsor	2014-16		Reliability and load growth			Single System Project	
Funding approved by sponsor	2017-19	\$4.9 M	Reliability and load growth			Single System Project	
Funding approved by sponsor	2015-17	\$10.1 M	Reliability and load growth			Single System Project	
Conceptual project for future need	2016	\$20 M	To connect the new Kalama Energy 346 MW gas turbine project and/or to provide for load growth in area	Project scheduled to 2016 energization		Single System Project	
	2013	\$9 M	Southern Oregon load growth - needs dynamic SVC control v. static caps.			Single System Project	
Project under study			Load growth along southern Oregon coast			Single System Project	
	2015		Reliability and load growth	delayed from 2014		Single System Project	
	delayed		Reliability and load growth	delayed beyond planning horizon		Single System Project	
	Energized		Load growth and system reliability			Single System Project	
Committed	2013	\$2.135 M	Local load growth	Delayed from 2012		Single System Project	
Committed	2016	\$1.7 M	Local load growth			Single System Project, possible impacts	
Committed	2014	\$2.33 M	Local load growth			Single System Project	
Committed	2014	\$2.4 M	System reliability			Single System Project, possible impacts	
Committed	2015	\$2 M	Local load growth			Single System Project	

# Western Projects continued

Project Name	Description	Sponsor	Parties Impacted by Project	Link to More Detail	Project Stage
South Cowlitz County Support	Build a new 115 kV Line from Cowlitz' Lewis River Sub to PAC Merwin 115 kV Sub. Source Cowlitz' Ariel Sub on new Line. Reconductor 115 kV back to Cowlitz' North Woodland Sub	Cowlitz	PacifiCorp.		Cowlitz is in discussion with PAC
Grants Pass 500/230 kV transformer	New 500/230 kV substation tapping PAC's Meridian to Dixonville 500 kV line. 230 kV line construction will include looping the existing Grants Pass to Meridian 230 kV line into the new substation as well as construction of a new 230 kV transmission line for the new substation to the existing Grants Pass 230 kV Substation.	PAC	BPA		Preliminary Study
Klamath Falls 500/230 kV Substation	New 500 kV substation tapping PAC's Captain Jack to Klamath Co-Gen 500 kV line. The 230 kV line construction will include looping the existing Klamath Falls to J.C. Boyle 230 kV line into the new substation.	PAC	BPA		Project under study
Santiam-Chemawa 230 kV Line Upgrade	Upgrade Santiam-Chemawa 230 kV line to higher capacity	BPA	PGE		Plan of service determined
North Bonneville 230 kV Line Re-termination	This project involves re-terminating the North Bonneville-Troutdale 230 kV line into a different bus position at North Bonneville Substation	BPA			Plan of service determined
Troutdale 230 Series bus sectionalizing breaker	Add another breaker in series with the existing bus section breaker	BPA			Plan of service determined
Pearl 230 Series bus sectionalizing breaker	Add another breaker in series with the existing bus section breaker	BPA			Plan of service determined
Alvey 500 kV Shunt Reactor	Add 180 MVAR Shunt Reactor at Alvey for voltage control	BPA			Plan of service determined
Lane 230 kV Bus Sectionalizing Breaker	Add 230 kV Sectionalizing Breaker at Lane substation	BPA			Project under study

Project Commitment Level	Scheduled Completion	Cost Estimate	Project Need/Driver & Other Notes	Changes from Previous Plan	Plan cross tribal lands	Type of Project	Study Team(s)
	2017-2019	\$7.7 M	Local load growth and needed voltage/ reliability support			Single System Project, possible impacts	
Under study	2019			Delayed from 2016		Single System Project, possible impacts	
Under study	2015			Moved up from 2018		Single System Project, possible impacts	
Committed	2016	\$900,000	local load service			Single System Project, possible impacts	
Committed	2015	\$2.1 M	Local load growth			Single System Project	
Committed	2018	\$1.0 M	Reliability and load growth			Single System Project	
Committed	2017	\$1.0 M	Reliability and load growth			Single System Project	
Committed	2014						

# Eastern Projects

Project Name	Description	Sponsor	Parties Impacted by Project	Link to More Detail	Project Stage
Lower Valley Reinforcement (Hooper Springs)	This is a joint project with BPA, PacifiCorp, and Lower Valley Energy. PacifiCorp will construct Three Mile Knoll - a new 345/138 kV substation. The Goshen-Bridger 345 kV line will be looped into the new substation. BPA will construct Hooper Springs - a new 138/115 kV substation. Lower Valley Energy will construct a new double circuit 115 kV line (approximately 20 miles) from Hooper Springs to Lanes Creek/Valley Substations.	BPA/ PAC/ Lower Valley Electric			
Big Eddy - Knight 500 kV line	Construct a new 500 kV line (approximately 29 miles) from Big Eddy to a new Knight Station, which connects to the Wautoma-Ostrander 500 kV line. (3 breaker ring bus)	BPA			Project Committed under Network Open Season
Central Oregon 500/230 kV Transformer Bank Addition	Add second 500/230 kV 700 MVAR transformer at Ponderosa.	BPA	PAC		Preliminary engineering and NEPA
La Pine capacitors	Add a 19 MVAR shunt capacitor at La Pine Substation	BPA			Committed
La Pine Reactor	Add 230 kV 40 MVAR shunt reactor at La Pine Substation	BPA			Committed
McNary 230 kV Shunt Capacitors	Add 2 groups of 230 kV 150 MVAR shunt capacitors at McNary	BPA			plan of service determined
De Moss-Fossil 115 kV Line Upgrade	Upgrade De Moss-Fossil 69 kV Line to 115 kV	BPA			
Hilltop Shunt Reactor	Add a 40 MVAR 230 kV shunt reactor at Hilltop Substation	BPA			
Bonanza 230/115 kV Substation	Add a 230/115 kV Bonanza Substation in the Prineville area	BPA	PAC		Project under Study
McNary 500/230 kV Transformer #2	Add a second 500/230 kV transformer at McNary (1428 MVA) and 230 kV bus section breaker	BPA	PAC		plan of service determined
Big Eddy 230/115 kV transformer	Replace Big Eddy 230/115 kV transformer #1	BPA			plan of service determined
John Day-Big Eddy 500 kV #1 Reconductor	Upgrade the John Day-Big Eddy 500 kV #1 Line	BPA			plan of service determined
Celilo Terminal Replacement	Celilo Terminal Replacement (PDCI Upgrade to 3220 MW). Replace aging DC terminal and line upgrades to accommodate 3220 MW rating	BPA			

Project Commitment Level	Scheduled Completion	Cost Estimate	Project Need/Driver & Other Notes	Changes from Previous Plan	Plan cross tribal lands	Type of Project	Study Team(s)
construction on hold pending agreement	2014	\$48 M	Load growth in eastern Idaho			Multi-system EOP with only one ColGrid participant	
Under Construction	2014	\$115 M	Transmission Service Requests	delayed from 2013 due to cultural and land acquisition issues		Requested Service Project	West of McNary Regional Planning Study Team
Under Construction	2013	\$31 M	Load growth and loss of the existing transformer			Multi-system EOP with only one ColGrid participant	
Committed	2014	\$1.3 M	Load growth and system reliability	delayed from 2012		Single System Project	
Committed	2015	\$2 M	Voltage support (off peak)	delayed from 2014		Single System	
Committed	2013	\$5.7 M	Voltage support and generation integration			Single System	
Committed	Energized	\$7.5 M	Voltage support and generation integration	Energized		Single System	
Committed	Energized	2.5 M	Voltage support	Energized		Single System	
	2014		Load growth			Single System	
Under Study	2016	\$18.5 M	Reliable Generation Interconnection				
Committed	2015						
Committed	2016-17						
Committed	2016	\$320 M	Replace aging equipment				

# Regional Projects

Project Name	Description	Sponsor	Parties Impacted by Project	Link to More Detail	Project Stage
West of McNary Area Reinforcement Project: Big Eddy - Knight Line	This project consists of a new 500 kV line from McNary Substation to John Day Substation which has been completed and a new 500 kV line (approximately 29 miles) from Big Eddy Substation to a tap point (3 breaker Ring at a new station called Knight) along the Wautoma-Ostrander 500 kV line.	BPA			Completed WECC Regional Planning, now in Technical Coordination Work Group (TCWG)
I-5 Corridor Project (SW Washington - NW Oregon Reinforcement)	This project consists of a new 500 kV line (70-90 miles) from Troutdale Substation to a Castle Rock Substation located approximately 12 miles north of Allston Substation on the Paul-Allston No.1 500 kV line.	BPA	PGE, PAC, CCP, Clark		Completed WECC Regional Planning
Cascade Crossing Project	The Cascade Crossing Project is a 200 mile 500 kV line from PGE's Coyote Springs generation plant in the town of Boardman, Oregon west to PGE's Bethel Substation in Salem, Oregon where the line will be terminated into a new 500/230 kV transformer bank. The new line will interconnect at a new Grassland Substation adjacent to the existing Boardman power plant and a new Cedar Spring Substation approximately 26 miles southwest of the Boardman power plant. BPA and PGE have recently signed a MOU to explore and evaluate a proposed change to this project. PGE would build Cascade Crossing beginning at Boardman, but would terminate the dual circuit, 500 kV transmission line at a new substation near Maupin, Oregon, called Pine Grove. PGE would invest in several enhancements to BPA's system (series compensation).	PGE, PAC, BPA		<a href="http://cascadecrossingproject.com/">http://cascadecrossingproject.com/</a>	In WECC Rating Process
Gateway West Project	Idaho Power and PacifiCorp are proposing a joint project with a 500 kV line from Winstar Substation (near Glenrock Wyoming) to Hemingway Substation in the Boise area.	Idaho and PAC			In WECC Rating Process
Hemingway - Boardman Project	In conjunction with the Gateway West project, Idaho Power is looking to extend this project from Hemingway Substation further to the north and west to the Boardman Substation.	Idaho/PAC/BPA	BPA, Avista, PAC		In WECC Rating Process
PG&E Canada - Pacific Northwest - Northern California Transmission Line Project	PG&E is proposing a 500 kV AC line from Selkirk Substation in SE British Columbia to NEO, along with an High Voltage DC line from NEO to the Tesla/Tracy area in the San Francisco Bay area. The bi-directional capacity of this line is planned to be 3,000 MW. Interconnections are also being considered at Devils Gap in the Spokane area and Round Mountain Substation in Northern California.	PG&E/AVA/BC	BPA, PSE, PGE, PAC		
Devil's Gap Interconnection to Canada - PNW - Northern California Transmission Line Project	In conjunction with the PG&E Canada-NW-Northern California Project, Avista is proposing an interconnection at Devil's Gap west of Spokane.	Avista	BPA		
Northern Lights Project	High Voltage Direct Current line beginning at Edmonton, Alberta and ending near Maupin, Oregon. At least one intermediate terminal is planned in a location south of Calgary, near Alberta's largest wind development region. The project is planned to be a bi-directional line with an expected capacity of up to 3,000 MW.	Northern Lights	BPA		
Juan de Fuca Cable Project #1	SeaBreeze Pacific is proposing an underwater 550 MW HVDC Light cable from Vancouver Island in BC to the Port Angeles, WA area across the Strait of Juan de Fuca. This project rating is planned to be bi-directional.	SeaBreeze	BPA, PSE		In WECC Rating Process
Juan de Fuca Cable Project #2	Sea Breeze Pacific is proposing a Multi-terminal underwater 1,100 MW high-voltage DC cable (+/- 300 kV) across the Strait of Juan de Fuca from Ingledow Substation near Vancouver, British Columbia, Canada to Pike Substation near Victoria on Vancouver Island Canada, to either the Shelton or Olympia Substations on the Olympic Peninsula, Washington. The 1100 MW project rating is planned to be fully controllable and bi-directional.	SeaBreeze	BPA		In WECC Rating Process

Project Commitment Level	Scheduled Completion	Cost Estimate	Project Need/Driver & Other Notes	Changes from Previous Plan	Plan cross tribal lands	Type of Project	Study Team(s)
Project Committed under Network Open Season. In permitting process.	2014		Transmission Service Requests	Big Eddy-Knight delayed from 2013			ColGrid West of McNary Regional Planning Study Team
Funding for NEPA and preliminary Engineering is Committed under Network Open Season	2016-18	\$342 M	Transmission Service Requests			Requested Service Project	ColGrid I-5 Corridor Regional Planning Study Team
cancelled	2017	\$610-825 M	Transmission service request	New options being considered		Multi-system EOP with only one ColGrid participant	
	2018-21		Transmission Service Requests				
	2016	\$630-820 M	Transmission Service Requests				
	on hold			Lower capacity alternatives being considered			
	on hold						
	on hold						

## Regional Projects continued

Project Name	Description	Sponsor	Parties Impacted by Project	Link to More Detail	Project Stage
West Coast Cable	SeaBreeze Pacific is proposing an underwater HVDC cable from Allston Substation in NW Oregon near Rainier to San Francisco Bay area. This project has a planned capacity of 1600 MW.	SeaBreeze	BPA		In WECC Rating Process
Montana to Washington Project	This project is proposed to meet a portion of the 2010 BPA NOS requests. Upgrades to the Montana to Northwest and West of Hatwai paths is proposed without any new line construction by upgrading existing and adding new series compensation in the lines. With the new project, the capability of the system will be increased between 550 and 700 MW.	BPA	AVA and other Colstrip Owners		Project under study
Garrison-Ashe Project	This project is proposed to meet the full capacity of the 2010 BPA NOS requests. A 430 mile series compensated Garrison-Ashe 500 kV line is proposed with an intermediate station between Taft and Hot Springs.	BPA	AVA		Conceptual Project
MATL Project	The Montana Alberta Tie Ltd Project is a 200 mile, 300 MW, 230 kV line connecting Lethbridge, Alberta and Great Falls, Montana going through Cutbank, Montana which has significant wind generation potential.	Enbridge			Under Construction
Green Line Project	This project is a 100 mile extension of the MATL project to connect to the Colstrip Transmission. This project will provide access to the Mid-Columbia Hub (up to 1000 MW Capacity).	Enbridge	Colstrip Transmission Owners		Feasibility State
Mountain States Transmission Intertie (MSTI)	A 500 kilovolt (kV), single-circuit electric transmission line from Townsend, Montana south to Midpoint Substation near Jerome, Idaho.	NWE	Colstrip Owners		

Project Commitment Level	Scheduled Completion	Cost Estimate	Project Need/Driver & Other Notes	Changes from Previous Plan	Plan cross tribal lands	Type of Project	Study Team(s)
	2015	\$115 M	Meet 2010 NOS Requests			Requested Service Project	
None	on hold		Meet 2010 NOS Requests			Requested Service Project	
Permitted	Aug-13	\$209 M	Transmission Service Requests				
			Transmission Service Requests				
	on hold						





The INGAA Foundation, Inc.

# Criteria for Pipelines Co-Existing with Electric Power Lines

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Prepared For:  
The INGAA Foundation

Prepared By:  
DNV GL

October 2015



See page 4

The INGAA Foundation  
FINAL Report No. 2015-04

Report name: Criteria for Pipelines Co-Existing with Electric Power Lines Det Norske Veritas (U.S.A.), Inc. Oil & Gas Computational Modeling  
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Objective:

The primary objective of this report is to present the technical background, and provide best practice guidelines and summary criteria for pipelines collocated with high voltage AC power lines. The report addresses interference effects with respect to corrosion and safety hazards, and fault threats.

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## EXECUTIVE SUMMARY

The primary objective of this report is to present the technical background, and provide best practice guidelines and summary criteria for pipelines collocated with high voltage AC power lines. The report addresses interference effects with respect to corrosion and safety hazards, and fault threats. The guidelines presented address mitigation and monitoring, encroachment and construction, risk severity classification, and recommendations for further industry development.

This report addresses the technical background to high voltage interference with respect to collocated and crossing pipelines, and presents basic procedures for dealing with interference scenarios. The provisions of this document are recommended to be used under the direction of competent persons, who are qualified in the practice of corrosion control on metallic structures, with specific suitable experience related to AC and/or DC interference and mitigation. This document is intended for use in conjunction with the reference materials cited herein.

Collocated pipelines, sharing, paralleling, or crossing high voltage power line rights-of-way (ROW), may be subject to electrical interference from electrostatic coupling, electromagnetic inductive, and conductive effects. If the interference effects are high enough, they may pose a safety hazard to personnel or the public, or may compromise the integrity of the pipeline. Because of increased opposition to pipeline and power line siting, many future projects propose collocating high voltage alternating current (HVAC) and high voltage direct current (HVDC) power lines and pipelines in shared corridors, worsening the threat.

Predicting HVAC interference on pipelines is a complex problem, with multiple interacting variables affecting the influence and consequences. In some cases, detailed modeling and field monitoring is used to estimate a collocated pipeline's susceptibility to HVAC interference, identify locations of possible AC current discharge, and design appropriate mitigation systems to reduce the effects of AC interference. This detailed computer modeling generally requires extensive data collection, field work, and subject-matter expertise. Basic industry guidelines are needed to help determine when more detailed analysis is warranted, or when detailed analysis can be ruled out based on the known collocation and loading parameters. A consistent technical guidance document will benefit the pipeline industry by increasing public safety and allowing for an efficient approach in assessment and mitigation of threats related to high voltage interference.

The INGAA Foundation contracted Det Norske Veritas (U.S.A), Inc. (DNV GL) to develop this guidance document. The project included a detailed industry literature review to identify applicable technical reports, international standards, existing guidance and operator procedures. In addition to the literature review, numerical modeling was performed to determine the effects of key parameters on the interference levels. The document addresses interference effects with respect to corrosion and safety hazards, mitigation, monitoring, encroachment and construction, prioritization and modeling. It also includes recommendations for further development.

The following severity ranking tables were developed for key variables and their impact on the severity of AC interference. Further background for the development of these rankings is provided throughout the report. Guidelines for determining the need for detailed analysis and applying these severity rankings are provided in Section 6.2.

## Separation Distance

**Table 3-Severity Ranking of Separation Distance**

Separation Distance - $D$ (Feet)	Severity Ranking of HVAC Interference
$D < 100$	High
$100 < D < 500$	Medium
$500 < D < 1,000$	Low
$1,000 < D \leq 2,500$	Very Low

## HVAC Power Line Current

**Table 4-Relative Ranking of HVAC Phase Current**

HVAC Current - $I$ (amps)	Relative Severity of HVAC Interference
$I \geq 1,000$	Very High
$500 < I < 1,000$	High
$250 < I < 500$	Med-High
$100 < I < 250$	Medium
$I < 100$	Low

## Soil Resistivity

**Table 5-Relative Ranking of Soil Resistivity**

Soil Resistivity - $\rho$ (ohm-cm)	Relative Severity of HVAC Co
$\rho < 2,500$	Very High
$2,500 < \rho < 10,000$	High
$10,000 < \rho < 30,000$	Medium
$\rho > 30,000$	Low

We worry that Energize Eastside combined with the Olympic Pipeline would score high on these risk criteria. Our concerns are reasonable according to two pipeline safety experts.

## Collocation Length

**Table 6-Relative Ranking of Collocation Length**

Collocation Length: $L$ (feet)	Relative Severity
$L > 5,000$	High
$1,000 < L < 5,000$	Medium
$L < 1,000$	Low

## Collocation / Crossing Angle

**Table 7-Relative Ranking of Crossing Angle**

Collocation/Crossing Angle - $\theta$ ( $^{\circ}$ )	Relative Severity
$\theta < 30$	High
$30 < \theta < 60$	Med
$\theta > 60$	Low

The research and analytical studies accentuated the need for accurate power line current load data when assessing the susceptibility of a steel transmission line to high voltage interference. For this reason, collaboration between the respective pipeline and power line operators is advised to accurately determine where detailed assessment is required, and develop efficient mitigation where necessary.

The general safety recommendations and guidelines for interference analysis presented in Section 6 provide guidance on the relative susceptibility of AC interference associated with the selected variables. They primarily address the likelihood or susceptibility of AC interference, and do not address the consequence aspect of an overall risk assessment, as these details are specific to each individual assessment.

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## Acronyms

AC	Alternating Current
CAPP	Canadian Association of Petroleum Producers
CFR	Code of Federal Regulation
CP	Cathodic Protection
CSA	Canadian Standards Association
CTS	Coupon Test Station
DC	Direct Current
DCD	DC Decoupler
DOC	Depth of Cover
DOT	Department of Transportation
EMI	Electromagnetic Interference
ER	Electrical Resistance
FBE	Fusion Bonded Epoxy
GPR	Ground Potential Rise
HVAC	High Voltage Alternating Current
HVDC	High Voltage Direct Current
IEEE	Institute of Electrical and Electronics Engineers
IF	Isolation Flange
INGAA	Interstate Natural Gas Association of America
LEF	Longitudinal Electric Field
MPY	Mils per year
OSHA	Occupational Safety and Health Administration
PRCI	Pipeline Research Council International
ROW	Right(s) of Way
TLM	Transmission Line Model

## 1 INTRODUCTION

Trends within both the electric power and pipeline industries have increased the number of projects that collocate high voltage alternating current (HVAC) and high voltage direct current (HVDC) power lines with steel transmission pipelines in shared rights-of-way (ROW). The primary objective of this report is to provide technical guidance and present best practice guidelines and summary criteria for steel transmission pipelines collocated with high voltage AC power lines.

Topography, permitting requirements, land access, increasingly vocal public opposition to infrastructure projects, and environmental concerns, including protected regions, all have led to an increase in sharing of common utility corridors. While there are numerous benefits to common utility corridors, there are also many concerns. Collocated steel transmission pipelines that share, parallel, or cross high voltage power line ROW may be subject to electrical interference from electrostatic coupling, electromagnetic inductive, and conductive effects. If these interference effects are high enough, they may pose a safety hazard to personnel or compromise the integrity of the pipeline.

Pipelines collocated with overhead HVAC lines account for a significant portion of the high voltage interference conditions encountered in the transmission pipeline industry. However, interference effects due to buried power lines and HVDC are also of concern to pipeline operators where close collocations exist. As aboveground HVAC is still the primary concern for pipeline interference, it is the primary focus of this report. However, comparison background and technical discussion is included related to HVDC and buried power line interference as well, and the effects of both should be considered on a case-by-case basis when steel transmission pipelines are closely collocated with these systems.

Numerous methodologies exist to analyze alternating current (AC) interference for specific collocations and crossings, but the analysis generally requires extensive data collection and detailed computational modeling. The accuracy of these models is sensitive to the HVAC power line operating parameters, which can often be difficult or costly for pipeline operators to obtain from electric power companies. Basic guidelines and prioritization criteria have been established in this report to provide guidance for pipeline operators to aid in a risk-based decision-making process and help prioritize regions for detailed modeling and mitigation design, or exclude further modeling analysis for a given region.

This report addresses interference effects related to encroachment and construction, corrosion and safety hazards, mitigation, and monitoring. This project included a detailed industry literature review to identify applicable technical reports, international standards and, guidance documents. Several INGAA members provided procedures. In addition to the literature review, numerical models were developed and trends presented detailing the effects of critical variables on interference levels under the conditions defined.

## 2 INDUSTRY LITERATURE REVIEW

There has been extensive research performed to understand the risks of high voltage interference and to develop efficient mitigation techniques. The effects of HVAC interference from a personnel safety and corrosion standpoint are a risk identified in much of the literature. Case studies in North America, the UK, and continental Europe have identified and documented AC corrosion concerns. Through-wall defects have been reported with corrosion rates greater than 50 mils/year (mpy) observed.<sup>1</sup>

In development of this guidance document a literature review identified and reviewed more than fifty technical references, US and International standards, existing guidance documents, research theses, journal manuscripts, and technical symposia papers. Additionally, INGAA collected operating procedures and guidelines from 10 member companies for review and comparison.

Where published, historically identified corrosion defects and pipeline failures associated with AC corrosion degradation have been reviewed and a selection are presented as case studies in Appendix A, demonstrating the magnitudes and variability in corrosion rates possible with AC accelerated corrosion.

The primary finding from this review is that there is significant variation in operating procedures and technical literature with respect to AC interference. Various companies' procedures were compared with published industry guidance, historical project data, and project experience to determine a best practice approach. Details and cross references are presented in each of the subsections of this document with a detailed review of the technical literature, case studies, and company procedures provided in Appendix A.

## **3 HIGH VOLTAGE INTERFERENCE ON ADJACENT PIPELINES**

### **3.1 HVAC Interference Modes**

Electrical interference from capacitive, electromagnetic inductive, and conductive coupling can affect pipelines collocated in close proximity to HVAC power lines. The subject of AC interference has been a growing concern across multiple industries in recent decades as improved pipeline coatings and utility ROW congestion has contributed to an increase in identified AC corrosion incidents. Recent trends in the high voltage electric power transmission industry are leading to increased power capacity and higher operating currents in certain systems, in part to overcome long distance transmission line losses.<sup>2</sup> This increase in operating current has a direct effect on the level of electromagnetic interference (EMI) and the corresponding magnitude of AC interference on affected pipelines. This trend toward elevated operating currents may present a significant challenge for achieving adequate mitigation on pipelines crossing or collocated with the high voltage power lines.

The three primary physical phenomena by which AC can interfere or "couple" with pipelines are through capacitive, resistive, or inductive coupling as detailed in Sections 3.1.1 through 3.1.3. High voltage interference can occur during normal operation, generally referred to as steady state, or during a power line fault. HVAC power line faults are any abnormal current flow from the standard intended operating conditions, and discussed further in Section 3.1.4.

#### **3.1.1 Capacitive Coupling**

Capacitive coupling, or electrostatic interference, occurs due to the electromagnetic field produced by AC current flowing in the conductors of a high voltage power line, which can induce a charge on an above ground steel pipeline that is electrically isolated from the ground. Capacitive effects are primarily a concern during construction when sections of the pipeline are aboveground on insulating supports, as indicated in Figure 1. The pipeline can build up charge as a capacitor with the surrounding air acting as the dielectric, which can maintain the electric field with a minimum loss in power, resulting in a potential difference with surrounding earth.

The magnitude of potential is primarily dependent on the pipeline proximity to the HVAC conductors, the magnitude of power line current, and the individual phase arrangement. If the potential buildup due to

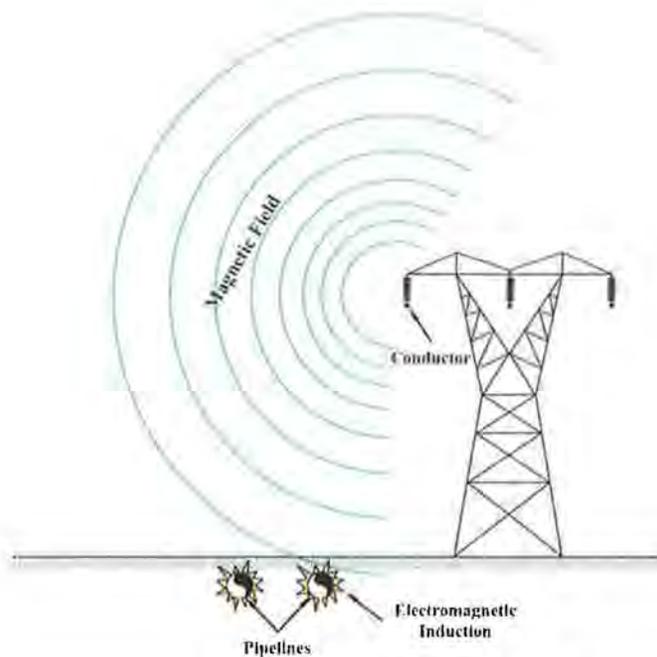
capacitive coupling is significant, electrostatic interference may present a risk of electric shock or arcing. While elevated capacitive voltages may exist, the corresponding current is generally low, resulting in low shocking consequence<sup>3,4</sup>.



**Figure 1. Illustration of Capacitive Coupling**

### 3.1.2 Inductive Coupling

Electromagnetic induction is the primary interference effect of an HVAC power line on a buried steel pipeline during normal steady state operation. EMI occurs when AC flowing along power line conductors generates an electromagnetic field around the conductor, which can couple with adjacent buried pipelines, inducing an AC voltage, and corresponding current, on the structure as depicted in Figure 2. This induced AC potential may present a safety hazard to personnel, and can contribute to AC corrosion of the pipeline, as discussed in Section 3.3.1.



**Figure 2. Illustration of Steady State HVAC Inductive Interference**

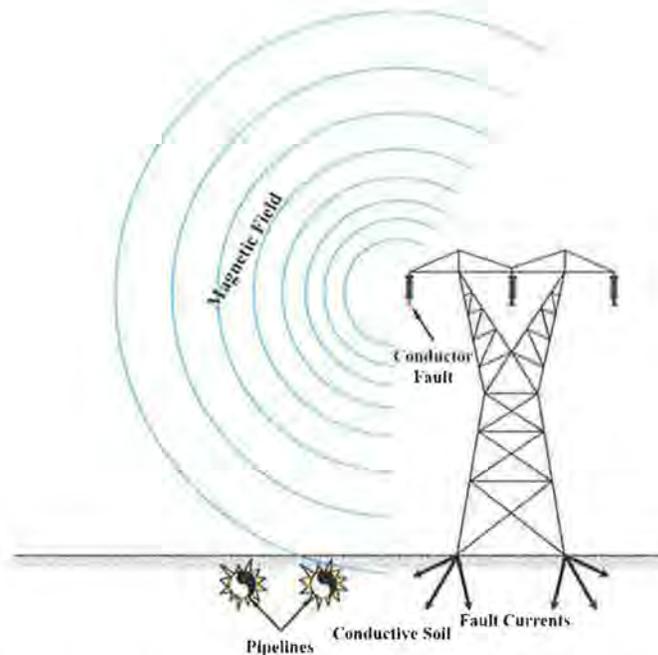
The inductive effects of the HVAC power line on an adjacent pipeline are a function of geometry, soil resistivity, coating resistance, and the power line operating parameters. The geometry characteristics include separation distance between the pipeline and the towers, depth of cover (DOC), pipe diameter, angle between pipeline and power line, tower footing design, and phase conductor configuration. These parameters remain relatively constant over the life of the installation. The coating resistance, power system resistance, and soil resistivity may vary with the seasonal changes and as the installations age, but they are considered constants for most analyses. However, the operating parameters of the power line – such as phase conductor load, phase balance, voltage, and available fault current – all have an influence on the effects of AC interference, and can vary significantly. The individual conductor current load and phase balance is dynamic and changes with load requirements and switching surges. These variations in operating parameters contribute to variations in levels of AC interference. During normal HVAC operation, the current load varies as the load demand changes both daily and seasonally.<sup>3,5</sup> While normal operating conditions are often referred to as “steady state” throughout the industry, the term is somewhat misleading as the current loads and corresponding induced AC potentials can be continuously varying, adding further complexity to quantifying interference magnitude.

For a straight, parallel, homogenous collocation, induced potentials are highest at the ends of the collocated segment, and fall exponentially with distance past the point of divergence.<sup>6</sup> For more complex collocations, voltage peaks may occur at geometric or electrical discontinuities, where there is an abrupt change in the collocation geometry or electromagnetic field. Specifically, voltage peaks commonly occur where the pipeline converges or diverges with the HVAC power line, separation distance or soil resistivity changes significantly, isolation joints are present on the pipeline, or where the electromagnetic field varies such as at phase transpositions.<sup>3,7,8,9</sup>

### 3.1.3 Resistive Coupling

Current traveling through the soil to a pipeline can cause resistive or conductive coupling. As the grounded tower of an HVAC power system shares an electrolytic path with adjacent buried pipelines through the soil, fault currents may transfer to adjacent steel pipelines if the pipeline presents a lower resistance electrical path. Resistive interference is primarily a concern when a phase-to-ground fault occurs in an area where a pipeline is in close proximity to an HVAC power line, and magnitudes of fault currents in the ground are high. However, a phase imbalance on an HVAC system with a grounded neutral can contribute to resistive interference as return currents will travel through the ground and may transfer to a nearby pipeline.

During a fault condition (see Section 3.1.4), the primary concern is the resistive interference transferred through the soil. However, inductive interference can also be a concern as the phase current, and corresponding EMI, of at least one conductor can be high, as depicted in Figure 3. In other words, during a fault, the inductive effects during normal operation as described in Section 3.1.2 increase due the elevated EMI during the fault period.



**Figure 3. Illustration of HVAC Fault Condition – Inductive and Conductive Interference**

If any of these electrical effects are high enough during operation, a possible shock hazard exists for anyone that touches an exposed part of the pipeline such as a valve, cathodic protection (CP) test station, or other aboveground appurtenance. During steady state normal power line operation, AC current density at a coating holiday (flaw) above a certain threshold may cause accelerated external corrosion damage to the pipeline. In addition, damage to the pipeline or its coating can occur if the voltage between the pipeline and surrounding soil becomes excessive during a fault condition.

### 3.1.4 AC Faults

For HVAC power lines, a fault is any abnormal current flow from the standard intended operating conditions. A fault can occur between one or more phase wires and the ground, or simply between adjacent phase wires. Faults can occur when one or more of the conductors are grounded or come in contact with each other, or due to other unforeseen events. This may be due to vegetation contacting the conductors, conductors contacting the towers or each other during high winds, physical damage to a tower, conductor, or insulator, flashover due to lightning strikes, or other abnormal operating condition. A phase-to-ground fault on a power line causes large currents in the soil at the location of the fault and large return currents on the phase conductor and ground return.

Faults are generally short duration transient events. Typical clearing times for faults range from approximately 5 to 60 cycles (0.08 to 1.0 seconds for 60-hertz transmission) depending on the location of the fault, breakers and type of communications. While the fault effects are transient, high-induced potentials or resistive coupled voltages along the ROW present a possible shocking hazard for personnel or anyone who may be in contact with above grade pipeline or appurtenances.

## 3.2 HVAC – Personnel Safety Hazards

An evaluation of the possible safety hazards for those working on a pipeline should take place whenever a pipeline is operating or constructed in close proximity to a HVAC power line. Personnel safety hazards are present during both pipeline construction and maintenance, and during normal steady state operation.

### 3.2.1 Hazards During Operation

#### Touch and Step Potential Limits

Personnel safety is of concern when a person is touching or standing near a pipeline when high voltages are present. The "touch potential" is defined as the voltage between an exposed feature of the pipeline, such as a CP test station or valve, and the surrounding soil or a nearby isolated metal object, such as a fence that can be touched at the same time. The touch potential is the voltage a person may be exposed to when contacting a pipe or electrically continuous appurtenance. The "step potential" is the voltage across a person's two feet and defined as the difference in the earth's surface potential between two spots one meter apart. The touch potential can be a concern during both normal steady state inductive and fault conductive/inductive conditions. Typically, the step potential is a concern during conductive fault conditions due to high currents and voltage gradients in the soil.

The Canadian Standards Association (CSA) and NACE International (NACE) have published standards addressing HVAC interference hazards. Both NACE and CSA standards<sup>10,12</sup> recommend reducing the steady state touch and step potential below 15 volts at any location where a person could contact the pipeline or any electrically continuous appurtenance. The 15-volt threshold is designed to limit the available maximum current through a typical human body to less than 10 mA. An 8 to 15 mA current results in a painful shock but is still in the maximum "let go" current range, for which a person can release an object or withdraw from contact.<sup>10</sup> The Institute of Electrical and Electronics Engineers (IEEE) Guide for Safety in AC Substation Grounding, indicates that a current in the range of 9 to 25 mA range may produce painful shock and involuntary muscular contraction, making it difficult to release an energized object.<sup>13</sup> Elevated body current in the range of 60 to 100 mA may cause severe injury or death as it can induce ventricular fibrillation, or

inhibition of respiration. Current lower than nine (9) mA will generally result in a mild shock, but involuntary movement could still cause an accident.<sup>10</sup>

The touch potential is equal to the difference in voltage between an object and a contact point some distance away, and may be nearly the full voltage across the grounded object if that object is grounded at a point remote from where the person is in contact with it. For example, a crane that was grounded to the system neutral and that contacted an energized line would expose any person in contact with the crane or its un-insulated load line to a touch potential nearly equal to the full fault voltage.

The step potential may pose a risk during a fault simply by standing near the grounding point due to large potential gradients present in the soil, typically during a short duration fault condition.

A risk evaluation of the possible hazards to personnel for those working on the pipeline and possible pipeline coating damage should take place whenever a pipeline is in close proximity to a HVAC power line. This assessment should consider the possible likelihood and consequence of HVAC interference hazards to determine if further analytical assessment or mitigation is necessary. NACE International Standard Practice SP0177-2014 (Mitigation of Alternating Current and Lightning Effects on Metallic Structures and Corrosion Control Systems) indicates mitigation is necessary in those cases where step or touch potentials are in excess of 15 volts. Mitigation is further discussed in Section 5.

### 3.2.2 Encroachment and Construction Hazards

There are multiple safety hazards to consider associated with pipeline construction near a high voltage power line, the most obvious of which is the possibly lethal hazard of equipment directly contacting an energized overhead conductor.<sup>3</sup> The Occupational Safety and Health Administration (OSHA) has multiple regulations for safety requirements and limitations for working near power lines that must be considered in addition to pertinent company standards, and industry best practice guidelines. These include, but are not limited to the following:

- 29 CFR 1910.269: Electric power generation, transmission, and distribution
- 29 CFR 1910.333: Selection and use of work practices
- 29 CFR 1926, SUBPART V: Power Transmission and Distribution

The OSHA standards address requirements for working near energized equipment, overhead power lines, underground power lines, and construction nearby.

Elevated capacitive potentials generated on pipeline sections isolated from the ground on insulating skids as described in Section 3.1.1 can pose a safety hazard. Pipeline segments that are supported aboveground during pipeline construction near an HVAC power line are subject to EMI and electrical capacitance can build up between the pipeline segments and earth. If no electrical path to ground is present, even a relatively short section of piping may experience elevated AC potential, presenting a shock hazard to personnel near the pipeline.

Cases presented in published literature indicate scenarios of measured potentials greater than 1,000 volts on a pipeline segment exposed to an HVAC corridor.<sup>4</sup> In general, while the capacitive coupled voltages can exceed the NACE 15 volt touch potential safety threshold, the corresponding current is low reducing shocking hazard. However, arcing due to capacitive coupling may present a possible safety hazard, as an arc may be a possible ignition source for construction vehicles refueling along the ROW. Grounding pipelines in HVAC ROW will reduce the possibility of shocking or arcing.

Capacitive coupling is generally mitigated by connecting temporary grounding or bonding during construction to provide a low resistance path to ground for any electrostatic interference. Section 6 addresses further mitigation techniques and guidance for construction practices.

### 3.3 HVAC Threat to Pipeline Integrity

High voltage interference poses multiple threats to pipeline integrity for collocated and crossing pipelines under both steady state and fault conditions. During normal steady state HVAC power line operation, the inductive interference can contribute to accelerated external corrosion damage to the pipeline. Under faulted conditions, elevated potentials can lead to coating damage or a direct arcing to the pipeline.

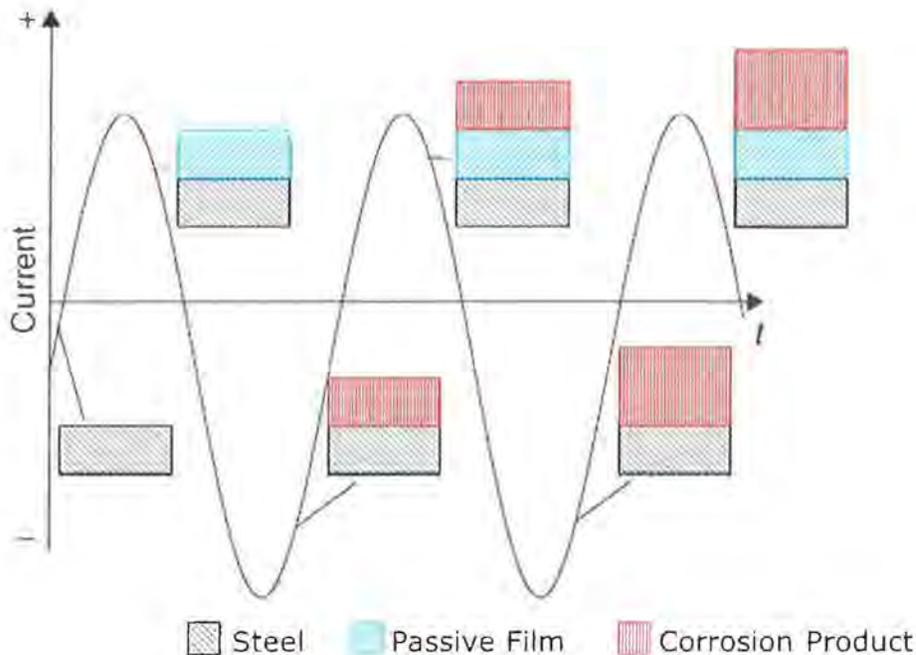
The steady state 15 VAC threshold presented in NACE and CSA standards<sup>10,12</sup> considers personnel safety and does not necessarily address corrosion issues. Research and experience has shown that AC accelerated corrosion can occur in low resistivity soils at AC voltages well below this threshold.<sup>3,6,14</sup>

#### 3.3.1 AC Corrosion

External corrosion, whether controlled by AC or DC, may pose a threat to the integrity of an operating pipeline. DC corrosion protection utilizes a system of corrosion resistant coatings and a CP system to provide electrochemical protection at coating holidays to reduce corrosion rate. However, AC corrosion is possible even in the presence of cathodically protected DC potentials due to high AC current density at coating holidays.

The concept of AC corrosion has been around since the early 1900s with only minor effects expected for many years.<sup>3,10</sup> AC accelerated corrosion has been recognized as a legitimate threat for collocated steel since the early 1990s, after several occurrences of accelerated pitting and leaks, ultimately associated with HVAC interference, were reported on cathodically protected pipelines.

Historically, there has been little consensus on specific mechanisms driving AC corrosion, and the severity of degradation attributed. However, several recent publications show tentative agreement in a plausible mechanism.<sup>6,15,17</sup> The explanation presented by Buchler, Tribollet, et al, suggests that AC corrosion on cathodically protected pipelines may be attributed to destabilization of pseudo-passive film that can normally form on exposed steel at a coating holiday under DC cathodic protection polarization. Due to the cyclic nature of AC current, the charge at the steel surface is continuously varying between anodic and cathodic polarization, which acts to reduce the passive film at the steel surface as shown in Figure 4. It is not the intention of this report to identify the specific mechanism driving material degradation due to AC corrosion, but rather to summarize a previously proposed mechanism and clarify the risks and contributing factors associated with AC corrosion.



**Figure 4. Graphical representation of proposed processes occurring during AC corrosion. Reproduced from Tribollet.<sup>6</sup>**

### 3.3.1.1 AC Current Density

While there may be disagreement regarding the specific mechanism driving AC corrosion, AC current density is generally recognized as being an indicator of the likelihood of AC corrosion for a given location. In January of 2010, NACE International prepared and published a report entitled "AC Corrosion State-of-the-Art: Corrosion Rate, Mechanism, and Mitigation Requirements," which provides the following insight on AC corrosion current density.

*"In 1986, a corrosion failure on a high-pressure gas pipeline in Germany was attributed to AC corrosion. This failure initiated field and laboratory investigations that indicated induced AC-enhanced corrosion can occur on coated steel pipelines, even when protection criteria are met. In addition, the investigations ascertained that above a minimum AC density, typically accepted levels of CP would not control AC-enhanced corrosion. The German AC corrosion investigators' conclusions can be summarized as follows:*

- *AC-induced corrosion does not occur at AC densities less than 20 A/m<sup>2</sup> (1.9 A/ft<sup>2</sup>).*
- *AC corrosion is unpredictable for AC densities between 20 to 100 A/m<sup>2</sup> (1.9 to 9.3 A/ft<sup>2</sup>).*
- *AC corrosion occurs at current densities greater than 100 A/m<sup>2</sup> (9.3 A/ft<sup>2</sup>)."3<sup>1</sup>*

The AC density for a given location is dependent on soil resistivity, induced voltage, and the size of a coating holiday. Research has indicated that the highest corrosion rates occur at holidays with surface areas of 1 to 3 cm<sup>2</sup> (0.16 to 0.47 in<sup>2</sup>).<sup>1</sup> AC current density is best obtained through direct measurement of a correctly sized coupon or probe. However, the theoretical AC current density can be calculated, utilizing the soil

resistivity and AC potential on a pipeline, in conjunction with Equation 1, presented in the State of the Art Report.<sup>1</sup>

$$I_{AC} = \frac{8V_{AC}}{\rho\pi d} \quad \text{Equation (1)}$$

Where:

- $I_{AC}$  = Theoretical AC Current Density (A/m<sup>2</sup>)
- $V_{AC}$  = Pipe AC Voltage to Remote Earth (V)
- $\rho$  = Soil Resistivity (ohm-m) (1 ohm-m = 100 ohm-cm)
- $d$  = Diameter of a circular holiday having an area equal to that of the actual holiday (m)

Multiple industry references discuss a current density threshold below which AC corrosion is not a significant factor; however, there is still disagreement on the magnitude of this threshold. While the majority of technical literature indicates AC corrosion is possible at current densities between 20 to 30 A/m<sup>2</sup>, there is experimental evidence presented by Goidanich, et al<sup>14</sup> indicating that AC current densities as low as 10 A/m<sup>2</sup> can contribute to a measureable increase in corrosion rate<sup>14</sup>. A significant conclusion of study published by Yunovich and Thompson in 2004<sup>9</sup>, reiterated in the NACE AC Corrosion State of the Art Report in 2010, indicated that there might not be a theoretical threshold below which AC corrosion is active. The focus should rather be on a practical limit, below which the contribution of AC interference to the overall corrosion rate is low, or rate of corrosion due to AC is not appreciably greater than the free corrosion rate for the particular conditions.<sup>3,9</sup> The results of the experimental study showed that a current density of approximately 20 A/m<sup>2</sup> produced a 90% or greater increase in the corrosion rate versus the control, in the absence of CP.<sup>9</sup> Experimental studies performed by Goidanich, Lazzari, et al in 2010 and 2014, in the presence of CP, concluded that while it was apparent AC current density greater than 30 A/m<sup>2</sup> showed a considerable increase in the corrosion rate, a current density as low as 10 A/m<sup>2</sup> resulted in a corrosion rate nearly double that of the specimens without AC.<sup>14, 18</sup>

For reference, the European Standard EN 15280:2013, "Evaluation of AC corrosion Likelihood of Buried Pipelines Applicable to Cathodically Protected Pipelines" adopted the 30 A/m<sup>2</sup> current density magnitude as a lower threshold, below which the likelihood of AC corrosion likelihood is low. In an effort to address the practical application seen in operation, considering interaction effects of CP current and AC interference, recent research has assessed the likelihood of AC corrosion in terms of the ratio between AC and DC current density ( $I_{AC}/I_{DC}$ ).

### 3.3.1.2 Current Density Ratio

Recent research has shown that the likelihood of AC corrosion on pipelines is dependent on both the level of AC interference and the level of cathodic current from either CP or other stray current sources.<sup>3, 15, 18</sup> In general, AC current density values below the previously cited 20 A/m<sup>2</sup> recommended limits were shown to accelerate corrosion rates in the presence of elevated DC current density due to excessive CP overprotection.

The latest revision of EN 15280:2013 was revised to present criteria based upon the AC interference and DC current due to CP. Alternative acceptance criteria are presented in terms of limiting cathodic current density, or limiting the AC to DC current density ratio ( $I_{AC}/I_{DC}$ ) below a specified level.

Current density obtained by use of coupons or electrical resistance (ER) probes will provide this ratio. However, both AC and DC current density data required to utilize these limits are often not available or easily obtained along the pipeline in practice. Therefore, the current density ratio limits provided within the EN 15280 standard are not widely used or easily applicable criteria. This reference demonstrates the recognized interaction of AC interference and CP systems, presenting an alternative approach that may be valuable for specific scenarios where data is available.

As mentioned previously, the measurement or calculation of AC current density has been the primary indicator to determine the likelihood of AC corrosion across industry in North America. It is possible to measure AC current density on a representative holiday through the installation and use of metallic coupons. A coupon representative of the pipe material, with a defined bare surface area, buried near the pipeline and connected to the pipeline routed through a test station will allow the measurement of current. These current measurements along with the known surface area of the coupon, allow for calculation of a representative current density. In many cases, the coupons are supplemented with additional instrumentation such as ER probes and reference electrodes to provide additional pertinent information. The ER probes provide a time based corrosion rate while the reference electrodes provide both AC and DC pipe-to-soil potentials.

Section 6 provides further details related to mitigation and monitoring methods for AC corrosion. Appendix A includes additional details related to literature review, historical AC corrosion rates, and industry case studies.

### 3.3.2 Faults

During a phase-to-ground fault on a power line, an adjacent or crossing pipeline may be subject to both resistive and inductive interference. Although these faults are normally of short duration (generally less than one second), pipeline damage can occur from high potential breakdown of the coating and conductive arcing across the coating near the fault. Further, the fault current is typically carried by a single conductor, resulting in short term elevated induced voltages that can reach thousands of volts or greater. This presents a significant risk to personnel in contact with the pipeline or electrically continuous appurtenance during a fault.

A phase-to-ground fault, or a lightning strike, on an HVAC power line can result in large potential differences with respect to the adjacent or crossing pipelines. If the potential gradient through the soil is sufficient, a direct arc to a collocated or crossing pipeline is possible, which can result in coating damage, or arc damage to the pipe wall up to the point of burn-through. Even if an arc is not sustained long enough to cause burn through, a short duration elevated current can cause molten pits on the pipe surface that may lead to crack development as the pipe cools. Fault arcing is generally a concern where fault potentials are greater than the dielectric strength of the coating, or at coating holidays within the possible arcing distance. Section 7.3 provides guidance limits for both issues. Where necessary, installation of grounding and shield wires can be used to mitigate the fault hazards as discussed in Section 6.

#### 3.3.2.1 Coating Stress Voltage

During fault conditions, damage to the pipeline or its coating can occur if the voltage between the pipeline and surrounding soil becomes excessive. Fault conditions that produce excess coating stress voltages across the coating are of concern for dielectric coatings. The main factors to consider are the magnitude of the voltage gradient and the dielectric strength of the coating type. It should be noted that there are several

parameters that are utilized to assess these issues: magnitude of the fault current, distance between the pipeline and fault, soil resistivity, coating age/quality, duration of the fault and coating thickness.

Guidance on allowable coating stress voltage varies across references. NACE SP0177-2014 indicates, "Limiting the coating stress voltage should be a mitigation objective." Multiple references offer varying coating stress limits and are generally considered to be in the range of 1 to 1.2 kV for bitumen, as low as 3 kV for coal tar and asphalt, and 3 to 5 kV for fusion-bonded epoxy (FBE) and polyethylene, for a short-duration fault."<sup>10</sup>

For reference, NACE SP0490-2007 "Holiday Detection of Fusion-Bonded Epoxy External Pipeline Coating of 250 to 760 μm (10 to 30 mil)" uses an equation for calculating test voltages which recommends a 15 mil (14 to 16 mils is a common specification for FBE coatings) fusion bonded coating (FBE) be tested at 2,050 volts.

NACE SP0188 2006 "Discontinuity (Holiday) Testing of New Protective Coatings" also uses an equation for calculating test voltages for coatings in general.

$$TV=1,250 \sqrt{T} \qquad \text{Equation (2)}$$

Where:

- $TV$  = Test Voltage (V)
- $T$  = Average coating thickness in mils

This results in a test voltage of 8,840 volts +/- 20% for a pipeline coated with a 50-mil coal tar coating.

The first standard above is the subject of AC mitigation and the following two standards are the recommendations for holiday testing; however, there appear to be inconsistencies as to what voltage will actually damage the various pipeline coatings. The inconsistencies appear to be due to the unidentified coating thickness in SP0177-2014 and actual duration of the fault resulting in conservative values.

Gummow et al. in their paper "Pipeline AC Mitigation Misconceptions"<sup>19</sup> present data that include the duration and coating thickness in the analysis resulting in values that are more practical. They conclude that FBE coatings with a 16 mil thickness should conservatively use a voltage gradient limit of 5,000 volts and that the 3kv to 5 kV range indicated in NACE SP0177-2014 would be more applicable in the range of 7.5 kV to 12.5 kV.

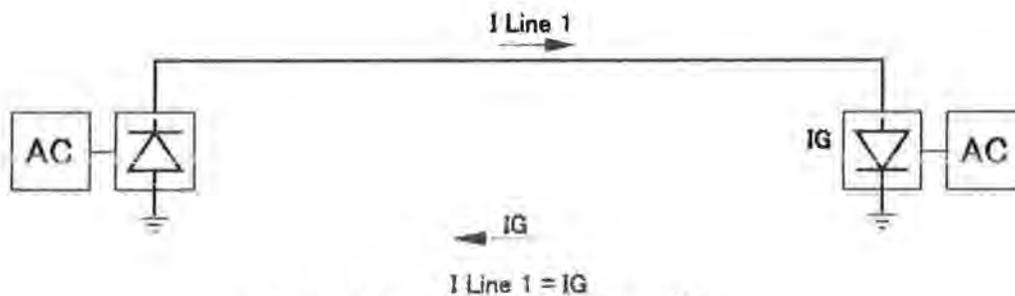
### 3.4 HVDC / Underground HVAC

High voltage power interference is primarily a concern for pipelines collocated with HVAC overhead power lines, due to the widespread sharing of common ROW, and the interference effects associated. However, there are associated concerns across industry regarding interference effects of aboveground HVDC transmission and underground AC power lines. Presently, the U.S. transmission grid consists of approximately 200,000 miles of 230 kV or greater high voltage transmission lines, with an estimate that underground transmission lines account for less than 1% of this total.<sup>20</sup> Industry trends indicate that due to significant disparity in overall installation costs, it is expected that while buried transmission lines will continue to be developed and implemented, overhead transmission will remain the primary means for electric transmission for the foreseeable future.<sup>2</sup>

In general, the level of interference from buried HVAC power lines is typically lower as the proximity between the individual phase conductors acts to balance electromagnetic fields, reducing EMI on foreign structures. Depending on the type of construction, sheathing or conduit may offer some level of electromagnetic shielding, further reducing inductive interference effects.

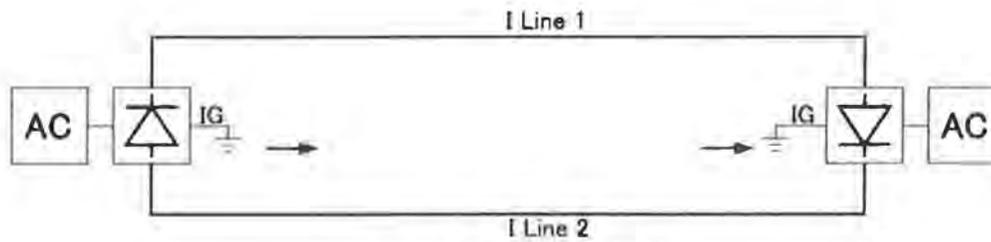
As aboveground HVAC is still the primary concern for pipeline interference, it is the primary focus of this report. However, the effects of both aboveground HVDC and buried transmission cables require review on a case-by-case basis when pipelines are closely collocated. There are currently less than 30 identified high voltage direct current (HVDC) transmission lines operating in the United States<sup>21</sup>. Although there are few relative to overhead HVAC, and the interference effects on a pipeline are different from HVAC transmission lines, they do warrant a brief discussion so that pipeline operators are aware of potential issues. The Canadian Association of Petroleum Producers (CAPP)<sup>22</sup> have produced a technical document that addresses in detail the issues associated with HVDC transmission lines influence on metallic pipelines. Due to the technical differences, the detailed extent of HVDC transmission line interference on steel pipelines necessitates its own study, beyond the scope of this document, however a summary overview of design and interference comparisons follows.

HVDC transmission systems in operation today are typically of monopole or bipole design. In each case, the systems consist of a transmission line between stations with the major components being DC-AC convertors and large ground electrodes. In monopole systems, a single conductor transports the power with an earth return, as depicted in Figure 5. It should be noted that where HVDC systems use a ground return, the interference concerns are similar to typical DC stray current interference, which is addressed in NACE SP0169 and is outside the scope of this document.



**Figure 5. Monopole System** <sup>(34)</sup>

In bipole systems, two conductors between stations allow the system to transport power through both conductors, one conductor and an earth return, or a combination of both, as depicted in Figure 6. The most common use of monopole systems is in submarine applications using the seawater as the earth return. The most common use of bipole systems consist of onshore overhead transmission towers to transport the power.



**Figure 6. Bipole System** <sup>(34)</sup>  
 $IG = I \text{ Line 1} - I \text{ Line 2}$

Tripole configurations have been considered and reviewed in research, but have not seen widespread use in practice. There are several types of designs and operation modes within the broad parameters of the monopole and bipole systems. During emergencies and in maintenance of the bipole system, an earth return is used. In an earth return mode there is a potential gradient generated and metallic objects, such as pipelines, can be subject to varying potentials and become a conductor of the return current if they provide a low resistance path. Where current is collected or received by the pipeline generally no damage occurs, unless the current is high enough to damage the coating. However, corrosion will occur at current discharge locations. The amount of corrosion is dependent on the amount of current and duration of discharge. In the case of large discharge current, significant corrosion damage can occur in relatively short time periods. The effects are similar to the interference currents caused by other DC power sources such as traction systems, cathodic protection systems or welding with an improper ground.

HVDC transmission lines also have the same coupling modes with pipelines that occur with HVAC transmission lines capacitive, inductive, and resistive. Although under typical circumstances these effects may be negligible. However, interference levels under faulted conditions can be significant.

### 3.4.1.1 Capacitive coupling

The results of research presented by Koshcheev indicate the electrical field below HVDC transmission lines does not generally require significant safety measures during construction when the pipe is isolated on skids, as the electric field influence associated with HVDC transmission is limited compared to HVAC.<sup>21</sup>

### 3.4.1.2 Inductive coupling

CAPP indicates the voltages induced due to HVDC, under steady state conditions tend to be negligible. The magnitude of induction may contribute to minor interference problems with telephone lines, and possibly other communications systems, but is typically low enough that neither pipeline integrity nor safety hazards are considered likely under steady state conditions. However, during fault conditions, there is a possibility for short duration of elevated inductive coupling.

### 3.4.1.3 Resistive coupling

During faulting both HVAC and HVDC transmission systems can present personnel safety issues and compromise pipeline integrity, with possible damage to the pipeline, coating, and associated equipment. A faulted HVDC power line presents a possible integrity concern for nearby pipelines. CAPP indicates that the fault current discharged to ground at the power line tower causes a ground potential rise (GPR) near the ground electrode. A voltage gradient exists relative to remote earth. A pipeline within the voltage gradient

will experience a coating stress voltage as discussed in Section 3.3.2.1. If high enough, the voltage stress could puncture the insulating coating possibly damaging the pipeline.

### 3.5 Industry Procedure Summary

The lack of industry consensus on the subject of AC corrosion guidelines has led to varied practices among pipeline operators in regards to mitigating AC interference on pipelines. As part of this study, The INGAA Foundation requested a review of industry practices and procedures related to AC interference. Based upon this review, all of the procedures address a safety concern and define a maximum allowable AC pipe-to-soil potential limit for above-grade appurtenances. For pipelines in close proximity to HVAC power lines, faults are identified as a hazard in almost all of the procedures. However, few addressed coating stress limit above which mitigation is required. For current density criteria, several procedures had clearly defined limits, while others addressed it as a concern for AC corrosion but did not specify a targeted limit of AC current density or define limits for mitigation. Table 1 provides a summary comparison of the industry procedures reviewed.

**Table 1-Industry Procedure Summary**

<i>Induced AC Potential Limit Requiring Mitigation</i>	<i>Fault Protection/Coating Stress Voltage Limit Requiring Mitigation</i>	<i>Current Density Criteria Requiring Mitigation</i>
In accordance with NACE: 15 V	Not specified	Not Specified
15 V	2500 V	Not Specified
15 V	Mentions damage possible from faults but no limit	Not Specified
15 V or higher - No work unless approved by area supervisor	Not specified	Not Specified
Modeling Required > 2 V	Consider with Modeling	30 A/m <sup>2</sup>
15 V	5000 V	75 A/m <sup>2</sup> requires mitigation, 50 A/m <sup>2</sup> requires further evaluation
10-15 V	150-2000 V depending on fault duration	30 A/m <sup>2</sup>
15 V	Faults to be considered along with a minimum separation distance, but no limit specified	20 A/m <sup>2</sup>
15 V	Faults to be considered during mitigation analysis, but no limit specified	50 A/m <sup>2</sup>
15 V	Faults to be considered during mitigation analysis, but no limit specified	50 A/m <sup>2</sup>

## 4 NUMERICAL MODELING

Predicting high voltage interference is a complex problem, with multiple interacting variables affecting the influence and impact. In recent decades, development of advanced calculation methods and computer-based tools for simulation of interference effects, analysis of faults, and development of mitigation methods has been significant.<sup>2,3,5,9,10</sup> Computer based numerical modeling can be utilized to examine the collocated pipeline's susceptibility to HVAC interference, help identify locations of possible AC current discharge, and where necessary design appropriate mitigation systems to reduce the effects of AC voltage, fault currents, and AC current density to meet accepted industry standards. These numerical models are capable of analyzing the interacting contribution of multiple variables to the overall magnitude of AC interference.

Computer modeling is used to analyze the interactions and sensitivity of the variables that affect the magnitude of AC induction on pipelines. This section provides a brief review of numerical modeling software in general, as well as the results of the individual variable analyses.

### 4.1 Modeling Software

Previous research has compared the benefits of specific industry standard software; literature is available for each of the common software packages.<sup>3,9,2023</sup> This review addresses the generalizations concerning the present industry standard software, but does not aim to address or endorse specific software packages.

For the majority of simple collocations considering a single pipeline and single HVAC power line numerous industry-accepted models have shown to be consistent in the assessment of HVAC interference. Often, for these simple cases, the benefit of a more complex model is not gained due to uncertainty in the analysis inputs. That is to say that for a majority of simple collocations, any of several industry accepted models are capable of providing an accurate analysis. The applicability is limited by the accuracy of the input data, and expertise of the analyst in utilizing the specific model. Often the uncertainty in critical input variables, such as the HVAC load current and phasing, outweighs the benefits gained from a more complex model. However, as the collocation complexity increases, both in terms of the number of structures and geometric routing, the limitations of some basic models support the benefits of the more detailed modeling software.

Typical industry standard software packages that were reviewed use a transmission line model (TLM) to calculate longitudinal electrical field (LEF), based on established fundamental Carson or Maxwell equations for electromagnetic fields. The geometry and routing of the complete pipeline and transmission line network incorporated in the model considers multiple pipelines, transmission lines, tower sections, and other collocation parameters. Collocations are simplified as a connected series of finite sections and nodes, with appropriate parameters applied simulating the pipeline, soil, and transmission load-ins. The modeling software can then calculate the LEF for each section and solve the fundamental equations to calculate the potential, current, and theoretical current density along a given collocation.

Calculation of the EMI and corresponding effects on buried pipelines requires a thorough understanding of the variables involved. Detailed modeling requires knowledge of electric field interactions, transmission current, tower design, bulk and local soil resistivity, and pipeline parameters such as geometry, coating, depth, diameter, electrical connections or isolations, and existing CP. All of these variables may significantly affect the AC interference model, and similarly the analogous real world interference. Likewise, the assumptions and simplifications made during the model setup can have significant impact on the accuracy and applicability of the outputs.

While most of the available models are able to analyze each of these variables, either directly or indirectly, the accuracy of the analysis is dependent on the expertise and understanding of the analyst to assess the given variables. Similarly, the accuracy of the models can only be as good as the input data. Multiple sources are required for the collection of data, i.e. measured in field, provided by power line or pipeline operators, or based off published nominal data. For that reason, the accuracy of the results is ultimately dependent on the expertise of analyst and the reliability of the data input to ensure technically appropriate setup, despite the presence of multiple models that have been shown to be capable of providing accurate analysis when used within their applicable limitations.

## 4.2 Variable Analyses

Due to the number of interacting variables affecting the overall levels of AC interference, it is difficult to isolate the effects of a single variable for all collocations scenarios encountered. Consequently, it is difficult to determine distinct limits for individual variables outside of which interference becomes negligible. Considering several key interacting variables is a more viable approach. For example, reported recommendations cite a distance of 1,000 feet as considered 'far' and assumed low risk for HVAC interference. However, in cases where power line current loads are greater than 1,000 amps and in regions of low soil resistivity, elevated induced AC potentials and corresponding current density exceeding recommended thresholds have resulted at even greater distances. Therefore, separation distance alone may not provide sufficient justification to exclude a collocation from further assessment. Conversely, considering the interacting effect of the key variables identified is necessary when determining the need for detailed analysis for a collocation.

DNV GL developed a series of computer models to illustrate the influence of key variables affecting induced AC on pipelines from nearby HVAC power lines. The software used is a graphical simulation platform developed to predict the steady state interference and resistive fault effects of HVAC power lines on buried pipelines in shared right-of-ways (ROWs). Using a TLM and appropriate input data, the software calculated the LEF, which then calculated the magnitude of induced AC potential, and current along the modeled collocated pipelines.

The models created for these studies are simplistic in terms of geometry and serve as a demonstration of the variables' influence on AC induction on adjacent pipelines. Based upon the number of variables and their interactions with respect to AC interference on pipelines, these studies determine the relevancy of the various parameters. The studies offer guidance demonstrating the trends associated with each parameter on the overall level of interference, and were used along with existing industry guidance and literature findings to develop the recommended guidelines presented in Section 6.

The primary variables analyzed as part of this study are as follows:

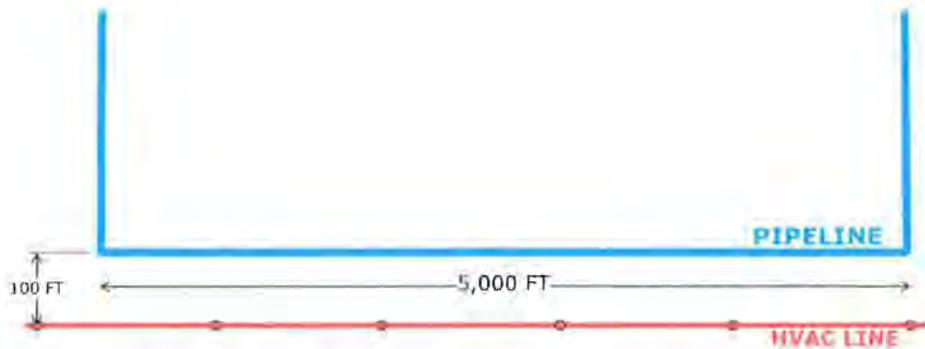
- HVAC Power Line Current
- Soil Resistivity
- Separation Distance Between Pipeline and Power Line
- Collocation Length of Pipeline and Transmission Line
- Angle Between Pipeline and Transmission Line
- Coating Resistance
- Pipeline Diameter and Depth of Cover

The results of these studies are presented and summarized in the following sub-sections.

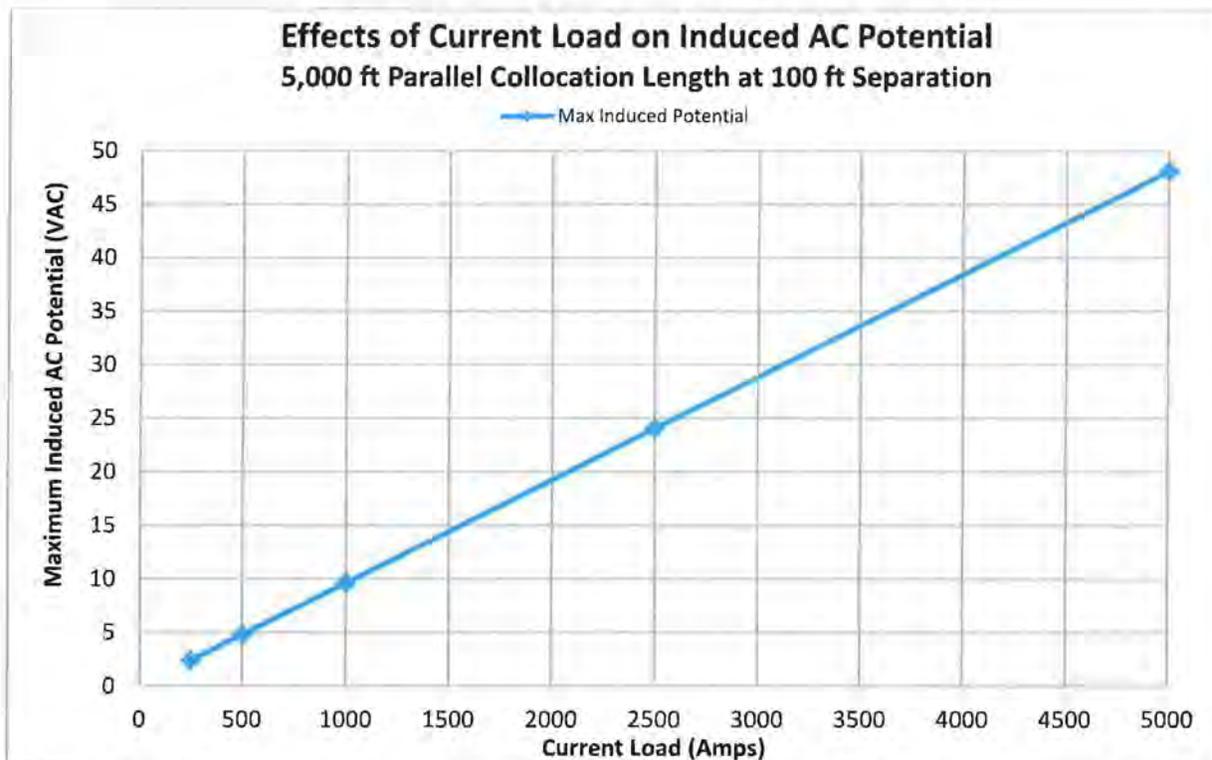
### 4.2.1 HVAC Power Line Current

A primary variable influencing the magnitude of induced AC potential on a pipeline collocated with HVAC power lines is the magnitude of the phase conductor current. The current load of the nearby power lines has a direct influence on the LEF generated by the HVAC power line circuit(s). The intensity of the LEF varies with the current loads affecting both magnitude of induced AC potential on the nearby pipeline, as well as the area of influence. The area of influence affects the separation distance at which a collocated pipeline experiences significant interference and is further discussed in Section 4.2.3.1.

To demonstrate the sensitivity of power line current on pipeline interference, DNV GL created a computer model simulating a single circuit vertical transmission line, parallel to a 10-inch diameter pipeline for 5,000 feet at a horizontal separation distance of 100 feet. The pipeline approaches the transmission line at a 90-degree angle and parallels the transmission line for 5,000 feet before receding from the transmission line at a 90-degree angle, as depicted in Figure 7. The HVAC load current was varied while all other model inputs remained constant, to analyze the influence of current alone. A uniform soil resistivity of 10,000 ohm-cm was applied and constant throughout the analyses. The transmission line current loads analyzed were 250, 500, 1,000, 2,500, and 5,000 amps based on ranges of operating and emergency loading conditions reported in literature and previously provided from power transmission operator's design conditions. Figure 8 shows the maximum induced AC potential as a function of transmission line current load.



**Figure 7. Simplified ROW Model Geometry**



**Figure 8. Maximum Induced AC Potential as a Function of HVAC Transmission Line Current**

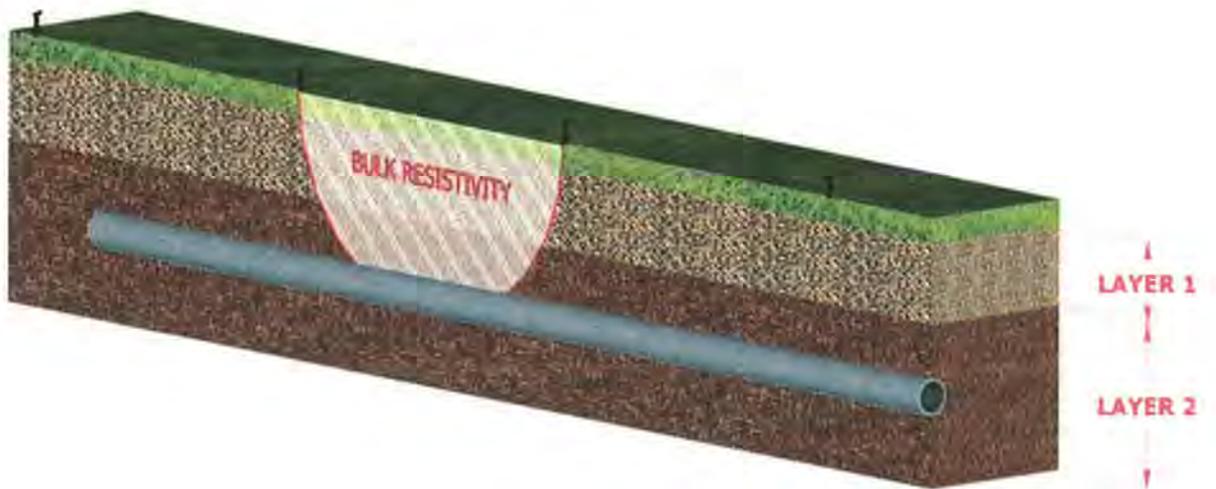
The results of this analysis show that the relationship between transmission line current and maximum induced AC potential on the pipeline is linear for a parallel collocation, considering a single interfering power line. When all other variables remain constant, the HVAC operating current load has a direct linear effect on the magnitude of the induced AC potential. This relationship allows for estimating influence of elevated current loads based on field measured AC pipe-to-soil potentials. For the specific case, with a pipeline collocated with a single HVAC circuit, if sufficient measurements of AC pipe-to-soil potential are taken, and corresponding transmission line current loads are provided for the specific time of measurement, the values can be scaled linearly to estimate the induced AC potential likely at the correspondingly scaled transmission current. This may be applicable, for example, for estimating the effects associated with a power line upgrade with a new current load. However, this method of approximation is only applicable for pipelines collocated with a single transmission line where sufficient data is available. As the number of transmission line circuits increases, the multiple interference sources and interaction the complexity of the interference increases such that the simply linear relationship is no longer valid. As the number of influencing HVAC circuits and pipelines within the area of influence are increased, the complexity of the interaction necessitates analysis that is more detailed.

It is known that while the higher current loads presented represent the high end of typical reported design loads, recent trends in the power transmission industry have shown development and installation of higher capacity HVAC transmission systems capable of carrying significantly greater current loads. For example, previous references indicate a typical load for 345kV to 500kV systems to be approximately 500 to 1,000 amps per circuit.<sup>324</sup> Recent research indicates increased capacity for 345kV lines carrying up to 5,000 amps

per circuit, and over 6,000 amps for 500kV systems.<sup>2,24</sup> While these magnitudes are not considered typical, numerous projects have developed recently that require mitigation for circuits operating at these elevated loads, indicating a need to consider actual current ratings for certain collocations. For this reason, loads are presented in terms of current rather than line voltage rating, as current is the driving load to control the level of EMI. It is noted that line ratings are typically given in terms of voltage ratings such as 138 kV, 345 kV, etc. however, the current load is the more relevant variable when determining the level of HVAC interference. Voltage rating alone can be misleading as the associated loads can be significantly higher or lower than the 'typical' current loads for that kV rating. For this reason, it is recommended to obtain current load data from the power utility company when assessing risk of interference.

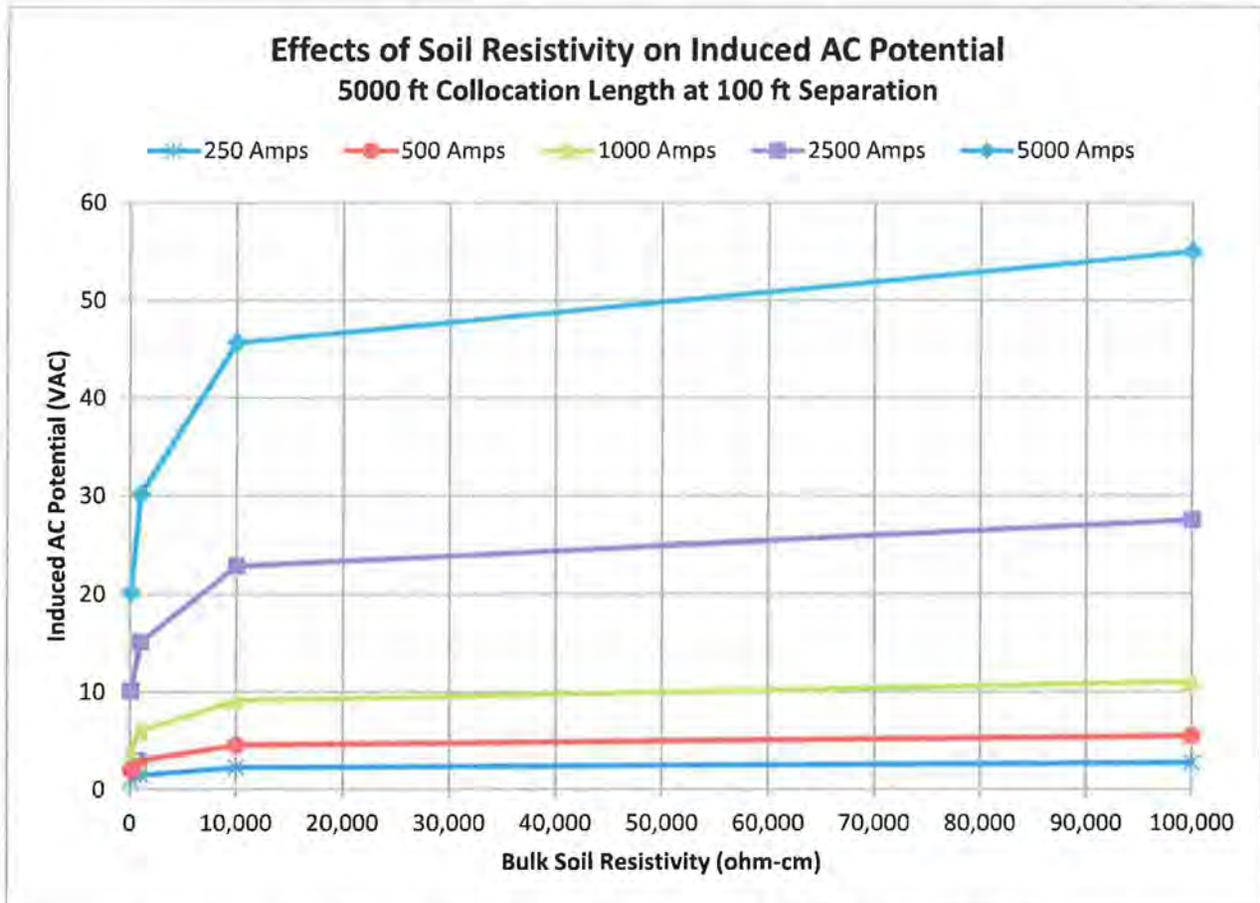
### 4.2.2 Soil Resistivity

The soil resistivity along the collocation affects the magnitude of induced AC potential distribution as well as the theoretical AC current density along a given pipeline. It is necessary to consider both the bulk and specific layer resistivity when assessing likelihood and severity of interference. The bulk resistivity to the pipeline depth is one of the controlling factors in the analysis of induced AC potential. The bulk resistivity is the average soil resistivity measured in a half-hemisphere to the depth of the pipe, as shown in Figure 9 below. However, the specific resistivity of the soil layer directly next to the pipe surface, shown as Layer 2 in Figure 9, is a primary factor affecting the corrosion activity at a coating holiday, considering both conventional galvanic and AC assisted corrosion. The bulk soil resistivity combined with the coating resistance of the pipeline affect the level of induced AC potential expected along the pipeline.



**Figure 9. Graphical representation of soil resistivity measurements, showing bulk and layer zones**

To demonstrate the sensitivity of soil resistivity on pipeline interference and current density, DNV GL created a computer model simulating a single circuit vertical transmission line, parallel to a 10-inch diameter pipeline with a configuration similar to the model setup described in Section 4.2.1. The soil resistivity was varied along the pipeline while all other model inputs remained constant, to analyze the influence of resistivity alone. The soil resistivity was uniform along the entire modeled collocation, considering 100, 1,000, 10,000, and 100,000 ohm-cm. Figure 10 shows the maximum induced AC potential corresponding to varying current loads.



**Figure 10. Maximum Induced AC Potential as a Function of Soil Resistivity**

The results of the analyses show that the induced AC potential increases logarithmically with increasing soil resistivity. This increase in induced AC potential changes significantly between 100 and 10,000 ohm-cm but approaches asymptotical limit at soil resistivity values greater than 10,000 ohm-cm.

The effects of soil resistivity have greater influence however on the current density. While an increase in soil resistivity can result in a slight increase in the magnitude of induced AC voltage for a given collocation, the theoretical current density and associated risk of AC corrosion decreases linearly with the increased resistivity. The layer resistivity of the soil directly next to the pipe surface is a primary factor in the corrosion activity at a coating holiday. The specific resistivity near the pipe at a holiday is inversely related to theoretical AC current density, as shown by the calculation for theoretical AC current density in Equation 1. Thus, an increase in soil resistivity results in a decrease in theoretical AC current density.

Considering the 250 amp current load case from Figure 10, the theoretical current density was calculated from the induced AC potential for each magnitude of soil resistivity, considering a 1 cm<sup>2</sup> holiday, shown in Figure 11 and Table 2. While the soil resistivity values increase several orders of magnitude across the range, the theoretical current density decreases on similar order, with minimal change in the overall induced AC potential, as shown in Figure 11 and 0 Table 2. The red dashed line represents the lower bound 20 amps/m<sup>2</sup> threshold for current density as discussed in Section 3.3.1.1. It can be seen that based on the calculations provided by Equation 1, a very high theoretical AC current density is possible for relatively low AC potential, if soil resistivity values are below 10,000 ohm-cm. This results in elevated risk for AC corrosion for soil resistivity ranges below 10,000 ohm-cm.

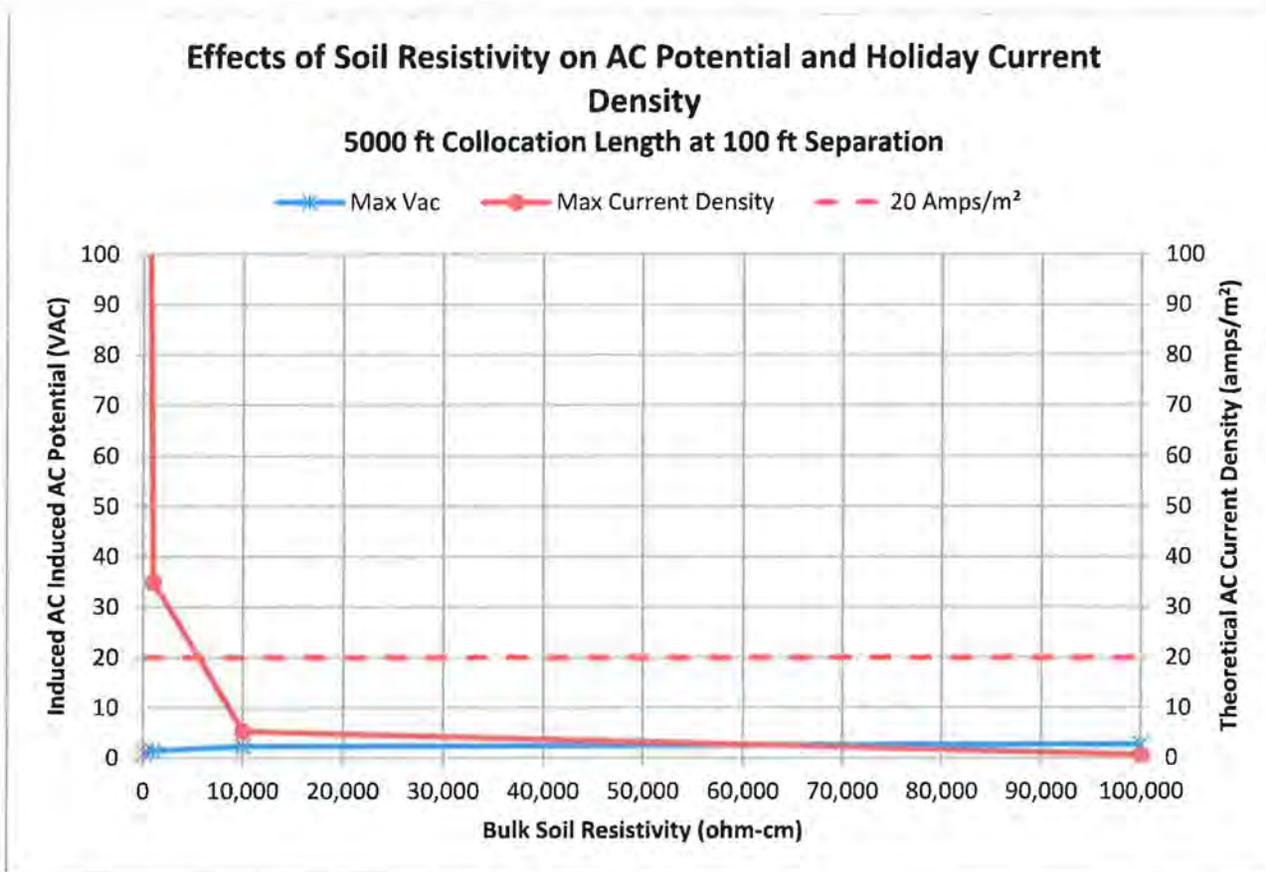


Figure 11. Effects of Soil Resistivity on Induced AC Potential and Corresponding Holiday Current Density. Current density presented for a theoretical 1cm<sup>2</sup> holiday

**Table 2-Calculated current density and induced AC potential**

$\rho$ (ohm-cm)	Calculated Current Density (A/m <sup>2</sup> )	Induced Potential (V <sub>ac</sub> )
100	234	1.0
1,000	35	1.5
10,000	5	2.3
100,000	0.6	2.8

Based on 5,000ft parallel collocation with a power line operating at 250 A load, 100-ft separation distance

### 4.2.3 Collocation Geometry

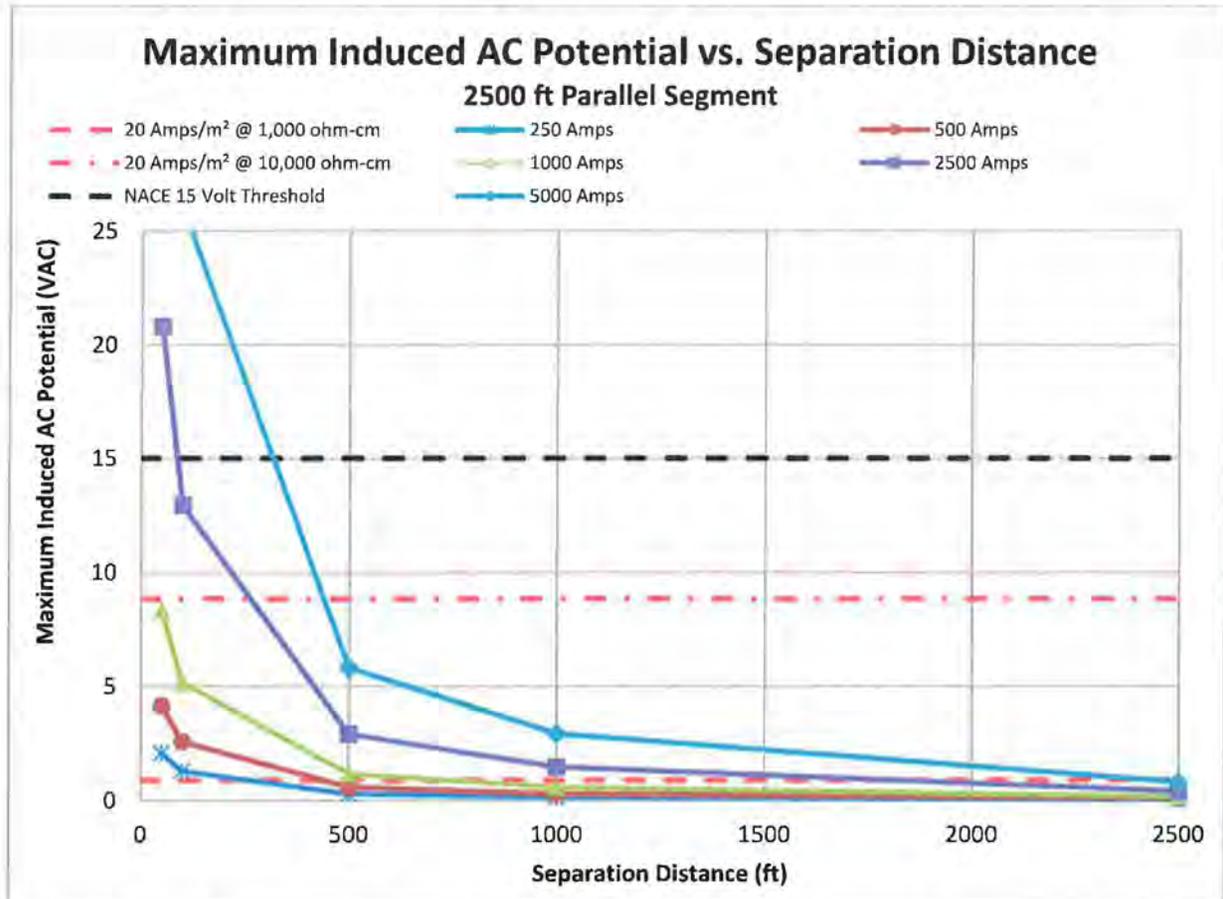
The geometry of the pipeline relative to the transmission line is critical in determining the magnitude and distribution of induced AC potential along the pipeline. The level of AC interference for a given collocation or crossing, with respect to collocation geometry, is dependent on the relative distance between the phase conductors and pipeline, the locations of convergence or divergence, and angle of approach or crossing. Each of these variables affects the overall level of induction or susceptibility to fault hazards, and their influence is dependent on all other configuration variables. When assessing susceptibility to AC interference all of these variables are considered. However, for the sake of this assessment, the following studies analyzed each independently in order to provide a simplified assessment of the influence of each parameter.

The figures presented in Section 4.2.3.1 to 4.2.3.3 incorporate a dashed line similar to the current density threshold indicator in Figure 11. The limit lines provide reference to the AC potential limit that may result in a theoretical AC current density of 20 amps/m<sup>2</sup> for a hypothetical 1 cm<sup>2</sup> holiday, at soil resistivity of 1,000 and 10,000 ohm-cm. The limit lines are included to provide guidance illustrating the levels that may pose an elevated risk of AC corrosion at potentials below the NACE specified 15 volt limit for personnel safety.

#### 4.2.3.1 Separation Distance Between Pipeline and Power Line

The separation distance between the pipeline and transmission line is a significant variable controlling the level of induced AC potential influencing a given pipeline. The proximity of the pipeline to the phase wires limits the strength of the LEF to which the pipeline is exposed.

To demonstrate the sensitivity of separation distance on pipeline interference, DNV GL created a computer model simulating a single 10-inch pipeline, and single circuit vertical transmission line, with similar configuration as described in Section 4.2.1. The separation distance was varied between the models while all other model inputs remained constant, to analyze the influence of separation alone. Induced AC potential results are plotted for separation distances of 50, 100, 500, 1,000, and 2,500 feet in Figure 12. The results indicate that for the higher load currents, the 20 A/m<sup>2</sup> recommended current density threshold is exceeded for separation distances greater than 500 feet is exceeded.



**Figure 12. Effects of separation distance on induced AC potential. Current density limits presented for a theoretical 1cm<sup>2</sup> holiday.**

As the distance between the pipeline and transmission line increases, the induction on the pipeline decreases. This is expected as where the distance between the pipeline and phase conductors increase the distance from the LEF origin increases, decreasing the coupling effects. The results of this study as presented in Figure 12 illustrate an important effect of the load current as well. The area of influence or separation distance at which a collocated pipeline experiences significant interference increases accordingly.

The figure also depicts potential levels corresponding to a 20 amp/m<sup>2</sup> current density for both 1,000 and 10,000 ohm-cm soil resistivity for reference. For the given parameters analyzed, a current load of 250 amps results in an induced potential of approximately 2 volts at a 50 foot separation distance which quickly decreases to less than 0.5 volts at a distance of 500 feet. However, a load of 2,500 amps results in an induced AC potential of approximately 21 volts at a separation distance of 50 feet, and approximately 1.5 volts at a separation distance of 1,000 feet. This is important when determining which pipeline collocations require detailed analysis, as there is variation among industry guidance documents for the limiting distance. A limiting distance of 1,000 feet is common practice, however, for HVAC current loads greater than 1,000 amps, significant interference might be possible at distances exceeding 1,000 feet. While the induced AC potentials magnitudes may appear relatively low in Figure 12, for separation greater than 2,000 feet, it should be noted this example is considering a single HVAC circuit, and only an approximately 0.5 mile collocation length. In practice additional interfering circuits collocated for longer distances would result in

higher induced AC potentials. Further, as discussed in Section 4.2.2, it is possible to have an elevated AC current density under relatively low soil resistivity conditions, such that AC corrosion is a concern at relatively low induced potential.

It is necessary to consider separation distance in conjunction with the other factors to exclude a collocation from further analysis for separation distances within 2,500 feet. At a minimum, operating current, or an estimate of it, is also necessary when determining if further analysis is required.

#### 4.2.3.2 Collocation Length of Pipeline and Transmission Line

Just as separation distance affects the magnitude and distribution of induced AC potential along the pipeline, so does the length of collocation. The collocation length is the distance along the ROW that a pipeline parallels or crosses the transmission line within a separation distance and angle that allow for inductive coupling. The collocation length affects the magnitude of induced AC potential that accumulates on the pipeline as it defines the length of the pipeline exposed to the LEF of the phase wires.

To demonstrate the sensitivity of collocation length on pipeline interference, DNV GL created a computer model simulating a single 10-inch pipeline, parallel to a single circuit vertical transmission line at a 50 foot offset. The collocation length was varied between the models while all other model inputs remained constant, to analyze the influence of collocation length alone. Collocation lengths of 500, 1,000, 2,500, 5,000, and 10,000 feet of the pipeline and transmission line compare the maximum induced AC potential in Figure 13.

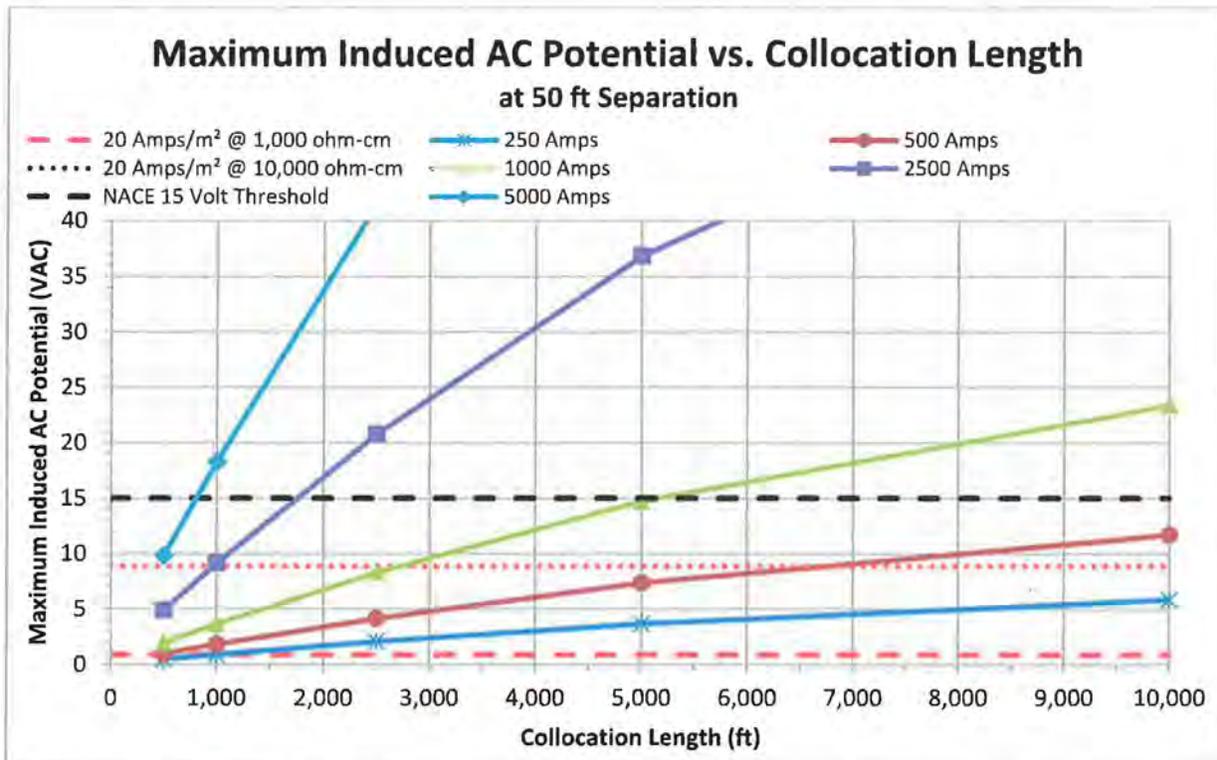


Figure 13. Maximum Induced AC Potential as a Function of Collocation Length

As the collocation length increases, the magnitude of induced AC potential on the pipeline increases, as the length of pipeline exposed to the LEF is increased. Collocation lengths as short as 500 feet are capable of inducing 2 – 10 VAC or greater considering a single collocated power line operating at 1,000 amps or greater.

The potential levels corresponding to a 20 amp/m<sup>2</sup> current density for both 1,000 and 10,000 ohm-cm soil resistivity have been included for reference. Considering a relatively low soil resistivity of 1,000 ohm-cm, the 20 amps/m<sup>2</sup> current density criteria is exceeded at a 2,500 foot collocation length for all load currents analyzed.

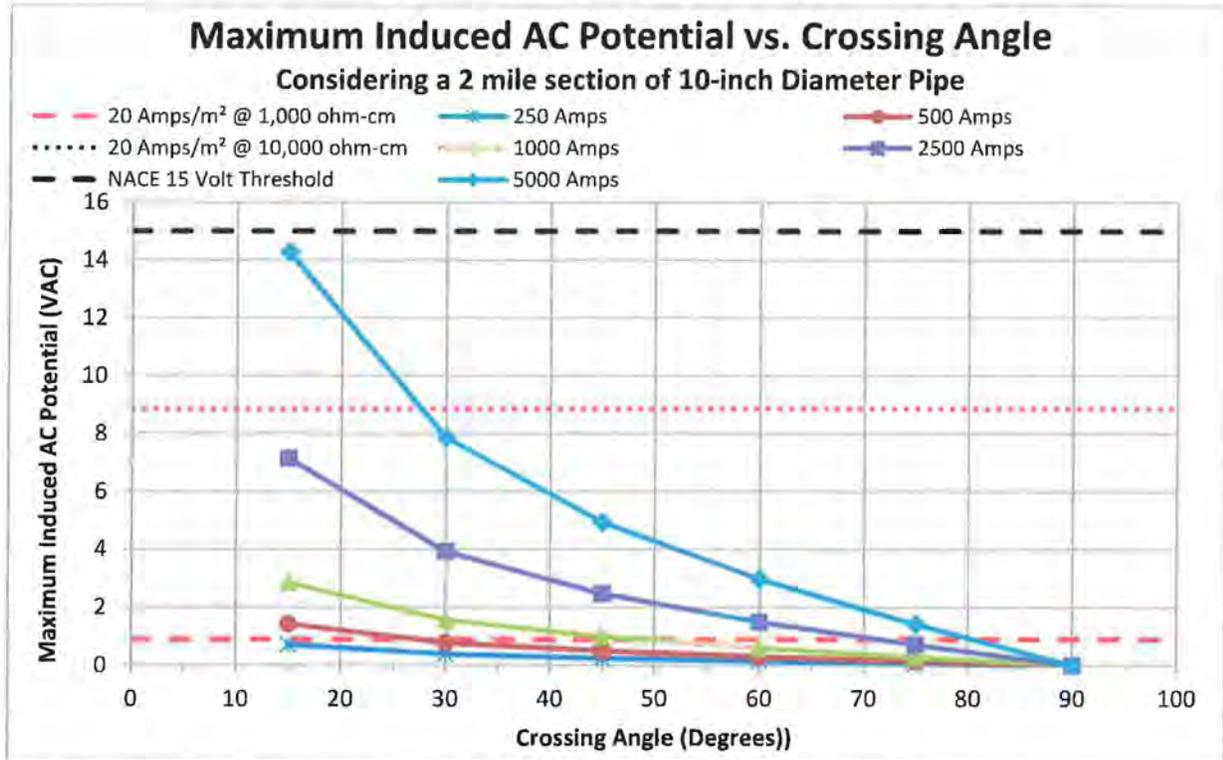
The results of the collocation length study also accentuate the sensitivity to HVAC load current as previously discussed in Section 4.2.1. The collocation length required prior to exceeding the 15 volt safety threshold for the 2,500 and 5,000 amp load conditions is approximately 1,750 and 800 feet respectively. These conditions are further increased in complex collocations where multiple lines exist.

It is necessary to consider collocation length in conjunction with the other factors to exclude a collocation from further analysis for separation distances within 2,500 feet. At a minimum, operating current, or an estimate of it, is also necessary when determining if further analysis is necessary.

#### **4.2.3.3 Angle Between Pipeline and Transmission Line**

The angle at which the pipeline and HVAC transmission line cross has an effect on the magnitude of induction on the pipeline at the crossing. As the angle increases between the pipeline and transmission line, the magnitude of the induction decreases as the component of the pipeline exposed to induction decreases. For a perpendicular crossing, with the pipeline crossing at or near 90° to the power line, the induction on the pipeline is minimized as the effective parallel length is minimized. The magnitude of the current on the transmission line also has a significant impact on the induced AC potential at crossing locations. Previous 'rule-of-thumb' practices throughout industry may have indicated crossings greater than 60° resulted in negligible induction on adjacent pipelines.<sup>2</sup> However, recent studies have resulted in HVAC installations with significantly greater current capacity, which acts to increase the corresponding interference resulting in cases with induced AC voltage at relatively high angle crossings.

To demonstrate the sensitivity of collocation angle on pipeline interference, DNV GL created a computer model simulating a single 10-inch pipeline, and single circuit vertical transmission line, with similar configuration as described in Section 4.2.1. The pipeline was approximately 2 miles long and the angle between the pipeline and transmission line varied between models while all other model inputs remained constant, in order to analyze the influence of crossing angle alone. Figure 14 shows the results of an analysis of crossing angles between 15 and 90 degrees and the calculated maximum induced AC potential for each case.



**Figure 14. Maximum calculated induced voltage at various HVAC line crossing angles**

Considering a typical 345kV circuit, and current loads of up to 1,000 amps, a crossing angle of greater than 45° degrees resulted in an induced potential of less than two (2) VAC for the study presented. A crossing angle of greater than 60° induces minimal potential such that the corresponding current density is less than 20 amps/m<sup>2</sup> even in a relatively low soil resistivity at 1,000 ohm-cm. Previous industry experience and general guidance practices across industry appear consistent with this understanding that crossings of greater than 60° are typically low-severity with respect to induction.

However, as the transmission line load increases to greater than 1,000 amps, it can be shown that crossing angles up to 60° may induce potentials such that corresponding current density exceeds 100 amps/m<sup>2</sup>, in low resistivity soil conditions. Depending on target limits for current density, models show that crossing angles of 80° can cause high current density in relatively low soil resistivity locations.

The crossing angles discussed above are with respect to induced AC interference specifically. Assessment for susceptibility to faults, and coating breakdown due to fault voltage, is required for all crossings where pipelines pass in close proximity to a tower ground.

#### 4.2.4 Coating Resistance

The resistance of the pipeline coating to ground is a significant factor controlling the level of induced potential that may build up on a pipeline. However, in practice the coating resistance is typically not known with great certainty and is generally inconsistent along the pipeline length. The coating resistance to ground is a function of the coating type, condition, thickness, and local soil resistivity, all of which may vary along a typical collocation length.

In general, a poorly coated pipeline, or deteriorated coating with low resistance to ground allows multiple paths to ground for AC potential to dissipate. This reduces the buildup of induction, resulting in lower AC potential and lower current density discharge at any individual holiday. Conversely, considering a well coated line with high dielectric strength and excellent coating condition, the resistance to earth along the length of the pipeline is relatively high allowing for greater induction build up over longer distances. For example, this case may exist with a newly FBE coated pipeline, with minimal holidays, in proximity to a collocated HVAC power line. Due to the high resistance to ground, and relatively few ground paths, the induced AC potential can build along the collocation length. This can generate elevated AC potentials, which may be hazardous from a safety standpoint, but also create a possible corrosion risk, as the AC current can discharge from a relatively few holidays after a physical or electromagnetic discontinuity, such as the pipeline diverging from the collocation.

Relative estimates of coating resistance are provided by Dabkoski in the report for Pipeline Research Council International (PRCI) and Parker<sup>24,25</sup>, and summarized in Appendix B for reference, to be utilized in detailed modeling analysis based on coating quality, and soil resistivity, however specific guidance is not provided for a relative risk associated with the various coating resistance values.

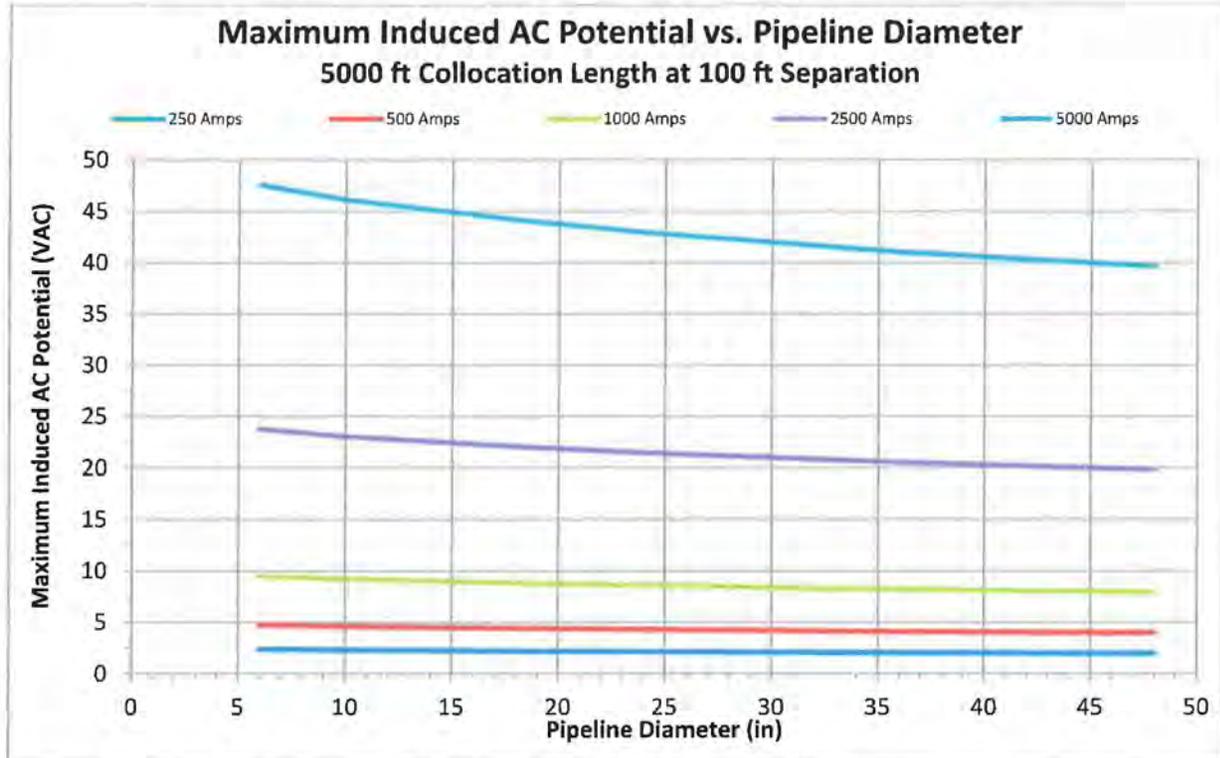
#### 4.2.5 Pipeline Diameter and Depth of Cover

The diameter of the pipeline collocated with or crossing an HVAC power line affects the level of induced AC potential on the pipeline. However, historical experience has indicated that the effect is relatively minor compared with the influence of other variables.

To demonstrate the sensitivity of pipe diameter on pipeline interference, DNV GL created a computer model simulating a single pipeline, parallel to a single circuit vertical transmission line for 5,000 feet at a horizontal separation distance of 100 feet. The pipeline approaches the transmission line at a 90-degree angle and parallels the transmission line for 5,000 feet before receding from the transmission line at a 90-degree angle. The pipeline model considered diameters of 6, 10, 18, 24, 36, and 48 inches, while all other model inputs remained constant, to analyze the influence of diameter alone. The model used a uniform soil resistivity of 10,000 ohms-cm. The results of this study indicate that the magnitude of induced AC potential decreases with an increase in pipeline diameter, as shown in Figure 15.

As the diameter of the pipeline decreases, the surface area exposed to the LEF also decreases. However, the magnitude of LEF generated by the transmission line remains unchanged. For a smaller diameter pipeline, the LEF influences a smaller surface area resulting in greater induced AC potential compared to a larger diameter line, considering all other variables equal. Further, the pipeline characteristic impedance varies inversely with pipeline diameter, as presented in previous work by PRCI<sup>24</sup>. Considering all other parameters equal, a larger diameter pipeline will have a generally lower effective resistance to ground, and therefore a lower tendency of HVAC interference. For relative comparison, an increase in diameter from 6 to 48 inches resulted in a 20% decrease in induced AC potential on the pipeline, regardless of the interfering current level.

In the previous analysis, the models used 10-inch diameter pipeline, which will provide a conservative estimate relative to typical larger diameter transmission lines. This was chosen to clearly demonstrate the effects of the individual variables.



**Figure 15. Maximum Induced AC Potential as a Function of Pipeline Diameter**

Similar to pipeline diameter, the pipeline depth of cover has a relatively minor influence on the induced AC potential on the pipeline. In general, the level of AC interference decreases with increasing depth of cover as the distance from the individual phase conductors and total resistance to the LEF is increased, though the effect is relatively minor for typical burial depths. A fixed depth of cover of approximately 5 feet was used in the sensitivity studies above.

## 5 MITIGATION

NACE International Standard Practice SP0177-2014 requires a mitigation system designed for pipelines where HVAC interference is present.<sup>10</sup> Mitigation system design varies across the industry, but in general all involve a low resistance grounding system to pass interfering AC to ground. Typical mitigation system designs can be either surface or deep grounding designs. Both designs have benefits and detriments considering performance, cost, and constructability.

Liquid and gas transmission pipelines are regulated under the Department of Transportation (DOT) Pipeline and Hazardous Materials Safety Administration (PHMSA) Regulations §49 CFR Part 195 Subpart H Corrosion Control (195.551 – 195.589)<sup>26</sup> and §49 CFR Part 192 Subpart I Requirements for Corrosion Control (192.451 – 192.491)<sup>27</sup>, respectively. The regulations have various requirements for corrosion control of which CP and electrical isolation are major factors in compliance. CP systems apply a DC to the pipeline, and electrical isolation quantifies the surface area or limits of the system. CP systems designed for transmission pipelines must meet federally regulated criteria.

### 5.1.1 DC Decouplers

When designing mitigation systems for induced AC and faults on transmission pipelines, detrimental effects to the CP system must be considered. It is essential to ensure they do not compromise the operation of the CP systems. Additional structures such as grounding and shield wires used in mitigating induced AC attached directly to the pipeline change the operating characteristics of the CP system, changing the surface area intended for the CP compromising its effectiveness. Direct current decouplers (DCD) alleviate this situation. However, there are some cases where the design of CP accounts for the mitigation. The decouplers, designed into the circuit, allow AC current to pass to ground, while blocking the DC CP current, maintaining the pipeline surface area. There are various types, sizes and ratings of decouplers used depending on the predicted faults or induced AC and mitigation design. DCDs are also used to block DC current at grounded above grade appurtenances, such as block valves, metering stations, and launcher/receiver stations.

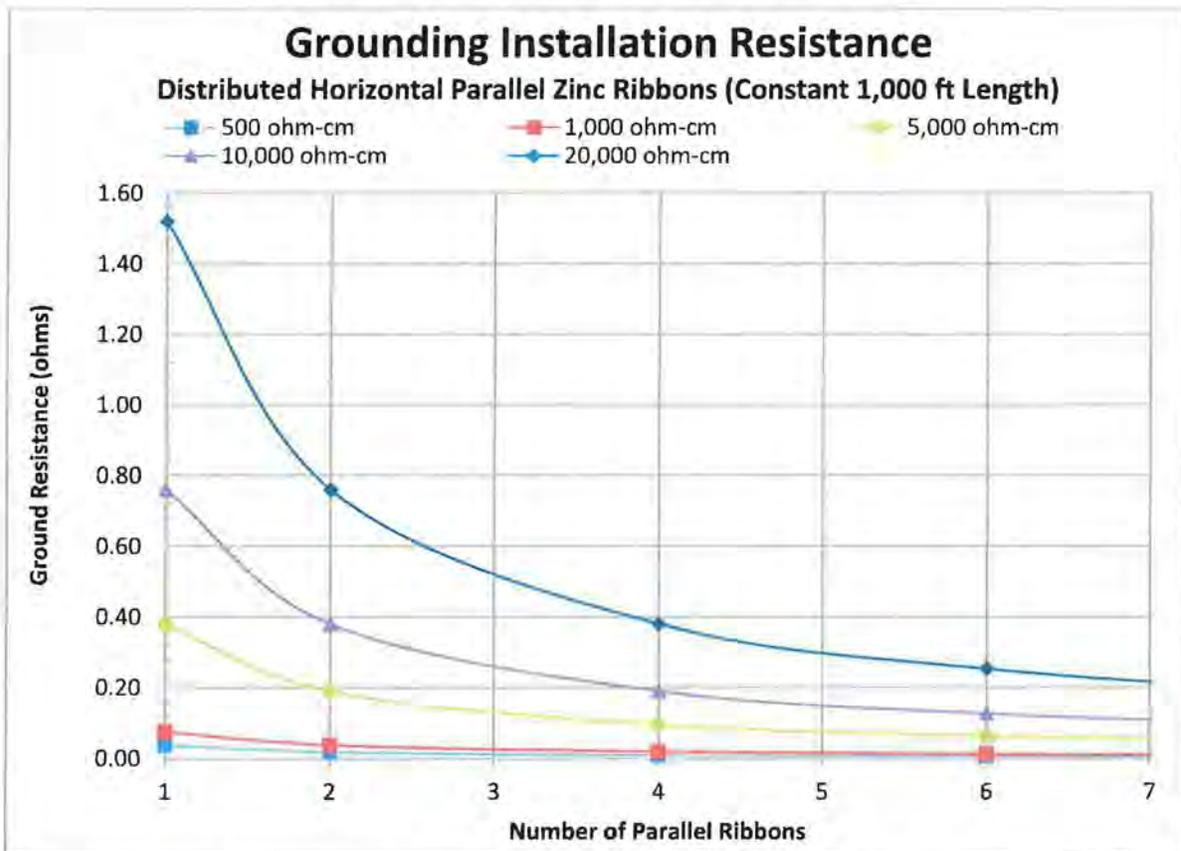
Decouplers installed across electrical isolation flanges (IF) prevent "burn over" which can occur when an AC fault current or lightning surge is large enough in magnitude to arc over the gap between flange faces or exceeds the rating of the IF.

## 5.2 Surface Grounding

Surface grounding generally refers to one of several types of mitigation grounding installed at or near the surface or pipe depth. Typical designs may consist of bare copper cable, zinc ribbon, or engineered systems buried generally parallel to the pipe path and connected to the pipeline through a DCD. During new construction, surface grounding can be installed directly in the pipe trench, or laid parallel to the pipe in an adjacent trench or bore. This approach allows for cost-effective installation of a significant length of mitigation at a lower cost relative to alternative forms of mitigation, but is dependent on construction access along the ROW.<sup>16</sup>

If necessary, connecting additional mitigation ribbon in parallel and even adding shallow vertical anodes to the circuit will further reduce grounding resistance up to a certain extent. Installing this type of mitigation system at distributed, targeted locations, optimized from the interference model, reduces the induction along the pipeline. Additionally, when laid parallel to the pipeline in regions where transmission line towers are in close proximity, the mitigation ribbon also acts to protect and shield the pipeline from damage resulting from fault and arcing scenarios.

Analysis of the reduction in ground resistance possible with various installation approaches included a calculation of the resistance of 1,000 foot long mitigation ribbon in varying soil resistivity, using the modified Dwight's Equation for multiple anodes installed horizontally<sup>28</sup>. Figure 16 illustrates how this calculated grounding resistance varies with the number of ribbons connected in parallel at multiple levels of soil resistivity. While numerous sizes of ribbon cables exist, the length is a much more significant factor in determining total resistance than diameter, when considering typical ribbon diameters, therefore this analysis considers a constant diameter ribbon.



**Figure 16. Grounding Resistance of Horizontal Parallel Zinc Ribbons at Varying Soil Resistivities**

As shown in Figure 17, at low soil resistivities, very low grounding resistance results with a single, relatively short ribbon length. As the soil resistivity increases, so does the achievable grounding resistance. The data is presented considering multiple parallel mitigation ribbons to demonstrate that further reduction in ground resistance is possible by adding additional grounding at a particular installation. However, diminishing returns exist such that further increasing the extent of grounding at a specific site, beyond a certain threshold, results in minimal additional reduction, as shown in Figure 16.

The length of vertical grounding installations requires review of economics, construction, and practical design considerations. Multiple shorter grounding rods can be incorporated to achieve a low resistance to ground without requiring deep drilling, where parallel surface grounding does not sufficiently reduce the ground resistance. Vertical ground rods should be separated horizontally by the length of the ground rods at minimum for optimum efficiency.<sup>23</sup>

For locations of high surface resistivity, one drawback for horizontal surface grounding is the length of mitigation ribbon wire required to achieve a low resistance. Where multiple parallel ribbons are required to achieve sufficient grounding resistance significant ROW access may be required. As discussed, the shared utility ROW may limit construction access for mitigation parallel to a collocated pipeline. Additionally, as pipelines cross physical obstructions, such as roadways, railroads, access may limit the extent of parallel mitigation systems. However, surface grounding still continues to be the preferred mitigation technique and can efficiently provide adequate mitigation grounding for a majority of collocations.

### 5.3 Deep Grounding

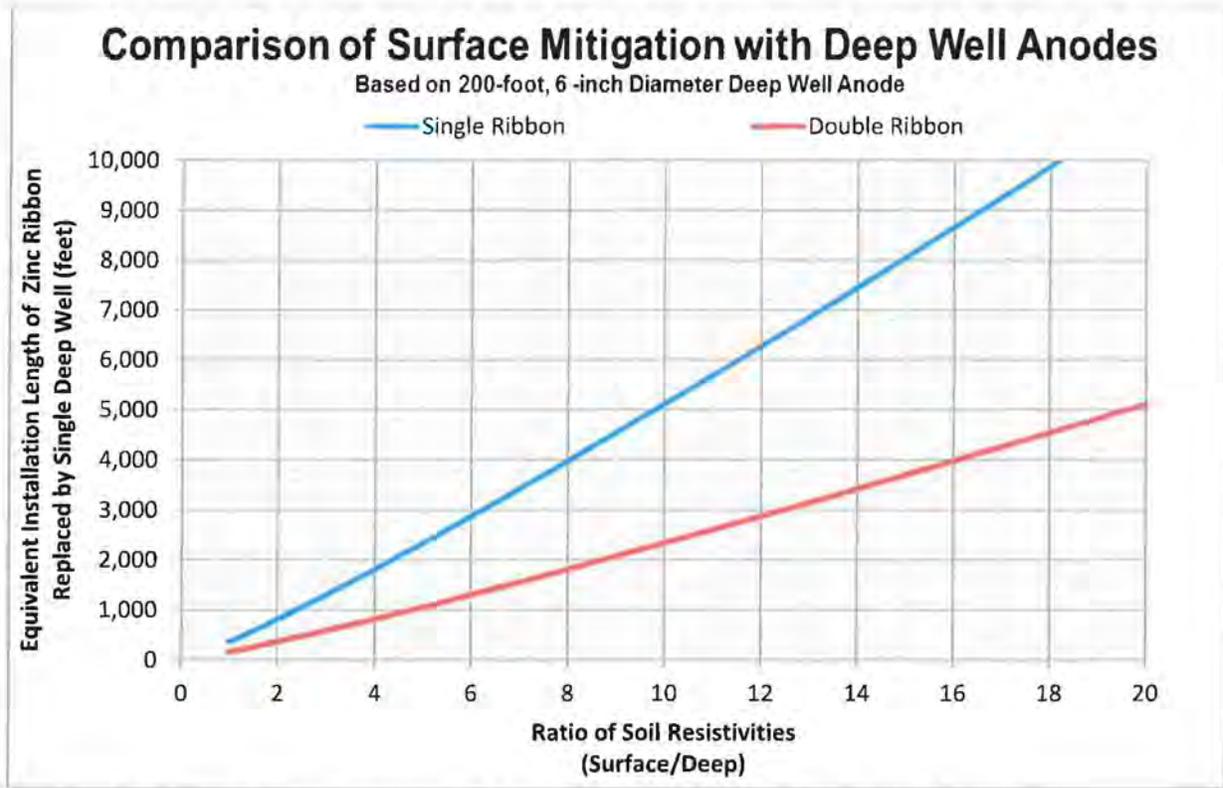
Deep drilled ground wells (deep wells) offer another form of mitigation grounding, and may be considered for select applications. Deep wells generally consist of one or more anodes drilled vertically into the ground in order to achieve low ground resistance. Actual deep well depths can vary based on needs, but they generally range greater than 100 feet in depth.

In general, construction costs are generally higher for deep well grounding than for comparable surface mitigation. However, deep well grounding can be a viable option in specific applications where one or both of the following criteria are satisfied.

- 1 The soil resistivity at the surface is significantly greater than ( $>20 \times$ ) the soil resistivity at lower depths.
- 2 Horizontal surface grounding is not feasible due to construction obstacles (roads, railways, right-of-way access, etc.)

For typical mitigation systems, where parallel ribbon and deep grounding are both options, parallel ribbon proves to be more efficient and economical because it can achieve a lower resistance to ground for lower overall cost. For comparison, ground resistance calculations were analyzed to determine the approximate equivalency in effective ground resistance between parallel zinc ribbon, and an individual deep well anode.

Figure 17 below shows a comparison of parallel horizontal grounding configurations compared to a single 6-inch diameter deep well anode approximately 200 feet deep. The soil resistivity ratio, plotted on the x-axis, is the ratio between the bulk soil resistivity to a depth of 10 feet for surface ribbon and the bulk soil resistivity to a 200 foot depth for a deep well. Along the y-axis is the equivalent length of horizontal surface grounding required to meet the same level of grounding resistance as the deep well anode. The two curves in the figure below display this trend for single and double surface ribbon installations.



**Figure 17. Comparison of Surface Mitigation to Deep Well Anodes**

Considering a typical scenario where deep soil resistivity values are of similar order to the surface resistivity, a single deep well grounding installation would be necessary for approximately every 1,000 to 2,000 feet of individual parallel ribbon. However, considering a hypothetical location where the deep soil resistivity is an order of magnitude lower than at the surface (soil ratio of 10), it can be shown that a single deep well installation could provide a similar ground resistance as approximately 5,000 feet of individual parallel ribbon. Under certain scenarios, where the ratio between the surface and deep soil resistivity is high, deep well anodes may become a viable solution to obtain a low grounding resistance. Previous case studies and project experience have rarely shown soil resistivity ratios of this magnitude, such that deep well grounding was a preferred option. However, where construction access is limited, not allowing for installing longer lengths of surface grounding to achieve the required mitigation deep well grounding may be beneficial. In scenarios where grounding is only necessary at a single specific location on the pipeline, deep well grounding may be an option.

## 5.4 Mitigation Comparison

Deep well anodes may provide a viable mitigation option under specific circumstances, but industry practice, historical assessments, and construction practice have generally shown that surface mitigation provides more economical and efficient mitigation for the majority of collocations. In cases where arc shielding protection is required to guard against fault scenarios, deep well anodes do not provide such protection, thus necessitating the installation of surface ribbon in addition to primary mitigation. Surface mitigation can also serve as fault shielding, protecting against damage to the pipeline and its coating when properly placed between the pipeline and power transmission ground.

A primary benefit for surface mitigation is ease of installation and a lower associated cost. Mitigation installed in the same trench beside the pipe during pipeline construction further reduces installation costs. Typical industry construction estimates indicate that the cost of a single drilled deep well anode installation may be ten times the cost of a 1,000-foot surface installation, if installed during pipe construction. This would indicate that each deep well anode would need to replace approximately 10,000 feet of surface mitigation before it is economically viable from a ground resistance standpoint alone. That said, the decision between surface and deep grounding installation methods most often comes down to a number of other considerations, including construction access, grounding distribution, and contractor preference in addition to cost alone. [Appendix C contains a simplified summary, presents the pros and cons for various mitigation materials and methods for reference.] The comparison information provides guidance and demonstrates the comparative benefits of each approach based on various soil resistivity layers.

## 5.5 Additional Mitigation Methodologies

The AC mitigation techniques discussed utilize low-resistance grounding to transmit induced AC voltage to ground. While grounding can be an effective mitigation technique for many interference cases, recent industry experience has identified collocations where induced potentials or current density reduction to adequate levels cannot be achieved by grounding alone. This is generally due to a combination of elevated transmission currents and unfavorable soil resistivity conditions. Trends in the power transmission industry have led to increased power capacity and corresponding operating currents, for some long distance transmission systems as shown. This increase in operating current has a direct effect on the level of EMI. In many cases, this has presented a significant challenge for achieving adequate mitigation on pipelines crossing or collocated with the power transmission lines. In these cases, additional mitigation techniques should be considered.

In terms of risk reduction or prevention, the approach to AC interference mitigation can be categorized on a primary, secondary, or tertiary level. Primary prevention targets controlling or reducing the source of the risk, through elimination or control. Secondary prevention targets reducing exposure to a risk factor, and tertiary prevention targets treating the response or consequences of the risk factor, generally after exposure to the risk. By these terms, a standard practice of mitigating AC induction by grounding alone is considered a tertiary form of mitigation. That is to say, the treatment targets only the consequence of the interference by reducing the detrimental AC effects at the pipeline level, after allowing the pipeline to be exposed to the interference risks. While not currently in widespread application, further research of primary and secondary risk controls should be considered in future development, to reduce overall interference and risks associated with AC interference, especially considering cases that cannot be effectively mitigated by traditional means. While the concepts presented may not be readily employed by pipeline operators without further research, they are presented to address the need for continued research and development of more robust high voltage interference mitigation methodologies, and pursue improved collaboration between the power line and pipeline operators.

### 5.5.1 Primary Threat Control of AC Interference

Although mitigation grounding is a common industry practice, cases exist where grounding alone is insufficient to reduce interference levels on collocated pipelines. For such cases, additional techniques should be considered. From an engineering risk basis, with respect to overall risk reduction, a preferred approach is to reduce the source of interference. Specifically, this means reducing the interference prior to it reaching the pipeline, generally through design controls during the development phase prior to construction, where

modifications to the pipeline or transmission line are possible. The level of interference experienced at the pipeline is dependent on the magnitude of EMI generated at the source, and the collocation parameters that limit the EMI levels reaching the pipeline. Specifically, revising collocation routing, and tower and circuit configuration modifications can reduce or optimize the level of EMI produced. Conductor arrangements can be designed to balance individual phases producing the lowest levels of EMI for a given circuit configuration.

For a given circuit configuration (single circuit horizontal/vertical, double circuit horizontal/vertical/delta, etc.) there exists an ideal phase sequence which minimizes the LEF at the pipeline location and thus results in lower magnitudes of AC interference. Dabkowski studied the magnitudes of the LEF for varying circuit types and phase sequence. The results demonstrated that for a single horizontal circuit a reduction of up to 9 percent of the LEF may be achieved, by choosing the proper phase sequence.<sup>24</sup> With the single circuit vertical case, the LEF at the pipeline location could be reduced by as much as 15% with the proper phase sequence.

The double circuit vertical tower configuration presents a unique scenario for phase sequencing. There are 36 possible phase sequences, classified into five sets of phase combinations: center point symmetric, full roll, partial roll upper, partial roll lower, and center line symmetric. The LEF magnitude between the various phasing configurations can vary significantly.<sup>29</sup> Generally, the ideal phase sequence for a double vertical circuit is the center point symmetric phase configuration, which generates an LEF approximately 65% to 90% less than the center line symmetric phase configuration.<sup>29</sup> This is significant when considering this is simply the result of the physical interaction between conductors, and primary mitigation reduction at the source reduces the interference levels that ever reach the collocated pipeline. Additionally, optimization of the phase configuration does not require unconventional installation methods to obtain this reduction in LEF magnitude.<sup>29</sup> It is recognized that for existing installations, pipeline operators generally may not be able to influence HVAC power design; however, for new construction and power system expansions where interference is a concern, communication between pipeline operators and transmission owners of possible effects is recommended in order to review possible interference hazards prior to construction. Where possible, pipeline and HVAC power line design controls can limit EMI and interference on adjacent pipelines.

The addition of phase transpositions along a given collocation can also act to reduce the overall EMI influencing a collocated pipeline. However, phase transpositions should only be considered as part of a detailed analysis, as the discontinuity presented by a phase transposition can create a localized point of elevated interference, and may have further impact on the power transmission design.<sup>24</sup> However, where appropriate, phase transpositions can create discontinuities and effectively break up long line interference built up on long collocations. Further, in areas where construction access may be limited, phase transpositions can be located strategically to reduce interference at the source.

### 5.5.2 Secondary Threat Control of AC Interference

With respect to overall threat reduction, a secondary control works by means of isolating a threat from a structure. In the case of AC interference, this specifically means intercepting and grounding the EMI prior to reaching the pipeline.

One proposed example is overhead shielding, which is used to mitigate AC interference in other industries including rail transport systems, but is notably less common in mitigating AC interference on pipelines. An overhead shielding technique works by placing a conductor, grounded at regular intervals, within a targeted region between the pipeline and the adjacent transmission line. This shielding conductor, located in the same LEF generated by the conductor circuit, induces a current and an accompanying LEF 180 degrees out

of phase with the field generated by the transmission line. In so doing the conductor acts to cancel part of the LEF generated by the transmission line, resulting in lower levels of induction on the pipeline. Dabkowski studied the effectiveness of this technique for the same tower configurations discussed in Section 5.5.1.<sup>29</sup> The results indicated a substantial reduction in the induced potential on the pipeline was possible; however, the mitigating effectiveness was highly sensitive to loading conditions, and the precise location of the shielding conductor. For the single circuit horizontal circuit, an auxiliary overhead ground wire resulted in a reduction of approximately 25% in the LEF, and thus the corresponding induction on the pipeline. The ideal placement of this overhead auxiliary shield wire was approximately the same height as the phase wires, which for single circuit horizontal circuits may make this solution impractical. For the single circuit vertical tower configuration, Dabkowski found a maximum LEF reduction of approximately 60% to 75% by mounting the overhead shield wire at an optimum height on the tower centerline. Reductions in the LEF generated by the double circuit vertical configuration were found to be range from 50%-95%. However, when examining slight imbalances of +/-5 to 15% between phase wires, the benefits realized by this auxiliary shield wire quickly diminished to 20% or less when compared to uniform current across all phase wires of the circuit.<sup>29</sup><sup>23</sup> While this is generally not a common practice in mitigation of pipeline interference, overhead shielding has been considered and studied in the past, and is used within other industries. Specific overhead shielding installations require detailed design, and precise locating but this approach may present an alternative means of mitigation where ineffective through more traditional means. Further research and testing is required on a case-specific basis to determine if this is a viable technique.

Fault and arc shielding, which are used to reduce the risk of damage to the pipeline and the coating near tower grounds during fault conditions are another form of secondary risk control. Fault protection typically takes the form of a parallel shield wire, similar to mitigation ribbon discussed in Section 5.2. However, the primary function of fault and arc shielding protection acts to intercept transmission line fault current and transfer to ground prior to reaching the pipeline. For this reason, the location and placement of the arc shielding mitigation is far more critical when protecting against conductive (fault) interference than for inductive interference.

### 5.5.3 Tertiary Threat Control of AC Interference

With respect to overall risk reduction, tertiary controls rely on reducing the consequences of the threat after exposure to the structure. Per this definition, typical grounding mitigation can be considered a tertiary control. Mitigation grounding works by transmitting the AC potential to ground, only after it has already reached the pipeline. While grounding has proven to be an effective means of mitigation for many historical installations, and installation is generally within the capabilities and access of the pipeline operators, scenarios occur where grounding alone is not sufficient to reduce interference to acceptable levels.

Ideally, a combination of primary, secondary, and tertiary mitigation techniques would provide the highest level of threat reduction and protection for the pipeline. However, addressing a threat at the lowest level possible will provide reduction in severity, increasing the likelihood that mitigation will be effective. That is to say, reducing AC interference at its source or shielding EMI from reaching an adjacent pipeline can provide greater risk reduction than simply allowing the interference to pass to the structure and dissipating to ground via tertiary mitigation methods. In practice however, it may not always be possible or practical to address interference at a primary or even secondary level. Tertiary mitigation through low resistance grounding techniques may provide adequate risk reduction for a majority of interference collocations. However, further research and continued development into additional mitigation techniques would benefit the industry.

## 5.6 MONITORING

As mentioned previously, the measurement or calculation of AC current density has been the primary indicator to determine the likelihood of AC corrosion across industry in North America. It is possible to measure AC current density on a representative holiday through the installation and use of metallic coupons or ER probes. A test wire connected to the coupon, routed to the surface and connected to the pipeline through a test station is an example of a simple installation. By inserting an ammeter into the circuit, an AC and DC current can be measured which when can be used to calculate the current density at that location. In many cases, test stations with coupons also include additional instrumentation such as ER probes and reference electrodes. The ER probes provide a time based corrosion rate while the reference electrodes provide both and AC and DC pipe-to-soil potentials for comparison.

Using coupon test stations (CTS), and ER probes, real-time monitoring can provide a better understanding of the interference effects acting on a collocated pipeline. However, as previously discussed, the magnitude of interference depends on the magnitude of current loads on the associated power lines. Correlation of the CTS and ER probe data with power line loads provides a thorough understanding of the system performance. While it has historically been difficult to obtain this information from power line operators, there is a recognized need to have good understanding of the operating power line loads to determine relevance of coupon test station or ER probe data. Additionally, best practices dictate obtaining data over a representative period (days or weeks as relevant) in order to assess the interference response during high load conditions. A measurement for AC potential or AC current density at a single point in time with unknown operating current loads may not be representative of the actual risk for interference on the pipeline.

## 6 GUIDELINES FOR INTERFERENCE ANALYSIS

The following steps are provided as best practice procedures for determining where detailed analysis is recommended based on the results of this study, industry standards, historical technical publications, and previous industry experience.

Pipeline operators are faced with many existing and new construction pipelines collocated and crossing power line ROW. Little guidance exists to assist in selecting and prioritizing collocations for detailed analysis and modeling. Under certain conditions, it may be possible to justify the low likelihood of AC interference, and exclude specific locations from further detailed modeling with detailed monitoring, or justification that the risk due to interference is low.

It is recommended to collect the following information, where possible, to determine if a detailed AC analysis is required. Appendix D is a sample of data to collect from the powerline company. Use the corresponding severity limits in Sections 6.1.1 through 6.1.5 to assist with this methodology:

- Peak and Emergency load rating (amps) for collocated power lines
- Line rating (kV) for collocated power lines
- Soil resistivity along the collocation at multiple depths
- Collocation and / or crossing routing geometry for the pipeline and power line
- AC pipe-to-soil (P/S) measurements (for existing pipelines)
- AC Current density using coupons or probes where previously installed
- Maximum fault potential and fault clearing time

Detailed "analysis" in the context of this document refers either to data collection using detailed monitoring or to specific application of numerical calculation of interference magnitudes. This analysis is done using detailed computer modeling or similar application of interference calculation methods.

## 6.1 Severity Ranking Guidelines

This section provides general guidance with respect to the relative severity ranking for the identified variables with respect to their impact on the severity of AC interference.

### 6.1.1 Separation Distance

Separation distance and load current are key factors in determining whether a collocation will experience significant AC interference. Generally, the separation distance is readily available or easily determined, so it is often a primary screening variable. However, it has been shown that significant interference is possible for distances greater than 1,000 feet when considering collocations with load capacity greater than 1,000 amps.<sup>7</sup> It is therefore recommended to consider collocations within 2,500 feet, and the decision for further analysis should also incorporate estimate of the power line current.

Severity ranking for separation distance is provided in Table 3. The following generalized rankings have been determined through review of industry data, parametric studies, and historical experience.

**Table 3-Severity Ranking of Separation Distance**

Separation Distance - $D$ (Feet)	Severity Ranking of HVAC Interference
$D < 100$	High
$100 < D < 500$	Medium
$500 < D < 1,000$	Low
$1,000 < D \leq 2,500$	Very Low

### 6.1.2 HVAC Power Line Current

The magnitude of transmission line currents is one of the most influential parameters determining the likelihood and severity of AC interference. However, there is often debate as to which load rating to consider for interference analysis and mitigation design. HVAC power lines generally have multiple ratings that specify the operating loads allowable during normal operation and peak or emergency load ratings allowable during short duration scenarios. Ultimately, the load rating considered should be a risk-based decision made by the pipeline operator, considering the frequency of occurrence for the load level, typical duration throughout operation, and the consequence associated.

From a personnel safety standpoint, it is recommended to consider the maximum load that a power line can carry for any duration. The terminology for this varies among transmission operators, but it is commonly referred to as "Emergency Load", defined as the maximum load a transmission circuit is capable of carrying for a short duration such as during an emergency or maintenance condition. Considering personnel safety, elevated step or touch potential could pose an instantaneous threat as a shocking hazard, regardless of duration of the elevated power line current. As the pipeline operator is generally unaware of an emergency load condition on the power line, it may not be feasible to reduce or prevent exposure during even a short-duration elevated current load. It is therefore generally best practice to consider the maximum capacity or

emergency loading conditions when assessing the risk of personnel safety threats such as shocking, unless other provisions can be made to prevent exposure.

However, AC corrosion is a time-dependent threat. The magnitude of AC current density possible on a pipeline under AC interference will be sensitive to the current load on the adjacent HVAC conductor. While emergency loads, or other spikes in power line current may cause an elevated current density, the associated corrosion damage may be low as the duration is limited.

The power line current is often the most controlling parameter influencing the magnitude of AC interference. For this reason, we recommend obtaining the power line load limits from the relevant power transmission operator when assessing the risk of AC interference on a given pipeline. These limits should include the various operating ratings (generally 'Normal', 'Peak', and 'Emergency'), the allowable duration for each, and expected frequency of occurrence.

Transmission operating parameters are not always readily available to pipeline operators, and this information may be difficult to obtain. However, the power line current is a primary factor, and the relevance and accuracy of an AC analysis may vary greatly with the accuracy of the operating current. Where actual load data is unavailable, published reference currents for various HVAC power line ratings are available in literature<sup>24</sup>. However, these guidelines are for reference only, and may provide over or under conservative results. In practice, there are cases where the operating currents provided for a specific power line significantly exceeded these estimates. Additionally, as discussed in Section 4.2.1, increase load capacity on new and upgraded systems may result in load ratings above the provided reference levels.

Severity rankings associated with HVAC load current for a collocated power line is provided in Table 4.

The following generalized rankings have been determined through review of published technical literature, industry data, parametric studies, and historical experience.

Section 5.2.1 contains further background and detailed information for effects of power line phase current.

**Table 4-Relative Ranking of HVAC Phase Current**

HVAC Current - $I$ (amps)	Relative Severity of HVAC Interference
$I \geq 1,000$	Very High
$500 < I < 1,000$	High
$250 < I < 500$	Med-High
$100 < I < 250$	Medium
$I < 100$	Low

### 6.1.3 Soil Resistivity

Soil resistivity affects both the magnitude of induced AC and the susceptibility to AC corrosion. The AC corrosion process, as presented in Section 3.3.1 is a function of the AC current density at a coating holiday, which in turn is dependent on the level of AC voltage on the pipeline and the local spread resistance. The bulk soil resistivity is a primary factor controlling overall level of induction, while the local soil resistivity near a holiday is a primary factor in the corrosion activity, as discussed in Section 4.2.2. The following generalized severity rankings have been determined based on industry experience and guidance provided in EN 15280:2013, with respect to AC corrosion.<sup>15</sup>

**Table 5-Relative Ranking of Soil Resistivity**

Soil Resistivity - $\rho$ (ohm-cm)	Relative Severity of HVAC Corrosion
$\rho < 2,500$	Very High
$2,500 < \rho < 10,000$	High
$10,000 < \rho < 30,000$	Medium
$\rho > 30,000$	Low

### 6.1.4 Collocation Length

The collocation length of the pipeline and transmission line affects the magnitude of induced AC potential accumulating on the pipeline as it defines the length of the pipeline exposed to the LEF of the phase wires. The following generalized rankings have been determined through parametric studies, and historical experience.

**Table 6-Relative Ranking of Collocation Length**

Collocation Length: $L$ (feet)	Relative Severity
$L > 5,000$	High
$1,000 < L < 5,000$	Medium
$L < 1,000$	Low

### 6.1.5 Collocation / Crossing Angle

The angle of collocation or crossing of the pipeline and power line limits the influence of induction. The following generalized rankings have been determined through parametric studies, and historical experience.

**Table 7-Relative Ranking of Crossing Angle**

Collocation/Crossing Angle - $\theta$ (°)	Relative Severity
$\theta < 30$	High
$30 < \theta < 60$	Med
$\theta > 60$	Low

## 6.2 Recommendations for Detailed Analysis

The guidance parameters presented are based on industry literature and standards where available. Where guidance has not previously been provided, qualitative classifications have been provided to aid in severity ranking and prioritization. The qualitative guidance parameters have been determined based on published industry guidance, numerical modeling parametric studies, previous analytical experience, laboratory studies, and failure investigations for AC corrosion related damage. The intention is not to replace or remove detailed analysis from the design decisions, but rather to aid in severity ranking and prioritization when determining where additional detailed analysis and mitigation design is required.

The guidelines within should be used by the operators as part of an overall risk-based decision. The details within this report and this section can only provide guidance regarding the severity of HVAC interference or AC corrosion. When determining whether to perform further detailed analysis, add location specific

monitoring, or where no further action is required, possible consequences must be a part of the decision process and reviewed on a case-specific basis.

As discussed in Section 4.2, collocations with power lines operating at greater than 1,000 amps are subject to interference under conditions where likelihood would otherwise be low. Special consideration required for collocations where the power line loads are greater than or equal to 1,000 amps. For this reason, an understanding of the power line load current is necessary for evaluating the need for further analysis. The two cases below provide an assessment of collocations and crossings encountered, based on:

**Case 1** – Current Load greater than or equal to 1,000 amps, pipeline crossing or collocated within 2,500 feet

**Case 2** – Current Load less than 1,000 amps, pipeline crossing or collocated within 1,000 feet

### 6.2.1 Case 1

For scenarios where power line current is known or can be estimated to operate at or above 1,000 amps, and a steel pipeline is crossing or collocated within 2,500 feet of the power line, a detailed analysis is recommended when one or more of the following conditions are met:

- Collocation Length severity is characterized as “High”
- Soil resistivity severity is characterized as “High” or worse
- Three or more of the variables identified in Section 6.1 are categorized as “Medium” or worse

### 6.2.2 Case 2

For scenarios where power line current is known or estimated to operate below 1,000 amps, and a steel pipeline is crossing or collocated within 1,000 feet of the power line, a detailed analysis is recommended when one or more of the following conditions are met:

- Phase current severity is characterized as “High” or worse
- Collocation length severity is characterized as “High”
- Soil resistivity severity is characterized as “High” or worse
- Three or more of the variables of severity rankings identified in Section 6.1 are categorized as “Medium” or worse

High angle crossings, with crossing angles of greater than 60°, while considered low-risk for inductive interference, are susceptible to fault or lightning arcing, as well as coating breakdown due to fault voltage. Crossings with an angle greater than 60° may still be susceptible to inductive interference if subject to very high current load, or multiple HVAC power lines.

### 6.2.3 Faults

As fault conditions are generally infrequent and of short duration, it is not practical to obtain measurements of AC potential during a fault condition. Analysis of fault voltages generally requires numerical modeling. Fault current levels or estimates of possible magnitudes, are generally obtained by HVAC power line operators and can vary significantly depending on tower design, power capacity, and location relative to substation and generation source.

Whenever a pipeline crosses or is collocated in close proximity within 500 feet an HVAC tower, it is susceptible to faults. Detailed calculations or modeling is required to determine the possibility of fault arcing and possible coating damage due to GPR.

### 6.2.4 Fault Arcing Distance

When a pipeline crosses or is collocated in close proximity to an HVAC tower ground, a theoretical fault arcing radius can be calculated. The fault arcing radius is the distance from a HVAC tower ground that a sustained lighting or fault arc may reach an adjacent metallic structure. The arcing radius is primarily a function of the fault or lightning current and the local soil resistivity magnitude, and is estimated using equations 2 and 3 based on Sunde's equations for lightning arc distance.<sup>30</sup> The equations presented were developed to predict a safe separation distance considering an elevated current due to lightning strike, and can be utilized to provide an estimate of possible fault arcing distance from a faulted high voltage tower ground as well.

$$r_a = 0.08 \sqrt{I_{ac} x \frac{\rho}{100}} \quad \text{If } \rho \leq 100,000 \Omega \cdot \text{cm} \quad (2)$$

$$r_a = 0.047 \sqrt{I_{ac} x \frac{\rho}{100}} \quad \text{if } \rho > 100,000 \Omega \cdot \text{cm} \quad (3)$$

Where:  $r_a$  = arc distance in m  
 $\rho$  = soil resistivity in  $\Omega \cdot \text{cm}$   
 $I_{ac}$  = the fault current in kA

### 6.3 Data and Documentation Requirements

Where the Severity Rankings Guidelines criteria indicated a more detailed analysis is necessary, collect the following information where possible, to facilitate development of an AC interference model. Appendix D contains a sample data log provided for reference:

Pipeline Parameters:

- Routing geometry
- Depth of cover
- Diameter
- Coating details
- Coating resistance
- Existing CP Installations
- Location of bonds
- Soil resistivity at multiple depths and locations along the ROW
- Location of insulating joints

Power line Parameters:

- Routing geometry
- Number of circuits
- Conductor configuration (dimensions, orientation, phasing)
- Conductor loading (Peak and Emergency current)

- Tower ground resistance
- Maximum fault voltage
- Fault clearing time
- Shield wire configuration

## 6.4 General Recommendations

As the operating current is a controlling parameter influencing AC interference, it is recommended to obtain the power line load current from the relevant electrical utility operator when assessing a collocation for the threat of AC interference. Historically, lack of collaboration between pipeline and power line operators has led to projects being assessed without accurate understanding of the power line data. This can lead to either an overly conservative and costly design or an under-designed system not adequately reducing the interference. Collaboration between the respective pipeline and power line operators is critical to accurate assessment and efficient mitigation of any possible interference effects.

In addition to the assessment described in previous sections, the following general recommendations apply for collocations and crossings where AC interference is a concern:

- Install coupon test stations or ER probes to monitor AC Current density, a coupon surface area of 1.0 cm<sup>2</sup> is recommended.
- During pipeline construction near HVAC transmission lines, confirm that the contractor safety program complies with the recommended 15 VAC limit for shock hazards, and applicable OSHA construction standards as referenced in Section 3.2.2.
- Record AC pipe-to-soil potentials along with the DC pipe-to-soil potentials during the annual cathodic protection survey on sections where AC interference threats may exist. This can provide information, should the power transmission company change its operating parameters, or unexpected changes occur between the pipeline and transmission line.
- Request power line loads corresponding to the time of AC pipe-to-soil potential measurement to provide thorough understanding of the interference measurements
- Measure soil resistivity at locations where AC interference threats may exist. This data can be used with the measured AC potentials to estimate theoretical AC current density for specific locations in the absence of coupons or ER probes.
- Operating personnel should be trained in the hazards and safe practices associated with working on pipelines subject to HVAC interference
- Suspend work (when possible) along the collocated or crossing section of pipeline during weather conditions that may lead to a transmission line fault.

Safety precautions are required when making electrical measurements:

- Only knowledgeable and qualified personnel trained in electrical safety precautions install, adjust, repair, remove, or test impressed current cathodic protection and AC mitigation equipment.
- Properly insulated test lead clips and terminals should be used to prevent direct contact with the high voltage source.
- Attach test clips one at a time using a single-hand technique for each connection when possible.

- Extended test leads require caution near overhead HVAC power lines, which can induce hazardous voltages onto the test leads, or present a source of data error.

## 7 REFERENCES

1. NACE TG 327, "AC Corrosion State-of-the-Art: Corrosion Rate, Mechanism, and Mitigation Requirements, NACE Report 35110, 2010
2. S. Finneran, B. Krebs, "Advances in HVAC Transmission Industry and its Effects on Induced AC Corrosion", CORROSION 2014, Paper No. 2014-4421
3. P. Simon, "Overview of HVAC Transmission Line Interference Issues on Buried Pipelines", NACE 2010
4. R. Gummow, S. Segall, "AC Interference Guidelines," CEPA 2014
5. E. Kirkpatrick, "Basic Concepts of Induced AC Voltages on Pipelines," Materials Performance, July, 1995
6. B. Tribollet, "AC-Induced Corrosion of Underground Pipelines," Underground Pipeline Corrosion, 2014, p. 35-61
7. Prinz, W. "AC induced Corrosion on Cathodically Protected Pipelines", UK Corrosion 1992, vol. 1, Proceedings of NACE, Nashville, USA, 26 April-1
8. H. Hanson, J. Smart, "AC Corrosion on a Pipeline Located in an HVAC Utility Corridor" CORROSION 2004, Paper No. 04209
9. M. Yunovich, N.G. Thompson, "AC Corrosion: Corrosion Rate and Mitigation Requirements," CORROSION 2004, Paper No. 206, 2004
10. M. Yunovich, N. Thompson, "AC Corrosion: Mechanism and Proposed Model," Proceedings of International Pipeline Conference 2004, paper no. IPC04-0574
11. NACE SP0177-2014 "Mitigation of Alternating Current and Lightning Effects on Metallic Structures and Corrosion Control Systems," 2014
12. CAN/CSA-C22.3 No.6-M91 "Principles and Practices of Electrical Coordination Between Pipelines and Electric Supply Lines," 2003
13. IEEE Std 80-2000 "Guide for Safety in AC Substation Grounding," 2000
14. S. Goidanich, L Lazzari, M. Ormallese, "AC Corrosion. Part 1: Effects on Overpotentials of Anodic and Cathodic Processes," Corrosion Science 52, 2010
15. EN15280, "Evaluation of AC Corrosion Likelihood of Buried Pipelines Applicable to Cathodically Protected Pipelines," 2013
16. R. Southey, F. Dawalibi, "Computer Modelling of AC Interference for the Most Cost Effective Solutions," CORROSION 98, Paper No. 564
17. M. Büchler and H-G. Schöneich (2009), "Investigation of Alternating Current Corrosion of Cathodically Protected Pipelines: Development of a Detection Method, Mitigation Measures, and a Model for the Mechanism," Corrosion 65, 578–586, 2009.
18. M. Ormellese, L. Lazzari, et al, "Proposal of CP Criterion in the Presence of AC Interference", NACE 2010, C2010-10032
19. R. Gummow, S. Segall, "Pipeline AC Mitigation 19Misconceptions" NACE Northern Area Western Conference, February 2010
20. "Underground Electric Transmission Lines", Public Service Commission of Wisconsin, 2011

21. L. Koshcheev, "Environmental Characteristics of HVDC Overhead Transmission Lines," HVDC Transmission Institute, St. Petersburg, for Third International Workshop on Grid interconnection in North Eastern Asia
22. Canadian Association of Petroleum Producers (CAPP), GUIDE, "Influence of High Voltage DC Power Lines on Metallic Pipelines," June 2014
23. J. Dabkowski, "Methodologies for AC Mitigation," CORROSION 2003, Paper No. 03703
24. J. Dabkowski, "AC Predictive and Mitigation Techniques", Pipeline Research Council International Catalog No. L51835e, 1999
25. M. Parker, E. Peattie, Pipeline Corrosion and Cathodic Protection, 1988
26. DOT PHMSA Regulations §49 CFR Part 195 Subpart H Corrosion Control (195.551 – 195.589)
27. DOT PHMSA Regulations §49 CFR Part 192 Subpart I Requirements for Corrosion Control (192.451 – 192.491)
28. H. Dwight, "Calculation of Resistances to Ground," Transactions of the American Institute of Electrical Engineers, Vol. 55, No. 12, (December 1936), pp. 1319-1328.
29. J. Dabkowski, "Mitigation of Buried Pipeline Voltages Due to 60 Hz AC Inductive Coupling, Pt. I Design of Joint Rights-of-Way," IEEE Transactions on Power Apparatus and Systems Vol. PAS-98, No. 5 (Sept/Oct, 1979): 1806-1813
30. E. Sunde, "Earth Conduction Effects in Transmission Systems", New York, 1968
31. I. Ragualt, "AC corrosion induced by VHV electrical lines on polyethylene coated steel gas pipelines," CORROSION 98, Paper No. 557
32. R. Wakelin, R. Gummow and S. Segall, "AC Corrosion - Case Histories, Test Procedures and Mitigation," CORROSION 98, Paper No. 565, 1998
33. S. Goidanich, "Influence of Alternating Current on Metals Corrosion," PhD thesis, Politecnico di Milano, 2005.
34. P. Nicholson, "High Voltage Direct Current Interference With Underground/Underwater Pipelines," CORROSION 2010, NACE Paper No. 10102

Where published, historically identified corrosion defects and pipeline failures associated with AC corrosion degradation were reviewed and are presented to demonstrate the magnitudes and variability in corrosion rates possible with AC accelerated corrosion. The general findings, discussion, technical details, and results are utilized and summarized throughout this document.

This lack of industry consensus on the subject of AC corrosion guidelines has led to varied practices among pipeline operators in regards to mitigating AC interference on pipelines. As part of this study, The INGAA Foundation requested a review of industry practices and procedures related to AC interference. The INGAA Foundation provided DNV GL with the procedures related to AC interference or mitigation for 10 pipeline operators who are members of the Foundation. The primary finding from this review is that there is significant variation in company procedures with respect to AC interference. Based upon this review, all of the procedures provided address a safety concern and define a maximum allowable AC pipe-to-soil potential limit for above grade appurtenances. Faults were included as a concern/risk for pipelines in close proximity to HVAC power lines in almost all of the procedures. However, few addressed coating stress limit above which mitigation is required. For current density criteria, several procedures had clearly defined limits, while others addressed it as a concern for AC corrosion but did not specify a targeted limit of AC current density or define limits for mitigation.

## Case Studies

Numerous studies, both laboratory and field based, have been performed that attempt to determine magnitudes of corrosion rates associated with AC interference. However, reviewing available technical literature confirms a wide range of experimental rates, and a scarcity of controlled field measured rates.

Where published, historically identified corrosion defects and pipeline failures associated with AC corrosion degradation have been reviewed and are presented to demonstrate the magnitudes and variability in corrosion rates possible with AC accelerated corrosion.

Field investigations reported by Ragault<sup>31</sup> considering a coated cathodically protected pipeline, identified corrosion rates between 12 and 54 mpy (0.3 and 1.4 mm/yr), for AC current densities ranging between 84 and 1,100 A/m<sup>2</sup>.

Wakelin, Gummow, et al<sup>32</sup> provided three case studies where field inspections identified defects as AC corrosion-related degradation. Based on inspection intervals and corrosion degradation, corrosion rates were identified ranging from 17 to 54 mpy (0.4 to 1.4 mm/yr) for AC current densities between 75 and 200 A/m<sup>2</sup>.

A German field coupon study, published by Prinz, and Shoneich,<sup>7</sup> indicated general AC corrosion rates between 2 to 4 mpy (0.015 to 0.1 mm/yr) for a current density of 100 A/m<sup>2</sup>, and 12 mpy (0.3 mm/yr) at 400 A/m<sup>2</sup>. However, pitting rates were considerably greater and showed a wider range between 8 and 56 mpy (0.2 to 1.4 mm/yr), with considerably less dependence on AC density.<sup>6</sup>

A doctoral thesis study by Goidanich presents similar findings concluding that AC current density as low as 10 A/m<sup>2</sup> may be considered hazardous as the experimental studies showed it nearly doubled the free corrosion rate of the experimental samples in simulated soil tests.<sup>33</sup>

A 1998 report by Wakelin, Gummow, et al published by NACE reviewed several case studies dating back to the 1960's where AC corrosion was identified or suspected to be the primary mechanism of degradation. The report summarized recorded details on multiple case studies with specific focus on comparison of corrosion rates and AC current density where known. In 1991, a failure investigated on a 12-inch diameter pipeline concluded AC accelerated corrosion after only four (4) years of service. Induced AC potentials measured as

high as 28 volts. Based on the nominal wall thickness and time to leak, an average pitting rate for the through wall pit was estimated to be greater than 55 mpy. Two other case studies indicated the average AC induced corrosion rates for the identified sites between 11 and 24 mpy.

A 2004 paper by Hanson and Smart, published by NACE, presents a case study for a gas pipeline installed in the summer of 2000.<sup>8</sup> The pipeline was collocated in a shared ROW with a 230 kV transmission line for approximately 9 miles, and then entered a shared power corridor with six power transmission lines, two of which were rated at 500 kV, all within sufficient proximity of the pipeline to cause interference. A leak occurred within 5 months of installation, before the line was in operation. Several other leaks were identified shortly after, with four leaks within close proximity. Induced AC potential measurements found AC voltages as high as 90 volts on the pipeline. The failure assessment indicated the corrosion was due to induced AC corrosion, and estimated rates in excess of 400 mpy.

The majority of literature reviewed indicates AC corrosion rates in the range of 5 to 60 mpy.<sup>3, 9, 10</sup> However, cases have been identified with localized corrosion rates significantly greater, in excess of 400 mpy. There is general agreement that higher AC current density leads to greater risk of AC corrosion. While higher current density may lead to accelerated corrosion rates, the correlation is not simple or direct.

## **International Standards**

Review and comparison of multiple international standards identified the consistencies and variations across accepted industry standards.

Recent laboratory and field work has focused on the interaction between AC and DC current density in determining overall risk of AC corrosion, and the latest European standards reflect this as discussed in Section 3.3.1.1.<sup>15</sup> However, there is no generally accepted method of correlating current density or any other measurable indicator to an expected corrosion rate. A direct method of approximating the AC corrosion rate using a buried coupon or probe would provide accurate information.

The Canadian Standards Association (CSA), NACE International (NACE), and the European Committee for Standardization (CEN) have developed published standards addressing HVAC interference issues, as below:

- CAN/CSA-C22.3 No. 6-13 "Principles and Practices of Electrical Coordination Between Pipelines and Electric Supply Lines"
- NACE SP0177-2014 "Mitigation of Alternating Current and Lightning Effects on Metallic Structures and Corrosion Control Systems"
- CEN EN 50443:2012 "Effects of Electromagnetic Interference on Pipelines Caused by High Voltage AC Electric Traction Systems and/or High Voltage AC Power Supply Systems"
- CEN EN 15280:2013 "Evaluation of AC Corrosion likelihood of buried pipelines applicable to cathodically protected pipelines"

Of these standards, the first three primarily discuss safety issues, interference effects, and mitigation systems but do not explicitly address criteria for AC corrosion control. The European Standard EN15280:2013 deals specifically with corrosion due to AC interference, and establishing criteria or tolerable limits for interference effects, as presented in Section 3.3.1.1.

NACE Standard Practice SP0177-2014, *Mitigation of Alternating Current and Lightning Effects on Metallic Structures and Corrosion Control Systems*, addresses problems caused primarily by the proximity of metallic

structures to AC power transmission systems. In this standard practice document, SP0177-2014 defines a steady state touch voltage of 15 volts or more with respect to local earth at above-grade or exposed sections and appurtenances to constitute a shock hazard. Findings presented in the standard indicate the average hand-to-hand or hand-to-foot resistance for adult male ranges from 600 ohms to 10,000 ohms. NACE uses "a reasonable safe value" of 1,500 ohms (hand-to-hand or hand-to-foot) for estimating body currents. Based upon work by C.F. Dalziel regarding muscular contraction, SP0177-2014 indicates the inability to release contact occurs between 6 mA and 20 mA for adult males.<sup>10</sup> Ten milliamps (hand-to-hand or hand-to-foot) is recognized as the maximum safe let-go current. This 15-volt safety threshold is therefore determined based upon 1,500 ohms hand-to-hand or hand-to-foot resistance and an absolute maximum let-go current of 10 mA. However, under certain circumstances, an even lower value is required. One such circumstance specifically identified where a lower touch potential safety threshold should be considered is "areas (such as urban residential zones or school zones) in which a high probability exists that children (who are more sensitive to shock hazard than are adults) can come in contact with a structure under the influence of induced AC voltage."<sup>10</sup> This standard practice document requires remedial measures to reduce the touch potential on the pipeline where shock hazards exist.

During construction of metallic structures in regions of AC interference, SP0177-2014 requires minimum protective requirements of the following:

- "On long metallic structures paralleling AC power systems, temporary electrical grounds shall be used at intervals not greater than 300 m (1,000 feet), with the first ground installed at the beginning of the section. Under certain conditions, a ground may be required on individual structure joints or sections before handling."
- "All temporary grounding connections shall be left in place until immediately prior to backfilling. Sufficient temporary grounds shall be maintained on each portion of the structure until adequate permanent grounding connections have been made."

The intent of the temporary grounds is to reduce AC potentials on the structure, and thus the shock hazard to personnel during construction. SP0177-2014 advises against direct connections to the electrical utility's grounding system during construction as this could actually increase the probability of a shock hazard to personnel.

Regarding AC corrosion, there are no established criteria for AC corrosion control provided in SP0177-2014. Further, this standard states that the subject of AC corrosion is "not quite fully understood, nor is there an industry consensus on this subject. There are reported incidents of AC corrosion on buried pipelines under specific conditions, and there are also many case histories of pipelines operating under the influence of induced AC for many years without any reports of AC corrosion."

While not a Standard Practice document, NACE published "AC Corrosion State-of-the-Art: Corrosion Rate, Mechanism, and Mitigation Requirements"<sup>1</sup> in 2010, providing guidance for evaluating AC current density, and providing recommended limits as discussed in Section 3.3.1.1.

The State-of-the-Art report also cites European Standard CEN/TS 15280:2006<sup>15</sup>, which previously offered the following guidelines related to the likelihood of AC corrosion:

*"The pipeline is considered protected from AC corrosion if the root mean square (RMS) AC density is lower than 30 A/m<sup>2</sup> (2.8 A/ft<sup>2</sup>).*

*In practice, the evaluation of AC corrosion likelihood is done on a broader basis:*

- *Current density lower than 30 A/m<sup>2</sup> (2.8 A/ft<sup>2</sup>): no or low likelihood;*
- *Current density between 30 and 100 A/m<sup>2</sup> (2.8 and 9.3 A/ft<sup>2</sup>): medium likelihood; and*
- *Current density higher than 100 A/m<sup>2</sup> (9.3 A/ft<sup>2</sup>): very high likelihood"*

#### EN 15280:2013

The latest revision of EN 15280:2013 was revised to present criteria based upon the AC interference and DC current due to CP. EN 15280:2013 presents using the cathodic protection system of the pipeline to ensure the levels of induced AC potential do not cause AC corrosion under the following conditions:

1. AC voltage on the pipeline should be decreased to a target value, which should be less than 15 V (measured over a representative time period, i.e. 24 hr)
2. Effective AC corrosion mitigation can be achieved while maintaining cathodic protection criteria as defined in EN 12954:2001
3. One of the following conditions is satisfied in addition to items 1 and 2:
  - o Maintain AC current density (RMS) over a representative period of time (i.e. 24 hr) less than 30 A/m<sup>2</sup> (2.8 A/ft<sup>2</sup>) on a 1cm<sup>2</sup> coupon or probe
  - o If AC current density is greater than 30 A/m<sup>2</sup> (2.8 A/ft<sup>2</sup>), maintain the average cathodic (DC) current density over a representative period of time (i.e. 24 hr) less than 1 A/m<sup>2</sup> on a 1cm<sup>2</sup> coupon or probe
  - o Maintain a ratio between AC current density and DC current density ( $J_{AC}/J_{DC}$ ) less than 5 over a representative period of time (i.e. 24 hr)

The NACE State-of-the-Art report also references experimental studies by Yunovich and Thompson that concluded

*"AC density discharge on the order of 20 A/m<sup>2</sup> (1.9 A/ft<sup>2</sup>) can produce significantly enhanced corrosion (higher rates of penetration and general attack without applied CP). Further, the authors stated that there likely was not a theoretical 'safe' AC density (i.e., a threshold below which AC does not enhance corrosion); however, a practical one for which the increase in corrosion because AC is not appreciably greater than the free-corrosion rate for a particular soil condition may exist."*<sup>4</sup>

## APPENDIX B COATING RESISTANCE ESTIMATES

### Pipe Coating Conductance/Resistance

Pipe Line Corrosion and Cathodic Protection, Marshall E. Parker & Edward G. Peattie

No.	Coating Quality	Soil Resistivity	Conductance Range		Resistance Range					
			$\mu\text{mhos/ft}^2$		$\text{ohm-m}^2$	$\text{ohm-ft}^2$		Kohm-ft <sup>2</sup>		
1	Excellent	High	1	10	92,903	9,290	1,000,000	100,000	1,000	100
2	Good	High	10	50	9,290	1,858	100,000	20,000	100	20
3	Excellent	Low	50	100	1,858	929	20,000	10,000	20	10
4	Good	Low	100	250	929	372	10,000	4,000	10	4
5	Average	Low	250	500	372	186	4,000	2,000	4	2
6	Poor	Low	500	1,000	186	93	2,000	1,000	2	1

PRCI

No.	Coating Quality	Soil Resistivity (ohm-m)	Coating Resistance (Kohm-ft <sup>2</sup> )		
1	Excellent	25	Multiply Soil Resistivity (ohm-m) by 5	5	125
	Excellent	50	Multiply Soil Resistivity (ohm-m) by 5	5	250
	Excellent	200	Multiply Soil Resistivity (ohm-m) by 5	5	1,000
	Excellent	600	Multiply Soil Resistivity (ohm-m) by 5	5	3,000
2	Good	25	Multiply Soil Resistivity (ohm-m) by 2	2	50
	Good	50	Multiply Soil Resistivity (ohm-m) by 2	2	100
	Good	200	Multiply Soil Resistivity (ohm-m) by 2	2	400
	Good	600	Multiply Soil Resistivity (ohm-m) by 2	2	1,200
3	Fair	25	Multiply Soil Resistivity (ohm-m) by 0.5	0.5	13
	Fair	50	Multiply Soil Resistivity (ohm-m) by 0.5	0.5	25
	Fair	200	Multiply Soil Resistivity (ohm-m) by 0.5	0.5	100
	Fair	600	Multiply Soil Resistivity (ohm-m) by 0.5	0.5	300

## **APPENDIX C MITIGATION COMPARISON SUMMARY**

## **Zinc Ribbon**

### **Advantages**

- Can typically be installed during pipeline construction minimizing installation costs
- Cost of raw material is typically one third the cost of copper
- Can be trenched or plowed in relatively inexpensively after pipeline installation
- Typically results in very low resistances
- Historically has performed as intended
- Surface mitigation ribbon can double as shielding for fault mitigation

### **Disadvantages**

- Zinc clad ribbon is more difficult to work with compared to copper
- Life expectancy is generally less than comparable copper installation

## **Copper Cable**

### **Advantages**

- Can typically be installed during pipeline construction minimizing installation costs
- Can be trenched or plowed in relatively inexpensively after pipeline installation
- Typically results in very low resistances
- Historically has performed as intended
- Surface mitigation cable can double as shielding for fault mitigation
- Depending on the size cable the material cost of a copper installation can be lower than a zinc installation

### **Disadvantages**

- Cost of raw material is typically higher than the cost of zinc
- Risk of having a more noble metal (cathodic) near or connected to pipeline even if through a decoupler

## **Deep Grounding (anodes used as the ground)**

### **Advantages**

- May be advantageous when surface resistivity is extremely high

### **Disadvantages**

- Typically high cost for both installation and materials
- Generally not suitable for mitigating ground potential rises (GPR) or arcing issues associated with faults

## **Shallow Grounding (driven ground rods or bored ribbon or cable)**

### **Advantages**

- Can be used to supplement horizontal ribbon or cable installation if required
- Magnitude of the surface resistivity affects the resistance

### **Disadvantages**

- Generally not suitable for mitigating ground potential rises (GPR) or arcing issues associated with faults

## **Engineered mitigation and/or Additives (no specific product identified)**

### **Advantages**

- Could increase design life

### **Disadvantages**

- Typically increases the material costs

### **Notes:**

- 1) These are typical statements and there are instances where they do not apply.
- 2) All mitigation installations are considered connected through a decoupling device such that there is no direct passage of DC current to or from the mitigation.

## **APPENDIX D DATA REQUEST TEMPLATE**

Company: \_\_\_\_\_

Project: \_\_\_\_\_

Project Number: \_\_\_\_\_

**High Voltage Alternating Current (HVAC) Power Transmission Parameters**

No.	Information Requested	T-Line 1	T-Line 2	T-Line 3
	<b>General</b>			
1	Owner:			
2	Power transmission voltage (kV):			
3	Average Tower Span (feet)			
4	Substation ground grid impedance (ohms):			
	<b>Phase Wires</b>			
5	No. of circuits:			
6	Circuit type:			
	Conductors:			
7	No. 1 average height (ft):			
8	No. 1 average horizontal distance (ft):			
9	No. 1 phasing (degrees):			
10	No. 2 average height (ft):			
11	No. 2 average horizontal distance. (ft):			
12	No. 2 phasing (degrees):			
13	No. 3 average height (ft):			
14	No. 3 average horizontal distance (ft):			
15	No. 3 phasing (degrees):			
16	Other: Cable Sag, Lowest point (feet):			
	<b>Circuit Loading</b>			
17	Peak loading (amps):			
18	Emergency loading (amps):			
19	Emergency loading time (hours):			
	<b>Shield Wires</b>			
20	No. of conductors:			
21	No. 1 type:			
22	No. 1 conductor GMR (ft):			
23	No. 1 conductor resistance (ohms/mil):			
24	No. 1 average height (ft):			
25	No. 1 average horizontal distance (ft):			
26	No.2 type:			
27	No. 2 conductor GMR (ft):			
28	No. 2 conductor resistance (ohms/mil):			
29	No. 2 average height (ft):			
30	No. 2 average horizontal distance (ft):			
	<b>Fault Current Parameters</b>			
31	Fault clearing time (cycles):			
32	Average tower resistance (ohms):			
33	Beginning of Collocation: Total _____ from left substation _____ from right substation			
34	Middle of Collocation: Total _____ from left substation _____ from right substation			
35	End of Collocation: Total _____ from left substation _____ from right substation			

Company: \_\_\_\_\_

Project: \_\_\_\_\_

Project Number: \_\_\_\_\_

**Pipeline Parameters**

No.	Information Requested	Pipeline 1	Pipeline 2	Pipeline 3
	<b>General</b>			
1	Pipeline number:			
2	Pipeline owner:			
3	Pipeline name:			
4	Product transported:			
5	Diameter (in.):			
6	Burial depth (ft.):			
7	Wall Thickness (inch):			
8	Length of Collocation (feet/miles):			
	<b>Coatings</b>			
9	Coating type (majority):			
10	Coating resistance (kohm-ft <sup>2</sup> ):			
11	Coating thickness (mils):			
	<b>Cathodic Protection</b>			
12	Location of cathodic protection:			
13	Resistance of cathodic protection groundbed(s):			
14	Bonding to foreign pipelines? (Y/N):			
15	Existing AC mitigation measures? (Y/N):			
16	Describe existing AC mitigation:			

## **CENSE concerns about pipeline safety for Draft EIS**

February 15, 2016

CENSE expresses concerns about the safety risks of locating two transmission lines (operating at 230 kV and 115 kV, respectively) and two petroleum pipelines in a single narrow utility corridor. The corridor is only 100 feet wide in some places. Along its 18-mile run through the Eastside, the corridor passes through heavily populated residential neighborhoods, schoolyards, parks, and commercial properties. Given its proximity to dense population, a pipeline fire would be devastating to our community, as described in the Bellevue Fire Department Standards of Response Coverage: "Given that pipeline incidents continue to occur in this country, and many for undetermined reasons, the community is still at risk. The combination of: a highly flammable liquid, in large quantities, and in urban environment translates into a significant consequence risk that approaches the 'catastrophic' level."<sup>1</sup>

## **Three risks**

### **Construction risk**

If the Energize Eastside project proceeds as proposed, PSE will install steel monopoles 85-130 feet high in the corridor. Heavy equipment will be used to excavate fairly large and deep foundations close to the pipelines. The pipelines, which are 40 to 50 years old, will be subjected to vibration and pressure. An accidental nick in the pipeline could cause ignition of the high-pressure contents, creating a fireball like the one which claimed three lives in Bellingham in 1999, on the same pipeline. In Texas in 2010, a worker lost his life when construction equipment hit a buried gas line while digging holes for transmission poles, so this is not just a theoretical risk.<sup>2</sup>

### **Arcing risk**

During EIS scoping meetings, Bellevue resident Lloyd Arnesen described an incident where a downed power line operating at 115 kV discharged electricity into one of the pipelines, causing sufficient damage that Olympic had to replace a section of the pipe. Although no breach was caused in this case, a recent report by the respected risk analyst DNV-GL confirms that breaching is possible, and would occur more rapidly at 230 kV than 115 kV. According to the report, "A direct arc to a collocated or crossing pipeline is possible, which can result in coating damage, or arc damage to the pipe wall up to the point of burn-through. Even if an arc is not sustained long enough to cause burn through, a short duration elevated current can cause molten pits on the pipe surface that may lead to crack development as the pipe cools."<sup>3</sup>

Arcing can happen even when wires do not fall. Such a possibility is described in a BPA safety guide available on the web: "Proper positioning of underground utilities is required to prevent

<sup>1</sup> [http://www.bellevuewa.gov/pdf/Fire/Standards\\_of\\_Coverage.pdf](http://www.bellevuewa.gov/pdf/Fire/Standards_of_Coverage.pdf), p. 66

<sup>2</sup> <http://www.wfaa.com/story/news/2014/08/09/13587360/>

<sup>3</sup> <http://www.ingaa.org/File.aspx?id=24732>, p. 19

an accident in an extreme case when an unusual condition might cause electricity to arc from the high-voltage wire to the tower and then to ground. This could produce a dangerous voltage on underground piping..."<sup>4</sup>

### **Corrosion risk**

The Executive Summary of the aforementioned report from DNV-GL describes risk factors that can accelerate corrosion of the pipeline. Some of these factors are parallel orientation, length of co-location, distance between wires and the pipeline, and total current running through the wires. We were dismayed to find that we rated a "high" or "very high" level of risk on at least 4 of the 5 risk factors. As a result, we engaged Dr. Frank Cheng, a recognized authority on the topic of electricity-induced pipeline corrosion, to describe what kind of study would be required to ensure safe practices are followed in the co-location of this infrastructure. His report and CV are included at the end of this comment.

Our level of concern is increased by an apparently nonchalant attitude regarding these safety issues demonstrated by the following remarks from PSE consultant Mark Williamson to the Newcastle Planning Commission on February 2, 2016:

*"... if you are more than 50 feet from a lattice tower or more than 25 feet from a single monopole (which is what's being contemplated here), you don't need to do any engineering studies. That's far enough that you can just be laissez-faire and let it go. Everything else that's closer (and most facilities in this country are much closer) require good coordination and studies between the utility company that has electricity and the one that runs the pipeline so you're sure those interactions don't adversely affect either facility."*

We remain unsure which standards or safety practices will be followed. We believe it would be appropriate for the EIS to provide sound, independent analysis about risks and potential mitigations. We seek objective information untainted by conflicts of interest. Dr. Cheng's report provides a good description of the kind of analysis we would like to see. In addition to this corrosion analysis, we would like to understand best practices to minimize the possibility of fires initiated by arcing events.

Sincerely,

Don Marsh, President  
CENSE.org

<sup>4</sup> <http://www.bpa.gov/news/pubs/GeneralPublications/lusi-Living-and-working-safely-around-high-voltage-power-lines.pdf>, p. 6

*Given that pipeline incidents continue to occur in this country, and many for undetermined reasons, the community is still at risk. The combination of: a highly flammable liquid, in large quantities, and in urban environment translates into a significant consequence risk that approaches the 'catastrophic' level.*

Bellevue Fire Department Standards of Response Coverage

# Safety of Collocation of Electric Power Lines and Pipelines

Date: February 15, 2016

Prepared for Mr. Don Marsh, President

Coalition of Eastside Neighborhoods for Sensible Energy (CENSE)

Prepared by Dr. Frank Cheng, Professor and Canada Research Chair in Pipeline Engineering

University of Calgary, Calgary, Alberta, Canada (fcheng@ucalgary.ca)

A 230 kV high-voltage alternating current (HVAC) electric power line is proposed by way of an energy transmission corridor, where two steel pipelines carrying refined liquid petroleum products such as diesel, aviation fuel and gasoline are collocated and parallel to the power line for about 16 miles. In this corridor that is as narrow as 100 feet, there is another 115 kV HVAC line in operation. Furthermore, the corridor passes through heavily residential areas, including the largest suburbs of Seattle, Washington.

It is generally acknowledged that buried pipelines can be corroded at an accelerated rate in the presence of AC interference. Recently, there have been mounting evidences of AC induced corrosion of pipelines and their failures. For example, a natural gas leak occurred due to a pinhole perforation near the center of pit on a natural gas pipeline in Oswego, New York in 2002. It was attributed to AC induced corrosion of the pipeline.

Generally, the HVAC affects adversely the integrity and safety of buried pipelines that are collocated with electric power lines right-of-way by three mechanisms, as briefed below, all of which are able to result in pipeline failures.

***Accelerated corrosion of pipelines and initiation of localized pitting corrosion at high AC current densities.*** The dramatic anodic polarization on pipe steels occurring during positive cycles of AC can cause significant corrosion on the steel. This is particularly serious at coating defects, where a high AC current density can result in localized pitting corrosion. This is the key mechanism resulting in pipeline perforation under AC interference.

***Increased disbondment of external coating from the pipeline.*** An alkaline environment can generate on the pipe steel surface during AC corrosion. The high solution pH can weaken and/or break the adhesion of polymeric coatings to steel substrate, resulting in coating disbonding. Generally, the coating disbondment is increased with the local AC current density.

***Shift of cathodic protection (CP) for corrosion protection.*** The AC is able to deviate the potential of the pipeline from the applied CP value, and reduce the CP effectiveness to protect the pipeline from corrosion attack. Sometimes, misleading information about the

actual cathodic potential of the pipeline can be caused by AC interference, which makes it incapable of evaluating CP performance by potential monitoring. 1 potential and reduced CP effectiveness

In addition to the effects on integrity of pipelines, AC interference also threatens the safety of operating personnel and the public when they are in contact with the pipeline system or standing in close proximity to the pipeline and HVAC transmission lines.

To evaluate the potential effect of the HVAC power lines on integrity of the collocated buried pipelines, a comprehensive study program would be developed prior to construction of the power lines. This includes collection of relevant information, numerical modeling and conductance of on-site testing for prediction and analysis of AC interference and the resulting consequences on the pipelines, acquisition of corrosion data for modeling validation, and pipeline integrity assessment.

Essential information that is collected from the utility company and pipeline operator includes:

**AC source data:** Phase-to-phase voltage, load current, tower configuration and construction material, phase data and frequency, conductor characteristics (material, height, spacing), and alignment of power lines to pipelines (height, distance, angle, length in collocation).

**Pipeline data:** Age of pipelines, outside and inside diameters of the pipe, burial depth, grade and mechanical properties of pipe steel, inclinations of the pipe, fluid carried, operating temperature and pressure, and incident history.

**CP data:** At least two latest CP survey reports, including the CP performance evaluation.

**Coating data:** Types of mainline and joint coatings, age of the coatings, coating permeability to water and CP current, distributions of the size and geometry of coating defects, coating performance (evaluated by direct current voltage gradient, DCVG, and alternating current voltage gradient, ACVG, methods), and coating repair history.

Tests to be planned and conducted in the field include:

**Monitoring of AC potential and AC current density:** Testing coupons made of the same steel as the pipeline and coated with the same pipeline coating are buried at certain distance intervals in the electric power lines/pipelines corridor. The AC potential and AC current density are monitored at least 24 hours on the coated steel coupons.

**Monitoring of CP potential:** Additional batches of testing coupons buried are under NACE2 recommended CP potential. The direct current (DC) potential of the coupons is monitored at least 24 hours. The free corrosion potential of the steel coupon in the soils will be measured.

**Collection of soil samples and analysis of soil properties:** The soil resistivity at various depths along the entire pipeline alignment will be measured. The soil humidity and oxygen content are recorded. Soil samples are collected at locations where the testing coupons are buried, and soil chemistry is analyzed.

**Analysis of AC corrosion and CP potential of the pipeline:** The latest CP survey and performance evaluation reports will be analyzed to assess the coating performance status. The recorded AC potential data are analyzed to extract the DC component from the recorded signals, which will be used to analyze the corrosion activity of the steel. The recorded AC current density is used to determine the AC corrosion rate of the steel. The DC potential of the CP-applied coupons is used to determine the "true" cathodic potential of pipe steel in the presence of AC interference. The soil resistivity and soil chemistry are used to evaluate the corrosiveness of the soil, and for modeling of the AC interference.

The field testing and data analysis will be performed by an independent, third party corrosion solution company. The company will issue the lead authority a formal report including AC corrosion modeling and measurement results, ranking of the risk of AC interference on the collocated pipelines, and evaluation of the threat of AC corrosion to the integrity of pipelines, as well as recommendations of AC mitigation measures implemented to minimize the effects of interference to acceptable levels.



Dr. Frank Cheng  
Professor and Canada Research Chair

<sup>1</sup> An electrochemical corrosion control technique by applying a cathodic current on protected structures, such as pipelines, to make them the cathode of a corrosion cell. The structures possess a reasonably negative potential in the corrosion-immunity region. All buried pipelines must be protected by CP according to regulations.

<sup>2</sup> National Association of Corrosion Engineers. An globally recognized premier authority for corrosion control solutions.

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## HIGHLIGHTS

- An internationally recognized authority in corrosion science and engineering in oil/gas and pipeline systems
- Canada Research Chair in Pipeline Engineering
- Fellow, NACE International, the Corrosion Society
- Recipient, 2014 NACE International, the Corrosion Society, H.H. Uhlig Award
- Recipient, 2015 Shi Chang-Xu Award, Chinese Society for Corrosion and Protection
- Chair, NACE International Task Group 521 "Testing of nonshielding property of pipeline coatings to CP"
- Member, U.S. National Academy of Sciences (NAS) Committee on Pipeline Transportation of Bitumen
- Country (Canada) Leader, NACE International IMPACT Study Program
- Theme Editor, Pipeline Engineering of the *Encyclopaedia of Life Support System* (EOLSS) developed under the auspices of UNESCO
- An author of 1 book, 4 book chapters, 145 journal articles (including one commentary article accepted by *Nature*) and 70 conference papers, as well as 18 invited plenary/keynote talks in international conferences
- In Google Scholar, 3980 citations, h-index 37 (there are 37 publications cited over 37 times), and i10-index 103 (there are 103 publications cited over 10 times) (up to Dec. 2015)

## I. EDUCATION

2000 – 2002      Postdoctoral Fellow in Materials Engineering, NOVA Research and Technology Center, Canada

1996 – 2000 Ph.D. in Materials Engineering, University of Alberta, Canada

1990 – 1993 M.Sc. in Corrosion, Institute of Metal Research, Chinese Academy of Sciences, China

1986 – 1990 B.Sc. in Corrosion, Hunan University, China

## II. PROFESSIONAL EXPERIENCES

2011 – present Professor, Canada Research Chair in Pipeline Engineering  
University of Calgary, Calgary, Canada

2009 – 2011 Associate Professor, Canada Research Chair in Pipeline Engineering  
University of Calgary, Calgary, Canada

2005 – 2009 Assistant Professor, Canada Research Chair in Pipeline Engineering  
University of Calgary, Calgary, Canada

2002 – 2005 Research Scientist Centre for  
Nuclear Energy Research, University of New Brunswick, Canada

1993 – 1996 Research Assistant  
Institute of Metal Research, Chinese Academy of Sciences, Shenyang,  
China

## III. AWARDS

2015 Fellow, NACE International, the Corrosion Society

2015 Shi Chang-Xu Award, Chinese Society for Corrosion and Protection

2014 NACE International, the Corrosion Society, H.H. Uhlig Award

2010 Engineering Students' Society Teaching Excellence Award, University of Calgary

2009 Departmental Research Excellence Award, University of Calgary

2000 Industrial Research Fellowship (IRF), NSERC

1999 Excellence in Presentation Award, the 38th Conference of Metallurgical Society of CIM

## IV. SERVICES

2015 – present: Country (Canada) Leader, NACE International IMPACT Study Program

2014 – present: Chair, NACE International TG 521 "Testing of Nonshielding Property of Pipeline Coatings to Cathodic Protection"

- 2014 – present: Treasurer and Board Director, NACE Foundation of Canada
- 2014 – present: Member, International Scientific Advisory Board, Institute of Oceanology, Chinese Academy of Science
- 2014 – present: Faculty Advisor, NACE International Calgary Student Section
- 2011 – present: Member, Editorial Board, the journal *Corrosion Engineering, Science and Technology*
- 2014 – 2015: Chair, NSERC Site Visit and Review Committee for Industrial Research Chair  
(IRC) in Nuclear Materials Corrosion at the University of Toronto
- 2014 – 2015: Member, Panel for Performance Review of the Institute of Oceanology, Chinese Academy of Sciences
- 2014 – 2015: Guest Editor, Special Issue on Pipeline Corrosion, the journal *Corrosion Engineering Science and Technology*
- 2013 – 2015: Member, U.S. Congressional Technical Advisory on Safety of Oil Pipeline Transportation
- 2014: Member, British Columbia Ministry of Transportation Panel on "Pacific Gateway" Kitimat West Douglas Channel Corridor Analysis
- 2013 – 2014: Member, Alberta Innovate–CEPA (Canadian Energy Pipeline Association) Crude  
Transmission Pipeline Roadmap Project Steering Committee
- 2012 – 2013: Member, U.S. National Academy of Sciences (NAS) Committee on Pipeline  
Transportation of Diluted Bitumen
- 2012 – 2013: Member, University of Calgary's Professorship and Chairs Committee
- 2009 – 2011: Member, Board of Directors, Canadian Fracture Research Corporation
- 2007 – 2013: Invited examiner, Alberta Professional Engineer and Geoscientist Association
- 2006 – 2009: Honorary Theme Editor in Pipeline Engineering, *Encyclopedia of Life Support System* (EOLSS) developed under the auspices of UNESCO

## V. CONFERENCE/WORKSHOP ORGANIZATION

- 2015 Chair, Symposium on Pipeline Integrity, the 25th International Offshore and Polar Engineering Conference, ISOPE, Kona, Hawaii, USA, Jun. 21–26.
- 2015 Member, Scientific Committee, International Conference on Mining, Materials and Metallurgical Engineering (MMME'15), Barcelona, Spain, Jul. 19–21.

- 2014 Member, Panel for Asset Integrity – from Selection to Implementation, 2014 Crude Pipeline Integrity Congress, Houston, USA, Nov. 19–20.
- 2014 Member, Scientific Committee, International Conference on Mining, Materials and Metallurgical Engineering (MMME'14), Prague, Czech Republic, Aug. 11–12.
- 2014 Member, Technical Program Committee, the 24th International Offshore and Polar Engineering Conference, ISOPE, Busan, Korea, Jun. 15–20.
- 2013 Member, Technical Program Committee, the 23rd International Offshore and Polar Engineering Conference, ISOPE, Anchorage, USA, Jun. 30–Jul. 5.
- 2011 Chair, Plenary Session, the 16th Chinese National Surface Engineering and Technology Conference, Wuhan, China, May 5–7.
- 2011 Organizer, the 2nd Workshop on Pipeline Material Reliability, Calgary, Canada, Apr. 3.
- 2010 Co-Chair, International Symposium on Fracture Control in Engineering, Conference of Metallurgists 2010, Canadian Metallurgical Society, Vancouver, Canada, Oct. 3–6.
- 2010 Organizer, the 1st Workshop on Pathway for Future Collaborations – Network on Pipeline Engineering R & D, Calgary, Canada, Mar. 3.
- 2006 Session Chair, the 14th Asia-Pacific Corrosion Control Conference, Shanghai, China, Oct. 21–24.
- 2006 Session Chair, the 6th International Pipeline Conference, Calgary, Canada, Sept. 25–29.

## VI. EXTERNAL REVIEW

### Grant Review

Icelandic Research Fund

Chilean FONDECYT National Research Funding

Kazakhstan National Center of Science and Technology Grant

Chinese National Natural Science Foundation

Canada Research Chairs Program

NSERC Discovery Grant (DG)

NSERC Strategic Project Grant (SPG)

NSERC Industrial Research Chairs (IRC) Grant

NSERC Collaborative Research and Development (CRD) Grant  
NSERC Industrial R & D Fellowship  
Canadian Foundation of Innovation (CFI) Leaders Opportunity Fund  
Resource for the Innovation of Engineered Materials (RIEM) Grant  
Initiative for Automotive Manufacturing Innovation (IAMI) Grant

### **Tenure Appointment and Promotion Review**

University of Wollongong, Australia  
University of Western Ontario, Canada  
Dalhousie University, Canada  
Jordan University of Science and Technology, Jordan  
McMaster University, Canada  
China Petroleum University (Beijing), China  
Huazhong University of Science and Technology, China

### **SCI Journal Manuscript Review**

Review manuscripts for over 30 SCI journals

## **VII. TALKS AND SEMINARS**

### **Invited Plenary and Keynote Talks**

- 2015 "Study of early-stage features of corrosion by an electrochemical atomic force microscope", the 8th Chinese National Corrosion Conference, Xiamen, China, Nov. 14-16.
- 2015 "Effect of steel metallurgy on pipeline corrosion studied by micro-electrochemical techniques", 2nd International Conference on Mining, Materials and Metallurgical Engineering, Barcelona, Spain, Jul. 19-21.
- 2015 "Corrosion, cracking and risk assessment of high-strength steel pipelines", 2015 International Pipeline and Line Pipe Steel Conference, Xi-An, China, Apr. 26-28.
- 2014 "Understanding internal corrosion of pipelines for improved inhibitor/biocide performance", 2014 Crude Pipeline Integrity Congress, Houston, USA, Nov. 19-20.
- 2014 "Preventing pipeline external corrosion by integration of coating with cathodic protection", 2014 Crude Pipeline Integrity Congress, Houston, USA, Nov. 19-20.

- 2014 "Modeling of internal corrosion of pipelines in oil/gas production", the 248th American Chemical Society (ACS) Meeting, Symposium on Challenges and Opportunities in Petroleum Oil Production, Refining and Utilization, San Francisco, USA, Aug. 10–14.
- 2014 "Reliable prediction of maximum operating pressure of pipelines by defect assessment", NACE International Sino–Corr Biannual Conference, Beijing, China, May 19–22.
- 2013 "Innovation in failure pressure prediction based on defect assessment on pipelines", the 7th Chinese National Corrosion Conference, Changyuan, China, Jul. 26–29.
- 2013 "Analysis of corrosion of oil transmission pipelines in North America", the 7th Chinese National Corrosion Conference, Changyuan, China, Jul. 26–29.
- 2012 "Assessing the impacts of corrosion on pipeline integrity", the Canadian Institute's Pipeline Integrity Strategies Meeting, Calgary, Canada, Mar. 19–20.
- 2011 "Technical challenges of the high–strength steel pipeline technology", the 4th Chinese International Pipeline Conference, Langfang, China, Sept. 5–8.
- 2011 "Pipeline corrosion under disbanded coating", the 6th Chinese National Corrosion Congress, Yinchuan, China, Aug. 21–24.
- 2011 "New trends and challenges in development of high–strength steel pipeline technology", the 3rd Iranian Pipe and Pipeline Conference, Tehran, Iran, May 24–25.
- 2011 "Recent developments on monitoring of the coating disbondment", the 3rd Iranian Pipe and Pipeline Conference, Tehran, Iran, May 24–25.
- 2010 "Application of micro–electrochemical techniques in corrosion research", the 2010 National Corrosion Electrochemistry Conference, Hangzhou, China, Aug. 15–18.
- 2010 "Understand the fundamentals of stress corrosion cracking of high–strength pipeline steels", the 7th Taiwan–Mainland China Corrosion Conference, Kunming, China, Aug. 9–12.
- 2006 "Pipeline stress corrosion cracking: Experimental research and modeling development", the 14th Asia–Pacific Corrosion Control Conference, Shanghai, China, Oct. 21–24.
- 2005 "Fundamental research in pipeline corrosion and stress corrosion cracking", the 13th National Conference on Electrochemistry, Guangzhou, China, Nov. 24–28.

#### **Invited Seminars**

- 2015 "Technical challenges in maximizing pipeline integrity and safety", Safety Engineering Institute, SINOPEC, Qingdao, China, Dec. 17.

- 2015 "Uses of micro- and nano-electrochemical techniques in corrosion research", Shanghai University, Shanghai, China, Nov. 18.
- 2015 "R & D hot topics in pipeline corrosion", CH2M Breakfast Event, Calgary, Canada, Jun. 19.
- 2015 "Corrosion and cracking of high-strength steel pipelines", Xi-An Jiaotong University, Xi-An, China, Apr. 28.
- 2014 "Mechanism, modeling and management of internal corrosion of pipelines", Beijing Chemical Technology University, Beijing, China, Dec. 12.
- 2014 "An overview of microbiologically influenced corrosion of oil transmission pipelines", SPE-ICoTA Inter-Society Technical Event, Calgary, Canada, Sept. 10.
- 2014 "An overview of pipeline corrosion research", Safety Engineering Institute, SINOPEC, Qingdao, China, Jul. 15.
- 2014 "Mechanistic understanding and modeling prediction of internal corrosion of oil pipelines", Institute of Oceanology, Chinese Academy of Sciences, Qingdao, China, Jul. 14.
- 2014 "Initiation of pitting corrosion at non-metallic inclusions in X100 steel", 2014 Pipeline Materials Workshop, University of Alberta, Edmonton, Canada, May 30.
- 2014 "Canadian pipelines and corrosion management", Pipeline College, Petro-China, Langfang, China, May 19.
- 2014 "Pipeline integrity: An overview", ASME Southern Alberta Technical Luncheon, Calgary, Canada, Mar. 4.
- 2013 "Pipeline integrity: public concerns, root analysis and technology innovation", Engineering Associates Program (EAP) Breakfast, University of Calgary, Calgary, Canada, Nov. 22.
- 2013 "Internal corrosion of transmission pipelines in crude oil", Huazhong University of Science and Technology, Wuhan, China, Nov. 12.
- 2013 "Canadian pipelines: Opportunities and technical challenges", Rotary Club of Calgary Centennial, Calgary, Canada, Oct. 16.
- 2013 "Innovation in pipeline internal corrosion management by direct assessment", SINOPEC, Dazhou, China, Jul. 30.
- 2013 "Evolution of high-strength line pipe steels and the associated technical challenges", Capital Steel Group Research Center, Beijing, China, Jul. 25.
- 2013 "Corrosion at pipeline weld and its correlation with local microstructure", Pipeline Materials Welding Workshop, University of Alberta, Edmonton, Canada, May 29.
- 2013 "Pipeline as energy highway – An overview of pipelines in Canada", Generate 2013 Alberta Youth Energy Literacy Summit, Kananaskis, Canada, Mar. 15.

- 2012 "A mini-review of pipeline failure mechanisms", U.S. National Academy of Sciences (NAS), Washington DC, USA, Oct. 24.
- 2012 "Latest progress in pipeline corrosion and materials research", China University of Petroleum (East China), Qingdao, China, Jun. 11.
- 2012 "The fundamental aspects of pipeline corrosion and the associated monitoring, predictive and assessment techniques", Southwest Petroleum University, Chengdu, China, Jun. 7.
- 2012 "Mechanochemical effect of pipeline corrosion", Beijing University of Aeronautics and Astronautics, Beijing, China, Jun. 5.
- 2012 "Corrosion assessment and failure pressure prediction of pipelines under complex stress/strain conditions", TNO, Delft, The Netherlands, Apr. 3.
- 2012 "Measurements and mechanism of AC corrosion of pipelines and its effect on cathodic protection", Elsyca, Leuven, Belgium, Apr. 2.
- 2012 "Characterization of pipeline coatings and corrosion of steel under coating", University of Oxford, Oxford, U.K., Mar. 30.
- 2011 "Typical scenarios of pipeline corrosion and cracking: micro-electrochemical uses", Shanghai Jiao-Tong University, Shanghai, China, Dec. 5.
- 2011 "Metallurgical aspects of corrosion and cracking of high-strength pipeline steels", Politecnico di Milano, Milan, Italy, Nov. 2.
- 2011 "Fundamental aspects and research in pipeline corrosion", Chimie ParisTech, Paris, France, Oct. 24.
- 2011 "Studies of corrosion of pipelines by micro-electrochemical measurement techniques", Xiamen University, Xiamen, China, Aug. 12.
- 2011 "Risk assessment and integrity maintenance of oil/gas pipelines", China University of Geosciences, Wuhan, China, Jul. 18.
- 2011 "Application of advanced micro-electrochemical techniques in pipeline corrosion research", University of Western Ontario, London, Canada, Jun. 1.
- 2010 "Integrity management to address pipeline corrosion and stress corrosion cracking", Pipeline R & D Center of Petro-China, Langfang, China, Aug. 6.
- 2010 "Canadian pipeline development and research in stress corrosion cracking of line pipe steels", R&D Center of Wuhan Iron & Steel Co., Wuhan, China, Jul. 29.
- 2010 "An overview of pipeline corrosion research at the University of Calgary", Workshop for Pathway for Future Collaborations, Calgary, Canada, Mar. 3.
- 2009 "Improved safety and efficiency in pipeline operation", ASME International Southern Alberta Section Luncheon Meeting, Calgary, Canada, Nov. 26.

2008 "Electrochemical measurements in corrosion research I. Macroscopic electrodes", University of Science and Technology Beijing, China, Dec. 16.

2008 "Electrochemical measurements in corrosion research II. Microscopic electrodes", University of Science and Technology Beijing, China, Dec. 17.

## VIII. PUBLICATIONS

### Book

1. Y. Frank Cheng, *Stress Corrosion Cracking of Pipelines*, John Wiley Publishing, Hoboken, NJ, USA, Feb. 2013.

### Books

#### chapters

4. Frank Y. Cheng, Application of Micro-Electrochemical Techniques in Corrosion Research, in: *Green Corrosion Chemistry and Engineering*, S.K. Sharma, Editor, Wiley-VCH Publisher, Germany, 2011, p.71-96.
3. Frank Y. Cheng, Erosion Accelerated Corrosion in Flow System-Behavior of Aluminum Alloys in the Automotive Cooling System, in: *Tribocorrosion of Passive Metals and Alloys*, D. Landolt, S. Mischler, Eds, Woodhead Publishing, Cambridge, 2011, p. 475-497.
2. Y.F. Frank Cheng, Internal Corrosion of Pipelines in Oil/Gas Production, in: *Advances in Chemistry Research*, Volume 6, J.C. Taylor, Editor, ISBN 978-1-61728-982-8, Nova Science Publishers, Inc., New York, 2010.
1. Frank. Y. Cheng, Pipeline Engineering, in: Pipeline Engineering, Ed. Yufeng F. Cheng, in: *Encyclopedia of Life Support System*, Developed under the Auspices of the UNESCO, EOLSS Publishers, Oxford, UK, 2010.

### Papers in Peer-Reviewed Journals

145. Frank Cheng, Are our pipelines safe? *Nature*, accepted on Dec. 23, 2015.
  144. Huiwen Tian, Y. Frank Cheng, Novel inhibitors containing multi-functional groups for pipeline corrosion inhibition in oilfield formation water, *Corrosion*, accepted on Dec. 1, 2015.
  143. Zhong Wu, Y. Frank Cheng, Lei Liu, Weijie Lv, Wenbin Hu, Effects of elastic and plastic deformations on corrosion of an aluminum bronze alloy in NaCl solution, *Corrosion* 72 (2016) 33-41.
  142. Yuanhao Feng, Y. Frank Cheng, Inhibitive performance of benzotriazole for steel corrosion studied by electrochemical and AFM characterization, *Journal of Materials Engineering and Performance* 24 (2015) 4997-5001.

141. Huiwen Tian, Y. Frank Cheng, Weihua Li, Baorong Hou, Triazolyl-acylhydrazone derivatives as novel inhibitors for copper corrosion in chloride solutions, *Corrosion Science* 100 (2015) 341–352.
140. Da Kuang, Y. Frank Cheng, Study of cathodic protection shielding under coating disbondment on pipelines, *Corrosion Science* 99 (2015) 249–257.
139. Zhong Wu, Y. Frank Cheng, Lei Liu, Weijie Lv, Wenbin Hu, Effect of heat treatment on microstructure evolution and erosion–corrosion behaviour of a nickel–aluminum bronze alloy in chloride solution, *Corrosion Science* 98 (2015) 260–270.
138. Y. Frank Cheng, Pipeline corrosion, *Corrosion Engineering, Science and Technology* 50 (2015) 161–162.
137. D. Kuang, Y.F. Cheng, Probing potential and solution pH under disbonded coating on pipelines, *Materials Performance* 54 (2015) 40–45.
136. D. Kuang, Y.F. Cheng, Effect of alternating current interference on coating disbondment and cathodic protection shielding on pipelines, *Corrosion Engineering Science and Technology* 50 (2015) 211–217.
135. D. Kuang, Y.F. Cheng, AC corrosion at coating defect on pipelines, *Corrosion* 71 (2015) 267–276.
134. X.D. Zhao, Y.F. Cheng, W. Fan, C. Vladimir, V. Volha, T. Alla, Inhibitive performance of a rust converter on corrosion of mild steel, *Journal of Materials Engineering and Performance* 23 (2014) 4102–4108.
133. X.D. Zhao, J.Z. Duan, B.R. Hou, Y.F. Cheng, Corrosion of mild steel in sea mud containing sulfate–reducing bacteria, *Canadian Metallurgical Quarterly* 53 (2014) 450–454.
132. D. Kuang, Y.F. Cheng, Understand the AC induced pitting corrosion on pipelines in both high pH and neutral pH carbonate/bicarbonate solutions, *Corrosion Science* 85 (2014) 304–310.
131. R.J. Jiang, E. Slingerland, Y.F. Cheng, Corrosion of galvanized steel cord reinforcement in HDPE composite pipes in petroleum production, *Corrosion Engineering, Science and Technology* 49 (2014) 296–302.
130. X.Y. Peng, Y.F. Cheng, Hydrogen permeation and the resulting corrosion enhancement of pipeline steels, *Canadian Metallurgical Quarterly* 53 (2014) 107–111.
129. L.Y. Xu, Y.F. Cheng, Experimental and numerical studies of effectiveness of cathodic protection at corrosion defects on pipelines, *Corrosion Science* 78 (2014) 162–171.
128. C. Zhong, W.B. Hu, Y.F. Cheng, Recent advances in electrocatalysts for electro–oxidation of ammonia, *Journal of Materials Chemistry A* 1 (2013) 3216–3238.

127. D. Han, Y.F. Cheng, Mechanism of electrochemical corrosion of carbon steel under deoxygenated water drop and sand deposit, *Electrochimica Acta* 114 (2013) 403–408.
126. G.C. Liang, E. Sanjuan, Y.F. Cheng, Strain aging of X100 steel in service and the enhanced susceptibility of pipelines to stress corrosion cracking, *Journal of Materials Engineering and Performance* 22 (2013) 3778–3782.
125. G.C. Liang, X.Y. Peng, L.Y. Xu, Y.F. Cheng, Erosion–corrosion of carbon steel pipes in oil sands slurry studied by weight–loss testing and CFD simulation, *Journal of Materials Engineering and Performance* 22 (2013) 3043–3048.
124. X.Y. Peng, T.Y. Jin, Y.F. Cheng, Correlation of initiation of corrosion pits and metallurgical features of X100 pipeline steel, *Canadian Metallurgical Quarterly* 52 (2013) 484–487.
123. Y. Yang, Y.F. Cheng, Mechanistic aspects of electrodeposition of Ni–Co–SiC composite nano–coating on carbon steel, *Electrochimica Acta* 109 (2013) 638–644.
122. R.J. Jiang, Y.F. Cheng, Mechanism of electrochemical corrosion of steel under water drop, *Electrochemistry Communication* 35 (2013) 8–11.
121. Frank Cheng, Controversy contained: In–depth look at CP shielding, *World Pipelines* 13 (2013) (9) 50–54.
120. L.Y. Xu, Y.F. Cheng, Development of a finite element model for simulation and prediction of mechano–electrochemical effect of pipeline corrosion, *Corrosion Science* 73 (2013) 150–160.
119. X. Su, Z.X. Yin, Y.F. Cheng, Corrosion of 16Mn line pipe steel in an extracted soil solution and the implication on long–term corrosion behavior, *Journal of Materials Engineering and Performance* 22 (2013) 498–504.
118. Y. Yang, Y.F. Cheng, Fabrication of Ni–Co–SiC composite coatings by pulse electrodeposition – Effects of duty cycle and pulse frequency, *Surface and Coatings Technology* 216 (2013) 282–288.
117. H.B. Xue, Y.F. Cheng, Hydrogen permeation and electrochemical corrosion behavior of the X80 pipeline steel weld, *Journal of Materials Engineering and Performance* 22 (2013) 170–175.
116. L.Y. Xu, Y.F. Cheng, Effect of alternating current on cathodic protection on pipelines, *Corrosion Science* 66 (2013) 263–268.
115. J. Liu, C. Zhong, W.B. Hu, Y.F. Cheng, Surfactant–free electrochemical synthesis of hierarchical platinum particle electrocatalysts for oxidation of ammonia, *Journal of Power Sources* 223 (2013) 165–174.
114. L.Y. Xu, Y.F. Cheng, Corrosion of X100 pipeline steel under plastic strain in a neutral pH bicarbonate solution, *Corrosion Science* 64 (2012) 145–152.

113. L.Y. Xu, X. Su, Z.X. Yin, Y.H. Tang, Y.F. Cheng, Development of a real-time AC/DC data acquisition technique for studies of AC corrosion of pipelines, *Corrosion Science* 61 (2012) 215–223.
112. L.Y. Xu, Y.F. Cheng, An experimental investigation of corrosion of X100 steel under uniaxial elastic stress in a near-neutral pH solution, *Corrosion Science* 59 (2012) 103–109.
111. Y. Yang, Y.F. Cheng, Parametric effects on the erosion–corrosion rate and mechanism of carbon steel pipes in oil sands slurry, *Wear* 276–277 (2012) 141–148.
110. L.Y. Xu, Y.F. Cheng, Reliability and failure pressure prediction of various grades of pipeline steel in the presence of corrosion defects and pre-strain, *International Journal of Pressure Vessels and Piping* 89 (2012) 75–84.
109. C.F. Dong, K. Xiao, X.G. Li, Y.F. Cheng, In-situ characterization of pitting corrosion of stainless steel by a scanning electrochemical microscopy, *Journal of Materials Engineering and Performance* 21 (2012) 406–410.
108. Z.Y. Liu, X.G. Li, Y.F. Cheng, Understand the occurrence of pitting corrosion of pipeline steel under cathodic polarization, *Electrochimica Acta* 60 (2012) 259–263.
107. Z.Y. Liu, X.G. Li, Y.F. Cheng, Mechanistic aspect of near-neutral pH stress corrosion cracking of pipelines under cathodic polarization, *Corrosion Science* 55 (2012) 54–60.
106. A.Q. Fu, Y.F. Cheng, Effect of alternating current on corrosion and the effectiveness of cathodic protection of pipelines, *Canadian Metallurgical Quarterly* 51 (2012) 81–90.
105. C.F. Dong, K. Xiao, X.G. Li, Y.F. Cheng, Galvanic corrosion of a carbon steel–stainless steel couple in sulfide solutions, *Journal of Materials Engineering and Performance* 20 (2011) 1631–1637.
104. Z.Y. Liu, X.G. Li, Y.F. Cheng, Effect of strain rate on cathodic reaction during stress corrosion cracking of X70 steel in a near-neutral pH solution, *Journal of Materials Engineering and Performance* 20 (2011) 1242–1246.
103. A.Q. Fu, Y.F. Cheng, Characterization of the permeability of a high performance composite coating to cathodic protection and its implications on pipeline integrity, *Progress in Organic Coatings* 72 (2011) 423–428.
102. C. Zhong, W.B. Hu, Y.F. Cheng, On the essential role of current density in electrocatalytic activity of the electrodeposited platinum for oxidation of ammonia, *Journal of Power Sources* 196 (2011) 8064–8072.
101. L. Li, X.G. Li, C.F. Dong, Y.F. Cheng, A cellular automaton model for simulation of metastable pitting, *Corrosion Engineering Science and Technology* 46 (2011) 340–345.

100. X. Tang, Y.F. Cheng, Quantitative characterization by micro-electrochemical measurements of the synergism of hydrogen, stress and dissolution on near-neutral pH stress corrosion cracking of pipelines, *Corrosion Science* 53 (2011) 2927–2933.
99. Z.Y. Liu, X.G. Li, Y.F. Cheng, Electrochemical state conversion model for occurrence of pitting corrosion on a cathodically polarized carbon steel in a near-neutral pH solution, *Electrochimica Acta* 56 (2011) 4167–4175.
98. Y. Liu, Y.F. Cheng, Inhibiting effect of cerium ions on corrosion of 3003 aluminum alloy in ethylene glycol–water solutions, *Journal of Applied Electrochemistry* 41 (2011) 383–388.
97. G.A. Zhang, Y.F. Cheng, Localized corrosion of carbon steel in a CO<sub>2</sub>-saturated oilfield formation water, *Electrochimica Acta*, 56 (2011) 1676–1685.
96. H.B. Xue, Y.F. Cheng, Characterization of microstructure of X80 pipeline steel and its correlation with hydrogen-induced cracking, *Corrosion Science* 53 (2011) 1201–1208.
95. Y. Liu, Y.F. Cheng, Inhibition of corrosion of 3003 aluminum alloy in ethylene glycol–water solution, *Journal of Materials Engineering and Performance* 20 (2011) 271–275.
94. Y. Liu, Y.F. Cheng, Characterization of passivity and pitting corrosion of 3003 aluminum alloy in ethylene glycol–water solutions, *Journal of Applied Electrochemistry* 41 (2011) 151–159.
93. Y. Yang, Y.F. Cheng, Electrolytic deposition of Ni–Co–SiC nano-coating for erosion-enhanced corrosion of carbon steel pipes in oil sands slurry, *Surface and Coating Technology* 205 (2011) 3198–3204.
92. T.Y. Jin, Y.F. Cheng, In-situ characterization by localized electrochemical impedance spectroscopy of the electrochemical activity of microscopic inclusions in an X100 steel, *Corrosion Science* 53 (2011) 850–853.
91. C. Zhang, Y.F. Cheng, Synergistic effects of hydrogen and stress on corrosion of X100 pipeline steel in a near-neutral pH solution, *Journal of Materials Engineering and Performance* 19 (2010) 1284–1289.
90. H.B. Xue, Y.F. Cheng, Electrochemical corrosion behavior of X80 pipeline steel in a near-neutral pH solution, *Materials and Corrosion* 61 (2010) 756–761.
89. H.B. Xue, Y.F. Cheng, Passivity and pitting of X80 pipeline steel in carbonate/bicarbonate solution studied by electrochemical techniques, *Journal of Materials Engineering and Performance* 19 (2010) 1311–1317.
88. C.F. Dong, K. Xiao, X.G. Li, Y.F. Cheng, Erosion accelerated corrosion of a carbon steel–stainless steel galvanic couple in a chloride solution, *Wear* 270 (2010) 39–45.

87. C.F. Dong, H. Sheng, Y.H. An, X.G. Li, K. Xiao, Y.F. Cheng, Corrosion of 7A04 aluminum alloy under defected epoxy coating studied by localized electrochemical impedance spectroscopy, *Progress in Organic Coatings* 67 (2010) 269–273.
86. Z.Y. Liu, X.G. Li, Y.F. Cheng, In-situ characterization of the electrochemistry of grain and grain boundary of an X70 steel in a near-neutral pH solution, *Electrochemistry Communication* 12 (2010) 936–938.
85. Y. Liu, Y.F. Cheng, Effects of coolant chemistry on corrosion of 3003 aluminum alloy in automotive cooling system, *Materials and Corrosion* 61 (2010) 574–579.
84. T.Y. Jin, Y.F. Cheng, Effects of non-metallic inclusions on hydrogen-induced cracking of API5L X100 steel, *International Journal of Hydrogen Energy* 35 (2010) 8014–8021.
83. C. Zhang, Y.F. Cheng, Corrosion of welded X100 pipeline steel in a near-neutral pH solution, *Journal of Materials Engineering and Performance* 19 (2010) 834–840.
82. H.B. Xue, Y.F. Cheng, Photo-electrochemical studies of the local dissolution of a hydrogen-charged X80 steel at crack-tip in a near-neutral pH solution, *Electrochimica Acta* 55 (2010) 5670–5676.
81. Y. Liu, Y.F. Cheng, Role of second phase particles in pitting corrosion of 3003 Al alloy in NaCl solution, *Materials and Corrosion* 61 (2010) 211–217.
80. A.Q. Fu, Y.F. Cheng, Electrochemical polarization behavior of X70 steel in thin carbonate/bicarbonate solution layers trapped under a disbonded coating and its implication on pipeline SCC, *Corrosion Science* 52 (2010) 2511–2518.
79. G.A. Zhang, Y.F. Cheng, Electrochemical characterization and computational fluid dynamics simulation of flow-accelerated corrosion of X65 steel in a CO<sub>2</sub>-saturated oilfield formation water, *Corrosion Science* 52 (2010) 2716–2724.
78. T. Li, X.G. Li, C.F. Dong, Y.F. Cheng, Characterization of atmospheric corrosion of 2A12 aluminum alloy in a tropical marine environment, *Journal of Materials Engineering and performance* 19 (2010) 591–598.
77. G.A. Zhang, Y.F. Cheng, Micro-electrochemical characterization of corrosion of pre-cracked X70 pipeline steel in a concentrated carbonate/bicarbonate solution, *Corrosion Science* 52 (2010) 960–968.
76. A.Q. Fu, Y.F. Cheng, Effects of alternating current on corrosion of a coated pipeline steel in a chloride-containing carbonate/bicarbonate solution, *Corrosion Science* 52 (2010) 612–619.
75. C.F. Dong, Z.Y. Liu, X.G. Li, Y.F. Cheng, Effects of hydrogen-charging on the susceptibility of X100 pipeline steel to hydrogen-induced cracking, *International Journal of Hydrogen Energy* 34 (2009) 9879–9884.

74. Z.Y. Liu, X.G. Li, C.W. Du, Y.F. Cheng, Local additional potential model for effect of strain rate on SCC of pipeline steel in an acidic soil solution, *Corrosion Science* 51 (2009) 2863–2871.
73. G.A. Zhang, Y.F. Cheng, Micro-electrochemical characterization and Mott-Schottky analysis of corrosion of welded X70 pipeline steel in carbonate/bicarbonate solution, *Electrochimica Acta* 55 (2009) 316–324.
72. L. Niu, Y.F. Cheng, Erosion-corrosion of aluminum alloy in ethylene glycol-water solutions in the absence and presence of sand particles, *Corrosion Engineering Science and Technology* 44 (2009) 389–393.
71. L.Y. Xu, Y.F. Cheng, Effect of fluid hydrodynamics on flow-assisted corrosion of aluminum alloy in ethylene glycol-water solution studied by a microelectrode technique, *Corrosion Science* 51 (2009) 2330–2339.
70. X. Chen, X.G. Li, C.W. Du, Y.F. Cheng, Effect of cathodic protection on corrosion of pipeline steel under disbonded coating, *Corrosion Science* 51 (2009) 2242–2245.
69. G.A. Zhang, Y.F. Cheng, Micro-electrochemical characterization of corrosion of welded X70 pipeline steel in near-neutral pH solution, *Corrosion Science* 51 (2009) 1714–1724.
68. Z.Y. Liu, C.F. Dong, X.G. Li, Q. Zhi, Y.F. Cheng, Stress corrosion cracking of 2205 duplex stainless steel in H<sub>2</sub>S-CO<sub>2</sub> environment, *Journal of Materials Science* 44 (2009) 4228–4234.
67. G.A. Zhang, Y.F. Cheng, Corrosion of X65 steel in CO<sub>2</sub>-saturated oilfield formation water in the absence and presence of acetic acid, *Corrosion Science* 51 (2009) 1589–1595.
66. Z.J. Jia, X.G. Li, C.F. Dong, Y.F. Cheng, Analysis of corrosion of hot-rolled X70 steel plate during storage, *Engineering Failure Analysis* 16 (2009) 2342–2347.
65. Y. Liu, Y.F. Cheng, Cathodic reaction kinetics and its implication on flow-assisted corrosion of aluminum alloy in aqueous ethylene glycol solution, *Journal of Applied Electrochemistry* 39 (2009) 1267–1272.
64. C.F. Dong, H.B. Xue, X.G. Li, H.B. Qi, Y.F. Cheng, Electrochemical corrosion behavior of hot-rolled steel under oxide scale in chloride solution, *Electrochimica Acta* 54 (2009) 4223–4228.
63. Y. Liu, G.Z. Meng, Y.F. Cheng, Electronic structure and pitting behavior of 3003 aluminum alloy passivated under various conditions, *Electrochimica Acta* 54 (2009) 4155–4163.
62. G.A. Zhang, Y.F. Cheng, Electrochemical corrosion of X65 pipe steel in oil-water emulsion, *Corrosion Science* 51 (2009) 901–907.

61. A.Q. Fu, Y.F. Cheng, Characterization of corrosion of X65 pipeline steel under disbonded coating by scanning Kelvin probe, *Corrosion Science* 51 (2009) 914–920.
60. Z.Y. Liu, X.G. Li, C.W. Du, L. Lu, Y.R. Zhang, Y.F. Cheng, Effect of inclusions on initiation of stress corrosion cracks in X70 pipeline steel in an acidic soil environment, *Corrosion Science* 51 (2009) 895–900.
59. C.W. Du, X.G. Li, P. Liang, Z.Y. Liu, G.F. Jia, Y.F. Cheng, Effects of microstructure on corrosion of X70 pipe steel in an alkaline soil, *Journal of Materials Engineering and Performance* 18 (2009) 216–220.
58. L. Zhang, X.G. Li, C.W. Du, Y.F. Cheng, Corrosion and stress corrosion cracking behavior of X70 pipeline steel in a CO<sub>2</sub>-containing solution, *Journal of Materials Engineering and Performance* 18 (2009) 319–323.
57. X.H. Nie, X.G. Li, C.W. Du, Y.F. Cheng, Temperature dependence of electrochemical corrosion characteristics of carbon steel in a salty soil, *Journal of Applied Electrochemistry* 39 (2009) 277–282.
56. G.A. Zhang, L.Y. Xu, Y.F. Cheng, Investigation of erosion–corrosion of 3003 aluminum alloy in ethylene glycol–water solution by impingement jet system, *Corrosion Science* 51 (2009) 283–290.
55. G.A. Zhang, Y.F. Cheng, On the fundamentals of electrochemical corrosion of X65 steel in CO<sub>2</sub>-containing formation water in the presence of acetic acid in petroleum production, *Corrosion Science* 51 (2009) 87–94.
54. A.Q. Fu, X. Tang, Y.F. Cheng, Characterization of corrosion of X70 pipeline steel in thin electrolyte layer under disbonded coating by scanning Kelvin probe, *Corrosion Science* 51 (2009) 186–190.
53. X. Tang, Y.F. Cheng, Micro–electrochemical characterization of the effect of applied stress on local anodic dissolution behavior of pipeline steel under near–neutral pH condition, *Electrochimica Acta* 54 (2009) 1499–1505.
52. K. Yao, Y.F. Cheng, Fabrication by electrodeposition of Pt–Ni electrocatalyst for oxidation of ammonia in alkaline solution, *International Journal of Hydrogen Energy* 33 (2008) 6681–6686.
51. G.Z. Meng, C. Zhang, Y.F. Cheng, Effects of corrosion product deposit on the subsequent cathodic and anodic reactions of X–70 steel in near–neutral pH solution, *Corrosion Science* 50 (2008) 3116–6122.
50. L. Zhou, Y.F. Cheng, Catalytic electrolysis of ammonia on platinum in alkaline solution for hydrogen generation, *International Journal of Hydrogen Energy* 33 (2008) 5897–5904.
49. C.F. Dong, A.Q. Fu, X.G. Li, Y.F. Cheng, Localized EIS characterization of corrosion of steel at coating defect under cathodic protection, *Electrochimica Acta* 54 (2008) 628–633.

48. G.A. Zhang, L.Y. Xu, Y.F. Cheng, Mechanistic aspects of electrochemical corrosion of aluminum alloy in ethylene glycol–water solution, *Electrochimica Acta* 53 (2008) 8245–8252.
47. Z.Y. Liu, X.G. Li, C.W. Du, G.L. Zhai, Y.F. Cheng, Stress corrosion cracking behaviour of X70 pipe steel in an acidic soil environment, *Corrosion Science* 50 (2008) 2251–2257.
46. L.Y. Xu, Y.F. Cheng, Electrochemical characterization and CFD simulation of flow–assisted corrosion of aluminum alloy in ethylene glycol–water solution, *Corrosion Science* 50 (2008) 2094–2100.
45. X. Tang, Y.F. Cheng, Localized dissolution electrochemistry at surface irregularities of pipeline steel, *Applied Surface Science* 254 (2008) 5199–5205.
44. X. Tang, L.Y. Xu, Y.F. Cheng, Electrochemical corrosion behaviour of X–65 steel in the simulated oil sand slurry. II: Synergism of erosion and corrosion, *Corrosion Science* 50 (2008) 1469–1474.
43. C. Zhong, X. Tang, Y.F. Cheng, Corrosion of steel under the defected coating studied by localized electrochemical impedance spectroscopy, *Electrochimica Acta* 53 (2008) 4740–4747.
42. B.R. Tian, Y.F. Cheng, Electrochemical corrosion behaviour of X–65 steel in the simulated oil sand slurry. I: Effects of hydrodynamic condition, *Corrosion Science* 50 (2008) 773–779.
41. L. Niu, Y.F. Cheng, Synergistic effects of fluid flow and sand particles on erosion–corrosion of aluminum in ethylene glycol–water solutions, *Wear* 265 (2008) 367–374.
40. L. Zhou, Y.F. Cheng, M. Amrein, Fabrication by electrolytic deposition of platinum black electrocatalyst for oxidation of ammonia in alkaline solution, *Journal of Power Sources* 177 (2008) 50–55.
39. M.C. Li, Y.F. Cheng, Corrosion of the stressed pipe steel in carbonate–bicarbonate solution studied by scanning localized electrochemical impedance spectroscopy, *Electrochimica Acta* 53 (2008) 2831–2836.
38. K. Yao, Y.F. Cheng, Investigation of the electrocatalytic activity of nickel for ammonia oxidation, *Materials Chemistry and Physics* 108 (2008) 247–250.
37. L. Niu, Y.F. Cheng, Development of innovative coating technology for pipeline operation crossing permafrost terrain, *Construction and Building Materials* 22 (2008) 417–422.
36. B.R. Tian, Y.F. Cheng, Electrolytic deposition of Ni–Co–Al<sub>2</sub>O<sub>3</sub> composite coating on pipe steel for corrosion/erosion resistance in oil sand slurry, *Electrochimica Acta* 53 (2007) 511–517.

35. K. Yao, Y.F. Cheng, Electrodeposited Ni-Pt binary alloys as electrocatalysts for oxidation of ammonia, *Journal of Power Sources* 173 (2007) 96-101.
34. G.R. Howell, Y.F. Cheng, Characterization of high performance composite coating for the northern pipeline application, *Progress in Organic Coatings* 60 (2007) 148-152.
33. L. Niu, Y.F. Cheng, Electrochemical characterization of metastable pitting of 3003 aluminum alloy in ethylene glycol-water solution, *Journal of Materials Science* 42 (2007) 8613-8617.
32. M.C. Li and Y.F. Cheng, Mechanistic investigation of hydrogen-enhanced anodic dissolution of X-70 pipe steel and its implication on near-neutral pH SCC of pipelines, *Electrochimica Acta* 52 (2007) 8111-8117.
31. L. Niu, Y.F. Cheng, Corrosion behaviour of X-70 pipe steel in near-neutral pH solution, *Applied Surface Science* 253 (2007) 8626-8631.
30. L. Niu, Y.F. Cheng, Application of electrochemical techniques in investigation of the role of hydrogen in near-neutral pH stress corrosion cracking of pipelines, *Journal of Materials Science* 42 (2007) 3425-3434.
29. Y.F. Cheng, Analysis of electrochemical hydrogen permeation through X-65 pipeline steel and its implications on pipeline stress corrosion cracking, *International Journal of Hydrogen Energy* 32 (2007) 1269-1276.
28. Y.F. Cheng, Thermodynamically modeling the interactions of hydrogen, stress and anodic dissolution at crack-tip during near-neutral pH SCC in pipelines, *Journal of Materials Science* 42 (2007) 2701-2705.
27. Y.F. Cheng, Fundamentals of hydrogen evolution reaction and its implications on near-neutral pH stress corrosion cracking of pipelines, *Electrochimica Acta* 52 (2007) 2661-2667.
26. Y.F. Cheng, L. Niu, Mechanism for hydrogen evolution reaction on pipeline steel in near-neutral pH solution, *Electrochemistry Communication* 9 (2007) 558-562.
25. B.R. Tian, Y.F. Cheng, Erosion-corrosion of hydrotransport pipes in oil sand slurries, *Bulletin of Electrochemistry* 22 (2006) 329-335.
24. Y.F. Cheng, Thermodynamically modeling the interactions of stress and anodic dissolution at crack tip during carbon steel stress corrosion cracking in high temperature water, *Bulletin of Electrochemistry* 22 (2006) 31-34.
23. Y.F. Cheng, Studies of X-65 pipeline steel corrosion in solutions containing carbon dioxide by electrochemical techniques, *Bulletin of Electrochemistry* 21 (2005) 503-509.
22. Y.F. Cheng, F.R. Steward, Corrosion of feeder pipe steels in high temperature water, *Corrosion Science* 46 (2004) 2405-2415.

21. Y.F. Cheng, J. Bullerwell, F.R. Steward, Electrochemical investigation of the corrosion and cracking behavior of chromium-modified pipe steels in the primary coolant in CANDU reactor, *Electrochimica Acta* 48 (2003) 1521–1530.
20. Y.F. Cheng, C. Yang, J.L. Luo, Determination of the diffusivity of point defects in passive films on carbon steel, *Thin Solid Films* 416 (2002) 169–173.
19. Y.F. Cheng, M. Wilmott, J.L. Luo, Application of electrochemical noise resistance in carbon steel corrosion, *Portugaliae Electrochimica Acta* 19 (2001) 43–51.
18. Y.F. Cheng, J.L. Luo, Factors affecting the measurements and analysis of electrochemical noise during carbon steel corrosion, *Bulletin of Electrochemistry* 17 (2001) 97–102.
17. Y.F. Cheng, M. Wilmott, J.L. Luo, Electrochemical noise and impedance characteristics of carbon steel corrosion in chloride solutions, *Bulletin of Electrochemistry* 17 (2001) 433–439.
16. Y.F. Cheng, M. Wilmott, J.L. Luo, Spectral analysis of electrochemical noise with different transient shapes, *Electrochimica Acta* 45 (2000) 1763–1771.
15. Y.F. Cheng, J.L. Luo, Comparison of pitting susceptibility and semiconducting properties of the passive films on carbon steel in chromate and bicarbonate solutions, *Applied Surface Science* 167 (2000) 113–121.
14. Y.F. Cheng, M. Wilmott, J.L. Luo, Analysis of the noise features at different stages during steel pitting in chloride solutions, *Bulletin of Electrochemistry* 16 (2000) 187–192.
13. Y.F. Cheng, J.L. Luo, Statistical analysis of metastable pitting events on carbon steel, *British Corrosion Journal* 35 (2000) 125–130.
12. Y.F. Cheng, J.L. Luo, Passivity and pitting of carbon steel in chromate solutions, *Electrochimica Acta* 44 (1999) 4795–4804.
11. Y.F. Cheng, M. Wilmott, J.L. Luo, Transition criterion of metastable pitting towards stability for carbon steel in chloride solutions, *British Corrosion Journal* 34 (1999) 280–286.
10. Y.F. Cheng, J.L. Luo, Electronic structure and pitting susceptibility of passive film on carbon steel, *Electrochimica Acta* 44 (1999) 2947–2957.
9. Y.F. Cheng, J.L. Luo, Metastable pitting of carbon steel under potentiostatic control, *Journal of the Electrochemical Society* 146 (1999) 970–978.
8. Y.F. Cheng, M. Wilmott, J.L. Luo, The role of chloride ions in pitting of carbon steel studied by statistical analysis of electrochemical noise, *Applied Surface Science* 152 (1999) 161–168.

7. Y.F. Cheng, M. Wilmott, J.L. Luo, Analysis of the role of electrode capacitance on the initiation of pits for A516 carbon steel by electrochemical noise measurements, *Corrosion Science* 41 (1999) 1245–1255.
6. Y.F. Cheng, B. Rairdan, J.L. Luo, Features of electrochemical noise generated during pitting of inhibited A516–70 carbon steel in chloride solutions, *Journal of Applied Electrochemistry* 28 (1998) 1371–1377.
5. Y.F. Cheng, J.L. Luo, Y.L. Du, C.N. Cao, Monitoring of galvanic current of dual-electrode ACM covered with thin electrolyte film, *Bulletin of Electrochemistry* 13 (1997) 280–285.
4. Y.F. Cheng, J.L. Luo, Y.L. Du, C.N. Cao, Inhibition behavior of cyclohexylamine phosphate on iron in sodium sulfate solution, *Bulletin of Electrochemistry* 13 (1997) 145–151.
3. Y.F. Cheng, Y.L. Du, Development of an electrochemical probe for monitoring hydrogen-induced cracking susceptibility of boiler pipe in pickling, *British Corrosion Journal* 32 (1997) 206–211.
2. Y.F. Cheng, Y.L. Du, Fracture mechanism of UNS G10190 steel in hydrochloric acid containing ferric ions, *Journal of Materials Science and Technology* 12 (1996) 223–230.
1. Y.F. Cheng, Y.L. Du, Development of hydrogen sensor for monitoring the susceptibility of steels to hydrogen-induced cracking, *Corrosion* 53 (1993) 776–784.

### **Conference Presentations and Proceedings**

70 conferences papers and presentations. The invited Plenary and Keynote talks are listed in Section VII. Other talks and the papers are not listed.

**January 13, 2016**

Mr. Donald Porter  
President  
BP Pipelines (North America), Inc.  
150 W. Warrenville Road  
Naperville, IL 60563

**Re: CPF No. 5-2015-5014**

Dear Mr. Porter:

Enclosed please find the Final Order issued in the above-referenced case to your affiliate, Olympic Pipe Line Company. It makes findings of violation and specifies actions that need to be taken by Olympic Pipe Line Company to comply with the pipeline safety regulations. When the terms of the compliance order have been completed, as determined by the Director, Western Region, this enforcement action will be closed. Service of the Final Order by certified mail is deemed effective upon the date of mailing, or as otherwise provided under 49 C.F.R. § 190.5.

Thank you for your cooperation in this matter.

Sincerely,

Jeffrey D. Wiese  
Associate Administrator  
for Pipeline Safety

Enclosure

cc: Mr. Chris Hoidal, Director, Western Region, OPS  
Ms. Clorinda Nothstein, Operations Manager, BP Pipelines (North America), Inc.

**CERTIFIED MAIL - RETURN RECEIPT REQUESTED**

## FINDINGS OF VIOLATION

In its Response, OPL did not contest the allegations in the Notice that it violated 49 C.F.R. Part 195, as follows:

**Item 1:** The Notice alleged that Respondent violated 49 C.F.R. § 195.573(e), which states:

**§ 195.573 What must I do to monitor external corrosion control?**

(a) . . .

(e) *Corrective action.* You must correct any identified deficiency in corrosion control as required by §195.401(b). However, if the deficiency involves a pipeline in an integrity management program under §195.452, you must correct the deficiency as required by §195.452(h).

The Notice alleged that Respondent failed to correct identified deficiencies in its corrosion control system that could adversely affect the safe operation of the pipeline, as required by 49 C.F.R. § 195.401(b). That section provides, in relevant part:

**§ 195.401 General requirements.**

(a) . . .

(b) An operator must make repairs on its pipeline system according to the following requirements:

(1) *Non Integrity management repairs.* Whenever an operator discovers any condition that could adversely affect the safe operation of its pipeline system, it must correct the condition within a reasonable time.

The Notice also alleged that Respondent violated 49 C.F.R. § 195.452(h)(1), cited in § 195.573(e), which states:

**§ 195.452 Pipeline integrity management in high consequence areas.**

(a) *Which pipelines are covered by this section?* This section applies to each hazardous liquid pipeline and carbon dioxide pipeline that could affect a high consequence area, including any pipeline located in a high consequence area unless the operator effectively demonstrates by risk assessment that the pipeline could not affect the area. . .

(h) *What actions must an operator take to address integrity issues?*

(1) *General requirements.* An operator must take prompt action to address all anomalous conditions the operator discovers through the integrity assessment or information analysis. In addressing all conditions, an operator must evaluate all anomalous conditions and remediate those that could reduce a pipeline's integrity. An operator must be able to demonstrate that the remediation of the condition will ensure the condition is unlikely to pose a threat to the long-term integrity of the pipeline. An operator must comply with §195.422 when making a repair.

The Notice alleged that Respondent failed to correct deficiencies in its corrosion control system

within a reasonable time, in accordance with § 195.401(b)(1). According to the Notice, in 2010 Respondent performed an in-line-inspection (ILI) that revealed discrepancies in the ILI data, revealing unrecorded casings on the pipeline system. Subsequent excavations performed by Respondent revealed additional unrecorded casings, sleeves, and half-sections of pipe at several locations. In 2011, OPL allegedly initiated a “Casing Wire Repairs” project to further evaluate and repair casing deficiencies within a 10-year time frame. The Notice alleged that Respondent’s 10-year time frame to complete the inspections and repairs was not a reasonable period of time in which to correct the identified deficiencies.

In addition, the Notice alleged that OPL violated 49 C.F.R. § 195.452(h)(1) by failing to take prompt action to address all anomalous conditions in high consequence areas (HCAs).<sup>2</sup> Specifically, the Notice alleged that Respondent’s “Casing Wire Repairs” project did not differentiate between anomalous conditions discovered in HCA areas versus non-HCA areas and that the company’s 10-year time frame for completing the project did not constitute prompt action for remediating deficiencies found in such areas.

Respondent did not contest these allegations of violation. Accordingly, based upon a review of all of the evidence, I find that Respondent violated 49 C.F.R. §§ 195.573(e), 195.401(b)(1), and 195.452(h)(1), by failing to correct identified deficiencies in corrosion control within a reasonable time and to take prompt action to address all anomalous conditions that could affect HCAs discovered through its integrity assessment or information analysis.

**Item 2:** The Notice alleged that Respondent violated 49 C.F.R. § 195.575(c), which states:

**§ 195.575 Which facilities must I electrically isolate and what inspections, tests, and safeguards are required?**

(a) . . .

(c) You must inspect and electrically test each electrical isolation to assure the isolation is adequate.

The Notice alleged that Respondent violated 49 C.F.R. § 195.575(c) by failing to test the electrical isolation of each buried pipeline in the OPI system to assure that the isolation was adequate. Specifically, the Notice alleged the Respondent failed to test the electrical isolation of previously unrecorded casings, as described in Item 1 above, to ensure that the isolation from other metallic structures was adequate. The Notice alleged that several casings were not present on alignment sheets or other cathodic protection records, indicating previously unrecorded pipelines had not been tested for adequate isolation.

Respondent did not contest this allegation of violation. Accordingly, based upon a review of all of the evidence, I find that Respondent violated 49 C.F.R. § 195.575(c), by failing to

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<sup>2</sup> An HCA is defined as: (1) a *commercially navigable waterway*, which means a waterway where a substantial likelihood of commercial navigation exists; (2) a *high population area*, which means an urbanized area, as defined and delineated by the Census Bureau, that contains 50,000 or more people and has a population density of at least 1,000 per square mile; (3) an *other populated area*, which means a place, as defined and delineated by the Census Bureau, that contains a concentrated population, such as an incorporated or unincorporated city, town, village, or other designated residential or commercial area; and (4) an *unusually sensitive area*. See 49 C.F.R. § 195.450.

test the electrical isolation of each buried pipeline to assure that the isolation was adequate.

These findings of violation will be considered prior offenses in any subsequent enforcement action taken against Respondent.

### **COMPLIANCE ORDER**

The Notice proposed a compliance order with respect to Items 1 and 2 in the Notice for violations of 49 C.F.R. §§ 195.573(e) and 195.575(c), respectively. Under 49 U.S.C. § 60118(a), each person who engages in the transportation of hazardous liquids or who owns or operates a pipeline facility is required to comply with the applicable safety standards established under chapter 601. In its Response, OPL indicated that it had taken certain actions to comply with the Proposed Compliance Order. The Director has reviewed such actions and recommended that this Compliance Order be modified accordingly. Therefore, pursuant to the authority of 49 U.S.C. § 60118(b) and 49 C.F.R. § 190.217, Respondent is ordered to take the following actions to ensure compliance with the pipeline safety regulations applicable to its operations:

1. With respect to the violations of § 195.573(e) (**Item 1**) and § 195.575(c) (**Item 2**), Respondent must:

A. Schedule the “Casings Wire Repair” project to mitigate all remaining indications in HCAs and non-HCAs no later than 18 months from the date of this Order;

B. Determine whether additional casings exist on its pipeline. Update maps and records, as necessary, to ensure all programmatic systems which use this data, including IMP, are accurate; and

C. Submit changes to the “Casing Wire Repair” project within 30 days after the receipt of this Final Order to Mr. Chris Hoidal, Director, Western Region, Pipeline and Hazardous Materials Safety Administration.

2. It is requested (not mandated), that Respondent maintain documentation of the safety improvement costs associated with fulfilling this Final Order and submit the total to Mr. Chris Hoidal, Director, Western Region, Pipeline and Hazardous Materials Safety Administration. It is requested these costs be reported in two categories: 1) total costs associated with preparation/revision of plans, procedures, studies and analyses; and 2) total cost associated with replacements, additions and other changes to pipeline infrastructure.

The Director may grant an extension of time to comply with any of the required items upon a written request timely submitted by the Respondent and demonstrating good cause for an extension.

Failure to comply with this Order may result in the administrative assessment of civil penalties

not to exceed \$200,000 for each violation for each day the violation continues or in referral to the Attorney General for appropriate relief in a district court of the United States.

Under 49 C.F.R. § 190.243, Respondent has a right to submit a Petition for Reconsideration of this Final Order. The petition must be sent to: Associate Administrator, Office of Pipeline Safety, PHMSA, 1200 New Jersey Avenue, SE, East Building, 2<sup>nd</sup> Floor, Washington, DC 20590, with a copy sent to the Office of Chief Counsel, PHMSA, at the same address. PHMSA will accept petitions received no later than 20 days after receipt of service of this Final Order by the Respondent, provided they contain a brief statement of the issue(s) and meet all other requirements of 49 C.F.R. § 190.243. Unless the Associate Administrator, upon request, grants a stay, the terms and conditions of this Final Order are effective upon service in accordance with 49 C.F.R. § 190.5.

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Jeffrey D. Wiese  
Associate Administrator  
for Pipeline Safety

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Date Issued

# The Best Alternative

## Executive Summary

PSE and CENSE (Coalition of Eastside Neighborhoods for Sensible Energy) may not agree on the feasibility of the company's proposed transmission project through four Eastside cities.

But at least we agree on one thing. The five alternative solutions evaluated in the Draft EIS are not practical solutions to power future growth of the Eastside.

- **Alternative 1B** (use existing Seattle City Light corridor): Seattle City Light has said they don't want to share these lines with PSE. We don't know how to change that conclusion.
- **Alternative 1C** (underground transmission lines): The state tariff enforced by the Washington Utilities and Transportation Commission makes it prohibitively expensive for communities to request undergrounding.
- **Alternative 1D** (underwater transmission lines): This alternative may be subject to the same expensive undergrounding tariff, and also raises questions about disturbing a Superfund site, shoreline issues, and concerns about salmon.
- **Alternative 2** (integrated resource approach): The analysis of integrated resources is based on incorrect or obsolete information, making this option appear more expensive and less feasible than it actually is.
- **Alternative 3** (new 115 kV lines and transformers): With 60 miles of new transmission lines, this alternative does not seem like an attractive or realistic option to anyone.

Alternative 2 would be the most attractive option for residents and businesses if it were redesigned using more up-to-date and accurate information. Such a solution would be less expensive, less damaging to communities and the environment, and safer for homes and schools in close proximity to the power lines and high-pressure petroleum pipelines.

Sadly, Alternative 2 was not designed or reviewed by experts in new technologies that make Demand Response and Electrical Efficiency the most important factors in planning the electrical grid of the future. This is validated by a quote from the Northwest Power Plan<sup>1</sup> that was finalized this year:

*In more than 90 percent of future conditions, cost-effective efficiency met all electricity load growth through 2035. It's not only the single largest contributor to meeting the region's future electricity needs, it's also the single largest source of new winter peaking capacity.*

EQL's full report is included following this introduction. The full report is quite detailed and technical. It may be more appropriate for analysis by industry experts, so this introduction attempts to distill the main points for the general public.

<sup>1</sup> [https://www.nwcouncil.org/media/7149671/7thplandraft\\_chap01\\_execsummary\\_20151020.pdf](https://www.nwcouncil.org/media/7149671/7thplandraft_chap01_execsummary_20151020.pdf)

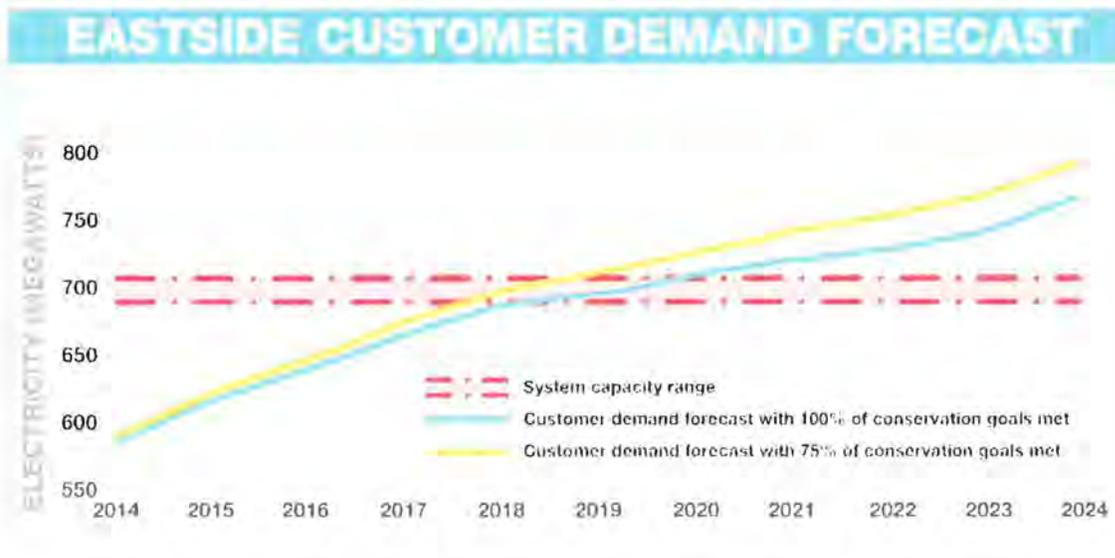
## A clear definition of need and cost

In order to determine the feasibility of any alternative solution, it is important to be clear about two crucial parameters:

1. How big is the need? Or, as the DEIS poses the question in section 2.3.3, what is the “projected deficiency in transmission capacity on the Eastside?”
2. What is the relative cost of alternatives compared to the cost of PSE’s proposed project?

### How big is the need?

In section 2.3.3, the DEIS says that Alternative 2 must cover 205 MW of projected shortfall by 2024. It is not clear in the DEIS where this number comes from. It is nearly three times the shortfall of approximately 70 MW shown for 2024 in PSE’s famous Eastside Customer Demand Forecast:



The DEIS explains that Alternative 2 must be evaluated by a different standard than a solution based on transmission lines because “every solution has a different degree of effectiveness and reliability.” The DEIS seems to dwell on every possible downside of the technologies included in Alternative 2 while turning a blind eye to the reliability risks of Alternative 1A. For example, suppose two of the approximately 150 power poles in PSE’s proposal fall down (a scenario we are allowed to consider under N-1-1 contingency planning, and not hard to imagine during a big earthquake). In that case, the capacity of Alternative 1A would be reduced by 20%, about 140 MW. It is difficult to imagine a scenario in which an N-1-1 failure would lead to a similar drop in capacity for Alternative 2. It improves reliability by not placing all our eggs in one basket.

There is evidence that PSE has been gradually skewing requirements to reduce the competitiveness of alternatives. In April 2015, an update to Quanta's Eastside Needs Assessment estimated the shortfall in transmission capacity at 123 MW. A few months later, the EIS consultant Stantec raised the estimate to 133 MW. In January 2016, PSE's latest Integrated Resource Plan pegged the number at 166 MW. A few weeks later, the DEIS was published with an estimate of 205 MW.

The shortfall has grown by 54% in less than a year, calling into question the stability of the methodology used to determine this number or the motives of the information source.

The important point is that size matters. The mix of technologies and programs needed to cover a 205 MW shortfall is different from the mix that would be used to cover a shortfall of 123 MW. One wouldn't simply "scale up" the smaller solution.

It's important to note that CENSE is skeptical of even the lesser 123 MW figure. The Lauckhart-Schiffman Load Flow Study<sup>2</sup> exposes errors in PSE's assumptions and simulations that would dramatically alter the size and timeframe of the need. For the purposes of this report, we assume that the shortfall is 123-133 MW in order to critique the DEIS, but we do not agree that this is a realistic estimate.

### **What is the cost?**

The DEIS treats cost as irrelevant for the purposes of evaluating environmental impact. However, in the real world, cost is an important factor in choosing one alternative over another.

PSE has not estimated the cost of the project for at least a year. The last cost estimates that were shared with the Community Advisory Group were in the range of \$150 million. EQL expects the actual cost will be closer to \$300 million, for the following reasons:

1. PSE initially thought that two transmission lines could be carried on a single set of monopoles. However, due to the meanderings of the Olympic pipelines in the shared corridor, there are many places where the lines must be carried by two poles to meet safety requirements. The number of poles and construction costs will increase.
2. PSE initially thought that the current transmission poles could be removed before construction of the new line began. Recently, the company has admitted that operation of the system with no lines in place during many months of construction would present a reliability risk. Therefore, the design must be altered to accommodate both sets of transmission lines in place simultaneously.

<sup>2</sup> <http://cense.org/Lauckhart-Schiffman%20Load%20Flow%20Study.pdf>

Taller poles will be required to maintain a safe distance between the old lines and the new lines. Also, the complexity of construction is significantly increased. Both of these factors will increase the cost of the project.

3. PSE assumed that it would be safe enough to put two transmission lines and two high-pressure petroleum pipelines in a utility corridor that is as narrow as 100 feet in densely settled residential neighborhoods. The DEIS wisely assumes that the corridor will have to be widened by up to 50 feet. This will require condemnation of homes and new easements, significantly increasing project costs.
4. Resistance to the project is much higher than PSE expected. The costs of advertising, public relations, and potential legal actions are correspondingly higher.

EQL's report points out a hidden cost of Alternative 1A. If PSE invests hundreds of millions of dollars in a transmission project, the amount of investment dedicated to important programs like Demand Response and Energy Efficiency will be reduced. Consequently, overall energy use will be higher with Alternative 1A than Alternative 2. That higher consumption must be matched by new generation, and PSE anticipates that need in the 2015 Integrated Resource Plan. PSE expects to build nearly 600 MW of new gas generation plants in 2021, just a few years after Energize Eastside is complete:

*Figure 1-7: Electric Resource Plan Forecast,  
Cumulative Nameplate Capacity of Resource Additions*

	2021	2027	2030	2035
<b>Conservation (MW)</b>	411	695	768	906
<b>Demand Response (MW)</b>	130	153	160	172
<b>Wind (MW)</b>	-	206	337	337
<b>Combined Cycle Gas (MW)</b>	599	969	1354	1354
<b>Peaker/CT Dual Fuel (MW)</b>	-	228	479	707

Alternative 2 could reduce overall energy use enough to eliminate the need for one 200 MW generation plant, saving ratepayers \$300 million. In the long run, Alternative 2 could save ratepayers the cost of both transmission and generation infrastructure, at least \$600 million. Including both of these avoided costs in the analysis makes Alternative 2 the better choice for cost effectiveness.

## Expert analysis from EQL Energy

To better understand how Distributed Energy Resources (DER) might contribute to the future operation of our energy grid, CENSE engaged industry expert EQL Energy from Portland, Oregon. EQL has been an important contributor to alternative energy solutions in Portland and other parts of the Pacific Northwest.

EQL possesses a different skill set than that needed to plan transmission lines. These skills have not been demonstrated by PSE or the EIS consultant Stantec. Consequently, Alternative 2 is not a credible DER solution. The description included in DEIS section 2.3.3.1 would lead the reasonable reader to conclude that this option is difficult to implement and dangerous for reliability.

Consequently, EQL's list of technologies and policies differs significantly from those included in the DEIS:

DER program	PSE estimate (MW in 2024)	EQL estimate (MW in 2024)
Targeted Energy Efficiency	42?	30
Distribution Efficiency (CVR)	0	18.8
Combined Heat & Power	0	30
Energy Storage	121	15
Peak Generation Plant	60	0
Dispatchable Standby Generation	?	18.8
Demand Response (unspecified)	32	
Demand Response (day ahead)		30
Demand Response (10 minute)		11.3
<b>Total</b>	<b>255?</b>	<b>153.9</b>

### Energy Efficiency

It is difficult to directly compare PSE's and EQL's estimates of potential savings from Energy Efficiency. In section 2.3.3.1, the DEIS states that 42 MW of savings would be required, but offers no clear idea of how that would be achieved: *"The potential for additional energy efficiency on the Eastside is not currently known and would require additional evaluation."* CENSE is disappointed that no more definitive estimate could be made of the potential.

The DEIS claims that savings of this magnitude would be *"an aggressive goal."* Also, *"The additional energy efficiency assumed for Alternative 2 would be triple the amount that PSE estimated is achievable after 2024, and that additional energy efficiency would have to be accomplished before 2024."* The DEIS analysis makes it seem pretty hopeless.

In contrast, EQL has estimated 30 MW can be saved through Energy Efficiency. This is lower than PSE's goal, and EQL believes it is more easily achieved because PSE and its consultants are using load data that is decades out of date. The obsolete data makes Energy Efficiency appear to be less effective than it actually has been in more recent years.

To get more accurate data, a "Request for Proposals" should be issued to companies that specialize in Energy Efficiency technologies and programs. A competitive bidding process would yield better estimates of the potential than the obsolete data being used by PSE and EIS consultants.

### **Distribution Efficiency**

Energy Efficiency achieves savings on the consumer's side of the electric meter by using less electricity to accomplish tasks such as lighting, heating, operating appliances and electronics, and charging batteries. In contrast, Distribution Efficiency increases the efficiency of how PSE and other utilities deliver electricity to consumers. This reduces overall electricity usage by up to 4% without any impact on customers. PSE has already incorporated this technology in a few substations, but the program can be expanded to more broadly reduce peak loads.

EQL included 18.8 MW of savings in its DER estimates, based on a somewhat conservative estimate of 2.5% of peak load. No estimate is included for Distribution Efficiency in the DEIS.

### **Combined Heat & Power**

Combined Heat & Power is a technology that generates electricity from the waste heat produced by burning natural gas to heat or cool a building. It is most effectively incorporated in new buildings, and it provides two benefits. The very efficient use of natural gas reduces total carbon emissions compared to long-distance transmission of electricity, and local generation of electricity can provide a degree of immunity from power outages. Widespread use could reduce the need for new generation facilities and transmission lines, benefitting all customers.

Bellevue has a special opportunity to incorporate this technology due to the number of new buildings planned for construction in downtown Bellevue and the Spring District. If these projects are contributing to the need for Energize Eastside, it seems fair to ask them to help solve the problem of increased energy use. It is not fair to place the burden of rising downtown energy use on residential neighborhoods with increased industrialization and lower property values.

EQL estimates 30 MW of savings due to Combined Heat & Power. No estimate is included in the DEIS.

## Energy Storage

DEIS section 2.3.3.4 describes a battery solution that would provide 121 MW to serve peak demand. However, the practicality of such a system is immediately dismissed: *"An energy storage system with power and energy storage ratings large enough to reduce normal overloads has not yet been installed anywhere in the world. For comparison, the largest operational transmission scale battery facility in the U.S. can provide 32 MW of power for about 40 minutes."* The DEIS analysis makes it sound like you'd have to be crazy to consider this idea.

EQL proposes a battery solution with a capacity of only 15 MW, approximately 8 times smaller than PSE's solution. For comparison, Southern California Edison is funding a project to install batteries with 250 MW of capacity. EQL's proposal is 16 times smaller, and by PSE's metric, 16 times more feasible.

But what about cost? EQL found a major error in the cost analysis included in the Strategen report referenced in the DEIS. Strategen ignored the cost of avoided transmission, leading to the improbable assumption that we would build transmission lines and battery storage units. When the error is corrected, the cost of batteries is approximately two times more cost effective than building new transmission lines. And battery costs will continue to fall, while the cost of transmission lines usually rises due to increasing property values.

Even PSE admits that battery storage will become a game changer as we increasingly rely on intermittent renewable energy sources like wind and solar power. We can prepare for the future by investing in small amounts of battery storage now, so we can learn from our experience and advance the state of the art. If possible, we should use products like grid batteries manufactured by the Mukilteo-based company UniEnergy. That's a smart investment in our energy future and our economy.

EQL estimates 15 MW of battery storage. The DEIS estimates 121 MW, but notes that the consultants skipped evaluation of a summer scenario because *"energy storage would not be a feasible stand-alone alternative."* This is an odd criteria to apply to energy storage, because the components of an *"integrated resource approach"* are designed to work together, not as stand-alone pieces.

### **Peak Generation Plant**

DEIS section 2.3.3.1 describes “three 20 MW generators to be implemented in combination with the other components described for Alternative 2.” As an important caveat, the DEIS notes that “PSE had eliminated this option from consideration” because “these types of generators produce a high noise level that would be incompatible with [residential] surroundings.” In discussion with Bellevue city council members, CENSE has learned that there is little political will to consider these generators.

EQL’s proposal does not rely on gas-fired peak generation plants. The DEIS assumes 60 MW of capacity.

### **Dispatchable Standby Generation**

Dispatchable Standby Generation (DSG) generates power on a customer’s site, as explained in DEIS section 2.3.3.3. The DEIS mentions many technologies that could be used for this purpose, such as gas turbines, microturbines, reciprocating engines, fuel

EQL’s proposal does not rely on gas-fired peak generation plants. The DEIS assumes 60 MW of capacity.

### **Dispatchable Standby Generation**

Dispatchable Standby Generation (DSG) generates power on a customer’s site, as explained in DEIS section 2.3.3.3. The DEIS mentions many technologies that could be used for this purpose, such as gas turbines, microturbines, reciprocating engines, fuel cells, and anaerobic digesters. However, no estimate is given regarding which ones are most practical or how much energy they might be expected to generate.

EQL describes a solution that they helped design in Portland, Oregon. Generators owned by businesses, hospitals, and government buildings are networked to the utility company. These generators are usually idle unless there is a power failure, when they are turned on to supply emergency power. The utility is provided a way to remotely control the generators when electricity demand peaks. The owner gets an attractive incentive for participating, and the generator reverts to its previous purpose (backup power) if an outage occurs.

Using the Portland program as a template, EQL used a scale factor to determine DSG potential for the Eastside. EQL estimates 18.8 MW of additional energy produced by DSG. The DEIS provides no estimate.



## Conclusions

The DEIS vaguely describes Alternative 2 using a resigned, pessimistic tone. The alternative seems risky and infeasible, because it was not developed or reviewed by experts with the specialized experience to accurately assess the technologies and potential energy savings.

EQL has described a more realistic way to achieve these energy goals in a manner that is cost-effective, better for the environment, better for our local economy, safer for residents, and more in sync with the Eastside's leading edge, high-tech roots.

Alternative 2 has another advantage. PSE's transmission line is an all-or-nothing proposal. It won't deliver a single electron until every pole is installed and every wire strung. It will not be operational until PSE's customers have spent at least \$300 million for it.

By comparison, Alternative 2 can be built incrementally. According to PSE's famous chart, the Eastside Customer Demand Forecast, there will be a shortfall of approximately 10 MW in 2020. It should be easy to meet that shortfall in the next four years using a subset of the technologies described by EQL. Two years after that, we need to find another 15 MW. That shouldn't be too hard. As time progresses, technology will improve, and batteries will become cheaper and more efficient. We may find that it's pretty easy to meet these goals.

But there's another possibility. What if we have another recession? Or what happens if the ridiculous rate of growth (2.4% per year) that PSE is predicting doesn't materialize? In these cases, we could scale back ongoing investments in Alternative 2, saving PSE's customers hundreds of millions of dollars.

The DEIS describes many risks, but it doesn't explain this one. A huge investment in Alternative 1A could create a technology dinosaur that industrializes the Eastside, does nothing to mitigate greenhouse gas emissions, and saddles our children and grandchildren with higher utility bills, leaving less money to invest in the energy technologies of the future. That doesn't seem like a very smart investment.

CENSE.org  
February 24, 2016

# Alternatives to Energize Eastside

## Response to Draft EIS

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*February 15, 2016*

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# 1 Introduction

EQL was asked to comment on Alternative 2 "Integrated Resource Approach" discussed in Chapter 2 of the Energize Eastside Draft EIS January 28, 2016.

EQL has reviewed and commented Energize Eastside studies and has participated in several PSE IRP advisory group meetings, EQL has commented on the following topics through Energize Eastside and IRP Advisory process:

1. Distributed energy resources (DER), (e.g., energy efficiency, demand response, dispatchable standby generation, solar, storage, EV charging, CHP, distributed generation, etc.),
2. Demand Side Resource and transmission alternatives to Energize Eastside.
3. Integration of transmission and distribution planning/costs into the utility least cost planning process,
4. Resource adequacy modeling and methods (e.g., EUE expected unserved energy, focus on resource types), and
5. Reliability in IRP, Transmission Planning, and SAIFI/SAIDI statistics, as well as scenario and sensitivity analysis.

EQL is an energy industry consultancy started in 2010 to assist utilities, utility customers, and vendors develop smart grid technologies and business cases that lower cost of utility service, improve reliability, and integrate renewable energy. Our staff has supported IRPs throughout the Western Electricity Coordinating Council and MISO since 1993. Since 2010, our work has been related to smart grid technology evaluation/planning, and integration of renewable energy and distributed energy resources (DER).

EQL's comments are those of EQL, and are meant to promote improved least cost utility planning.

## 2 Critical Points on EIS Alternative 2

Alternative 2 if done properly could meet criteria for Eastside expected growth in peak load. Unfortunately, the work and discussion of Alternative 2 in the EIS is confusing, insufficient to determine feasibility, uses bad data and forecasts, and demonstrates very little attention by City of Bellevue and PSE.

Many utilities around the world are considering Distributed Energy Resources (DER) to defer or avoid transmission infrastructure, including ConEd (NY), SCE (CA) BC Hydro (BC), BPA (OR/WA), etc.<sup>1</sup>, DERs include targeted energy efficiency, demand response, dispatchable standby generation, solar, storage, EV charging, CHP, distributed generation, etc.

### 2.1 A proper Alternative 2 analysis would prevent increases in Eastside winter peaks and meet all 15 electrical criteria, and 4 non-electrical criteria.

A proper analysis would include accurate peak load forecast, cost effectiveness analysis, and ideally an all source RFI. A rule of thumb Eastside forecast is provided in Figure 1 below.

To put it simply, Alternative 2 DER would avoid ratepayer funding for transmission, distribution, generation, and environmental costs. To meet the peak load growth Puget Sound Energy will request to spend over \$300MM on Energize Eastside and another \$300MM for a peaking power plant (PSE 2015 IRP). If we assume that expected peak load to be met is 200 MW, the capital expenditure would be \$3,000/kW. Most DER, TODAY, can be installed and operated for less. When you consider expected cost reductions and performance improvements Alternative 2 is the lowest cost choice.<sup>2</sup>

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<sup>1</sup> <https://www.raponline.org/document/download/id/4765>

<sup>2</sup> storage cost reductions expected to be 50% over next 5 years, Internet of things, sensors and controls for demand response will become more cost effective and prevalent, EV charging control to avoid peak.

Figure 1: DER potential at PSE above the DSR 100% forecast

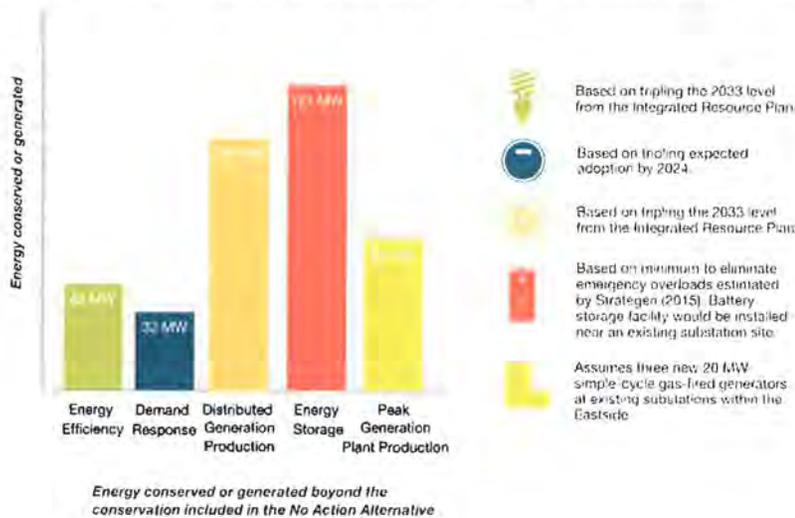
DER Measure	% of winter peak
<b>System Winter Peak load</b>	
Solar	0.0%
Targeted Energy Efficiency	4.0%
Distribution Efficiency (CVR)	2.5%
Combined Heat & Power (CHP)	4.0%
Storage	2.0%
Dispatchable Standby Generation (10 minute)	2.5%
DR Day Ahead	4.0%
DR (10 minute)	1.5%
<b>Total</b>	<b>20.5%</b>

If PSE proceeds with transmission and generation, then DER will become less cost effective. In fact, Idaho Power after finishing construction of their Langley Gulch gas plant tried to shut off all their demand response programs. You don't need DER capacity if your trying to pay off a new gas plant.

2.2 Alternative 2 assessment is insufficient to determine feasibility and lacks credible analysis or estimate.

The EIS provides only a theoretical example of technology that could address winter peak load reductions which has no value in determining feasibility. See example graph in Fig. 2-14 in EIS.

(EIS Fig. 2-14) Theoretical example of Energy conserved or distributed generation



In order to properly assess an Integrated Approach the EIS should either hire independent consulting firm to estimate cost effective DER on Eastside, or issue an all source RFP for all DER in affected eastside area. This process would include all avoided costs and provide actual estimates for DER capacity amounts and cost, as well as real vendors estimates. This process is being used in New York's Brooklyn-Queens Demand Management program which started in 2014. New York utility ConEd is expected to invest \$200MM to implement DER to avoid transmission build.

2.3 PSE Eastside winter peak load forecast has been a moving target throughout planning process, and has steadily increased over study period.

PSE has been changing the required winter peak load reduction on the Eastside throughout the Energize Eastside planning process. (see figure below). PSE has a history of changing methods and planning standards when justifying capital expenditures, e.g., peaking power plants. In the 2015 Integrated Resource Plan, PSE changed their planning standard, which led to an increase in 2021 peak load of 351 MW. Figure 1 below summarizes the source and the estimate of peak load reduction required to meet Eastside load requirement.

Figure 2: Range of Estimates for Eastside Peak Load increase through 2024

Source	Estimate (MW)	Date	Reference
E3 Non-Wires Study	70 MW	Oct 2014	
Quanta - Eastside Needs Assessment	123	Apr 2015	Page 19
Stantec Review Memo (referenced in EIS)	133	July 2015	Page 1-7 Draft EIS
PSE 2015 IRP	166	Jan 2016	IRP Ch.5 page 31
Draft EIS (2016)	205	Jun 2015	EIS Page 2-34

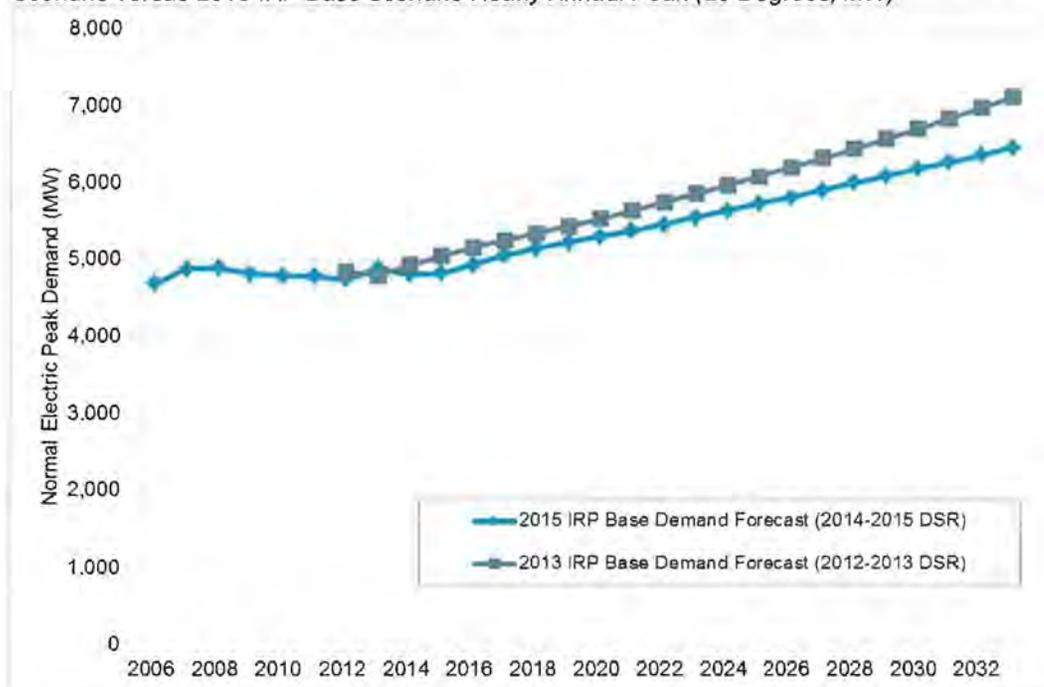
\* Assumes peak load after planned baseline energy conservation

The Draft EIS discusses 205MW non-transmission resources needed by 2024, which is a likely mistake. This value stems from an email from Jens Nedrud, Energize Eastside project manager, where he explains that the amount of conservation required to be equivalent to transmission capacity is 205 MW. Mr. Nedrud only mentions conservation, not other DER. Mr. Nedrud is the project manager for Energize Eastside, so estimates from him should be questioned.

## 2.4 PSE Eastside winter peak load forecast is wrong and has been consistently too high for the past 6 years.

Figure 2 below shows how peak load is historically flat, then suddenly takes off in the future. You'll find this to be true with PSE's previous peak load forecasts. I understand that forecasts are, by their nature are wrong, but PSE has a habit of overestimating peak load.

Figure 3: PSE 2015 IRP *Figure 5-21: Electric Peak Demand Forecast before DSR 2015 IRP Base Scenario versus 2013 IRP Base Scenario Hourly Annual Peak (23 Degrees, MW)*



Winter peaks have gone down in the Pacific Northwest in the last 5 years, and growth in the winter peak will continue to be less than the increase in growth in energy use. PSE's winter peak decreased by 11 MW from 2013 to 2014. This holds true because:

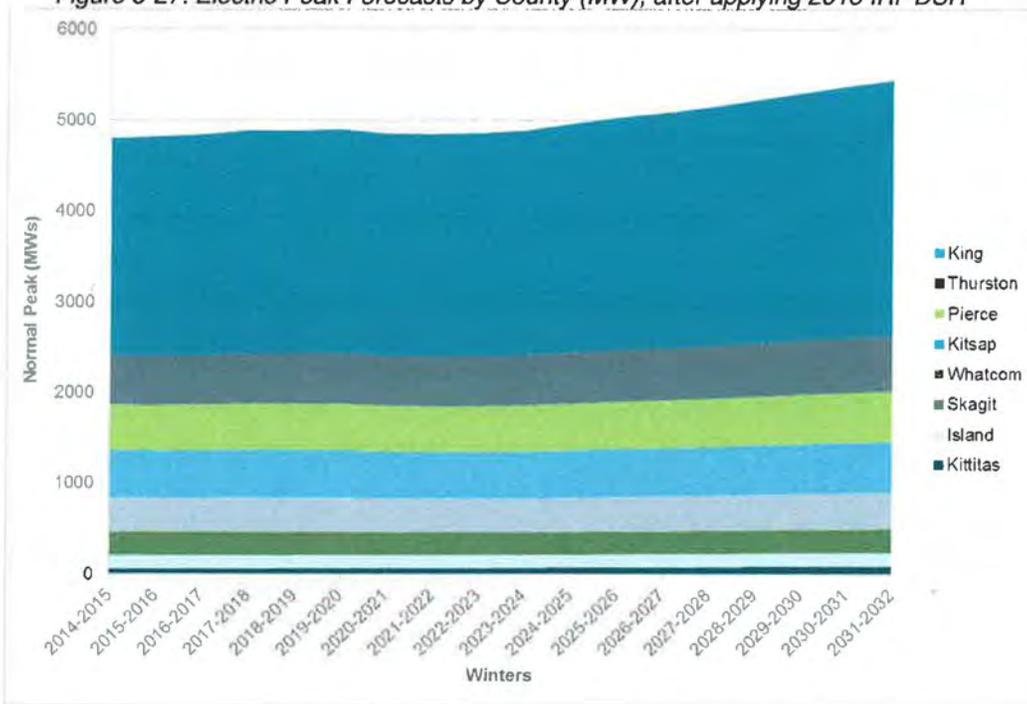
1. Electric heating load is saturated. I.e., new growth does not include electric heating that contribute to winter peak,
2. Fuel Conversion from electric to gas and propane are reducing winter peaks,
3. Milder winter temperatures reduce chance of extreme cold weather, and
4. Higher growth in multifamily and commercial,

PSE's 2011 IRP had peak forecasts rising from 2011 forward.<sup>3</sup> This is not happening.

**Notice in Figure 5-27 from PSE's 2015 IRP, the peak demand does not begin to increase until 2024.**

<sup>3</sup> [http://www.utc.wa.gov/\\_layouts/CasesPublicWebsite/GetDocument.ashx?docID=42&year=2010&docketNumber=100961](http://www.utc.wa.gov/_layouts/CasesPublicWebsite/GetDocument.ashx?docID=42&year=2010&docketNumber=100961)

Figure 5-27: Electric Peak Forecasts by County (MW), after applying 2013 IRP DSR



### 3 Other Points on EIS Alternative 2

#### 3.1 PSE local needs assessment is not a local cause

PSE has suggested the transmission need is based on local winter peak demand on the eastside. This is only a small part of the story. The issue arises by modeling a series of unlikely regional wholesale power scenarios (e.g., plants offline, Canadian imports, transmission line outages, and high winter peak demand) that creates: 1) high winter power flows South to North through the PSE's eastside transmission corridor, and 2) increased loads on eastside substations. These modeled events would lead to equipment exceeding their thermal limits and the need to shed load at substations or limit power flow on the PSE 115kV system through eastside.

Based on the 2012 Memorandum of Agreement between PSE, Seattle City Light (SCL), and BPA, PSE has agreed to provide expanded transmission service through Puget Sound Area. SCL agreed to projects that would limit flow through their system by placing series inductors at two of their substations. This demonstrates that the issue and needs are indeed a regional one, not just local

This local problem, if it were ever to occur, would happen for a few hours of the year during extreme cold days and hours of peak load on eastside. The EIS extreme scenarios suggest up to 13 days this could occur, but does not forecast number of hours. Given PSE's winter peak is in morning (8am) or evening (6pm) The load reduction would need to be for a few hours during these times. EQL's experience suggests that the winter peaks come in 2-3 day consecutive days (cold snaps) and last maybe one to two hours per day.

According to EIS scenarios, in 2026 eastside load will need to shed 133MW to accommodate flows to Canada over PSE 115kV system.

Another troubling area is how PSE attributed winter peak demand reductions to forecasted energy efficiency measures. It is impossible to determine how PSE and its contractors did this conversion. However, EQL Energy is familiar with the issue that load shapes used in the Pacific Northwest to attribute capacity reductions from energy efficiency are inaccurate and out of date. Some end use load shapes (ELCAP) date back to the 1980s. The topic of inaccurate load shapes and hence capacity contribution of energy efficiency has been consistently discussed and agreed upon by the Northwest Power and Planning Council, as well as the Regional Technical Forum on energy efficiency.

##### **3.1.1 The Problem – several days and a few hours in the winter**

The problem PSE has identified in their Energize Eastside proposal comes about through a series of unlikely events that lead to high winter power flows South to North through the Eastside and creates overloads on certain substations. This problem, if it were ever to occur, would only happen for a few hours of the year. PSE has not estimated the number of hours because the scenarios and stress cases they use don't

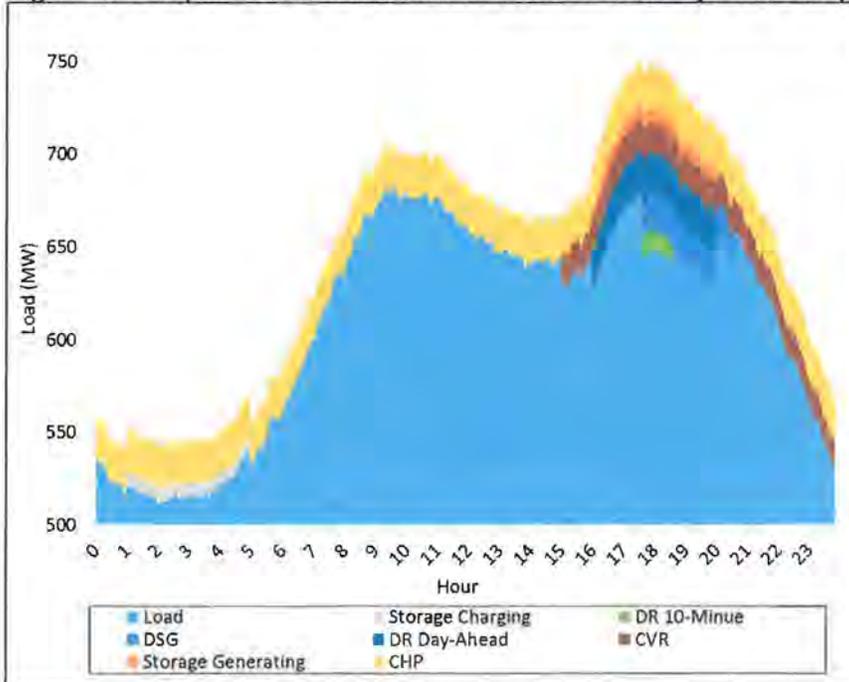
lend themselves to firm estimates. If PSE could estimate the number of hours they would need winter peak demands to be reduced, it likely would come in 2-3 day consecutive days (cold snaps) and last maybe one to two hours per day.

If Energize Eastside or one of the alternatives were not to be pursued, power outages would not be imminent during these peak demand hours unless at least three failures occur in the grid, a scenario that exceeds NERC reliability requirements. The total number of customers affected by these unlikely outages would be 3 to 5 percent of the 1.1 million customers that will pay for the project with higher electricity bills for the next 40 years.

### 3.1.2 The DER Solution

Distributed Energy Resources are well suited for targeting winter peak demands in the Eastside Area. Many North American electric system operators invest in DER to avoid transmission and peaking generation. These DER include demand response, storage, EV charging control, DSG, and Distribution Efficiency. If the problem is less than 60 hours per year, it is often much less expensive to manage demand than build Transmission and Generation. Efficiency and CHP tend to provide reductions throughout the day, but can be targeted for time of day contributions. Figure 4 shows a sample peak day load shape for the Puget Sound area with a stack of resources deployed both throughout the day and during a dispatch at 5:30PM during the peak to depict what could happen in the event of an outage.

Figure 4: Sample DER Contribution to Winter Peak Day Load Shape<sup>4</sup>



<sup>4</sup> Data source for load shape: Puget Area Net Load for 12.20.2008  
<http://transmission.bpa.gov/Business/Operations/Misc/default.aspx>

\* This is not an Eastside area load shape, but is representative of typical winter peak load patterns for NW utilities.

### 3.2 PSE lags rest of country in DER

Utilities like Puget Sound Energy are way behind other areas of the country in investing in DER, especially demand response. For example, the rest of North America relies on over 60,000MW of demand response, and has eliminated billions of dollars of investments in peaking generation and transmission. The Northwest Power and Conservation Council in their recently released 7<sup>th</sup> Power Plan, identified 4,300 megawatts of regional demand response potential. PSE currently has no demand response resources it can rely upon.

One example of a DER approach to avoiding transmission project is New York's Brooklyn-Queens demand management project.<sup>5</sup> Growth began to occur in this area from gentrification and employment growth. The utility ConEd estimated the cost to meet this growth would require a \$1Billion investment in expanded transmission and substation capacity. In 2014 the Public Service Commission approved the Brooklyn/Queens Demand Management program to invest up to \$200MM to avoid the larger infrastructure costs.

The Northwest is not new to Non-Wire Alternatives. In the 1990s BPA was considering transmission across the Cascades to support Puget Sound Area growth and reliability. The transmission cost assessment led to a plan that included aggressive demand side resources in Puget Sound Area, and use of series capacitors for voltage support. These lower cost alternatives deferred the project to the point of never being built.

### 3.3 EIS Impacts of Alt 2

The negative impacts of Alternative 2 were primarily associated with peaking generation and storage located on the Eastside, and relate to land and greenhouse gas (GHG) emissions.

EQL Energy, however, is not suggesting any new reciprocating engines, or peaking power units as part of EIS Alt. 2. We would expect primarily Combined Heat and Power (CHP) to be constructed in this alternative. CHP often uses biomass/biogas as well as natural gas, and would contribute to GHG, or could have noise impact. CHP has the benefit of also being "energy efficient" because the low value heat is used in industrial or commercial processes. Puget Sound Area has examples of CHP, e.g.,

- a. Renton, WA South Treatment Plant that can produce up to 8MW of power.<sup>6</sup>
- b. Seattle, WA Enwave Seattle uses biomass and natural gas to produce 50 MW of electricity, and 35 MW of heat equivalent.

<sup>5</sup> <http://www.neep.org/file/2414/download?token=bNV2vVea>, <http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId=%7B83594C1C-51E2-4A1A-9DBB-5F15BCA613A2%7D>

<sup>6</sup> <http://www.kingcounty.gov/services/environment/wastewater/resource-recovery/Energy/Renewable/cogen.aspx>

c. Univ. of Washington has 5MW natural gas CHP

CHP would require capacity on natural gas infrastructure.

A Dispatchable Standby Generation (DSG) program would have to go through air permitting compliance, but it is a permissible use. PSCleanAir has suggested that a DSG program like PGE would follow EPA NESHAP RICE rules.

EQL Energy would not recommend storage implementation as described in Alt. 2 of EIS. Six acres of storage does not make much sense. Energy storage highest value is utility owned and managed, yet behind the meter at a customer site. This means customers get backup and reliability, and utility can use for system issues, e.g., winter peak demands. This also avoids the 6 acres of storage containers suggested in the EIS draft (which is ridiculous). Fire and environmental authorities are becoming comfortable with both Li-ion and flow battery technology. PSE is working on a Li-ion storage system at Glacier. State of Washington is also granting \$40MM to projects in grid modernization and storage.

Alt 2 would cost less than Alt 1 and provide secondary benefits to customers through improved reliability and resiliency.

Alt 2 would have less risk during weather and natural disasters. DERs would provide backup power during intermediate or sustained outage.

### 3.4 Alt 2 works with PSE Economic Study of Flexible AC Transmission (FACTS).

Flexible AC Transmission systems on high voltage lines would protect PSE transmission facilities from reaching thermal limits while providing required service to loads. Combining this alternative with appropriately procured and analyzed DER provides a good alternative in Draft EIS.

See PSE Economic Study request at link below.

[http://www.oasis.oati.com/PSEI/PSEIdocs/Oct\\_31\\_PSET\\_Economic\\_Study\\_Request\\_from\\_EQL.PDF](http://www.oasis.oati.com/PSEI/PSEIdocs/Oct_31_PSET_Economic_Study_Request_from_EQL.PDF)

## 4 Alternative 2 Issue Details

In estimating Non-Wires Alternatives (NWA) like Alternative 2, PSE and its contractors have miscalculated both the technical and cost effective potential for DER in the Eastside area. They have used outdated information and methods, overestimated winter peak demand, improperly calculated "cost effectiveness", and have not considered forecasts of technology cost and performance improvements.

#### 4.1 2014 Non-Wires Alternative Screening Study underestimates DER Potential for Eastside

PSE relies on 2013 Cadmus report and a 2014 E3 report to estimate DER potential on the eastside. These analysis both have used bad or out-of-date data, improper analysis, and have underestimated the DER potential for the Eastside.

E3's 2014 Screening study<sup>7</sup> has bad data and provides no data or description of DER measures that were considered cost effective beyond the PSE baseline:

- i. Estimated cost of Energize Eastside at the time of the Screening Study was \$220 MM. The cost has been stated to be between \$150 and \$300MM.
- ii. Avoided cost analysis should use avoided cost of Transmission, Generation, and Distribution over 10 year period. A non-wires study should be performed that combines EE project deferral (\$155/kW-yr) with avoided cost of peaking Generation Capacity (\$184/kW-yr) and generic T&D deferral (\$23/kW-yr<sup>8</sup>). The sum of these (\$362/kW-yr) will buy PSE more DER than that forecasted by E3 and PSE. Other avoided costs that could play a role include environmental costs, customer cost savings, etc.

PSE's proposal to rebuild Sammamish-Lakeside-Talbot 115 kV line to 230 kV (Energize Eastside) is a project PSE says is needed to support a 65 to 133MW load growth in PSE's eastside. This transmission project is estimated to cost \$300MM or \$1,500/kW, about the same capital cost of a 200MW reciprocating engine. By integrating cost of transmission with system generation the cost to serve this 200MW load growth is \$600MM or \$3,000/kW capital cost.

- iii. DER alternatives and cost estimates are not well defined, so it is difficult to evaluate the accuracy of Alternative 2.
- iv. Include backup generators to be used as contingency reserve (e.g., Portland General Electric).

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<sup>7</sup> [http://www.energizeeastsideeis.org/uploads/4/7/3/1/47314045/attachment\\_5\\_-\\_screening\\_study.pdf](http://www.energizeeastsideeis.org/uploads/4/7/3/1/47314045/attachment_5_-_screening_study.pdf)

<sup>8</sup> E3 2014, page 23 PSE's IRP team also provided avoided generation capacity cost of \$184/kW-year and an avoided generic T&D cost of \$23/kW-year, which are both represented in 2014 dollars. For this analysis, we assumed that PSE's generic T&D avoided cost and the specific transmission line deferral value related to PSE upgrades are additive. This additive assumption presumes that load reductions in King County can defer the need for more general planned distribution system upgrades, in addition to deferring the construction of the specific Eastside upgrades.

- v. Storage is quickly becoming more cost effective and accepted as an alternative to T&D investments.

Recommendation. PSE should redo DSR, DR, and DER forecasts on Eastside using all levelized costs, including transmission (e.g., Energize Eastside), distribution, and supply-side resource alternatives. This will undoubtedly increase the amount of DSR and DER PSE has forecasted in the Draft IRP.

**2016 PSE all source RFP.** In 2016 PSE is expected to issue an all source RFP for distributed resources. WUTC should ensure that the avoided cost for resources in the Eastside accurately reflect all avoided costs, e.g., transmission, generation, distribution, customer benefits, environmental costs, etc. Through needs assessment of Energize Eastside, PSE's Eastside zone needs winter capacity resources to address transmission congestion and reliability by 2018. The IRP analysis supports addition of further distributed energy resources by 2021.

#### **4.1.1 Defining distribution located resources**

PSE should move away from current categories of distribution-side resources towards resource descriptions that meet utility requirements (energy, capacity, reserves, etc). As mentioned above these requirements need better descriptions than just MW and aMW. These requirements need amount, duration, time of day/season, etc.. The distribution located resources PSE has used 3 categories of distribution located resources seen in Cadmus report 2014:<sup>9</sup>

1. DSR, Demand Side Resources, energy efficiency. (which uses bad estimates for peak demand reductions (MW)
2. DR, demand-response
  - a. Residential DLC- Water Heat
  - b. Residential DLC – Space and Water heat
  - c. Residential Critical Peak Pricing (CPP)
  - d. C&i CPP
  - e. C&i Load Curtailment
3. DG, distributed generation, solar

Figure 5 is suggests a better way to describe all distribution level resources. This categorization allows planners to place different values on a resource based on its quality and location. For instance, getting dispatchable capacity for winter peaks is more valuable (\$/kW-year) than non-dispatchable capacity.

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<sup>9</sup> [https://pse.com/aboutpse/EnergySupply/Documents/IRPAG\\_Cadmus\\_presentation\\_2014-12-08.pdf](https://pse.com/aboutpse/EnergySupply/Documents/IRPAG_Cadmus_presentation_2014-12-08.pdf)

Figure 5: EQL Categories of Distributed Energy Resources



#### 4.2 Energy Efficiency contribution to peak demand reductions underestimated

PSE and its consultants use end use load shapes that are out of date to calculate peak demand reduction from energy efficiency programs. Many of these load shapes are based on end uses and technologies from the 1980s. This leads to lower peak reduction (MW) per unit of energy efficiency (MWh). The Northwest Power and Conservation Council has been building a business case to update these load shapes, and is expected to pursue this work in 2016.<sup>10</sup>

#### 4.3 Puget Sound DER and DSR avoided Cross-Cascades Transmission in 1990s

In the 1990s BPA was considering transmission across the Cascades to support Puget Sound Area growth and reliability. The transmission cost assessment led to a plan that included aggressive demand side resources in and use of series capacitors for voltage support. These lower cost alternatives deferred the project to the point of never being built.

DER, when cost of Transmission is considered, will increase dramatically. Estimates in Figure 2 below are estimates based on EQL estimates from WECC and NPCC forecasts.

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<sup>10</sup> <http://rtf.nwccouncil.org/subcommittees/enduseload/>

#### 4.4 Western electricity markets

On March 5, 2015, PSE announced it would participate in the California ISO energy imbalance market that will provide imbalance energy via locational marginal pricing. This decision by PSE management to participate in EIM, demonstrates that PSE believes in a planning and operational paradigm that explicitly recognizes locational value of generating and demand-side resources.

PSE participation in Western energy imbalance market will allow better management of existing transmission assets to existing generation and load balance. In Energize Eastside assessment, PSE has not considered the operational improvements that will exist for generation, demand management, and DER.

PSE joining the EIM does not have much effect on capacity procurement, except a possible reduction in flexibility requirement for resources.

### 5 Assessment of Eastside DER Potential

EQL Energy expects PSE could add over 160MW of capacity to Eastside DSR forecast by 2021. below. Using an Avoided Cost analysis that includes avoiding cost of Transmission, Distribution, and supply-side generation should include:

Capital Cost (\$/kW)	\$1,500/kW	Transmission
Capital Cost (\$/kW)	\$1,500/kW	Thermal Resource (e.g., Peaker)
Capital Cost (\$/kW-yr)	\$31.00	Distribution
O&M Fixed \$/kW-yr	\$10.55	
O&M Variable \$/MWh	\$2.96	

#### 5.1 DSR and DER Contribution

The terminology around resources on the distribution side can be confusing. PSE uses DSR or demand side resources, which includes energy efficiency, demand response, and distributed generation. The EE Documents we reviewed focus on energy efficiency and do not fully address DSR and its impact on peak capacity (MW). Analysis that is reported in Annual Average Megawatts (aMW) provides limited useful information for analyzing for transmission and distribution infrastructure needs.

In our report, we distinguish between DSR and DER forecasts and work to not double count resources.

DSR – Demand Side Resources: efficiency, demand response, and distributed generation (detail and types are unknown in PSE EE analysis). Cadmus 2013 IRP DSR

assessment does not include kW or peak contribution, nor do they provide DR assessments.

**DER – Distributed Energy Resources:** EQL uses this term to refer to all resources on the distribution system, including distribution efficiency (CVR and power factor correction), demand response, combined heat and power, dispatchable standby generation, and storage.<sup>11</sup>

DER and load management in critical areas is an opportunity to invest in measures that address infrastructure costs and regional load growth while engaging and benefitting customers, just like energy efficiency. Through the evaluation of Energize Eastside it is unclear the extent to which PSE has considered the use of distributed energy resources (DER) in their modeling, either as a resource or as a means to reduce load.

The DER resources described below should be considered in addition to the PSE’s DSR contribution to the 100% conservation load forecast.

Many of these DERs are dispatchable, including demand response, dispatchable standby generation (DSG), and energy storage and can therefore target peak load and reduce the need for infrastructure expansion in transmission and distribution.

### 5.1.1 Distributed Resource Planning

The DER contribution to peak load should be appropriately allocated among existing and future Eastside substations such that DER quantity reasonably matches the load assumed to be present at these substations.

Figure 8 below shows substation locations in the Eastside area that have historically recorded higher load and may be more likely to serve larger customers sites with high DER potential such as commercial/industrial, multifamily residential, institutional, government, campus and hospital loads.

Distributed Resource Planning is a process which more accurately calculates capacity and value for DER in specific areas of a utility distribution system.

On February 6, 2015 the CPUC released a ruling providing guidance to IOUs with respect to the DRPs that are to be filed by July 1, 2015. The document<sup>12</sup> provides additional guidance to utilities beyond AB 327. The guidance specifies 11 components that are to be included, at a minimum, in the locational DER benefits analysis.

Figure 6: Distributed Resource Planning Value Analysis

Locational Value Component	
1	Avoided Sub-transmission, Substation and Feeder Capital and Operating Expenditures: DER ability to avoid Utility costs incurred to increase capacity to ensure the system can accommodate forecasted load growth

<sup>11</sup> In California Distribution Resources Planning they include energy efficiency into their DER analysis.

<sup>12</sup> Docket R14-08-013 DRP Guidance: <http://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M146/K374/146374514.PDF>

2	Avoided Distribution Voltage and Power Quality Capital and Operating Expenditures: DERs ability to avoid Utility costs incurred to ensure power is delivered within required operating specifications, including transient and steady-state voltage, reactive power and harmonics
3	Avoided Distribution Reliability and Resiliency Capital and Operating Expenditures: DERs ability to avoid Utility reliability related costs incurred to prevent, mitigate and respond to routine outages (Utilities shall identify specific reliability metrics DERs could improve), and resiliency related costs incurred to prevent, mitigate, or respond to major or catastrophic events (Utilities shall identify specific resiliency metrics DERs could improve)
4	Avoided Transmission Capital and Operating Expenditures: DERs ability to avoid need for system and local area transmission capacity
5	Avoided Flexible Resource Adequacy (RA) Procurement: DERs ability to reduce Utility flexible RA requirements
6	Avoided Renewables Integration Costs: DERs ability to reduce Utility costs associated with renewable integration (for this line item, the Utilities shall attempt to coordinate their efforts with the development of the updated RPS Calculator and the Renewables Integration Charge)
7	Any societal avoided costs which can be clearly linked to the deployment of DERs
8	Any avoided public safety costs which can be clearly linked to the deployment of DERs
9	Definition for each of the value components included in the locational benefits analysis
10	Definition of methodology used to assess benefits and costs of each value component explicitly outlined above, irrespective of its treatment in the E3 Cost-Effectiveness Calculator
11	Description of how a locational benefits methodology can be a into long-term planning initiatives like the Independent System Operator's (ISO) Transmission Planning Process (TPP), the Commission's Long Term Procurement Plan (LTPP), and the California Energy Commission's (CEC) Independent Energy Policy Report (IEPR), including any changes that could be made to these planning process to facilitate more integrated analysis

Figure 7: DRP locational value components (CPUC DRP Guidance)

Notes:

The Resource Adequacy (RA) program, administered by the CPUC and CAISO is a 1-year forward bilateral capacity market. Utilities must procure sufficient resources to meet their expected peak load. Since it began in 2006, utilities were required to procure system-wide peak capacity resources, and local resources as needed in constrained areas. In 2013, a flexible resource requirement was added.

Figure 8: Bellevue Substation Peak Load Heat Map (2006)



**Sources:**

Data: City of Bellevue substation peak load for 2002 and 2005<sup>13</sup>

See Appendix A for data table

Map: EQL (using Microsoft Excel/Bing Maps)

**Note:** PSE's transmission topology in this area has changed and is expected to continue to change to serve changing load patterns, therefore this rendering is for sample purposes only.

PSE's existing 115 kV network in the Eastside with suggestions of areas that may experience higher load growth, may require additional infrastructure such as new substations, and therefore would represent advantageous locations for PSE and/or other appropriate parties to incentivize and site distributed energy resources.

### Customer Driven DER

DER adoption behavior and demand for services is customer driven based on broad socio-economic factors and technology advancements –not strictly regional or based only on energy cost.

Customer desire for self-reliance is increasing

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<sup>13</sup> City of Bellevue Comprehensive Plan Utilities Element Update, November 2006  
[http://www.ci.bellevue.wa.us/pdf/PCD/PSE\\_System\\_Plan\\_Update\\_November\\_2006.pdf](http://www.ci.bellevue.wa.us/pdf/PCD/PSE_System_Plan_Update_November_2006.pdf)  
(accessed 06.08.2015)

- **Ernst & Young:** 33% of the multi-national firms are expected to meet a greater share of their energy needs through **self-generation over the next five years**
- **Navigant:** nearly 75% of surveyed **residential customers** have “**concerns about the impact electricity costs** have on their monthly budgets, and **63%** are interested in **managing energy used in their homes**”
- **Best Buy:** 36% of **residential** customers desire to “financially and physically protect the home” (Home Safeguarding persona)

### 5.1.2 Distributed Solar

PSE currently has 2,800 customers and 17.4MW of capacity producing 17,037MWh of energy a year. As mentioned above, the Cadmus March 2015 memorandum has many errors regarding PV Solar forecasting and should not be reference by PSE. EQL suggests the following as an estimate of growth in energy from distributed solar.

Figure 9: Range of Distributed Solar by 2030

MW	Capacity	Energy	
	MW	MWh	aMW
Minimum	5	5,000	0.57
BaseCase	50	50,000	5.71
Maximum	400	400,000	45.66

### 5.1.3 Distribution Efficiency (aka CVR)

In 2007 Puget Sound and 12 other Pacific Northwest Utilities participated in a Northwest Energy Efficiency Alliance (NEEA) pilot to evaluate the energy and capacity savings from operating Conservation Voltage Reduction. <sup>14</sup> The study tested and found a 2 to 4 percent capacity reduction through distribution efficiency projects. An updated 2014 NEEA study found that over half the CVR projects operating in the United States are used for peak demand reductions versus energy efficiency. <sup>15</sup>

Wide scale adoption is beginning. One hurdle to adoption was mentioned in NEEA paper as, “hurdle to CVR implementation includes the lost customer revenue due to CVR rollout. End users reduce energy consumption with CVR and thus lower utility revenue. Utilities are often reluctant to recuperate lost revenue through rate increases, especially during times of slow or no load growth in the utility service area. Utilities can recuperate lost revenue from CVR more easily during periods of more rapid load growth. BPA currently offers incentives for CVR initiatives, which can help with utility cost recovery.”

<sup>14</sup> [https://www.leidos.com/NEEA-DEI\\_Report.pdf](https://www.leidos.com/NEEA-DEI_Report.pdf)

<sup>15</sup> <http://neea.org/docs/default-source/reports/long-term-monitoring-and-tracking-distribution-efficiency.pdf?sfvrsn=5> (page 45)

In Washington, Energy efficiency standard I-937 is currently a main driver for CVR implementation for IOUs in Washington State. I-937 mandates IOUs to undertake cost effective energy efficiency measures, such as CVR.

PSE has implemented Conservation Voltage Reduction (CVR) on three to six PSE substations before energy is sent to customers, thereby reducing customers' electric power consumption at the point of consumption on the customers' side of the meter.

CVR will be useful to PSE during winter peak load events due to the influence of resistive loads during those times. Reducing voltage is more effective for winter resistance heating load than for other types of load such as motors that experience greater use in summer for cooling loads.

**CVR Target: 2.5% of peak load**

#### **5.1.4 Demand Response**

By 2021 NPCC estimates the Pacific Northwest states will obtain between 600 and 1,080 MW (or 3%) of winter peak through demand response. At present, only a fraction of that quantity is operational. The Council is currently preparing their 7<sup>th</sup> power plan and has been working with regional utilities and industry stakeholders.<sup>16</sup>

In a 2015 report for NPCC, Navigant estimates that by 2030 Northwest utilities will have achieved nearly **9% of winter peak** load from demand response.

*The estimated cumulative DR market potential for capacity programs represents nearly 9% of winter peak load by 2030. This estimate is in line with estimates of other DR potential studies conducted both in the Northwest and other parts of the country.<sup>17</sup>*

Cadmus 2013 DSR report for PSE IRP (page 7) suggests that by 2033 PSE could expect **4.7% of winter peak** to be reduced by Demand Response. Cadmus (2013) is approximately half of Navigant (2015) winter peak reduction forecast.

Two types of DR are likely to be beneficial for eastside areas:

1. Day-Ahead notification peak load reduction DR
2. Emergency 10-minute response DR

Because PSE identifies a peak load resource requirement for the Eastside, we have identified a need to study a demand response program to operate during these times, when PSE's most expensive resources will likely be supplying power. DR programs are often cost effective when displacing this expensive generation, such as PSE's peaking units in Whatcom County. When combined with the additional value of

<sup>16</sup> <https://www.nwcouncil.org/news/meetings/2015/06/>

<sup>17</sup> [http://www.nwcouncil.org/media/7148943/npcc\\_assessing-dr-potential-for-seventh-power-plan\\_updated-report\\_1-19-15.pdf](http://www.nwcouncil.org/media/7148943/npcc_assessing-dr-potential-for-seventh-power-plan_updated-report_1-19-15.pdf)

providing an infrastructure alternative, the cost effectiveness of such a DR program is improved. Many utilities have implemented day-ahead notification DR programs that call upon enrolled customer or 3<sup>rd</sup> party resources to reduce their demand for a specified duration, typically 2-4 hours.

In addition, emergency DR programs have successfully been implemented that are capable of fast response for contingency reserve purposes. An example is a 10-minute response program run by Southern California Edison.<sup>18</sup> These programs are typically of higher value due to the short notice time and reliability service provided. SCE's program pays customers \$240/kW-year for capacity that successfully participates.

For purposes of the EIS analysis, we have requested conservative DR quantities, shown in Figure 10, for the eastside area that are reflective of percentages of peak load that have been achieved in other areas and below those estimated by Navigant (2015).

Figure 10: Eastside Area DR by 2021

Eastside DR Estimate	
Day-Ahead DR quantity	4%
10-minute DR quantity	1.5%

Because PSE has indicated it may include DR at a level of approximately 2.7% of load by 2020, the 4% DR estimate above for day-ahead programs is incorporated into the 100% conservation forecast used by PSE.<sup>19</sup>

WECC rule Bal-002-WECC-1 was referenced by PSE<sup>20</sup> as one of the reasons the reserve amounts are increasing. This same rule allows a balancing authority to use a number of different resources to meet this requirement including demand response:

- “\* A resource, other than generation or load, that can provide energy or reduce energy consumption
- \* Load, including demand response resources, Demand-Side Management resources, Direct Control Load Management, Interruptible Load or Interruptible Demand, or any other Load made available for curtailment by the Balancing Authority or the Reserve Sharing Group via contract or agreement.”

### 5.1.5 Dispatchable Standby Generation (DSG)

Portland General Electric's DSG program can be used as an example for one designed to provide enhanced reliability in the Eastside area. The DSG program connects customer backup generators to the distribution grid using parallel switchgear at sites such as hospitals, commercial/industrial, and government buildings. PGE remotely dispatches the generators, which are capable of providing uninterrupted service to

<sup>18</sup> [https://www.sce.com/NR/rdonlyres/7A1BC024-698D-44A0-98D1-ABD8DEE9E451/0/NR572V20810\\_BIP.pdf](https://www.sce.com/NR/rdonlyres/7A1BC024-698D-44A0-98D1-ABD8DEE9E451/0/NR572V20810_BIP.pdf)

<sup>19</sup> May 19 PSE IRP Advisory Group meeting materials

<sup>20</sup> PSE IRP Chapter 6 page 16

customers in the event of a grid outage. As part of the program, PGE invests in and owns some of the interconnection equipment, pays for fuel, and performs ongoing testing – required for units at many sites such as hospitals.

DSG potential is determined by using a simple proportion of peak load to DSG capacity installed at PGE and applying it to PSE, as shown in Figure 11 below.

Figure 11: Potential DSG by 2021

DSG Potential	MW
2018 PGE System Peak	4000
Current PGE DSG Capacity	94
DSG MW per System MW	2.5%
2018 PSE System Peak	6000
2018 Eastside Peak Load Forecast	750
PSE System DSG Potential	141
<b>PSE Eastside Area DSG Potential</b>	<b>18.8</b>

Note that the size of PGE’s DSG program is growing and has plans to increase the program capacity to 125 MW in the next 5 years. Using the proportion method described above, Eastside DSG potential would increase to 22.7 MW.

While the simple DSG potential figures provided here are adequate to inform planning at this stage, additional detailed analysis of DSG capacity will be valuable to PSE and Eastside reliability regardless which transmission projects are built. PSCleanAir has suggested that a DSG program like PGE would follow EPA NESHAP RICE rules. Developer of DSG program would have to go through air permitting compliance, but it is a permissible use.

PSE evaluated using DSG as part of a stipulation in Washington Utilities and Transportation Commission (WUTC) Order 06 in docket UE-130617, in which both parties agreed that PSE should perform an evaluation. Specifically, the Settlement agreement states: PSE agrees to evaluate the PGE Dispatchable Standby Generation (DSG) program, described in the testimony of staff witness Juliana Williams, and either provide a report to the Commission of PSE’s conclusions and recommendations by December 1, 2014, regarding the financial and technical feasibility of PSE implementing a similar DSG program in its territory, or file a tariff implementing DSG service by December 1, 2014.

EQL evaluated the PSE report and finds it evasive, inconclusive, and provides the following feedback.

**Specific Comments on PSE DSG Findings and select sections. (Dec. 1, 2014)**

Findings	
The primary benefit of the PGE DSG program has been the ability to use the standby generators as a cost-effective resource to meet non-spin operating reserve obligations.	True

PSE does not have a near-term need for non-spin operating reserves and has maintained more than adequate operating reserves during peak events	PSE can use DSG to meet winter peak demands.
While originally established as peaking resource, PGE's use of its distributed standby generator fleet as a peaking resource has been <i>de minimis</i> during the life of the program	True. Program is not used as peaking resource.
New Environmental Protection Agency (EPA) emissions requirements that limit operation and testing on diesel-fired emergency standby generators create uncertainty and potential operational constraints during times of peak need	True that EPA rules are in flux for legal reasons. Current laws to watch are state and local air permits. PSCleanAir has suggested that a DSG program like PGE would follow EPA NESHAP RICE rules
Under normal conditions, PGE's standby generator fleet is not economic compared to other alternatives during dispatch decisions	DSG resources are not part of normal dispatched resources
PSE lacks sufficient market research of its customers that would justify investment in a DSG program including potential participation rates and standby generator inventory	Getting this information would be very easy
It is unlikely PSE would be able to implement a DSG program to meet any near-term capacity needs given time, resources, and current systems capability	PSE has time to develop DSG
Section 4.6 Compliance	
Section 5.2 Constraints and Opportunities	
Market Barrier. The 2011 CBRE market search led to no customers expressing interest in further engagement with PSE to interconnect a standby generation system to the grid.	PGE Customers are not that different than PSE Customers. It takes a clear customer value proposition and a few key customers to get it started.
Monitoring and dispatch. PSE does not own software that allows for monitoring and dispatch. PSE need operational and technical knowledge to operate new software.	EQL can assist.
Interconnection. PSE needs specifications for interconnecting standby generators. PSE does not have interconnection agreement	EQL Team can assist
PSE has several low-cost resources to meet non-spin reserve obligations.	<b>Contradicted in IRP</b>
Operating reserves exceed need by 200-400MW in most peak hours.	<b>Contradiction with IRP forecasts</b>

The NERC contingency reserves standard (BAL-002-WECC-2<sup>21</sup>) applies to the NW Power Pool Reserve Sharing Group (RSG), and requires the RSG to carry the larger of: 3% of load + 3% of generation OR the **Most Severe Single Contingency (what is this for PSE?)**. Contingency reserves can be comprised of any combination of seven types defined in the standard. DSG is categorized as the Operating Reserve – Supplemental subcategory of Contingency Reserve. This reserve type was formerly

<sup>21</sup> <http://www.nerc.com/files/BAL-002-WECC-2.pdf>

defined as Non-Spin reserve, but was changed to supplemental in the current standard to be inclusive of demand side management pursuant to FERC Order 740.<sup>22</sup>

E3 incorrectly ruled out DSG in their 2014 non-wires study for Energize Eastside. They wrote,

“The US Environmental Protection Agency (EPA) prohibits PSE from relying on customer-sited backup generation for peak shaving of utility loads for resource planning purposes, which PSE planners believe would prevent them from planning grid conditions that rely on backup generation to defer transmission upgrades. This regulation exists primarily to protect local air quality. Therefore, customer-sited backup generation was excluded from the DG non-wires potential estimates.”

### **5.1.6 Combined Heat and Power (CHP)**

CHP is the simultaneous use of a fuel, primarily natural gas, to generate electricity and provide heat. When properly designed, CHP is capable of operating at higher efficiency than typical central station power plants.

PSE’s Non-Wires Screening Study<sup>23</sup> CHP analysis, performed by E3 and informed by earlier work by Cadmus, found approximately 1 MW of peak CHP resource by 2023 across all of PSE’s King County service area. Because this quantity can reasonably be achieved in a single building, the previous estimate is likely not reflective of actual potential. In order to determine this potential, a new study is warranted, especially in light of the amount of growth expected to occur in Bellevue and PSE’s need for peak capacity resources.

With the cost of capacity to utilities often exceeding \$100/kW-year, infrastructure deferral benefits and electricity sales revenue are components that contribute to cost effectiveness determination and would inform the ultimate potential of this resource. PSE needs over 1000 MW of new capacity by 2025, according to recent IRP development information.<sup>24</sup>

150 MW of load growth could occur in the Bellevue downtown and Bel-Red areas in the next 20 years.<sup>25</sup> The new development represents a large opportunity because many DER technologies such as CHP make the most sense when incorporated during the design phase and provide further benefits when central utility plants serve multiple buildings. But such a strategy requires deliberate planning and clear leadership to become successful.

Because Downtown and Bel-Red will consume significant quantities of natural gas regardless of PSE’s electricity infrastructure decisions, the extent to which this gas can be put to use generating electricity should be studied. Additionally, the civil construction work to occur in these areas in future years points toward investigation of co-locating energy infrastructure and potentially common use infrastructure such as district energy where central utility plants supply heating, cooling and electricity to a potentially large development, such as the Spring District.

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<sup>22</sup> <http://www.ferc.gov/whats-new/comm-meet/2010/102110/E-6.pdf>

<sup>23</sup> [http://www.energizeeastsideeis.org/uploads/4/7/3/1/47314045/attachment\\_5\\_-\\_screening\\_study.pdf](http://www.energizeeastsideeis.org/uploads/4/7/3/1/47314045/attachment_5_-_screening_study.pdf)

<sup>24</sup> May 19 PSE IRP Advisory Group meeting materials

<sup>25</sup> Exponent Reliability Study

**Recommendation:** Explore 3<sup>rd</sup> party or PSE owned central utility plants with CHP in parts of the Eastside that will experience the most new construction.

Figure 12: Base CHP Quantity 2021

	<b>Eastside CHP Estimate</b>
CHP	4% of peak load

**Note:**

Transmission topology alternative D adds Eastside generation. Because a larger central plant CHP project should be considered for this option, selection of this alternative could result in a substantially higher CHP penetration.

**5.1.7 Energy Storage**

Energy Storage is receiving a great deal of attention right now due to the cost declines seen in recent years and an increasing number of predictions for continuing storage cost reduction.<sup>26</sup> PSE, Avista, and Snohomish PUD have received \$15MM to study use of energy storage.

Figure 13: Energy Storage Quantity 2021

	<b>Eastside Storage Estimate</b>
Storage	2% of peak load

**5.1.8 PSE DER Potential & Interconnection**

Many existing and future commercial, multifamily residential, institutional and corporate campus sites are centered near downtown Bellevue, Bel-Red and South Redmond—areas that are driving the need for new transmission and distribution infrastructure. Cost effectiveness of DER investments in these areas stands to be influenced to the extent they can substantively contribute to load service and reliability needs. In other words, a next-generation energy system, which is being pursued by leading utilities, will make full use of DERs by integrating their capabilities into utility planning and operations, a step that may well deliver cost reductions to PSE ratepayers – and one that will require developing appropriate compensation mechanisms to DER owners. In addition, PSE or 3<sup>rd</sup> parties could own DERs that may be designed to provide benefits directly to specific customers (i.e. storage installed behind-the-meter), while simultaneously providing infrastructure deferral benefits enjoyed by all ratepayers.

DER interconnection and operations practices will become more important as these resources grow in quantity and take on additional performance obligations related to reliability and system resiliency. Should PSE and Eastside communities decide to move to make full use of DER options as part of a strategy to support and enhance regional growth, appropriate technical interconnection and operations procedures and

<sup>26</sup> Sample media story addressing storage:  
<http://cleantechnica.com/2015/03/04/energy-storage-could-reach-cost-holy-grail-within-5-years/>

standards will be needed. DER best practices are emerging from California, New York, and Hawaii, states that have taken the lead. The standards by which PSE designs and operates the 12.5 kV distribution system will be important for DERs so as to ensure maximum utilization of the system, including supporting 2-way power flows.

Most distribution systems move electricity in one direction – from power plants to substations to customers. But when customers interconnect generation resources, their power will flow the other direction, serving other customers and in some cases flowing power back to the substation itself and serving load further upstream, possibly at higher voltages. While there is no fundamental reason why these new flows of electricity cannot occur, investments in additional monitoring equipment and advanced control technologies will be needed.

These types of investments, involving software, communications, controls, and switching equipment, are also likely to provide reliability benefits by enhancing the ability of utilities to automatically switch customers to alternate feeds in the event of an outage on a given distribution circuit.

Heidi Bedwell, Energize Eastside EIS Program Manager,

372 people have signed a petition on Action Network telling you to Correct flaws in the Energize Eastside Draft EIS.

Here is the petition they signed:

Dear Ms. Bedwell,

I am very concerned about Puget Sound Energy's "Energize Eastside" project, which proposes to build 18 miles of high-voltage transmission lines through four Eastside cities (Alternative 1A).

PSE tries to justify the need for the project using an impossible scenario that would cause regional blackouts, according to the Lauckhart-Schiffman Load Flow Study, available at CENSE.org.

Alternative 1A would place new lines and poles much too close to aging petroleum pipelines. Responsible safety standards require at least a 50 foot separation. A construction or operational accident could cause a catastrophic pipeline explosion like the one that killed three Bellingham residents in 1999. This risk is not adequately addressed in the EIS.

Alternative 2, the Integrated Resources Approach, is a safer and less costly alternative. But the solution described in the EIS was not developed or reviewed by independent experts that have suitable experience with modern electrical grid technologies, including Demand Side Management and Distributed Energy Resources. The costs and capabilities are based on inaccurate and obsolete studies. As the Northwest Power Council's Seventh Power Plan makes clear, a carefully developed plan would easily beat alternative 1A in cost, safety, and support for the environment.

The other transmission line options (1B, 1C, 1D and Alternative 3) are not practical for financial or political reasons.

Ratepayers are asked to spend more than a billion dollars over the lifetime of PSE's transmission line. The Draft EIS must answer these basic questions in order to convince residents that we are getting the best possible plan for our energy future.

You can view each petition signer and the comments they left you below.

Thank you,

Don Marsh

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**1. Limei Xie** (*zip code: 98006*)

**2. Susan Smith** (*zip code: 98006*)

The safety of residents living near the natural gas pipelines should be of the utmost concern. Building

high voltage transmission lines on top of aging pipelines puts my family and my neighbors at risk. Please reconsider the necessity and safety of "Energize Eastside" proposal.

**3. li\_qin xie** (*zip code: 98006*)

negative impacts on environments; safety issues to our communities;

**4. Aaron Peloquin** (*zip code: 98056*)

**5. Jenny Choi** (*zip code: 98006*)

**6. meifang zhou** (*zip code: 98006*)

It is a disaster, too dangerous to control if happening accident

**7. Aileen Wu** (*zip code: 98006*)

Please do not sacrifice the environment for us and our future generations so PSE can make big profit by selling power to Canada!

**8. Gary Albert** (*zip code: 98006*)

The experts (USE, Stantec, etc.) who have reviewed the PSE Energize Eastside project did not complete an independent "load flow" analysis to determine the actual "need." They said the procedures PSE used were standard for the industry. That's garbage in garbage out without an independent load study. If you set up the criteria for the load flow to tilt heavily in favor of PSE, as PSE has done with energy directed to Canada and not utilizing peaking power, then there has never truly been an independent review. PSE said numerous times they would allow a citizen review of their load flow study, i.e. someone from CENSE, if they could get the appropriate security clearances. When CENSE located a retired PSE manager willing to help answer this question and able to get the appropriate security clearances needed, PSE changed their position and said EE had already been independently verified by several other experts and CENSE therefore did not have a need to know. What are they afraid of, a little sunlight on their boondoggle to pad the bottom line with unnecessary infrastructure building while sticking unsightly power poles dangerously close to fuel petroleum lines. Time for a real review by picked by someone not influenced by the city or PSE.

**9. Annie Everett** (*zip code: 98927*)

I am definitely opposed to the new PSE power lines!

**10. Alice wang** (*zip code: 98006*)

Please stop PSE from using "energize Eastside" as its excuse to expand their international business to push up revenue at the expense of forcing local residents to lose their property value, beautiful environment, school and street safety, neighborhood lifestyle. PSE will benefit financially while local residents will suffer the consequences and pay the high price for PSE's corporate gain!!! If PSE truly want to energize Eastside, not their corporate wallet, they should go with alternative 2!!!

**11. Aileen Leo** (*zip code: 98006*)

**12. Eng Teck Po** (*zip code: 98006*)

**13. Anna Coy** (*zip code: 98005*)

From everything I have seen or heard, we do not need to have this huge power line gouged through Bellevue!

**14. Amy Lee** (*zip code: 98008*)

**15. Yan Zhen** (*zip code: 98006*)

**16. Andrea Borgmann** (*zip code: 98005*)

Despite PSE's alarmist statements about the imminent threat of blackouts starting in less than two years (2018!), PSE has not validated the need for this project. PSE's report "validating" the need assume significant transfer to Canada during peak load times (1,500 MW) and turning off local gas generation plants. These assumptions are not defensible or reasonable as fundamental assumptions in assessing local electrical needs.

The EIS process must seriously assess the question of need in order to assess reasonable alternatives. The City's role is not simply to take at face value the utility's assertions.

The proposed project will come at significant cost to ALL PSE ratepayers due to the WUTC's allowance of billing for capital projects for 40 years with a 10% rate of return. There are simply more cost effective, more appropriately scaled projects to meet the Eastside's electrical needs over the coming years.

**17. Angela Byers** (*zip code: 98006*)

**18. Anna Ceberio-Verghese** (*zip code: 98027*)

Listen to CENSE.

**19. Anne Kim** (*zip code: 98006*)

**20. WEI TUNG** (*zip code: 98006*)

GAS pipeline underneath the proposed route is a major safety issue during construction and future operation.

Also need to consider underground line option, at least for the residential area.

**21. April Tan** (*zip code: 98006*)

**22. Allen Rauschendorfer** (*zip code: 98056*)

PSE has not established a need to expand the existing grid. Generating and transferring power through my Olympus neighborhood so PSE can sell power to Canada is an unacceptable situation. The on going health risks, property devaluations, and making an already high risk proximity of a gas line to high voltage power lines situation even worse is not only unacceptable but unfathomable. PSE is taking profits over public safety and we cannot stand and watch them do it!

**23. archana verma** (*zip code: 98006*)

We believe that Energize Eastside is a misguided project driven only by a motivation for corporate

profits. It will sacrifice the well being of families living close to the proposed power towers. Plus independent studies have shown that the claims made by PSE to the effect that Energize Eastside is needed for future customer demands are false and misleading. We strongly oppose Energize Eastside and we believe that PSE has not proven at all the need and validity for going ahead with this project. Please stop PSE.

**24. Astrid Zuppinger** (*zip code: 98005*)

PSE is attempting to build an unnecessary project in one of the most educated areas in the world. This will harm the Puget Sound with huge transmission poles and wires and we will be targeted to have more health issues. If you love the beautiful Northwest, then allow the intelligent Engineers in this area to come up with a better solution then doing a quick wiring up that will effect the world around us.

**25. Any Tappen** (*zip code: 98008*)

**26. Bill Jacobs** (*zip code: 98056*)

**27. Paul Gibbons** (*zip code: 98006*)

My Rate for Power should not be used to pay for "RETURN ON INVESTMENT" for a foreign company.

**28. Peiqi Shen** (*zip code: 98006*)

Devastating impact to environment and people's health ! Put cables underground.

**29. Fran Kutoff** (*zip code: 98006*)

Please take the time (there is NO hurry) and study the safest and most community-friendly and environmental-friendly solution to this issue. Bellevue is a beautiful city; let's not muck it up with huge power poles!

**30. Beibei Chen** (*zip code: 98006*)

**31. Barbara Braun** (*zip code: 98006*)

Please, please, please pause the EIS process to evaluate the alternatives properly using independent experts

Also pass city ordinances to insure the proper safety regulations are in place around the pipeline especially given the earthquake danger.

**32. Rebecca Peck** (*zip code: 98006*)

We don't need Energize Eastside. Please read the honest, unbiased Lauckhart-Schiffman load study.

**33. Beth Billington** (*zip code: 98004*)

**34. Binchi Zhang** (*zip code: 98006*)

**35. William Weston** (*zip code: 98005-3154*)

Poles and lines as high as 15 story buildings should be avoided if humanly possible.

**36. W. Robert Moore** (*zip code: 98006*)

Demand forecast not credible, project does not analyze alternative sources of energy, and public safety is at risk.

**37. Cindy Williams** (*zip code: 98006*)

Consider this me signing this petition. I agree with Russell.

**38. Robert Wiley** (*zip code: 98006*)

This project is unnecessary and must not go forward.

**39. Bonnie Lau** (*zip code: 98006*)

I am very concerned about Puget Sound Energy's "Energize Eastside" project, which proposes to build 18 miles of high-voltage transmission lines through four Eastside cities (Alternative 1A).

**40. Michael Boyce** (*zip code: 98006*)

Energize Eastside is DUMB:

D-Dangerous

U-Unnecessary

M-Misguided

B-Boondoggle

**41. Brett Fidler** (*zip code: 98005*)

We do not need more towers and lines. Let's use a smarter grid and new alternative energy sources.

**42. Michele Brown-Ruegg** (*zip code: 98006*)

I do not support your proposal to build new high-voltage power lines across the eastside and through family neighborhoods

**43. Brian Schafer** (*zip code: 98006*)

**44. ellen kerr** (*zip code: 98005*)

**45. Sheng XU** (*zip code: 98006*)

**46. Hengyu Xu** (*zip code: 98006*)

It will bring lots of negative impacts on environments and safety issues to our communities.

**47. Carol Xiang** (*zip code: 98006*)

Effect health of the Newport high school students.

**48. Carol Almero** (*zip code: 98008*)

Stop PSE from this scare tactic to capitalize on outdated technology.

**49. Cheryl Shannon** (*zip code: 98033*)

**50. Cherie Carchano** (*zip code: 98008*)

**51. Carin Chatterton** (*zip code: 98056*)

Use the proper data for this study. New lines ARE NOT NEEDED!

**52. Lauren Ulatoski-Root** (*zip code: 98008*)

This plan has been appalling from the start.

**53. Tyler Armstrong** (*zip code: 98007*)

**54. Hong chang** (*zip code: 98006*)

Negative impacts on the environment; not safety to our community.

**55. Chen Zhao** (*zip code: 98006*)

**56. Mei Chen** (*zip code: 98006*)

**57. Lin Gong** (*zip code: 98006*)

We do not need a new PSE transmission line.

**58. Richard Guttu** (*zip code: 98006*)

We oppose the intrusion this would cause.

**59. Chris Burges** (*zip code: 98005*)

EIS is a project of greed, not of necessity. Why would EIS tell the City Councils and the public a much higher percentage growth (7%) rather than .5% that it tells WECC? There are so many problems with the information they put out. Switching to LEDs had greatly decreased load at many homes and businesses. There is no mention of this, or of so many other factors in what energy is needed.

Building these huge transmission lines won't create more electricity. It will just allow PSE to sell more electricity to Canada - which should not be a cost that PSE citizens will have to bear.

Greed. PUre greed.

**60. Chris Liang** (*zip code: 98006*)

**61. Cindy Fang** (*zip code: 98006*)

**62. Xue Song** (*zip code: 98006*)

**63. Carol Kunde** (*zip code: 98052*)

I don't not understand why people living in established communities have to be subjected to huge structures in their neighborhoods without a vote of the residents. For some of my neighbors, the proposed power lines will be placed, (literally) in their back yards.

**64. Qing Ye** (*zip code: 98006*)

For better environment and community!

**65. David & Claudia Lee** (*zip code: 98005*)

We are Woodridge residents, and are opposed to the Energize Eastside project which proposes to build 18 miles of high voltage transmission lines. As proud residents of our community, these high voltage transmission lines would devalue our property as well as deface the community.

**66. Corrin Ponte** (*zip code: 98006*)

Stop the lies! Save our homes and our trees!

**67. Wei Wei Chen** (*zip code: 98006*)

Negative impacts on environments; safety issues to our communities.

**68. Dan Wu** (*zip code: 98059*)

Please correct.

**69. Dana Luhr** (*zip code: 98058*)

**70. Daniel Kaner** (*zip code: 98011*)

**71. David Luk** (*zip code: 98006*)

**72. Deb Engevik** (*zip code: 98005*)

**73. Debra Burges** (*zip code: 98005*)

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Encourage energy preservation. Encourage CLEAN energy. Value our environment. Value property values. Do not blindly do what a corporation wants without considering what is best for the people of the region.

**74. Joe Michaels** (*zip code: 98005*)

**75. David Herbig** (*zip code: 98006*)

There is no need for this project at this time. PSE is only doing this to increase revenues to PSE and

**49. Cheryl Shannon** (*zip code: 98033*)

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**75. David Herbig** (*zip code: 98006*)

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is ignoring the impact on rate payers.

**76. Diane Fern** (*zip code: 98006*)

**77. Denise Dice** (*zip code: 98006*)

**78. Alison Dildine** (*zip code: 98056*)

I do not approve of PSE's plan to install larger power poles and lines through our Olympus neighborhood. There is no urgent need for them and they will ruin our great neighborhood. PSE has not been up front about supplying CENSE with the requested documents to back up PSE's claim that this project is needed.

**79. Jason Hong** (*zip code:* )

**80. David Xie** (*zip code: 98006*)

**81. Bruce Williams** (*zip code: 98056*)

The Energize Eastside project will do a huge amount of aesthetic and environmental damage while placing residents in danger of pipeline explosions. A complete and accurate load study proves the project is not needed.

**82. Don Miller** (*zip code: 98006*)

The City of Bellevue is failing to fulfill their responsibilities as the Lead Agency on this EIS process. Action by concerned and informed citizens has been repeatedly rejected in favor of the deceptive and profit motivated actions of this foreign owned company. You can take steps now to avoid the permanent burden on all Puget Sound rate payers but you have to accept that the work done by citizens in our community is driven neither by profit nor deception. Do the job you are expected to do.

**83. Hu Dong** (*zip code: 98006*)

**84. Yan Dong** (*zip code: 98006*)

**85. Donald Lionetti** (*zip code: 98005*)

**86. Don Marsh** (*zip code: 98006*)

**87. Donald Ray** (*zip code: 98005*)

A 100 year old problem with the same 100 year old solution.

1. A fully independent and fair analysis still has not been accomplished. Most who works on this study are still attached in some way to the conclusions.

2. Variable "time-of-day-rates" is too quickly dismissed when peak power, not total demand, is the reason for this huge capital and old school solution. 3. We need a solution that is geared to a managed approach. I would even pay more to get a future system in line with greater energy management and not just charge me for an increase in capacity.

Can't we manage our peak power differently today? Please verify what century we live in.

**88. Devon Shannon** (*zip code: 98033*)

**89. Jessie Xu** (*zip code: 98006*)

**90. tong wu** (*zip code: 98006*)

Make it underground and don't impact our neighborhood

**91. Eva Downs** (*zip code: 98056*)

Not only is this project dangerous, disruptive and damaging to neighborhoods and families, there is no need to build these huge transmission poles.

**92. Elizabeth Minkin** (*zip code: 98006*)

I am very concerned about the safety of placing new high voltage lines too close to aging petroleum pipelines and the possible risks and damage to proximate residential properties.

**93. Qinghui Liu** (*zip code: 98006*)

My family and I would love to keep the view of our community as it is, not with the huge power poles. We don't want to live under those poles either.

**94. Edward Huang** (*zip code: 98006*)

We don't need new PSE transmission line!!!

**95. S Ekermann** (*zip code: 98007*)

**96. Kenneth Vasilik** (*zip code: 98006*)

**97. Erica Johnson** (*zip code: 98006*)

**98. Erin Kenway** (*zip code: 98005*)

We recently moved to the Woodridge community because of the gorgeous views, great location, strong community and quality of schools. These amenities are what bring up the value of our homes and keeps our community strong. This project would have an extremely negative effect on home values in a community that is consistently ranked among the top in the nation.

**99. Wenchun Lo** (*zip code: 98006*)

**100. Jamie Moy** (*zip code: 98006*)

**101. Dena Fantle** (*zip code: 98006*)

Dear Council members, please represent myself and all the other the residents of our wonderful city and ensure a thorough due diligence is done on PSE's Energize Eastside project, including a full review of the concrete findings in the CENSE report proving the project is absolutely not necessary (& possibly motivated by the greed of this privately held utility). In addition please implement a 6-12 month moratorium prior to moving forward with a phase 2 EIS for this unnecessary project. Thank you

**102. Fran k Bosone** (*zip code: 98006*)

Stop this ridiculous project now. Keep Bellevue beautiful.

**103. feifei zhang** (*zip code: 98006*)

I am very concerned about Puget Sound Energy's power lines project.

**104. Phyllis Flood** (*zip code: 98006*)

**105. Ying Zhao** (*zip code: 98006*)

Oppose the PSE project

**106. Frances Lee** (*zip code: 98006*)

THIS PROPOSED HIGH-TENSION CABLE IS AN AFFRONT TO OUR HEALTH (REGARDLESS OF WHAT YOUR "EXPERTS" CLAIM) AND UNJUSTIFIABLE INVASION OF OUR ABILITY TO PAY OVER THE LONG RUN. CEASE YOUR ATTACK ON OUR FINANCES AND ENVIRONMENT.

**107. Steven Fricke** (*zip code: 98007*)

**108. Guanghai Zhang** (*zip code: 98006*)

**109. Gang Zhai** (*zip code: 98006*)

We think the high voltage power line should not be close to schools and residential community because

1. it's dangerous for kids
2. the high voltage power tower and power lines cause health issues.
3. the high voltage power tower and line will hurt the real estate value.

thanks

**110. Gabriele Neighbors** (*zip code: 98004-8610*)

**111. Dee Mulford** (*zip code: 12302*)

**112. Glenna White** (*zip code: 98056*)

I support and adopt the objections to the draft EIS as raised by CENSE. Do the right thing!

**113. Glenn Gregory** (*zip code: 98006*)

**114. Stephen Lee** (*zip code: 98006*)

Against power line in Somerset neighborhood

**115. Margaret Niendorff** (*zip code: 98004*)

Please review PSE's assumptions - they appear overblown and unnecessary. And "Energize Eastside" harms our City in a Park.

**116. Margot Smith** (*zip code: 98006*)

PSE's Energize Eastside proposal and in particular, its preferred 1A alternative are deeply flawed on many counts. I am among many Bellevue residents opposing Alternative 1A and urging that the Integrated Resources Approach (Alternative 2) be given comprehensive consideration. The EIS under consideration does not include reliable and complete information by independent experts qualified in these technologies.

**117. Grace Li** (*zip code: 98006*)

**118. Julie Chen** (*zip code: 98006*)

We don't want this project in our neighborhood for many reasons, which are probably already addressed by many residents.

I just wanted to say this project is going backward from the trend--- while other countries and cities are going underground, PSE is doing the opposite.

**119. Patricia and Bruce Brown** (*zip code: 98006*)

**120. Gregg Smith** (*zip code: 98006*)

**121. Gretchan Lindsey** (*zip code: 98006*)

As a rate payer and citizen, I expect your data, scenarios and options to be up-to-date using current data and methods, accurate and not misleading.

**122. Roy Grinnell** (*zip code: 98006*)

To: Heidi Bedwell, Energize Eastside EIS Program Manager  
From: Roy Grinnell, P.E.

Dear Ms. Bedwell,

I am very concerned about Puget Sound Energy's "Energize Eastside" project, which proposes to build 18 miles of high-voltage transmission lines through four Eastside cities (Alternative 1A).

PSE tries to justify the need for the project using an impossible scenario with improper and flawed assumptions that would cause regional blackouts, according to the Lauckhart-Schiffman Load Flow Study, available at [CENSE.org](http://CENSE.org).

Alternative 1A would place new lines and poles much too close to aging petroleum pipelines. Responsible safety standards require at least a 50 foot separation. A construction or operational accident could cause a catastrophic pipeline explosion like the one that killed three Bellingham residents in 1999. Pipeline corrosion along this line is already a problem. This risk is not adequately addressed in the EIS.

Alternative 2, the Integrated Resources Approach, is a safer and less costly alternative. But the solution described in the EIS was not developed or reviewed by independent experts that have suitable experience with modern electrical grid technologies, including Demand Side Management and Distributed Energy Resources. The costs and capabilities are based on inaccurate and obsolete studies. As the Northwest Power Council's Seventh Power Plan makes clear, a carefully developed plan would easily beat alternative 1A in cost, safety, and support for the environment.

The other transmission line options (1B, 1C, 1D and Alternative 3) are not practical for financial or political reasons.

Ratepayers are asked to spend more than a billion dollars over the lifetime of PSE's transmission line. The Draft EIS must answer these basic questions in order to convince residents that we are getting the best possible plan for our energy future.

**123. Grace Drone** (*zip code: 98006*)

Dear Ms. Bedwell,

I am very concerned about Puget Sound Energy's "Energize Eastside" project, which proposes to build 18 miles of high-voltage transmission lines through four Eastside cities (Alternative 1A).

PSE tries to justify the need for the project using an impossible scenario that would cause regional blackouts, according to the Lauckhart-Schiffman Load Flow Study, available at CENSE.org.

Alternative 1A would place new lines and poles much too close to aging petroleum pipelines. Responsible safety standards require at least a 50 foot separation. A construction or operational accident could cause a catastrophic pipeline explosion like the one that killed three Bellingham residents in 1999. This risk is not adequately addressed in the EIS.

Alternative 2, the Integrated Resources Approach, is a safer and less costly alternative. But the solution described in the EIS was not developed or reviewed by independent experts that have suitable experience with modern electrical grid technologies, including Demand Side Management and Distributed Energy Resources. The costs and capabilities are based on inaccurate and obsolete studies. As the Northwest Power Council's Seventh Power Plan makes clear, a carefully developed plan would easily beat alternative 1A in cost, safety, and support for the environment.

The other transmission line options (1B, 1C, 1D and Alternative 3) are not practical for financial or political reasons.

Ratepayers are asked to spend more than a billion dollars over the lifetime of PSE's transmission line. The Draft EIS must answer these basic questions in order to convince residents that we are getting the best possible plan for our energy future.

**124. haili sun** (*zip code: 98006*)

**125. Hannah Ge** (*zip code: 98006*)

I'm very concerned about this project. My suggestions: first, let's evaluate if this project is indeed needed and have no alternative solutions e.g. green energy or other lower energy consumption approach for households or commercial estates in Bellevue, second, let's find out if the project can go through a less invasive route than have to cut through residential areas including schools and busy shopping areas.

**126. Norm Hansen** (*zip code: 98005*)

Phase 1 EIS needs a final report since the line may not be needed. See new load flow studies by CENSE. Phase 2 would be a waste to rate payers if not needed.

**127. Helen Si** (*zip code: 98006*)

**128. Helen Tian** (*zip code: 98006*)

**129. Li Han** (*zip code: 98006*)

**130. David Herman** (*zip code: 98056*)

**131. Angela Allison** (*zip code: 98006*)

**132. Richard Howell** (*zip code: 98056*)

PSE needs to listen to us. This project is not needed nor welcome. This is simply a corporate profit grab at the expense of the rate payers and eastside residents.

**133. Huatong Sun** (*zip code: 98006*)

**134. Hui Lu** (*zip code: 98006*)

Against Energize Eastside project!

**135. Huiying Ye** (*zip code: 98006*)

**136. Dana Tillson** (*zip code: 98005*)

No need for new transmission lines

**137. Chuanzhong Nie** (*zip code: 98006*)

**138. Kevin Iden** (*zip code: 98056*)

I am very concerned about Puget Sound Energy's "Energize Eastside"!!!

**139. Irene Kearns** (*zip code: 98005*)

**140. LU ZHANG** (*zip code: 98006*)

**141. Test Cense** (*zip code: 98006*)

A little comment

**142. Jennifer Pinkowski** (*zip code: 98006*)

**143. Julie Huang** (*zip code: 98005*)

**144. Jacqueline Becker** (*zip code: 98006*)

**145. jamie kim** (*zip code: 98005*)

I am very opposed to this project because it appears independent evidence contradicts the need for this project.

**146. Jing chang** (*zip code: 98052*)

**147. Barbara Bobbitt** (*zip code: 98007*)

**148. Jane Kim** (*zip code: 98006*)

NO HIGH POLE AND WIRE TOWERS in our neighborhood. There is eminent danger of hitting the gas pipeline. Higher transmission wires and poles create sound and health dangers to people as well.

**149. JC McCabe** (*zip code: 98006*)

**150. Judy Mock** (*zip code: 98006*)

Thank you for your time and concern with this important issue.

**151. Jeffrey Byers** (*zip code: 98006*)

**152. Jennifer Xu** (*zip code: 98006*)

No PSEG high voltage power line

**153. Jennifer Wilson** (*zip code: 98006*)

**154. Jessie Chow** (*zip code: 98034*)

We need to find a better solution for the future of our children and the environment, not for the short term Corp profits.

**155. Jeff Felix** (*zip code: 98005*)

Based on all of the analysis that I've seen, we don't need this project.

**156. Jian Chen** (*zip code: 98006*)

**157. Helen Liang** (*zip code: 98006*)

**158. NAN ZHU** (*zip code: 98006*)

STOP PSE PROFITIBG AT LOCAL'S COST

**159. JD Yu** (*zip code: 98006*)

According to expert lauckhart-schiffman load flow study, there is enough capacity margin to serve growth on the eastside for 20 to 40 years. There is no need to build new transmission line.

**160. John Laughlin** (*zip code: 98006*)

I'm concerned about safety with respect to the pipeline and neighborhood character.

**161. Linda Galluzzo** (*zip code: 98056*)

**162. Julie Lionetti** (*zip code: 98005*)

**163. Jodi Gable** (*zip code: 98006*)

**164. jodis zhu** (*zip code: 98006*)

this is not good for our living environment

**165. Joe DeGennaro** (*zip code: 98056*)

To: Heidi Bedwell, Energize Eastside EIS Program Manager

From: Joe & Cathy DeGennaro

Dear Ms. Bedwell,

I am very concerned about Puget Sound Energy's "Energize Eastside" project, which proposes to build 18 miles of high-voltage transmission lines through four Eastside cities (Alternative 1A).

PSE tries to justify the need for the project using an impossible scenario that would cause regional blackouts, according to the Lauckhart-Schiffman Load Flow Study, available at CENSE.org.

Alternative 1A would place new lines and poles much too close to aging petroleum pipelines. Responsible safety standards require at least a 50 foot separation. A construction or operational accident could cause a catastrophic pipeline explosion like the one that killed three Bellingham residents in 1999. This risk is not adequately addressed in the EIS.

Alternative 2, the Integrated Resources Approach, is a safer and less costly alternative. But the solution described in the EIS was not developed or reviewed by independent experts that have suitable experience with modern electrical grid technologies, including Demand Side Management and Distributed Energy Resources. The costs and capabilities are based on inaccurate and obsolete studies. As the Northwest Power Council's Seventh Power Plan makes clear, a carefully developed plan would easily beat alternative 1A in cost, safety, and support for the environment.

The other transmission line options (1B, 1C, 1D and Alternative 3) are not practical for financial or political reasons.

Ratepayers are asked to spend more than a billion dollars over the lifetime of PSE's transmission line. The Draft EIS must answer these basic questions in order to convince residents that we are getting the best possible plan for our energy future.

**166. John Merrill** (*zip code: 98006*)

**167. Robert Jones** (*zip code: 98056*)

Why are we wasting time on Puget Sound Energy's proposal when it is not needed, not safe, a blight on the communities involved, and its only purpose is to make money for their investors?

**168. joy paltiel** (*zip code: 98006*)

I am signing this petition instead of writing my own letter simply because I share the concern of others

and don't need to rewrite the message in any other way in order for you to get it. There are so many reasons to stop this disaster from happening. I trust you will recognize that this because the transmission lines need to be stop... for all the right reasons. Thank you for your attention.

**169. Joy Phelps** (*zip code: 98006*)

This unnecessary project exposes the greed of PSE, which puts the 9.8% ROI it will gain ahead of public safety.

**170. Yanping Liu** (*zip code: 98006*)

**171. Janet Berg** (*zip code: 98006*)

**172. Angela Juan** (*zip code: 98006*)

I live right by the side of the trail along with the tall power line and Olympic Petroleum pipeline in Newport Hills Bellevue. It is scary enough already for us to live by those thing every day.

We definitely don't want Puget Sound Energy to build even more taller, bigger, and stronger power line by our house. These tall power lines will threaten our lives in the future if there's something wrong with it and it will cause the explosion with the petroleum pipeline and burn us into ashes in one second!

If there's an seismic gigantic earthquake which is expecting, happen in the future in our or our children lifetime, these tall power lines will cause even more damage such as fire and burn down all the houses and all the people when they fall from the earthquake because they are so Huge! We don't need More Tragedy on top of the catastrophe! We PREVENT it!!!

We got way enough radiation already everyday live by these tall power lines, we Don't want those huge tall power lines to NUKE us even more everyday in our life. We want to live healthy and Not to get life threatening Cancer from those Huge power lines in our life.

We work hard in our life and finally we could afford to buy the house we live in now with 30 years of mortgage. We Can't afford to lose our house value dropped by 20% or more because of those Huge power lines!

Eastside is a very nice neighborhood here and we Don't want PSE to build those Huge Gigantic power line to destroy and to threaten our lives, our health, our peace of mind, our property, and the beauty of the nature where we live! So NO Giant Power Lines in Eastside!!! Seriously!!! Please and Thank You!

**173. Judith Mercer** (*zip code: 98006*)

Please reject the PSE's Energize Eastside. It is unnecessary, expensive and dangerous.

**174. Julia Chan** (*zip code: 98006*)

No new energize project at somerset

**175. kenn gennari** (*zip code: 98006*)

**176. Kalai Socha-Leialoha** (*zip code: 98005*)

We live in Bridle Trails. I agree with CENSE that what PSE wants to do is unnecessary on many levels. I would not like to see their current plan go through if at all possible.

~ thank you,

Kalai Socha-Leialoha

**177. Karen Xu** (*zip code: 98006*)

Building high voltage power line at residential area and schools are huge potential hazard to local community.

**178. An anonymous signer** (*zip code: 98005*)

As a homeowner I am Opposed the the proposed towers in Woodbridge; look beyond these residential neighborhoods!

**179. Katherine ma** (*zip code: 98006*)

**180. Kathleen Sherman** (*zip code: 98006*)

**181. Kathy Judkins** (*zip code: 98006*)

Alternative 1A could cause my over a million dollar home to be demolished due to the 50 foot clearance required from the pipeline. Also during construction I would have no access to my garage or street on the easement. I will fight this plan until I die.

**182. Kathleen Millen** (*zip code: 98059*)

**183. Kathy Woodman** (*zip code: 98005*)

**184. Kausik Kayal** (*zip code: 98056*)

**185. Keith Collins** (*zip code: 98005*)

The whole process was flawed from the start. City hall seems to be in the pocket of PSE. Stop this nonsense now!

**186. Grace Zhang** (*zip code: 98006*)

**187. Kenneth YAMAMOTO** (*zip code: 98006*)

The upgraded evidence convinces me that we do not need this extensive upgrade that PSE proposed. If we can wait for the battery backups in in 10 to 20 years a less expensive and simpler solution will be the way to go.

**188. Kristin Quam** (*zip code: 98006*)

I support the no action alternative because it gives the community time to increase conservation efforts and to harness technological advancements. If alternative one is approved there will be no going back. Please do what is best for our neighborhoods and community. PSE can find another way to satisfy their foreign investors.

**189. Karen Esayian** (*zip code: 98006*)

**190. Kristi Weir** (*zip code: 98006*)

DEIS should be about protecting the environment. The best thing for the environment would be NOT to build Energize Eastside as it is to needed. We can meet our energy needs by renewable resources as well as conservation through building design. It would be hard to replace the carbon sequestration that 8000 tree provide and which Energize Eastside would cut down.

**191. Steven Shimamoto** (*zip code: 98006*)

NO POWER LINES!!

**192. Shioon Kim** (*zip code: 98006*)

Before PSE processes the high voltage project, they needs to prove it is safe or not for electric magnetic field.

It looks like for them for their business grow but not for our residents.

**193. Eri Koizumi** (*zip code: 98056*)

After all, please think about what if your house is in this zone.

**194. Kathleen Quam** (*zip code: 98006*)

I support a no-action alternative. With the 15 year anniversary of the Nisqually earthquake, I am reminded of the unique safety concerns our region faces. The proposed transmission lines are too close to the aging Olympic pipeline.

**195. Krishna Nareddy** (*zip code: 98006*)

Please do not abuse the existing easement to install a high powered power transmission line whose main purpose is to sell power to Canada.

Our neighborhoods will pay the price and that's not fair!

**196. Kristen McSherry** (*zip code: 98005*)

**197. Larry Johnson** (*zip code: 98056*)

I support and adopt the objections to the draft EIS as raised by CENSE. Do the right thing!

**198. Laura Liutkiene** (*zip code: 98006*)

**199. yueqin wang** (*zip code: 98006*)

Protect our beautiful home. Please give up or change new high voltage power line design in Somerset. Thanks.

**200. Laura Boylan** (*zip code: 98008*)

**201. Leah Willert** (*zip code: 98027*)

**202. Leslie Milstein** (*zip code: 98006*)

Let's have better studies of the project.

**203. Anita Li** (*zip code: 98006*)

**204. Jeanette Liao** (*zip code: 98006*)

**205. Steve wu** (*zip code: 98006*)

support CENSE, keep our community safe for kids.

**206. Linda Anderson** (*zip code: 98005*)

**207. Lindsey Kaner** (*zip code: 98055*)

**208. liping ke** (*zip code: 98006*)

Make it less impact to our neighborhood make it environmental friendly

**209. Lisa Howard** (*zip code: 98006*)

**210. Lori Elworth** (*zip code: 98056*)

Pause this EIS here and get the truth. Determine energy need that is unbiased. The city of Bellevue, as the lead agency, should determine need. You have the responsibility to control this process with regard to safety and cost. Use your independent technical experts and legal council and pause the DEIS. PSE is not providing answers to questions asked by CENSE. I am a member of CENSE.

**211. Lori Wheatley** (*zip code: 98006*)

To: Heidi Bedwell, Energize Eastside EIS Program Manager

From: Lori Wheatley

Dear Ms. Bedwell,

I am very concerned about Puget Sound Energy's "Energize Eastside" project, which proposes to build 18 miles of high-voltage transmission lines through four Eastside cities (Alternative 1A).

PSE tries to justify the need for the project using an impossible scenario that would cause regional blackouts, according to the Lauckhart-Schiffman Load Flow Study, available at CENSE.org.

Alternative 1A would place new lines and poles much too close to aging petroleum pipelines. Responsible safety standards require at least a 50 foot separation. A construction or operational accident could cause a catastrophic pipeline explosion like the one that killed three Bellingham residents in 1999. This risk is not adequately addressed in the EIS.

Alternative 2, the Integrated Resources Approach, is a safer and less costly alternative. But the solution described in the EIS was not developed or reviewed by independent experts that have suitable experience with modern electrical grid technologies, including Demand Side Management and Distributed Energy Resources. The costs and capabilities are based on inaccurate and obsolete studies. As the Northwest Power Council's Seventh Power Plan makes clear, a carefully developed plan would easily beat alternative 1A in cost, safety, and support for the environment.

The other transmission line options (1B, 1C, 1D and Alternative 3) are not practical for financial or

political reasons.

Ratepayers are asked to spend more than a billion dollars over the lifetime of PSE's transmission line. The Draft EIS must answer these basic questions in order to convince residents that we are getting the best possible plan for our energy future.

**212. Luxi Ji** (*zip code: 98006*)

**213. Lorraine Meyer** (*zip code: 98005*)

I do not feel that this project is in the best interests for the Eastside and the residents. The logistics of installing these mammoth poles in our area is certainly unreasonable due to access to the proposed area.

**214. Lucy Regan** (*zip code: 98006*)

I am against locating the proposed power lines in close proximity to aging petroleum pipelines, next to Tyee middle school to put potential safety risk to our neighborhood and students.

**215. Matthew Luhr** (*zip code: 98058*)

Enough is enough.

**216. Lori White** (*zip code: 98005-1353*)

**217. Laurie Wick** (*zip code: 98005*)

Go back to the drawing board! The need for Energize Eastside as proposed has NOT been demonstrated.

**218. Michelle Liu** (*zip code: 98006*)

Negative impact to the environment, safety issues for the community.

**219. Lily Yin** (*zip code: 98006*)

EIS program will definitely damage all scenic view from eastside. We love this land because it is beautiful. We enjoyed the land and against any program would destroy the view.

**220. Lynn Ang** (*zip code: 98006*)

There is no need for a 18 foot overhead transmission line. Any new lines should be underground. It's ugly, outdated and dangerous to have such a thing in a neighborhood. It's also expensive and destroy the beauty of our neighbour.

**221. Lynne Prevetie** (*zip code: 98056*)

Because the DEIS used PSE's Load Flow data to prove the actual need for the project, it seems glaringly flawed. I would encourage a fair report. Certainly the cost of your own Load Flow Study would look small compared with the cost and damage of Energize Eastside.  
Thank you.

**222. Linda Young** (*zip code: 98056*)

STOP THIS NOW - IT IS NOT NEEDED.

YOU CANNOT DESTROY HOMES AND WRECK FAMILIES LIVES

YOU CANNOT CHOP DOWN 8000 TREES

YOU CANNOT PUT PEOPLE IN DANGER - OLYMPIC PIPE LINE IN THE EXACT SAME PATH AS  
230 VOLTAGE - DO YOU WANT TO BE RESPONSIBLE FOR PEOPLE BEING BURNT TO DEATH?

**223. mingmei xu** (*zip code: 98006*)

pse is crazy for money. They think of none for local residence.

**224. Lisa Beelin** (*zip code: 98005*)

**225. Marcia LeVeque** (*zip code: 98006*)

Please be progressive in planning to keep Bellevue a safe place for all our neighborhoods without high voltage poles near an oil pipeline. It's important to consider different alternatives that other states are already using to help provide the power we need for our beautiful city.

**226. Marty Arnot** (*zip code: 98006*)

Let's not destroy our neighborhoods with unneeded power poles. There are better solutions for the Eastside

**227. Mei Qi** (*zip code: 98006*)

**228. Melinda Carbon** (*zip code: 98008*)

**229. Michael Evered** (*zip code: 98006*)

This project is not needed, would endanger public safety and would be a visual blight on our City

**230. Linda Meyer** (*zip code: 98005*)

I do not feel it is necessary for large high wire lines. If energy is needed there are other options. Do not believe energy is needed for this area.

**231. Mark Grossbard** (*zip code: 98005*)

**232. Michael Kenway** (*zip code: 98005*)

**233. Tomiko Teramoto** (*zip code: 98056*)

We are a retired couple and hope to end our life here. If our home is purchased by PSE, we can not get similar value and environment house any more. We can not get mortgage because we live with limited income.

You are destroying our life!

**234. Michael Zwilling** (*zip code: 98007*)

**235. Michele Miller** (*zip code: 98005*)

Enough is enough I already have the four lines of power and two pipelines. The people that maintain

these utilities forget the properties belong to the home owners and not them. All this happens on less than an acre of land. My family has owned this property since 1971. This is all about PSE selling more power outside this area and making money not protecting us for the future.

**236. Mina Peterson** (*zip code: 98005*)

As a full time real estate professional for 30 years, I can say unequivocally putting any visible towers in this or any neighborhood will dramatically devalue homes considerably throughout the neighborhoods and have a continued impact indefinitely.

The impact will be felt immediately and even the possibility of this project proceeding will and is something that buyers who might be considering a move to the area are asking about and rethinking the locations they are considering.

Whether or not the energy companies care or consider our home values, Buyers and Homeowners do care.

I know many many buyers and property owners believe, living near these towers can cause cancers and have other potential harmful health effects. This belief is particularly evident with the wave of many cultures new to the area. It is definitely seen as bad luck and bad energy.

Just having the power towers that currently run through these areas or any other, I can attest to the fact that 80% or more of the potential buyers to a particular home in close proximity to these current towers will NOT purchase a home due to health concerns alone, real or not real.

The values of homes with views will drop as well just having the eye sore of possible huge towers, not just possible health concerns.

**RUN THE CABLE UNDERGROUND AND IN CABLES ON THE FLOOR OF LAKES! NOT THROUGH OUR NEIGHBORHOODS.**

**237. Mary Lynne Poole** (*zip code: 98005*)

Puget Sound is pushing ugly, unnecessary and dangerous high tension wires throughout the East side. Please rule against Puget Sound.

**238. Min Chen** (*zip code: 98006*)

**239. Michelle Molan** (*zip code: 98006*)

**240. Margaret Moore** (*zip code: 98006*)

PSE cannot be allowed to move forward with this project as planned. There is ample evidence that it is poorly conceived for many of the wrong reasons. Help us now!

**241. Money Wan** (*zip code: Wa98056*)

Do not agree with PSE plan .

**242. Mindy Suurs** (*zip code: 98006*)

**243. Mei yan** (*zip code: 98006*)

**244. Natalie Duryea** (*zip code: 98005*)

Save our City!!!!

**245. Thomas Neighbors** (*zip code: 98004-8610*)

**246. Hao Wang** (*zip code: 98006*)

Dear Ms. Bedwell:

We are very concerned about PSE's proposal to build 130 ft tall power lines that potentially go through several Bellevue residential neighborhoods. The concept to build high voltage transmission lines in the middle of residential homes is extremely irresponsible. It will create significant risks to the people who live in the adjacent areas. Our city is located in a seismic active zone. And those transmission lines are too close to the petroleum pipelines and residential homes.

As a public official, you are in the position can change this project into right direction. We ask you to listen to the voices of local residents. Please don't let the big cooperation dictate the future of our beautiful city.

Thank you very much!

Sincerely yours,

Hao Wang  
Yingli Xu  
Emily Wang

**247. Choy Leng Yeong** (*zip code: 98006*)

**248. Judith Odell** (*zip code: 98006*)

Please do not have these built.

**249. Orville Gunnoe** (*zip code: 98007*)

There is a reason why responsible power/utility companies found their origins as government-owned organizations. PSE could learn lessons by not trying to bulldoze or steamroll its customers to submit to poorly devised and flawed plans for the future.

**250. Ontie Griebel** (*zip code: 98005*)

**251. Michael Oldham** (*zip code: 98006*)

I am against any new power transmission lines being added next to the Lake Lanes corridor.

**252. Jin Wang** (*zip code: 98006*)

**253. Eugen Pajor** (*zip code: 98056*)

Please stop the "not needed" and unsafety PSE project

**254. Patricia Magnani** (*zip code: 98006*)

**255. Patricia Janes** (*zip code: 98005*)

The PSE proposal is dangerous, will destroy the views of many, will send the power to Canada, will send the profits to Australia at the expense of all the rate payers in All the cities involved. There are alternatives that would give the extra power, if really needed. These have been neglected by PSE. The city of Bellevue and others involved deserve more respect. Please ask for it Thank you.

**256. Paul Kim** (*zip code: 98006*)

**257. Pal Nichoson** (*zip code: 98052*)

This "Energize Eastside" project by Puget sound Energy is a badly flawed idea that is not needed. Lets put a hold on this now.

**258. Julie Baker** (*zip code: 98005*)

We are very concerned about the PSE powerline project and do not believe that adequate research has been performed to justify the need for these proposed towers.

**259. PING CHEN** (*zip code: 98006*)

**260. Penny Bahner** (*zip code: 98005*)

The PSE's Energize Eastside project is shown to not be necessary per the Lauckhart-Schiffman Load Flow Study and it is just another way that a government agency believes we, the people, are stupid and uninformed. I am absolutely not in favor of this project being jammed down our throats.

**261. Peter Wise** (*zip code: 98007*)

Please think harder and more deeply about how you can improve service without putting Eastside residents in danger and destroying our views with giant poles and pylons.

**262. Petra Sixl** (*zip code: 98006*)

I have great fears regarding safety in our area and communities. In the Seattle Times on Sunday, 2/28/16, was an article about a Quake drill in June. The article says, the next Quake will be far more damaging then the one in 2001, magnitude 9, which is equivalent to 35,2 billion tons of TNT and will last 4-5 minutes.

I think, we all should keep this in mind when we plan for our future!

**263. Phil Sherman** (*zip code: 98006*)

**264. Margie Pietz** (*zip code: 98056*)

I really resent the way PSE is trying to ram this project down our throats. It will not only be a huge blight to our neighborhood but take away some of our homes. PSE has not shown that this project is needed and the net result of building this mega project is we get to pay for it and PSE makes money selling the extra power to Canada, etc.

**265. ping yin** (*zip code: 98006*)

**266. Huimin Huang** (*zip code: 98056*)

**267. Qiang Zhang** (*zip code: 98006*)

negative impacts on environments; safety issues to our communities; et al

**268. Li Qiao** (*zip code: 98006*)

To: Heidi Bedwell, Energize Eastside EIS Program Manager

From: [Your Name]

Dear Ms. Bedwell,

I am very concerned about Puget Sound Energy's "Energize Eastside" project, which proposes to build 18 miles of high-voltage transmission lines through four Eastside cities (Alternative 1A).

PSE tries to justify the need for the project using an impossible scenario that would cause regional blackouts, according to the Lauckhart-Schiffman Load Flow Study, available at CENSE.org.

Alternative 1A would place new lines and poles much too close to aging petroleum pipelines. Responsible safety standards require at least a 50 foot separation. A construction or operational accident could cause a catastrophic pipeline explosion like the one that killed three Bellingham residents in 1999. This risk is not adequately addressed in the EIS.

Alternative 2, the Integrated Resources Approach, is a safer and less costly alternative. But the solution described in the EIS was not developed or reviewed by independent experts that have suitable experience with modern electrical grid technologies, including Demand Side Management and Distributed Energy Resources. The costs and capabilities are based on inaccurate and obsolete studies. As the Northwest Power Council's Seventh Power Plan makes clear, a carefully developed plan would easily beat alternative 1A in cost, safety, and support for the environment.

The other transmission line options (1B, 1C, 1D and Alternative 3) are not practical for financial or political reasons.

Ratepayers are asked to spend more than a billion dollars over the lifetime of PSE's transmission line. The Draft EIS must answer these basic questions in order to convince residents that we are getting the best possible plan for our energy future.

**269. Qi Li** (*zip code: 98006*)

**270. Angela qu** (*zip code: 98006*)

**271. Bin Xu** (*zip code: 98006*)

**272. Rachel Ting** (*zip code: 98006*)

**273. Rajendra Kuramkote** (*zip code: 98056*)

To: Heidi Bedwell, Energize Eastside EIS Program Manager

From: Rajendra Kuramkote

Dear Ms. Bedwell,

I am very concerned about Puget Sound Energy's "Energize Eastside" project, which proposes to build 18 miles of high-voltage transmission lines through four Eastside cities (Alternative 1A).

PSE tries to justify the need for the project using an impossible scenario that would cause regional blackouts, according to the Lauckhart-Schiffman Load Flow Study, available at CENSE.org.

Alternative 1A would place new lines and poles much too close to aging petroleum pipelines. Responsible safety standards require at least a 50 foot separation. A construction or operational accident could cause a catastrophic pipeline explosion like the one that killed three Bellingham residents in 1999. This risk is not adequately addressed in the EIS.

Alternative 2, the Integrated Resources Approach, is a safer and less costly alternative. But the solution described in the EIS was not developed or reviewed by independent experts that have suitable experience with modern electrical grid technologies, including Demand Side Management and Distributed Energy Resources. The costs and capabilities are based on inaccurate and obsolete studies. As the Northwest Power Council's Seventh Power Plan makes clear, a carefully developed plan would easily beat alternative 1A in cost, safety, and support for the environment.

The other transmission line options (1B, 1C, 1D and Alternative 3) are not practical for financial or political reasons.

Ratepayers are asked to spend more than a billion dollars over the lifetime of PSE's transmission line. The Draft EIS must answer these basic questions in order to convince residents that we are getting the best possible plan for our energy future.

**274. William Rambo** (*zip code: 98006*)

Marylin and I have attended many PSE meetings at City Hall, Hotels and neighborhood discussions. We have done it:

- Out of SAFETY concerns with the gas lines (Possible fires will run up the hill very fast).
- The PSE forecast on growth in demand vs actual expectations seem to be greatly overblown.
- PSE's inputs into the simulations neglect the supplemental generation that the "rate payers" have already funded for peak shaving in emergencies.
- the analysis gives no importance to the negative property value impact of the industrial look on one of the largest and best Puget Sound Basin/ Olympic Mt. view subdivisions which invested in underground distribution to protect the views.

We don't see a need or justification for this significant investment at the expense of rate payers.

Respectfully,

Marylin and Bill Rambo

**275. Randy Chung** (*zip code: 98056*)

**276. Russell Borgmann** (*zip code: 98005*)

Please address fundamental flaws in EIS assumptions and the EIS process.

**277. Michael Davis** (*zip code: 98006*)

Very concerned about damage to pipeline and noise from wires. Our house is very close, and existing electrical line crosses over our backyard. The pipeline also is in our backyard.

**278. Frank Song** (*zip code: 98006*)  
this is not good for our environmemt

**279. Rebecca Kinnestrand** (*zip code: 98052*)

I do not believe PSE has the welfare of the citizens of this area in mind. Building power lines over the gas pipeline is an extreme danger to our house and my children who play within 20 yards of the buried pipeline. The Eastside does not need more power, that is only what PSE is saying to push through this project.

**280. Rebecca Laughlin** (*zip code: 98006*)

**281. Rhee Elikor** (*zip code: 98006*)

I strongly believe, based on the research done by CENSE, that this project is neither necessary nor safe for the citizens of Bellevue and the surrounding communities.

**282. Richard Chen** (*zip code: 98006*)

**283. Bo Han** (*zip code: 98006*)

Dear Ms. Bedwell,

I am very concerned about Puget Sound Energy's "Energize Eastside" project, which proposes to build 18 miles of high-voltage transmission lines through four Eastside cities (Alternative 1A).

PSE tries to justify the need for the project using an impossible scenario that would cause regional blackouts, according to the Lauckhart-Schiffman Load Flow Study, available at CENSE.org.

Alternative 1A would place new lines and poles much too close to aging petroleum pipelines. Responsible safety standards require at least a 50 foot separation. A construction or operational accident could cause a catastrophic pipeline explosion like the one that killed three Bellingham residents in 1999. This risk is not adequately addressed in the EIS.

Alternative 2, the Integrated Resources Approach, is a safer and less costly alternative. But the solution described in the EIS was not developed or reviewed by independent experts that have suitable experience with modern electrical grid technologies, including Demand Side Management and Distributed Energy Resources. The costs and capabilities are based on inaccurate and obsolete studies. As the Northwest Power Council's Seventh Power Plan makes clear, a carefully developed plan would easily beat alternative 1A in cost, safety, and support for the environment.

The other transmission line options (1B, 1C, 1D and Alternative 3) are not practical for financial or political reasons.

Ratepayers are asked to spend more than a billion dollars over the lifetime of PSE's transmission line. The Draft EIS must answer these basic questions in order to convince residents that we are getting the best possible plan for our energy future.

**284. Rita Lei** (*zip code: WA98006*)

**285. Robert Zapalski** (*zip code: 98056*)

**286. Ronda Woodcox** (*zip code: 98006*)

**287. Rachel Primeau** (*zip code: 98007*)

**288. Ronald Redpath** (*zip code: 98056*)

The justification for this project appears to have been manipulated to arrive at the desired answer. In addition, I am very concerned about the safety of this project in that it shares space with the Olympic Pipeline.

**289. Ruth Marsh** (*zip code: 98006*)

**290. Kathryn Behrens** (*zip code: 98006*)

Many children play in the Forest Hill Neighborhood park which is adjacent to the Olympic Pipeline, not to mention the homes that are also adjacent to this pipeline. Please do not place new poles and lines close to these aging pipelines, parks, and homes.

**291. Ryan Shan** (*zip code: 98006*)

**292. Shannon Rome** (*zip code: 98033*)

**293. Sandra Alston** (*zip code: 98004*)

Please make available to customers more info to explain contradictory findings. This would include-- need, cost, and hazards.

**294. Sandy Seppi** (*zip code: 98027*)

**295. Sarah Daniels** (*zip code: 98006*)

**296. scally liang** (*zip code: 98006*)

**297. Scott LeVeque** (*zip code: 98006*)

Please hold PSE accountable to respond to the numerous concerns raised against this project. I've attended multiple meetings where PSE simply deflects, or refuses to answer, questions which get raised that challenge their own internal agenda.

Thank you.

**298. Sean Cox** (*zip code: 98006*)

**299. Kayla Laughlin** (*zip code: 98056*)

I am yet to be convinced we need this expensive project. I am very concerned for neighborhood safety, and the detrimental impact on our communities and environment. I now hear that homes in my neighborhood may need to be removed to expand the easement that runs through Newcastle (which has two gas pipelines)! If and when this project is needed, we all know there are other alternatives with less impact on our neighborhoods and our pocketbooks.

**300. Yanbing Wang** (*zip code: 98006*)

I have two little kids. I am really concern the impact on kids' health.

**301. Sam Esayian** (*zip code: 98006*)

**302. Susan Hagensen** (*zip code: 98006*)

Please consider the findings of CENSE.

**303. Sharon Chen** (*zip code: 98006*)

**304. Shi Sun** (*zip code: 98006*)

**305. xiao Meng** (*zip code: 98006*)

We don't want power line going through Somerset area.

**306. Jamie Tan** (*zip code: 98006*)

**307. Zhi Sun** (*zip code: 98006*)

I am against the PSE's plans to build 230kv 130-foot power poles though Somerset and our city.

**308. helen wu** (*zip code: 98006*)

no high voltage power transmission line in Somerset area, we want Green tree and safety park for family.

**309. Shyan Griffith** (*zip code: 98006*)

We want to preserve the appearance of our neighborhood and protect the environment for our children by fighting against PSE's plans to build 230kv 130-foot power poles though Somerset and our city.

**310. Sirisha Dontireddy** (*zip code: 98006*)

**311. Steven Geagan** (*zip code: 98056*)

**312. LeMoin Beckman** (*zip code: 98006*)

Please do not let this ugly, costly, and unnecessary tragedy happen.

**313. Charles Cobb** (*zip code: 98006*)

Bring Sanity back to Bellevue. Stop this unneeded corporate ripoff

**314. Chao Song** (*zip code: 98006*)

**315. Sonia Zwilling** (*zip code: 98007*)

**316. sue johnson** (*zip code: 98007*)

I don't believe PSE really needs to do this and that it is simply a way to increase their profits.

**317. Sorin Gherman** (*zip code: 98006*)

**318. Spencer Hinds** (*zip code: 98006*)

**319. Sue Stronk** (*zip code: 98056*)

Stop this process now and unite Lauckhart and PSE in front of EFSEC and settle NEED once and for all!

**320. Star Evans** (*zip code: 98006*)

The eagles have a nest in the tree above my house and the lines would literally span OVER the top of my house!

**321. Stuart Campbell** (*zip code: 98006*)

Is this really necessary?

**322. mary lienhard** (*zip code: 98005*)

im against this project

**323. Stanislav Rumega** (*zip code: 98006*)

**324. Su Yamamura** (*zip code: 98006*)

**325. Xun Sun** (*zip code: 98005*)

**326. susan wu** (*zip code: 98006*)

We need keep our community safe.

**327. Suzie Lyons** (*zip code: 98005*)

Please take Cense's viewpoint very seriously. These types of big business pushes happen all over the world because individuals do not have the time or resources to respond to the bully tactics of wealthy businesses. Cense is doing something positive for the individuals of Bellevue (and surrounding communities) so please listen.

**328. Terry and Kari Block** (*zip code: 98006*)

Please correct the flaws in the Energize Eastside draft EIS. Protect our neighborhoods!

**329. Tammy Alford** (*zip code: 98006*)

**330. Yuhong Liu** (*zip code: 98006*)

**331. Tanya Franzen-Garrett** (*zip code: 98006*)

The lack of regulation, oversight and accountability with regards to PSE and their proposed "necessary project" greatly disturbs me. A privately, foreign owned company should not be allowed to

bully it's will and profit gain onto the backs of unwilling citizens. Not only will it cost us Millions of dollars, but it will greatly affect our neighborhoods, the esthetics that we have worked hard to build and maintain, and our property values.

**332. Thomas Cezeaux** (*zip code: 98056*)

I don't believe PSE's rationale for the need of this project is accurate.

**333. Randy Tada** (*zip code: 98006*)

Please eliminate this wasteful and unnecessary project to protect our neighborhoods and our pocketbooks.

**334. Irene Endow** (*zip code: 98006*)

I am very concerned about the enormous poles being so close to the pipeline. No good can come of this combination. Please don't let this unnecessary plan go through.

**335. Richard Kaner** (*zip code: 98006*)

**336. erich kirsch** (*zip code: 98005*)

**337. Tim liu** (*zip code: 98006*)

support CENSE, keep our community safe for kids.

**338. Todd Johnson** (*zip code: 98006*)

**339. Ron Wilson** (*zip code: 98006*)

**340. Todd Dunlap** (*zip code: 98005*)

**341. Trent Wheatley** (*zip code: 98006*)

To: Heidi Bedwell, Energize Eastside EIS Program Manager

From: Trent Wheatley

Dear Ms. Bedwell,

I am very concerned about Puget Sound Energy's "Energize Eastside" project, which proposes to build 18 miles of high-voltage transmission lines through four Eastside cities (Alternative 1A).

PSE tries to justify the need for the project using an impossible scenario that would cause regional blackouts, according to the Lauckhart-Schiffman Load Flow Study, available at CENSE.org.

Alternative 1A would place new lines and poles much too close to aging petroleum pipelines. Responsible safety standards require at least a 50 foot separation. A construction or operational accident could cause a catastrophic pipeline explosion like the one that killed three Bellingham residents in 1999. This risk is not adequately addressed in the EIS.

Alternative 2, the Integrated Resources Approach, is a safer and less costly alternative. But the solution described in the EIS was not developed or reviewed by independent experts that have suitable experience with modern electrical grid technologies, including Demand Side Management and Distributed Energy Resources. The costs and capabilities are based on inaccurate and obsolete studies. As the Northwest Power Council's Seventh Power Plan makes clear, a carefully developed plan would easily beat alternative 1A in cost, safety, and support for the environment.

The other transmission line options (1B, 1C, 1D and Alternative 3) are not practical for financial or political reasons.

Ratepayers are asked to spend more than a billion dollars over the lifetime of PSE's transmission line. The Draft EIS must answer these basic questions in order to convince residents that we are getting the best possible plan for our energy future.

**342. Terry Sinclair** (*zip code: 98006*)

Fixed-income senior, home is part of my retirement plan. This unneeded project will depreciate home values & is high safety-risk to implement. No justification for the project, if one is honest about load study assumptions.

**343. Tom Weir** (*zip code: 98006*)

This project is not needed and there are other technologies to use to meet any future demand which are less harmful to the environment and would make the system more flexible and less prone to blackouts.

**344. Yuqiong Liu** (*zip code: 98006*)

**345. Gary A. Johnson** (*zip code: 98006*)

Supports Alternative 2

**346. ning wang** (*zip code: 98006*)

Negative impact on environment.

**347. William Herling** (*zip code: 98006*)

To: Heidi Bedwell, Energize Eastside EIS Program Manager  
From: William Herling

Dear Ms. Bedwell,

I am very concerned about Puget Sound Energy's "Energize Eastside" project, which proposes to build 18 miles of high-voltage transmission lines through four Eastside cities (Alternative 1A).

PSE tries to justify the need for the project using an impossible scenario that would cause regional blackouts, according to the Lauckhart-Schiffman Load Flow Study, available at CENSE.org.

Alternative 1A would place new lines and poles much too close to aging petroleum pipelines. Responsible safety standards require at least a 50 foot separation. A construction or operational accident could cause a catastrophic pipeline explosion like the one that killed three Bellingham residents in 1999. This risk is not adequately addressed in the EIS.

Alternative 2, the Integrated Resources Approach, is a safer and less costly alternative. But the solution described in the EIS was not developed or reviewed by independent experts that have suitable experience with modern electrical grid technologies, including Demand Side Management and Distributed Energy Resources. The costs and capabilities are based on inaccurate and obsolete studies. As the Northwest Power Council's Seventh Power Plan makes clear, a carefully developed plan would easily beat alternative 1A in cost, safety, and support for the environment.

The other transmission line options (1B, 1C, 1D and Alternative 3) are not practical for financial or political reasons.

Ratepayers are asked to spend more than a billion dollars over the lifetime of PSE's transmission line. The Draft EIS must answer these basic questions in order to convince residents that we are getting the best possible plan for our energy future.

**348. Baicen Wang** (*zip code: 98006*)

**349. Yuan Li** (*zip code: 98006*)

**350. Wendy Dore** (*zip code: 98006*)

**351. JOHN WOO** (*zip code: 98056-1796*)

Home/property was purchased in 1987 knowing that Olympic Pipeline was in "my backyard", safe from further development. Boy was I wrong. If Alternative 1A moves forward, my home/property will be "MARKED FOR DEATH". Why should I continue to pay Property Tax if the only value left is with PSE?

**352. Le Wang** (*zip code: 98006*)

**353. Wolfgang Sixl** (*zip code: 98006*)

Please correct the flaws

**354. Xudan He** (*zip code: 98006*)

No new high voltage power lines in the neighborhood please. Thanks.

**355. Xiaohong yang** (*zip code: 98006*)

Please don't build the new powerline in our neighbor. It's not safe, and lower our neighborhood environment.

**356. Xiao Shang** (*zip code: 98006*)

Not safe for dense neighborhoods

**357. Xin Yu** (*zip code: 98006*)

**358. Xueyi Wang** (*zip code: 98006*)

Strongly support CENSE!

**359. Yan Jiang** (*zip code: 98006*)

please don't hang power lines over our neighborhood schools. our kids need a safe environment to grow up.

**360. Yan zhou** (*zip code: 5402301158*)

I strongly object this project since it will have an negative effect on environment and people.

**361. Allen Su** (*zip code: 98008*)

The right thing needs to be done. The proper assesement should be made before reaching any decision.

**362. Grace Huang** (*zip code: 98006*)

To: Heidi Bedwell, Energize Eastside EIS Program Manager

From: Grace Huang

Dear Ms. Bedwell,

I am very concerned about Puget Sound Energy's "Energize Eastside" project, which proposes to build 18 miles of high-voltage transmission lines through four Eastside cities (Alternative 1A).

PSE tries to justify the need for the project using an impossible scenario that would cause regional blackouts, according to the Lauckhart-Schiffman Load Flow Study, available at CENSE.org.

Alternative 1A would place new lines and poles much too close to aging petroleum pipelines. Responsible safety standards require at least a 50 foot separation. A construction or operational accident could cause a catastrophic pipeline explosion like the one that killed three Bellingham residents in 1999. This risk is not adequately addressed in the EIS.

Alternative 2, the Integrated Resources Approach, is a safer and less costly alternative. But the solution described in the EIS was not developed or reviewed by independent experts that have suitable experience with modern electrical grid technologies, including Demand Side Management and Distributed Energy Resources. The costs and capabilities are based on inaccurate and obsolete studies. As the Northwest Power Council's Seventh Power Plan makes clear, a carefully developed plan would easily beat alternative 1A in cost, safety, and support for the environment.

The other transmission line options (1B, 1C, 1D and Alternative 3) are not practical for financial or political reasons.

Ratepayers are asked to spend more than a billion dollars over the lifetime of PSE's transmission line.

The Draft EIS must answer these basic questions in order to convince residents that we are getting the best possible plan for our energy future.

**363. Ying Liu** (*zip code: 98006*)

I live close to the power line. There're studies showed that the high voltage power lines have negative effects to children's development. It's unfair to sacrifice my children's health to "energize Canada"

**364. Yiting huang** (*zip code: 98006*)

i strongly against this PSE project

**365. Maya Keselman** (*zip code: 98006*)

No to new power lines.

**366. Yun Li** (*zip code: 98056*)

**367. David Zhang** (*zip code: 98006*)

Save our environment! No Powerlines!

**368. yong zhang** (*zip code: 98006*)

The power line is too close to tyee middle school. It also damage housing market in my neighborhood. I am strongly against it

**369. Mingyan Li** (*zip code: 98006*)

**370. Wei Zhuang** (*zip code: 98006*)

negative impacts on environments; safety issues to our communities

**371. Zhenming Jiang** (*zip code: 98006*)

**372. jian zhang** (*zip code: 98006*)

Pse shluld consider the safety and property value of local residents, in stead of only corporate profit.

Gary Albert  
4629 142nd PL SE  
Bellevue 98006  
[albert.gary@gmail.com](mailto:albert.gary@gmail.com)

Tammy Alford  
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Beth Billington  
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Patricia and Bruce Brown  
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Michele Brown-Ruegg  
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[chrisjcb@hotmail.com](mailto:chrisjcb@hotmail.com)

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Julia Chan

somerset Dr se

Bellevue 98006

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- Thanks to all of you for your efforts in preparing this Draft EIS; as a retired electrical engineer and Environmental, Safety & Health engineer, I can certainly understand the amount of work involved
- Throughout 2014, served as a member of PSE's Community Advisory Group, to help ensure open communications between PSE and the residents of Kennydale and the residents of the Lake Lanes community to our North.
- During that time, I also became a member of the citizen group CENSE: **Coalition of Eastside Neighbors for Sensible Energy**
- Due to that experience and my evaluation of the project Alternatives offered in the D. EIS, I strongly believe that Alt. 2, the **Integrated Resources Approach**, is clearly the best choice.
- It is the only choice that provides a path for PSE to move forward into the 21<sup>st</sup> century while avoiding all of the negatives that go along with Alternative 1A: such as safety challenges , increased charges to the Eastside's ratepayers, decreased quality of life due to visual pollution, spoiling of our environment, devalued neighborhoods, and more.
- In closing, please consider Eastside flow studies other than those PSE or others may have provided.
- Specifically, I am asking you to read the Load Flow Study that was commissioned by CENSE in November 2015 and conducted by Richard Lauckhart, former PSE Vice President of Power Planning, and Richard ROBER Schiffman, a 23 year veteran of the energy industry. Their Study provides a credible challenge to PSE's **Eastside Customer Demand Forecast** and thus supports the viability of Alt. 2. I have 2 summary copies for you, and the entire report is available at CENSE.org .
- Thank you for this opportunity to present my views tonight.

Submitted by Darius Richards  
2.25.16 Renton Phase 1  
DEW public hearing

## LAUCKHART-SCHIFFMAN DEMAND FORECAST



# Load Flow modeling for "Energize Eastside"

Richard Lauckhart

Roger Schiffman

February 18, 2016

**The entire report, including appendices,**

**is available at**

**[CENSE.org](http://CENSE.org)**

# Executive Summary

In November 2015, the citizen group CENSE asked Richard Lauckhart and Roger Schiffman to study the scenario that motivates Puget Sound Energy's transmission project known as "Energize Eastside." We (Lauckhart and Schiffman) are nationally recognized power and transmission planners with specific knowledge of the Northwest power grid.

It is standard industry practice to use a "load flow model" to determine the need for a transmission project like Energize Eastside. In order to assess the reliability of the grid, analysts use specialized computer software to simulate failure of one or two major components while serving peak load conditions. For Energize Eastside, PSE simulates the failure of two major transformers during a peak winter usage scenario (temperature below 23° F and peak hours between 7–10 AM and 5–8 PM).

We ran our own load flow simulations based on data that PSE provided to the Western Electricity Coordinating Council (WECC). We used a "Base Case" for winter peak load projected for 2017–2018. PSE confirms this is the same data used as the basis for the company's "Eastside Needs Assessment."

Our findings differ from PSE's as follows:

1. PSE modified the Base Case to increase transmission of electricity to Canada from 500 MW to 1,500 MW. This level of energy transfer occurring simultaneously with winter peak loads creates instability in the regional grid. Transmission lines connecting the Puget Sound area to sources in central Washington do not have enough capacity to maintain this level of demand.
2. PSE assumed that six local generation plants were out of service, adding 1,400 MW of demand for transmission. This assumption also causes problems for the regional grid.
3. Even if the regional grid could sustain this level of demand, it is unlikely that regional grid coordinators would continue to deliver 1,500 MW to Canada while emergency conditions were occurring on the Eastside.
4. We found that the WECC Base Case contains a default assumption that PSE may not have corrected. The ratings for critical transformers are based on "summer normal" conditions, but the simulation should use significantly higher "winter emergency" ratings. The default value could cause PSE to underestimate System Capacity and overstate urgency to build the project.
5. The Base Case shows a demand growth rate of 0.5% per year for the Eastside. This is much lower than the 2.4% growth rate that PSE cites as motivation for Energize Eastside.

**Our study finds critical transformers operating at only 85% of their winter emergency rating, providing enough capacity margin to serve growth on the Eastside for 20 to 40 years.**



# Qualifications

**Richard Lauckhart** served as a high level decision maker at Puget Sound Power & Light (the predecessor of Puget Sound Energy). His employment with the company spanned 22 years as a financial and transmission planner as well as power planning. He served as the company's Vice President of Power Planning for four years.

Richard took a voluntary leave package when Puget Power merged with Washington Energy Company in 1997. He provided additional contract services to PSE for more than a year following the merger. After leaving PSE, Richard worked as an energy consultant, providing extensive testimony on transmission system load flow modeling before the California Public Utility Commission.

**Roger Schiffman** has 23 years of energy industry experience covering utility resource planning, electricity market evaluation, market assessment and simulation modeling, regulatory policy development, economic and financial analysis, and contract evaluation. Roger has led a large number of consulting engagements for many clients. He has extensive knowledge of industry standard modeling software used for power market analysis and transmission planning.

We are well acquainted with the physical layout and function of the Northwest power grid and the tools used to analyze its performance. Our resumes can be found in Appendix H.

Richard has provided pro bono consultation to CENSE since April 2015. He has received no financial compensation other than reimbursement of travel expenses. Roger had no relationship with CENSE prior to this report.

# Methodology

The power grid is a complex interconnected system with behaviors that cannot be easily understood without computer modeling software. We acquired a license to run the industry standard simulation software known as “GE PSLF”<sup>1</sup> to perform our studies.

The PSLF software uses a database that is supplied by the operator. We had hoped to use the same database that PSE used in its studies, but PSE refused to share it after months of negotiations. Instead, we received clearance from the Federal Energy Regulatory Commission (FERC) to access the database PSE submitted to the Western Electricity Coordinating Council (WECC). FERC determined that we presented no security threat and had a legitimate need to access the database (see FERC’s letter in Appendix A).

We used the WECC Base Case for the winter of 2017–18, which PSE confirms is the database the company used for that time period. We and PSE have made subsequent changes to the Base Case model in order to incorporate various assumptions. We don’t know exactly what changes PSE made to the database, but we will be explicit about the changes we made.

## **N-0 base scenario**

To ensure that everything was set up correctly, we ran a simulation using the unmodified Base Case and checked to see if the results aligned with those reported by WECC. This is referred to as an “N-0” scenario, meaning that zero major components of the grid are offline and the system is operating normally. The outputs of this simulation matched reported results.

The WECC Base Case assumes that the Energize Eastside project has been built. In order to determine the need for the project, we needed to study the performance of the grid without it. We reset the transmission configuration using parameters from an earlier WECC case that did not include the project.

## **N-1-1 contingency scenario**

An “N-1-1” scenario models what would happen if two major grid components fail in quick succession. Utilities are generally required

<sup>1</sup> <http://www.geenergyconsulting.com/pslf-re-envisioned>

to serve electricity without overloads or outages in this scenario to meet federal reliability standards.

PSE determined that the two most critical parts of the Eastside grid are two large transformers that convert electricity at 230,000 volts to 115,000 volts, the voltage used by all existing transmission lines within the Eastside. To simulate the N-1-1 scenario, the Base Case is modified to remove these two transformers from service.

PSE apparently made two additional modifications to the WECC Base Case. First, the amount of electricity flowing to Canada was increased from 500 MW to 1,500 MW. Next, the company reduced the amount of power being produced by local generation plants from 1,654 MW to 259 MW. The rationale behind these modifications isn't obvious, and we were concerned how the regional grid (not just the Eastside) would perform with these assumptions in place.

To our surprise, simply increasing the flow to Canada to 1,500 MW while also serving peak winter power demand in the Puget Sound region was enough to create problems for the regional grid. The simulation software could not resolve these problems (Appendix E describes the problems in greater detail). While it's possible that PSE and Utility System Efficiencies found ways to work around these challenges by making additional changes to the Base Case, we do not know what these changes were. We are confident that prudent grid operators would reduce flows to Canada if an N-1-1 contingency occurs on the Eastside during heavy winter consumption. PSE would turn on every local generation plant. These responses resolve the problems. This is the more realistic scenario we modeled in our N-1-1 simulation.

The WECC Base Case uses default values for transformer capacity ratings that correspond to a "summer normal" scenario. The summer rating is reduced in order to protect transformers from overheating during hot summer weather. The "winter emergency" rating would be consistent with best engineering practice for equipment outages during very cold conditions (less than 23° F) that produce peak winter demand. We used this higher rating in our simulation.

# Results

## N-0 results

To compare the N-1-1 results with normal operation of the grid serving peak winter demand, we ran an N-0 study using the WECC Base Case for winter 2017-18 with the following modifications:

1. Energize Eastside transmission lines are reverted to present capacity.
2. Flow to Canada is reduced from 500 MW to 0 MW.
3. Transformers run at "winter normal" capacity.

Figure 1 shows load as a percentage of "winter normal" capacity on each of the four transformers.

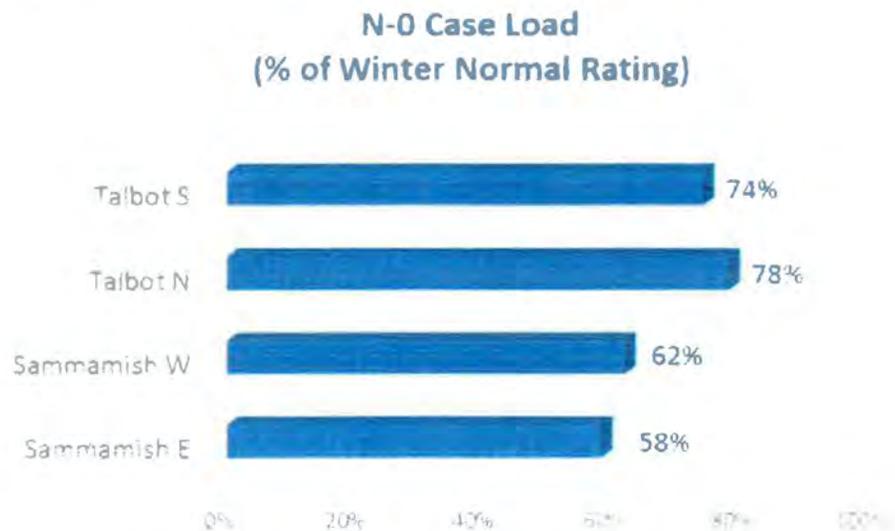


Figure 1: With all transformers in service, winter peak load causes no overloads.

## N-1-1 results

The N-1-1 results are based on the WECC Base Case for winter 2017–18 with the following modifications:

1. Two transformers are out of service.
2. Energize Eastside transmission lines are reverted to present capacity.
3. Flow to Canada is reduced from 500 MW to 0 MW.
4. Transformers run at “winter emergency” capacity.

Figure 2 shows that the remaining two transformers, Talbot N and Sammamish W, remain within “winter emergency” capacity ratings.

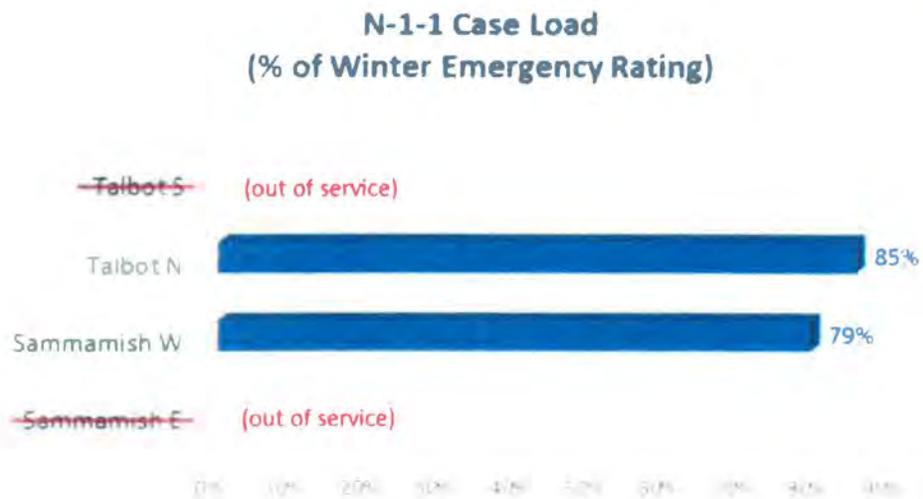


Figure 2: Loads on two remaining transformers are in a safe range.

# Analysis

We carefully analyzed the results of the N-1-1 simulation to get a broader view of how the grid is behaving in this scenario. Electricity is served by a combination of high-voltage transformers (transforming 230,000 volts to 115,000 volts) and low-voltage transformers (115,000 volts to 12,500 volts).

When we simulated failure of two high-voltage transformers located at Sammamish and Talbot Hill, as PSE did, we discovered that some of the load is redistributed to other high-voltage transformers in the Puget Sound area (see Figure 3). This is a natural adaptation of the networked grid that occurs without active management by PSE or other utilities. The regional grid has enough redundant capacity to balance the load without causing overloads on any transformer or transmission line in the region.

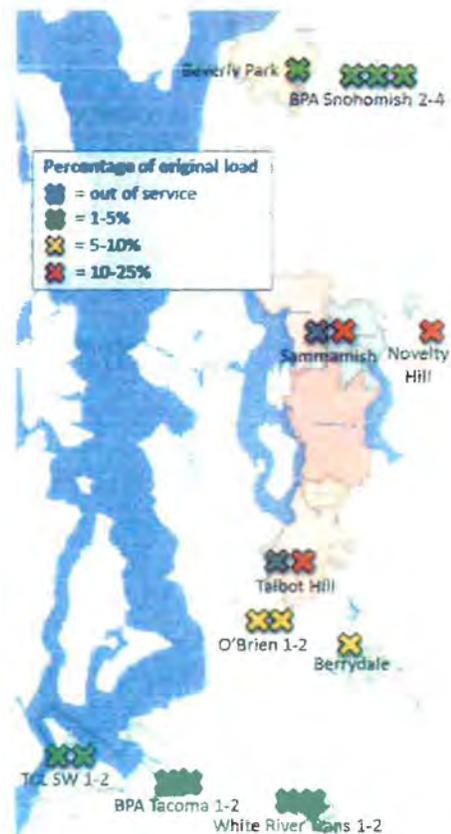


Figure 3: Load is distributed among other transformers after two transformers fail.

We conclude that the grid is capable of meeting demand in emergency circumstances in the winter of 2017–18. How soon after that will system capacity become strained?

Concerns about future capacity are illustrated in Figure 5, PSE’s demand forecast graph.<sup>2</sup> This graph raises several questions. For example, it’s not clear how PSE determined the “System capacity range” of approximately 700 MW. If this value is derived from the transformer capacities listed in the WECC Base Case, these capacities are set to default values corresponding to “summer normal” conditions.

PSE’s graph shows Customer Demand growing at an average rate of 2.7% per year. However, data submitted by PSE to WECC shows a growth rate of only 0.5% per year. An explanation of this discrepancy is necessary to understand this graph.

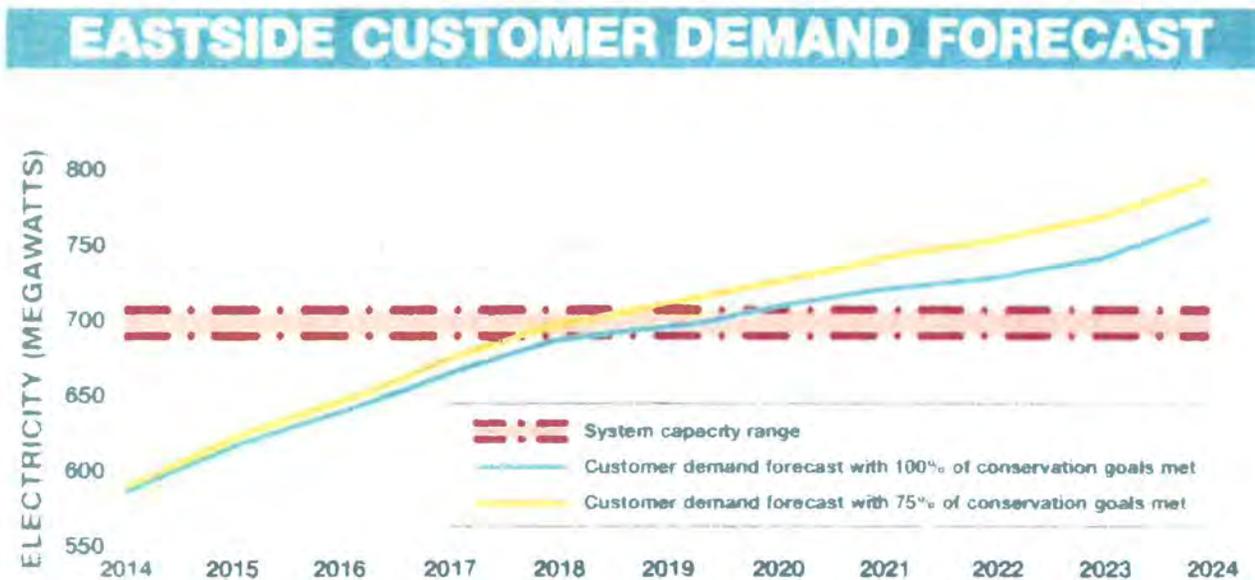


Figure 4: PSE’s graph shows customer demand exceeding system capacity in 2018.<sup>2</sup>

<sup>2</sup> <http://www.energizeeastside.com/need>

Although we don't have enough information to create a graph suitable for long-term planning, we we feel Figure 5 is a better approximation of system capacity and demand growth on the Eastside.

The "System capacity" is based on "winter emergency" transformer ratings, which are more appropriate than summer ratings for this scenario. The higher ratings raise the overall capacity to approximately 930 MW.

The "Customer demand" line shown in Figure 5 is based on loads reported in the load flow simulation for the two remaining Eastside transformers. The 2014 value is higher than in PSE's graph, because these transformers serve loads outside the Eastside area. The growth rate matches the 0.5% rate observed in WECC Base Cases.



Figure 5: Alternative Demand Forecast shows slower demand growth and higher system capacity (based on "winter emergency" transformer ratings).

# Comparison with other studies

The conclusions of the Lauckhart-Schiffman study differ from previous studies. We stand by our conclusions and will share our models and results with anyone who has clearance from FERC.

Here we review the other studies and explain why their conclusions might differ from ours.

## **PSE/Quanta**

Two different load flow simulations were performed by PSE and Quanta, a consultant employed by PSE. We have the following concerns with both studies:

1. An unrealistic level of electricity is transmitted to Canada.
2. Nearly all of the local generation plants are turned off.
3. The appropriate seasonal ratings for the critical transformers were not used.
4. It's not clear how the customer demand forecast was developed, but there is an unexplained discrepancy between the forecast used for Energize Eastside (2.4% annual growth) and the forecast reported to WECC (0.5% annual growth).

The first two assumptions cause regional reliability problems for the WECC Base Case that must have required additional adjustments by PSE/Quanta. We don't know what those adjustments were.

## **Utility System Efficiencies**

The City of Bellevue hired an independent analyst, Utility System Efficiencies (USE), to validate the need for Energize Eastside. USE ran one load flow simulation that stopped electricity flow to Canada. According to USE, 4 of the 5 overloads described in the PSE/Quanta studies were eliminated, and the remaining overload was minor.

Our load flow simulation studied the same scenario (N-1-1 contingency with no flow to Canada and local generators running), but we did not find any overloads. We believe three assumptions explain the different outcomes:

1. USE does not specify what level of generation was assumed for local generation plants. In verbal testimony before the Bellevue

- City Council, USE consultants said that they did not assume all of the capability of local generation was operating. Our study assumes these plants will run at their normal capacity.
2. USE says emergency ratings were used for the critical transformers, but it isn't clear if USE used "winter emergency" ratings. Our study assumes winter emergency ratings.
  3. USE does not independently evaluate the customer demand forecast (2.4% annual growth is assumed). Our study assumes the load growth forecast that PSE provided to WECC.

We believe our assumptions more accurately reflect the actual conditions that would occur in this scenario.

### **Stantec Consulting Services**

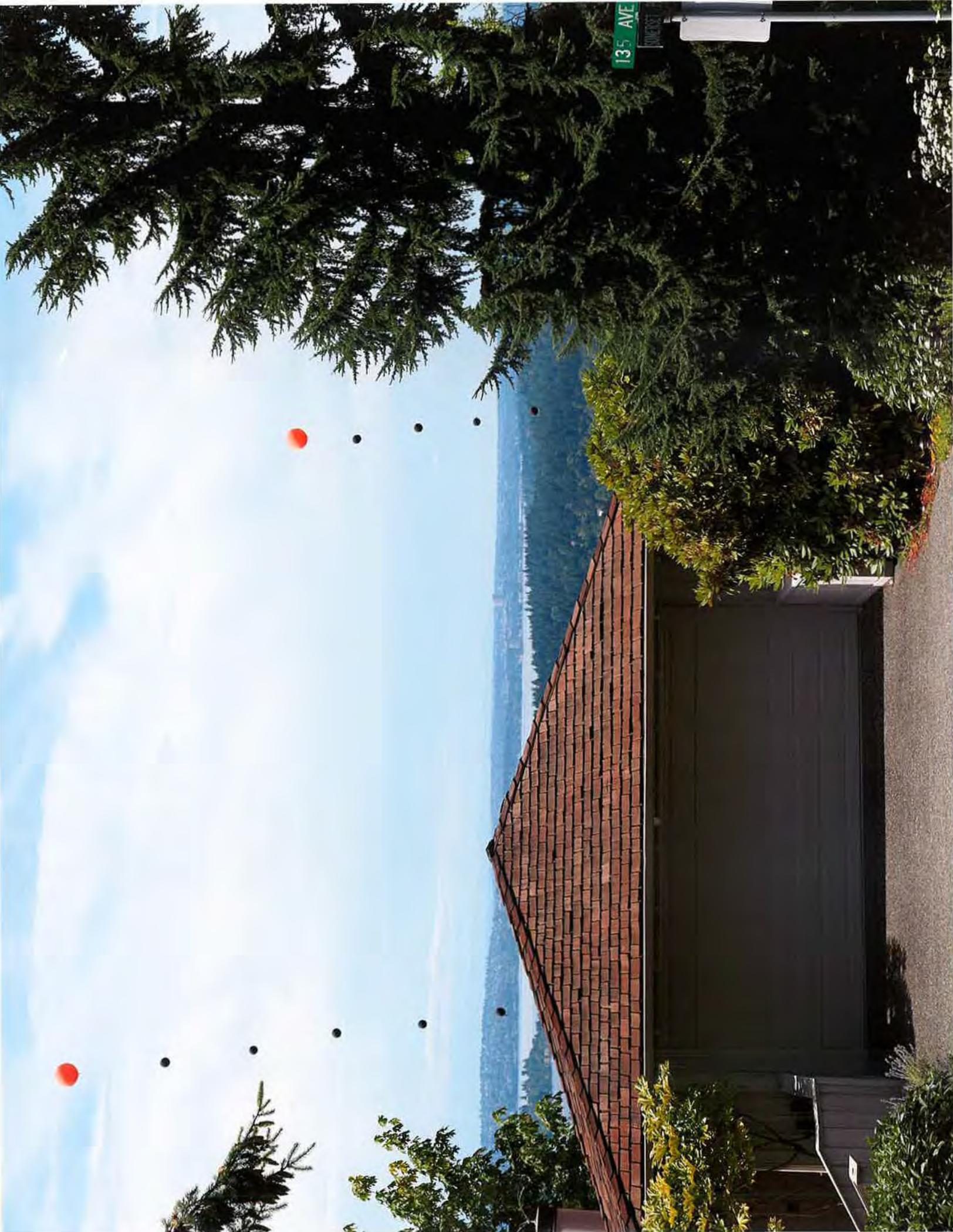
In July 2015, the independent consulting firm Stantec was asked to review the studies done by PSE and USE. Stantec issued its professional opinion without performing any independent analysis or load flow simulations. Stantec says PSE's methodology was "thorough" and "industry standard." However, Stantec does not address the shortcomings we have identified with previous studies.

**The entire report, including appendices,**

**is available at**

**[CENSE.org](http://CENSE.org)**





Specimen #17 Dublin Henry  
Phase 1 DEIS Belleme 3.1.16



- 130'
- 120'
- 110'
- 100'
- 90'
- 80'
- 70'

60'

134<sup>th</sup> PL SE

Speaker #17 Public Hearing  
Phase I DEIS Bellevue 3.1.16



Speaker # 17 - Public Hearing  
Phase 1 DEN - Bellevue 3.1.16

Dan Erbig

1 March 2016

Ms. Heidi Bedwell  
Energize Eastside EIS Program Manager  
Land Use Division, Development Services  
City of Bellevue  
450 110th Avenue NE  
Bellevue, WA 98004

Subject: Comments on Draft Environmental Impact Statement  
for "Energize Eastside"

Hello Ms. Bedwell:

Following are my comments on the DEIS for PSE's proposed 'Energize Eastside' project:

1. The DEIS lacks sufficient detail and specificity in the descriptions of the alternatives and options; absence of this information prevents a reasonable evaluation of the alternatives and options, especially their environmental and economic impacts. This deficiency should be corrected by including more precise information about each alternative/option, including (where appropriate) a preliminary one-line diagram, and a reasonably exhaustive list of major components.
2. For each alternative/option considered, there should be a preliminary quantitative assessment of the impact on PSE's tariff(s) and rate schedules.
3. For each alternative/option considered, there should be a preliminary life cycle cost estimate for their acquisition and ownership. Such estimates should be based on the same economic/financial bases, and expressed in the same-year dollars.
4. The discussion of 'distributed generation' (DG) option (para. 2.3.3.3) does not explain who pays for the acquisition and ownership of possible resources required (gas turbines, microturbines, fuel cells, etc.), and how such payments would be made. Also lacking is any description of how electrical output would be delivered to loads in the DG service area, and how such output would be priced. In addition, there is no description of the

operating/dispatch protocols for DG generation centers, nor how many of each type would be required to satisfy the peak load demands. A generalized map is also needed to give some indication of the geographical location(s) for the different types of DG considered.

I request that my comments be include in the record of comments for the DEIS.

Sincerely yours,

A handwritten signature in cursive script that reads "David F. Plummer".

David F. Plummer

14414 NE 14th Place  
Bellevue, WA 98004-4001

## How you can make your comments most effective



Check out the Department of Ecology Citizen's Guide to SEPA Review and Commenting at [EnergizeEastsideEIS.org/sepa-review](http://EnergizeEastsideEIS.org/sepa-review).

**Be clear, concise, and organized.** Decide what you need to say before you begin. If you have a number of points, group your comments in a logical order.

**Be specific.** Give support to your comments by including factual information. For instance, compare how things *were*, to how they *are*, to how you believe they *will be* in the future—and why.

Refer to Comprehensive Plans, development regulations, information on similar projects or situations, and other environmental laws or documents. Be as accurate as possible.

**Identify possible solutions.** Suggestions on reasonable mitigation—conditions to avoid, minimize, or reduce adverse impacts—can help influence how a project is ultimately built. After identifying your concern, suggest possible solutions.

—fold here—

### Comments on the Phase 1 Draft EIS of PSE's Energize Eastside Project

Name Deborah Hayes Address\* 4208 137<sup>th</sup> Ave NE  
Belleuve WA 98005

\* You must provide your physical mailing address to be considered a "party of record," eligible to appeal the adequacy of the EIS.

Re: EIS for Energize Eastside

I would like to voice my concern about this project. It is an overly costly project with regard to charges to PSE customers, the lost of property values and homes, habitat and trees. Alternative 2 will have a much ~~less~~ less impact on all concerned. Even though I feel we can completely avoid this whole project with conservation and higher tech methods that do not use massive power poles — if we must improve our electrical grid, I urge Alt. 2.

Thank you  
Deborah Hayes

March 07, 2016

Dear Ms. Bedwell,

We just came from Wisconsin and were to try buy a property in the area. But when heard the Puget Sound Energy's "Energize Eastside" project we are very concerned and curious.

First, Bellevue is a beautiful area now. It is hard to image what kind place would be with those high-voltage transmission towers/ poles stand. It is also hard to believe that who would like to live in the area with human's health threatened and higher cost if the project would get through.

Second, we drove more than 2000 miles, through 5 states. Occasionally, we saw some high-voltage transmissions towers/poles and lines, but all seat in the places with NO houses around or wild area. We are surprised seeing those high-voltage transmission lines in Bellevue, which is a high-tech and beauty place. ( By the way, we saw NO high-voltage transmission lines in Seattle.) We understand this OLD animals were built in old time. Now we really regret to hear that some one wants to put more and much higher towers/poles to carry much stronger electricity voltage in the density population places..

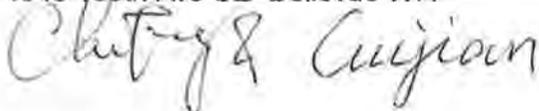
Some people.said the high-voltage transmission lines does NOT hurt human being, This is Irresponsible. If so, why other states like Wisconsin, Minnesota, North Dakota .... those much poor states spent more money buried the high-voltage transmission lines??! Every research discovered that electric and magnetic fields have negative effective on human and plants, even with those who said that very low magnetic fields MAY NOT have much negative effective or can use some methods to reduce it. But nobody can confirm that the high-voltage transmission lines does NOT hurt human being. Who would like to live this kind of area, or in other words, who would like to use his health to bet that?! More serious and important question arises here is if something happen in the future, who is going to take the responsibility?

The third, the permission for PSE to create the new high-voltage transmission lines was authorized more than 10 years ago. The science and technology was developed well in this area in last a few years, and some new technologies could well be applied for PSE's this project as we heard. Actually, nowadays It is HARD to hear or see to create new towers/poles to transmit high-voltage in resident places!! Why PSE does not use the newer tech but insists using the OLD one which would damage the beautiful area and possible human health? Not familiar with the new tech? money? Or?! Do PSE leaders and related people ever think this may be the last one or two projects in United States that use high-voltage transmission lines ? !

We just want the PSE and Bellevue Leaders consider those points and do NOT make wrong decision which would cause future troubles.

Fang & Zijian Cui

4543 135th Ave SE Bellevue WA



As fifty year residents of the Woodridge neighborhood in Bellevue, we are submitting comments on the Draft Environmental Impact Statement for the Energize Eastside Project. We have studied the reports, attended meetings, joined CENSE and are advocating the No Action Alternative and, as a second choice, Alternative 2, the Integrated Resource Approach, for two reasons.

#### Reason #1 Pipeline safety concerns.

PSE's easement for high voltage power lines lies concurrent with the Olympic Pipe Line Company's petroleum pipeline on the Eastside. The pipelines are considered hazardous liquid pipelines and, if damaged, could cause explosions or fires. These pipelines run near residential neighborhood and schools. These pipelines could be damaged by corrosion from proximity to electromagnetic interference from high voltage power lines. These pipelines could also be damaged in the process of siting and construction of towers.

In addition, the location of high voltage power lines and petroleum pipelines in close proximity pose risks during seismic events and lightning strikes.

#### Reason #2 Costs of Energize Eastside

What will be the total cost (direct and indirect) of Energize Eastside Alternative 1? We have seen several different estimates of the direct financial costs of the project, each higher than the prior one. In addition, the indirect costs involved with losing 8000 trees or disrupting family homes and property taken by condemnation have not been fully evaluated and considered.

When considering conflicting assumptions regarding customer utility demands this project should be placed on hold and alternative technologies fully studied. PSE's forecast of energy problems as early as 2018 conflicts with the Lauckhart-Schiffman Load Flow Study that shows 'customer demand won't approach current system capacity until 2058.' Please look at all the evidence before approving the Draft Environmental Impact Statement for the unsafe, costly, and disruptive Energize Eastside Project

Frank and Joan Cohee

March 7, 2016

12109 SE 23<sup>rd</sup> Street, Bellevue WA 98005

cc CENSE

Oral and written remarks concerning the draft EIS for Energize Eastside

Submitted by Gary Cliff on 2/27/16 at the Newcastle Elementary School

.....  
My name is Gary Cliff and I have lived at 8435 128<sup>th</sup> Ave. SE in the Olympus subdivision of Newcastle for the past 18 years. I retired 2 years ago after working 38 years in the IT industry. I want to thank you in advance for giving me the opportunity to express my concerns.

I have many concerns regarding the Energize Eastside project, but due to the time constraints, I will only focus on two.

My first concern is very fundamental and straight forward – Is Energize Eastside really needed? PSE conducted a **Load Flow** study which is the definite study for justifying the need for this project. Such critical data must be scrutinized and challenged when necessary. It should not be taken at face value as factual. CENSE has teamed with nationally recognized power and transmission experts with specific knowledge of the Northwest power grid to conduct a Load Flow study to validate PSE's findings. The result of this study contradicts many of PSE assumptions and conclusions regarding need. **CENSE** has submitted this document for your review and I am asking that MS. Bedwell <sup>Stephan</sup> and team provide a written response to our citizens detailing your areas of agreement or disagreement regarding the CENSE study.

I am also concerned with the safety of this project regarding the installation and removal of poles and other construction activity so close to a petroleum pipeline. I know PSE states they have done this before and not to worry. My guess is the citizens of Bellingham were also told not to worry and we know how that turned out. I have no idea of the probability of a catastrophic event similar to Bellingham's, but even if it is a fraction of 1 percent, it is too high a risk to take with our lives and property.

My concluding remarks are directed towards the decision makers in this process, the city councils and various other administrators representing us. Very few people in their careers have the opportunity and responsibility to make a decision that is truly meaningful and impactful. Whether you want to or not, the choices you make this year will leave a lasting legacy. It will be either be a positive legacy that you will be proud of in the years to come because you stood up against a large corporation that did not have the best interests of its customers at heart, or you will leave a negative legacy of 18 miles of high poles and wires that were not needed. How will you explain to your children and grand children that you did not make the tough decisions when so many people were relying on you?

And please remember that the citizens of the East Side expect you to do your duty. Thank you.

Comments by James Adcock, Electrical Engineer, graduate of MIT

5005 155<sup>th</sup> PL SE

Bellevue WA 98006

I have read in comparison to PSE and City's claims, the Lauckhard-Schiffman Analysis, which I find credible. I do not find PSE and City's claims to be credible.

What I see, in agreement with Lauckhard-Schiffman, is a consistent pattern of PSE overclaiming needs to build additional transmission and generation. Currently PSE simultaneously in front of the UTC is claiming that they need an additional natural gas peaker plant – that they cannot meet winter peak needs without additional generation – that all generation plants need to run simultaneously, and then some. While at the same time, in front of City, to meet the same winter peak needs, PSE is claiming they need additional transmission capacity so that they can run – at the same moment in time – with only about half their generation running. These two claims cannot be true simultaneously. Either you need more peak generation, or more transmission, but not both. Or in reality, I suggest you need neither, you are simply trying to overbuild in order to overcharge your ratepaying customers, in order to “apply lipstick to a pig” – to apply “window dressing” to the company before your owners, Australia's dirtiest company, Macquarie, “flips” the company to new buyers, ala Bain Capital.

Part of the problem is that PSE refuses to acknowledge the reality of climate change, which has rapidly increased the temperature of our region on the coldest winter days. Our coldest winter days – those exact days which PSE says they need to design for, have already warmed about 15 degrees since the 1950's, reducing peak heating load about 25% compared to what PSE is designing for.

Ignoring this reduction in peak load requirements, PSE instead projects forward – and they always overproject future needs – they project 2.4% a year future load growth. They propose addressing this by replacing a 115kV line with a 230kV line which has 500% to 600% greater load carrying capacity. This represents more than 200 years of load growth. Except growth cannot continue for 200 years, there is not that much space for new office buildings, and PSE will have burnt the planet to a crisp long before then.

Now in the DEIS the other shoe begins to drop. PSE admits that a 230kV line doesn't fit into the existing routes they propose. Houses will have to be torn down in Newcastle. I believe more homes will have to be torn down in Somerset. According to the DEIS reference documents, Homeowners will be restricted from using their own property, their own back yards. You cannot sit in your own

backyard, drinking a cool drink, sitting in a lawn chair. Some home owners will not be allowed to park cars on their own property. And getting into their cars others will experience “nuisance shocks.” There is no such thing as a “nuisance shock.” Any shock can kill. The higher the imposed voltages the more like the shock is to kill. PSE should have told these things to the citizen route-choosing committees so that they could have made informed decisions. Instead PSE hid this information from them. The Tetra Tech Linear routing study was fatally flawed – the transmission line doesn’t even fit within the corridor which they artificially opened up to the detriment of homeowners, and only homeowners. Tetra Tech study, Page 32, figure 3-11.

Further, the DEIS finds extreme damage to Somerset in the DEIS impacts map, figure 11-13, but the DEIS body language fails to even acknowledge this extreme and disparate impact on one community. In general document-wide the DEIS “ratings” of environmental damages have no plausible correlation to reality.

If City and PSE insist on building something, again I call for a more modest rebuild of the existing lines staying at 115kV, doubling each line capacity. This won’t fix all of Seattle’s and BPA’s overload conditions, but PSE has acknowledged under oath in front of FERC that isn’t necessary, that this is “only” a local transmission line. In which case PSE only needs to meet their own load growth, not help relieve Seattle and BPA overloads. PSE and City keep playing games instead of seriously considering this 115kV rebuild alternative. They say “Oh, we looked at bigger transmissions lines, and then we looked at bigger transformers.” This is hogwash. This is playing dumb. When you rebuild bigger you need BOTH bigger lines and bigger transformers. PSE and City know this. It is standard Electrical Engineering “Freshman 101” – the PSE 230kV proposal for example contains BOTH new transmission lines AND new transformers. PSE makes the excuse that they don’t want to put two transformers where one was before. OK take the old transformer out, and put a new larger one in. This is obvious. Stop Playing Dumb! Take a REAL LOOK at the alternatives we are asking you to consider. And make the new transmission line a high temperature line while you are at it.

The original Tetra Tech Linear Routing Study “Eastside 230 KV Project Constraints and Opportunities Study for Linear Site Selection” page 33 December 2013 shows they use a 160 foot safety buffer around (say) used car lots, 100 foot safety buffer around children sleeping in bedrooms, HOWEVER if the children sleeping in bedrooms are closer than 100 foot from the proposed 230,000 volt transmission line, then PSE will ignore the fact that children are sleeping in bedrooms within 100 foot of the transmission lines. IE PSE ignores industry standard safety buffers around sleeping children in this proposed design. The argument behind the original Tetra Tach Linear Routing study appears to be that PSE does not need to meet normal safety standards if the proposed 230,000 volt transmission line is within existing 115kV corridors. However, in this DEIS “the other shoe drops” and PSE and City now acknowledge that PSE cannot even successfully route the proposed 230,000 volt transmission line within the existing 115kV corridors – PSE will have to tear down houses, and will also place constraints on adjacent homeowners use of their properties, including no car

parking, no lawn chairs in back yards, no trees, etc. Since PSE cannot successfully contain the effects of the 230,000 volt transmission line to the existing corridor, it seems to me that the original Tetra Tech “relaxation” of constraints, ignoring traditional 160 foot safety buffers – or even 100 foot safety buffers – is inappropriate. Rather the same safety buffer width should have been used for ALL of the Tetra Tech Linear Routing study. Why children sleeping in their bedrooms should matter less to PSE and City than used cars sitting in a used car lot is simply beyond me!? Why should the 160 foot buffer be relaxed on the use of the existing 115kV corridor – if PSE can’t even keep the proposed 230,000 volt line and its negative effects within that existing 115kV corridor? Again, PSE tries to “slip by” the original Tetra Tech Routing Study false assumptions by only revealing at this late date that they cannot even successfully build the 230kV within the existing 115kV corridor!

Again, I believe “Evidence” that City and PSE use in support of their EIS and Project positions needs to be “public” – in traditional EIS parlance “an EIS represents a public teaching.” You cannot make a “public teaching” based on “secret documents!” City’s consultants claim that that the PSE and ColumbiaGrid documents that they reference are available to the public. But when I ask ColumbiaGrid and PSE for a copy of these documents, even willing to follow CEII procedures, PSE blocks my access to these documents, stating to the contrary that these documents are not available to the public, period. When these documents are made available to City’s consultants, and not to this electrical engineer, then City will claim “superior knowledge” of what PSE’s plans really are, and on what basis PSE is claiming to need this massive 230,000 volt “overbuild” – while discounting this electrical engineer’s input, and the inputs of other public commentators. City giving itself access to these documents via consultants, using these documents in evidence, but preventing the DEIS and EIS public reviewers, such as this electrical engineer, equal access to that supposed evidence, is unfair, inappropriate, and unequal. In doing so, City demonstrates bias in favor of PSE, and against the homeowners unfairly and unreasonably impacted by this massive project routed through their backyards, in their bedroom communities – transmission lines which are not even appropriately routed through industrial areas as City’s own planning standards require.

PSE could simply rebuild more powerful 115kV transmission lines with the existing corridors, and at existing tower heights: PSE and City do not meaningfully explore other reasonable options to PSE’s favorite 230,000 volt gigantic project. Upscaling from 115kv to 230,000 volts represents about a 500% increase in power capacity (by normal electrical engineering design standards). PSE’s already inflated growth estimates are 2.4% a year. Thus, by PSE’s own estimates their preferred 230,000 volt line would have the capacity to support growth for over 200 years. By any reasonable engineering standard this is simply WAY TOO BIG! [see my engineering analysis at the end of this document] [For comparison consider that current average load is a little more than 300 Megawatts – ONE end of ONE existing 115kV line [and [there are existing four ends on the two existing 115kV lines]] can pretty much meet this load.]

What with the catastrophic effects of climate change, we do not even know if the human race will continue to exist in 100 years. Normal utility planning periods is to look 20 years in the future – NOT 200 YEARS – because we simply do not know what society is going to look like in 200 years. We do not even know if the projected Wilberton buildout growth spurt is going to last 20 years. Let us consider a smaller, much more modest project: Rebuild one 115kV line in place, doubling the capacity of that line and its associated transformers. Then, if necessary rebuild the second 115kV line in place, doubling capacity. PSE says that they only want to have one transformer at the end of each line, so that will mean replacing the existing transformers with larger ones. It doesn't mean you can't build a double-power 115kV line, or two. It just means you have to replace BOTH the existing lines AND the existing transformers with units of twice the capacity. [PSE and City say "Oh we examined making the lines bigger, and we examined making the transformers bigger" – but this is just "playing dumb" – you have to make BOTH the lines bigger AND the transformers bigger – this is "Electrical Engineering 101." Existing lines would need to be replaced with lines of about 40% larger diameter. Or you run "twinned" sets of wires. At the same time PSE should move to new generation "high temperature" wires. Existing transformers would need to be replaced with larger transformers of approx. double the current volume, mean each linear dimension of the transformers would need to increase by about 25%. You have to replace existing wood towers, or at least the crossbars and insulators, with stronger units that can carry the doubled weight. PSE has made some excuses about road sizes and transformers, but large transformers are often designed to be shipped in three parts, each of standard road width. And/or parts of large transformers can be assembled on-site. Doubling capacity meets a 2.4% growth rate for more than 40 years – a much longer time period already than is reasonable and necessary for utility planning. We do not know how fast Wilberton will be built out – if at all. The local or national economy may tank. Tech companies may choose to build out elsewhere, etc. We just don't know. That is why we do not build 200 years in advance of need! Traditional utility planning looks 20 years into the future – NOT 200 years into the future!

This is a Local Transmission Line ONLY: Is this project a Local Transmission Line Project – one that only needs to meet the load requirements of Bellevue, or is this a Regional Transmission Line Project – one intended to be build "oversized" in order to also relieve load on other utilities and transmission line providers in the region – Seattle City Light, BPA, Snopud, etc.? In their presentation to King County [Eastside Transmission Solutions Report. King County Area [REDACTED VERSION] October 2013, Updated February 2014 Puget Sound Energy] PSE claims that the project is a Regional Resource. It is for this reason that PSE is proposing such a huge 230,000 volt project. But in this DEIS City says that the only need is for a LOCAL transmission line project, that PSE DOES NOT with this project need to overbuild to meet regional needs. And, in a citizen lawsuit [CENSE] in front of FERC, PSE swore that this is ONLY a "Local Transmission Project" not a "Regional Resource" – in which case the project does not need to be a 500% larger capacity 230,000 volt "overbuild" but rather can be a much more modest 115kV rebuild simply doubling existing capacity, retaining the existing pole heights and transmission line footprints – entirely within the existing transmission line corridor. [COALITION OF EASTSIDE NEIGHBORHOODS FOR SENSIBLE ENERGY (CENSE), a nonprofit Washington corporation;

CITIZENS FOR SANE EASTSIDE ENERGY (CSEE), a nonprofit Washington corporation; LARRY G. JOHNSON and GLENNA F. WHITE, husband and wife; and STEVEN D. O'DONNELL, individually; Complainants, v. PUGET SOUND ENERGY, a for-profit Washington corporation; SEATTLE CITY LIGHT, a public utility and department of the City of Seattle; BONNEVILLE POWER ADMINISTRATION, a federal agency and marketing agent for federally owned Northwest power facilities; and COLUMBIAGRID, a nonprofit Washington corporation, Respondents.] Given that PSE has sworn oath in front of FERC that this is ONLY a Local Transmission Line, City and PSE should explore build options that ONLY meet local need – which do not include huge oversizing “Overbuild” to meet Regional Desires, desires so that Seattle, BPA, Snopud, etc, do not in turn have to meet their own requirements to meet their own growth needs – growth needs which they can clearly meet on their own, in fact would prefer to meet on their own, as discussed in the ColumbiaGrid planning documents – PSE’s suggested huge overbuild of the 230,000 kV line was not even a REMOTELY “preferred” option for solving the regional ColumbiaGrid partner’s overload conditions. They can solve their own problems, they do not depend on this PSE huge Overbuild. Let these other utilities and transmission providers meet their own needs – DO NOT allow PSE to Overbuild to meet these others’ needs – at the expense of innocent homeowners, their children, and their families.

PSE assumptions of “Right of Way:” It is not clear to me that PSE assumption of its “Right of Way” are correct. The existing 115kV corridor is recognized on plat maps as being a 115kV corridor. Nothing was said about ever making this a 230kV corridor. In addition, my understanding of the existing 115kV “Right of Way” was assumed to exist because of the hypothetical existence of a public road along the corridor. But no road was ever built along most of this corridor. This means that already the adjacent property owners were already burdened with the imposition of 115kV lines, without even a partial offsetting benefit of road access. Again, it is not clear to me that PSE even has a right of way.

Environmental Impact of destruction of views in Somerset: DEIS gives “short shift” of the environmental impact of the destruction of views in Somerset. City makes false claim that somehow the value of views in some sort of nebulous thing which we cannot put a value on. This is simply false. Homeowners pay a high, and well-known premium for the environmental advantages of views, just like owners of waterfront property pay a huge premium for the environmental advantage of waterfront access. If City were to “drydock” waterfront property owners by filling in the lake and building an industrial complex in front of these waterfront properties, would City then claim little or no damage has been done to the waterfront property owners??? This is crazy. The valuation of aspects of the Environment is well-known and well-studied. This field is called “Environmental Economics.” The traditional “Environmental Economics” valuation of an aspect of the environment is as follows: that aspect is worth AT LEAST as much a people are willing to pay for it. Some people may not want a view, some people may not want to take a hike at Mt Rainier Paradise, for example. That doesn’t mean Mt Rainier National Park has no value, or that we can’t as a human society put a value on the national park! If strawberries cost \$6 a lb. February and you don’t think that they are worth \$6 a lb. – you do not want to buy them – but I do think they

are worth \$6 a lb. and I do buy them, then the strawberries are worth \$6 a lb. – regardless of the fact that YOU didn't want them! A willing seller has met a willing buyer. That is how we set prices in a free and democratic society. Examining real estate prices in Somerset, for example, I find a house with a superior view worth \$1.5 million. A similarly positioned house with a much inferior view is worth \$750,000 dollars. A willing buyer has met a willing seller and set a market price on this view – about \$750,000 for the view portion of this property alone. I count about 500 superior view properties in Somerset where people have paid real money for their views, and where the King County assessor has taxed them with real dollars for many decades on those views – those views have real, tangible, and quantifiable values. I estimate then that between \$50 million and \$250 million dollars in environmental view damages to Somerset alone from PSE's proposed 230,000 volt line. City and PSE are trying to pretend that views don't have real environmental value, and that they aren't actually engaged in a "taking" from the homeowners' paid-for property! [whether or not that "taking" needs to be compensated, this is REAL environmental economic value.] This City and PSE position is false, and a shameful misrepresentation of this huge amount of environmental damage. Figure 11-3 correctly identifies Somerset as being a community of extremely high and disparate view impact – but then in the body text City and PSE try to pretend that this impact is doesn't exist, or is very very small! This is wrong, this is false. Somerset has from day one – since its development in the 1960's defined itself as a view community. It has the strongest possible covenants, protecting each other's views. For example, it has no tall trees to obstruct views – the very way that PSE intends to obstruct views! City and PSE intend to destroy many 10's of millions of dollars of environmental value which Somerset homeowners HAVE PAID FOR in their properties – City and PSE are pretending that these environmental PAID FOR BY HOMEOWNERS values simply do not exist!

Two REAL Routing Options Please: City requires PSE to submit two real routing option for consideration. PSE has only submitted one real routing option – the routing not-quite-within the existing 115kV corridor. PSE has submitted a second "fake" routing from Tradition Lake through East Bellevue – knowing full well that there is a moratorium on additional transmission line development in East Bellevue. This is not, and never was, a "real" routing option, because of the moratorium. Further, PSE turns it into a "Scare" option – making it look deliberately bad – again, it is not being submitted as a "real" routing option – PSE turns it into a "Scare" option by showing all the things PSE might have to do over the next 100 years to strengthen the entire area. A "Scare Option" meaning saying basically "Ooh look at all these very bad things you are going to make us do if you do not rubber stamp our preferred choice!" But many of these "strengthening" efforts shown in conjunction with the Lake Tradition option are going to have to be built out eventually anyway. What does represent this option is simply the 115kV line from Tradition Lake. And again, that is not a real option because of the East Bellevue moratorium. And that PSE puts forth this SINGLE 115kV line from Tradition Lake points out that PSE's preferred option of a 230,000 volt line in the existing 115kV corridor is WAY TO BIG to be necessary – because such a 230,000 volt line has 500% of the capacity of the SINGLE 115kV line in the Tradition Lake alternative proposal.

Here's my electrical engineering analysis of how much load can be carried by various capacities of 115kV and 230kV lines:

Voltage	138000	345000	765000
Current per Conductor (A)	770	1010	1250
Conductors per Bundle	1	2	4
Phases	3	3	3
Wattage	318780000	2090700000	11475000000
Wattage (MW)	318.78	2090.7	11475
Voltage Ratio		2.5	2.217391304
Power Ratio		6.55844156	5.488592337

Summary Design Rule: Double the Voltage for approx 5X (500%) capacity increase.

Number of 115kV vs. 230kV lines:

No 115kV	No 230kV	Percent 1-line Carrying Capacity	Percent 2-line Carrying Capacity	Ratio to existing	Years of Life Left at 2% Growth Rate
1	0	100%	50%	50%	
2	0	200%	100%	100%	5
3	0	300%	150%	150%	30
4	0	400%	200%	200%	55
1	1	600%	300%	300%	105
0	2	1000%	500%	500%	205

Average Load of the Entire Eastside equals 342 aMW -- a little more than the capacity of ONE end of ONE 115kv line!  
 IE existing lines already have the capacity of almost 4X average load!

Speaker #24 Phase I DEIS Public Hearing  
Bellevue 3.1.15

**Janis Medley**

4609 Somerset Drive SE • Bellevue, WA 98006 • 425 922 7415

March 1, 2015

Comments submitted to the Energize Eastside DEIS at the Bellevue Comment Meeting, March 1, 2015

Janis Medley  
4609 Somerset Dr SE  
Bellevue, WA 98006

My comments relate to the chapter on Environmental Health.

Section 8.9 reads:

*"There is a risk of damage and subsequent explosion whenever construction or operations and maintenance occur near buried natural gas lines or the Olympic Pipeline."*

I think we all agree with THAT.

And it concludes by saying:

*"However, that risk is not considered an unavoidable significant impact because the probability of damage occurring is minimized by conformance with industry standards, regulatory requirements, and construction and operational procedures that address pipeline safety."*

I think that's saying: the likelihood of anything really bad happening will be minimized by conformance to all the rules and regulations that are listed in Appendix M.

OK, so Let's look at how well OPL is conforming to regulations.

OPL's conformance to PIPELINE SAFETY is monitored by the WUTC and the Federal Pipeline and Hazardous Materials Safety Administration. On numerous occasions, OPL has been cited for: *"Failing to correct identified deficiencies in its corrosion control system within a reasonable time and to take prompt action to address all anomalous conditions."* And just for the record, in 2008, PSE, the self-described pipeline expert, was fined \$1.25 million for fraudulent gas pipeline inspection records.

OPL's conformance to RESPONDING TO SPILLS is regulated by The WA Dept of Ecology. The BEST SPILL RESPONSE takes a minimum of 15 minutes. That's a long time when flaming jet fuel is approaching your home and family.

OPL knows a little about this. In 2004, an employee at the OPL pumping and control station in Renton, heard an explosion and looked out the office window to see flames shooting 20 feet in the air. This explosion was caused by a leak in a test line connected to the pipeline. How safe should we feel if OPL can't prevent an explosion at its own headquarters?

There is another danger not addressed in the EIS. What is the probability that vibration from heavy machinery will disturb the soil supporting the pipeline and create hairline cracks? Like the Bellingham explosion, which occurred 5 years after the pipeline was damaged, will this project create a ticking time bomb?

**Janis Medley**

4609 Somerset Drive SE • Bellevue, WA 98006 • 425 922 7415

The construction and operations impacts on Environmental Health were rated as negligible or minor.

Of course that might be true in a perfect world where OPL and PSE conform to all the regulatory requirements. But in the real world, ignoring their history of non-compliance is irresponsible and dangerously simplistic. Section 8.9 as written is unacceptable.

**Attachments:**

Eight Communications between Olympic Pipeline and WUTC and the Pipeline and Hazardous Materials Safety Administration

**Utilities and Transportation Commission**  
**Standard Inspection Report for Intrastate Hazardous Liquid Systems**  
**Records Review and Field Inspection**

S – Satisfactory    U – Unsatisfactory    N/A – Not Applicable    N/C – Not Checked  
 If an item is marked U, N/A, or N/C, an explanation must be included in this report.

A completed **Inspection Checklist, Cover Letter and Field Report, IMP and OQ Field Validation Forms** are to be submitted to the Chief Engineer within **30 days** from completion of the inspection.

Inspection Report			
Inspection ID/ Docket Number	5821		
Inspector Name & Submit Date	Dennis Ritter, December 15, 2014		
Chief Engineer Name & Review Date	Joe Subsits, December 31, 2015		
Operator Information			
Name of Operator:	Olympic Pipe Line Company	OPID #:	30781
Name of Unit(s):	Laterals- Seattle, Sea Tac, Tacoma, Olympia, Vancouver		
Records Location:	Renton, WA		
Date(s) of Last Review:	June 18 – 22, 2012	Inspection Date(s)	November 17-20, 2014

**Inspection Summary:**

November 17-First day of inspection, Renton, WA Records

Nov 18-Field Seattle, SeaTac, Tacoma Laterals

Nov 19-Field Vancouver, Olympia Laterals

Exit Interview: November 20, 2014

All of the Olympic Pipeline laterals were inspected. These include the Seattle lateral (12" line, 12.83 miles long), SeaTac lateral (12" line, 5.54 miles long), Tacoma lateral (8" line, 3.72 miles long), Olympia lateral (6" line, 14.9 miles long), and Vancouver lateral (12" line, 4.4 miles long). The Olympia lateral has been out-of-service since early 2009. The 6" pipeline was purged and filled with nitrogen gas at 13 psig pressure. A section of the Olympia lateral was removed for construction of a new road at approximately MP 12.2 88<sup>th</sup> Ave. Records were reviewed in Renton WA at Renton Station. A field visit to selected facilities was conducted on Nov 18 and 19. See Field Notes for locations. Results of this inspection were as follows:

- **No. 147) WAC 480-75-510 Pipeline companies must initiate remedial action as necessary to correct any deficiency observed during corrosion monitoring, within ninety days after the pipeline company detects the deficiency.**  
**OPL has a listing of corrosion control deficiencies. On this list are test lead stations which cannot be read and need to be dug up to repair. According to OPL personnel, this listing was originally prepared by the previous CP technician, who has been gone since 2012. It is not known when these deficiencies were found, however, it was at least prior to 2012 and mitigation has not been initiated. It cannot be determined whether the pipeline is adequately cathodically protected in these areas.**
- **No. 149) §195.573 What must I do to monitor external corrosion control?**  
 (a) *Protected pipelines. You must do the following to determine whether cathodic protection required by this subpart complies with Sec. 195.571:*  
 (1) *Conduct tests on the protected pipeline at least once each calendar year, but with intervals not exceeding 15 months. However, if tests at those intervals are impractical for separately protected short sections of bare or ineffectively coated pipelines, testing may be done at least once every 3 calendar years, but with intervals not exceeding 39 months.*  
**OPL was late in reading 3 distinct test points at the Tacoma DF for the year 2012.**
- **No. 160) §195.583 What must I do to monitor atmospheric corrosion control?**  
 (a) *You must inspect each pipeline or portion of pipeline that is exposed to the atmosphere for evidence of atmospheric corrosion, as follows:*  
 If the pipeline is located:                      Then the frequency of inspection is:  
 Onshore    At least once every 3 calendar years, but with intervals not exceeding 39 months  
**For the Seatac DF, Tacoma Junction, and Tacoma DF, the Maximo work order system did not have these input correctly resulting in late reads for 2014 for these assets. They should have been read in March, 2014, they were read in November, 2014.**



U.S. Department of Transportation  
Pipeline and Hazardous Materials  
Safety Administration

1200 New Jersey Ave, S.E.  
Washington, D.C. 20590

JAN 13 2016

Mr. Donald Porter  
President  
BP Pipelines (North America), Inc.  
150 W. Warrenville Road  
Naperville, IL 60563

**Re: CPF No. 5-2015-5014**

Dear Mr. Porter:

Enclosed please find the Final Order issued in the above-referenced case to your affiliate, Olympic Pipe Line Company. It makes findings of violation and specifies actions that need to be taken by Olympic Pipe Line Company to comply with the pipeline safety regulations. When the terms of the compliance order have been completed, as determined by the Director, Western Region, this enforcement action will be closed. Service of the Final Order by certified mail is deemed effective upon the date of mailing, or as otherwise provided under 49 C.F.R. § 190.5.

Thank you for your cooperation in this matter.

Sincerely,

*Jeffrey D. Wiese*  
cc: Jeffrey D. Wiese  
Associate Administrator  
for Pipeline Safety

Enclosure

cc: Mr. Chris Hoidal, Director, Western Region, OPS  
Ms. Clorinda Nothstein, Operations Manager, BP Pipelines (North America), Inc.

**CERTIFIED MAIL - RETURN RECEIPT REQUESTED**

**U.S. DEPARTMENT OF TRANSPORTATION  
PIPELINE AND HAZARDOUS MATERIALS SAFETY ADMINISTRATION  
OFFICE OF PIPELINE SAFETY  
WASHINGTON, D.C. 20590**

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**In the Matter of** )

**Olympic Pipe Line Company,** )  
**an affiliate of BP Pipelines (North America), Inc.,** )

**Respondent.** )

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**CPF No. 5-2015-5014**

**FINAL ORDER**

Between August 11 and 29, 2014, pursuant to 49 U.S.C. § 60117, representatives of the Pipeline and Hazardous Materials Safety Administration (PHMSA), Office of Pipeline Safety (OPS), and the Washington Utilities and Trade Commission (WUTC), conducted an on-site pipeline safety inspection of the facilities and records of Olympic Pipe Line Company (OPL or Respondent) in the States of Oregon and Washington. OPL is jointly owned by BP Pipelines (North America), Inc. (BPNA) and Enbridge Energy Partners, LP, and is operated by BPNA. The OPL hazardous liquid products pipeline consists of approximately 400 miles of intrastate and interstate pipelines running from Blaine, Washington, to Portland, Oregon. The system transports gasoline, diesel, and jet fuel, with a capacity of 315,000 barrels, and includes 10 breakout tanks.<sup>1</sup>

As a result of the inspection, the Director, Western Region, OPS (Director), issued to Respondent, by letter dated July 2, 2015, a Notice of Probable Violation and Proposed Compliance Order (Notice). In accordance with 49 C.F.R. § 190.207, the Notice proposed finding that OPL had violated 49 C.F.R. §§ 195.573 and 195.575, and proposed ordering Respondent to take certain measures to correct the alleged violations.

BPNA responded to the Notice on behalf of OPL, by letter dated August 6, 2015 (Response). Respondent did not contest the allegations of violation but provided information concerning the corrective actions it had taken since the August 2014 inspection. Respondent did not request a hearing and therefore has waived its right to one.

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<sup>1</sup> BP Pipelines (North America), Inc., website, available at <http://www.olympicpipeline.com/> (last accessed November 27, 2015).

## FINDINGS OF VIOLATION

In its Response, OPL did not contest the allegations in the Notice that it violated 49 C.F.R. Part 195, as follows:

**Item 1:** The Notice alleged that Respondent violated 49 C.F.R. § 195.573(e), which states:

**§ 195.573 What must I do to monitor external corrosion control?**

(a) . . .

(e) *Corrective action.* You must correct any identified deficiency in corrosion control as required by §195.401(b). However, if the deficiency involves a pipeline in an integrity management program under §195.452, you must correct the deficiency as required by §195.452(h).

The Notice alleged that Respondent failed to correct identified deficiencies in its corrosion control system that could adversely affect the safe operation of the pipeline, as required by 49 C.F.R. § 195.401(b). That section provides, in relevant part:

**§ 195.401 General requirements.**

(a) . . .

(b) An operator must make repairs on its pipeline system according to the following requirements:

(1) *Non Integrity management repairs.* Whenever an operator discovers any condition that could adversely affect the safe operation of its pipeline system, it must correct the condition within a reasonable time.

The Notice also alleged that Respondent violated 49 C.F.R. § 195.452(h)(1), cited in § 195.573(e), which states:

**§ 195.452 Pipeline integrity management in high consequence areas.**

(a) *Which pipelines are covered by this section?* This section applies to each hazardous liquid pipeline and carbon dioxide pipeline that could affect a high consequence area, including any pipeline located in a high consequence area unless the operator effectively demonstrates by risk assessment that the pipeline could not affect the area. . .

(h) *What actions must an operator take to address integrity issues?*

(1) *General requirements.* An operator must take prompt action to address all anomalous conditions the operator discovers through the integrity assessment or information analysis. In addressing all conditions, an operator must evaluate all anomalous conditions and remediate those that could reduce a pipeline's integrity. An operator must be able to demonstrate that the remediation of the condition will ensure the condition is unlikely to pose a threat to the long-term integrity of the pipeline. An operator must comply with §195.422 when making a repair.

The Notice alleged that Respondent failed to correct deficiencies in its corrosion control system

within a reasonable time, in accordance with § 195.401(b)(1). According to the Notice, in 2010 Respondent performed an in-line-inspection (ILI) that revealed discrepancies in the ILI data, revealing unrecorded casings on the pipeline system. Subsequent excavations performed by Respondent revealed additional unrecorded casings, sleeves, and half-sections of pipe at several locations. In 2011, OPL allegedly initiated a “Casing Wire Repairs” project to further evaluate and repair casing deficiencies within a 10-year time frame. The Notice alleged that Respondent’s 10-year time frame to complete the inspections and repairs was not a reasonable period of time in which to correct the identified deficiencies.

In addition, the Notice alleged that OPL violated 49 C.F.R. § 195.452(h)(1) by failing to take prompt action to address all anomalous conditions in high consequence areas (HCAs).<sup>2</sup> Specifically, the Notice alleged that Respondent’s “Casing Wire Repairs” project did not differentiate between anomalous conditions discovered in HCA areas versus non-HCA areas and that the company’s 10-year time frame for completing the project did not constitute prompt action for remediating deficiencies found in such areas.

Respondent did not contest these allegations of violation. Accordingly, based upon a review of all of the evidence, I find that Respondent violated 49 C.F.R. §§ 195.573(e), 195.401(b)(1), and 195.452(h)(1), by failing to correct identified deficiencies in corrosion control within a reasonable time and to take prompt action to address all anomalous conditions that could affect HCAs discovered through its integrity assessment or information analysis.

**Item 2:** The Notice alleged that Respondent violated 49 C.F.R. § 195.575(c), which states:

**§ 195.575 Which facilities must I electrically isolate and what inspections, tests, and safeguards are required?**

(a) . . .

(c) You must inspect and electrically test each electrical isolation to assure the isolation is adequate.

The Notice alleged that Respondent violated 49 C.F.R. § 195.575(c) by failing to test the electrical isolation of each buried pipeline in the OPL system to assure that the isolation was adequate. Specifically, the Notice alleged the Respondent failed to test the electrical isolation of previously unrecorded casings, as described in Item 1 above, to ensure that the isolation from other metallic structures was adequate. The Notice alleged that several casings were not present on alignment sheets or other cathodic protection records, indicating previously unrecorded pipelines had not been tested for adequate isolation.

Respondent did not contest this allegation of violation. Accordingly, based upon a review of all of the evidence, I find that Respondent violated 49 C.F.R. § 195.575(c), by failing to

<sup>2</sup> An HCA is defined as: (1) a *commercially navigable waterway*, which means a waterway where a substantial likelihood of commercial navigation exists; (2) a *high population area*, which means an urbanized area, as defined and delineated by the Census Bureau, that contains 50,000 or more people and has a population density of at least 1,000 per square mile; (3) an *other populated area*, which means a place, as defined and delineated by the Census Bureau, that contains a concentrated population, such as an incorporated or unincorporated city, town, village, or other designated residential or commercial area; and (4) an *unusually sensitive area*. See 49 C.F.R. § 195.450.

test the electrical isolation of each buried pipeline to assure that the isolation was adequate.

These findings of violation will be considered prior offenses in any subsequent enforcement action taken against Respondent.

### COMPLIANCE ORDER

The Notice proposed a compliance order with respect to Items 1 and 2 in the Notice for violations of 49 C.F.R. §§ 195.573(e) and 195.575(c), respectively. Under 49 U.S.C. § 60118(a), each person who engages in the transportation of hazardous liquids or who owns or operates a pipeline facility is required to comply with the applicable safety standards established under chapter 601. In its Response, OPL indicated that it had taken certain actions to comply with the Proposed Compliance Order. The Director has reviewed such actions and recommended that this Compliance Order be modified accordingly. Therefore, pursuant to the authority of 49 U.S.C. § 60118(b) and 49 C.F.R. § 190.217, Respondent is ordered to take the following actions to ensure compliance with the pipeline safety regulations applicable to its operations:

1. With respect to the violations of § 195.573(e) (**Item 1**) and § 195.575(c) (**Item 2**), Respondent must:

A. Schedule the “Casings Wire Repair” project to mitigate all remaining indications in HCAs and non-HCAs no later than 18 months from the date of this Order;

B. Determine whether additional casings exist on its pipeline. Update maps and records, as necessary, to ensure all programmatic systems which use this data, including IMP, are accurate; and

C. Submit changes to the “Casing Wire Repair” project within 30 days after the receipt of this Final Order to Mr. Chris Hoidal, Director, Western Region, Pipeline and Hazardous Materials Safety Administration.

2. It is requested (not mandated), that Respondent maintain documentation of the safety improvement costs associated with fulfilling this Final Order and submit the total to Mr. Chris Hoidal, Director, Western Region, Pipeline and Hazardous Materials Safety Administration. It is requested these costs be reported in two categories: 1) total costs associated with preparation/revision of plans, procedures, studies and analyses; and 2) total cost associated with replacements, additions and other changes to pipeline infrastructure.

The Director may grant an extension of time to comply with any of the required items upon a written request timely submitted by the Respondent and demonstrating good cause for an extension.

Failure to comply with this Order may result in the administrative assessment of civil penalties

not to exceed \$200,000 for each violation for each day the violation continues or in referral to the Attorney General for appropriate relief in a district court of the United States.

Under 49 C.F.R. § 190.243, Respondent has a right to submit a Petition for Reconsideration of this Final Order. The petition must be sent to: Associate Administrator, Office of Pipeline Safety, PHMSA, 1200 New Jersey Avenue, SE, East Building, 2<sup>nd</sup> Floor, Washington, DC 20590, with a copy sent to the Office of Chief Counsel, PHMSA, at the same address. PHMSA will accept petitions received no later than 20 days after receipt of service of this Final Order by the Respondent, provided they contain a brief statement of the issue(s) and meet all other requirements of 49 C.F.R. § 190.243. Unless the Associate Administrator, upon request, grants a stay, the terms and conditions of this Final Order are effective upon service in accordance with 49 C.F.R. § 190.5.

*Jeffrey D. Wiese*  
\_\_\_\_\_  
for: Jeffrey D. Wiese  
Associate Administrator  
for Pipeline Safety

JAN 13 2016

\_\_\_\_\_  
Date Issued

**NOTICE OF PROBABLE VIOLATION  
and  
PROPOSED COMPLIANCE ORDER**

**CERTIFIED MAIL - RETURN RECEIPT REQUESTED**

July 2, 2015

Mr. Donald Porter  
President  
BP Pipeline NA  
Olympic Pipe Line Company  
150 W. Warrenville Rd.  
Naperville, IL 60563

**CPF 5-2015-5014**

Dear Mr. Porter:

Between August 11 and August 29, 2014, representatives of the Pipeline and Hazardous Materials Safety Administration (PHMSA), and Washington Utilities and Trade Commission (WUTC), pursuant to Chapter 601 of 49 United States Code, inspected your Olympic Pipe Line Co. (OPL) system in the States of Oregon and Washington.

As a result of the inspection, it appears that you have committed probable violations of the Pipeline Safety Regulations, Title 49, Code of Federal Regulations. The items inspected and the probable violations are:

1. **§195.573 What must I do to monitor external corrosion control?**  
**(e) Corrective action. You must correct any identified deficiency in corrosion control as required by Sec. 195.401(b). However, if the deficiency involves a pipeline in an integrity management program under Sec. 195.452, you must correct the deficiency as required by Sec. 195.452(h).**

OPL failed to correct identified deficiencies in corrosion control as required by Sec. 195.401(b) and Sec. 195.452(h). After a 2010 in-line-inspection (ILI), OPL found discrepancies in the ILI data that indicated the presence of unrecorded casings on the pipeline system. OPL subsequently performed excavations which revealed casings, sleeves, or half sections of pipe at these locations. Some of these casings OPL knew about, but many were previously unknown by the operator's staff. In 2011, OPL initiated the "Casing Wire Repairs" project to evaluate ILI indications that suggested the presence of these casings, investigate the indications, and either remove the casing or add test leads to inspect and test for casing isolation.

Section 195.401(b) requires OPL to correct "any condition that could adversely affect the safe operation of its pipeline system... within a reasonable time." Section 195.452(h) requires OPL to take "prompt action to address all anomalous conditions the operator discovers" in high consequence areas (HCAs). As of August 2014, OPL had mitigated about 100 of the ILI indications, with 97 suspected casings remaining to evaluate. OPL's projected timeline for completion is 2020. OPS alleges that 10 years to correct these anomalies is not a reasonable or prompt schedule. In addition, the written Casing Wire Repair project does not differentiate between HCA versus non-HCA locations when prioritizing casing investigation digs.

2. **§ 195.575 Which facilities must I electrically isolate and what inspections, tests, and safeguards are required?**
  - (a) **You must electrically isolate each buried or submerged pipeline from other metallic structures, unless you electrically interconnect and cathodically protect the pipeline and the other structures as a single unit.**
  - (b) **You must install one or more insulating devices where electrical isolation of a portion of a pipeline is necessary to facilitate the application of corrosion control.**
  - (c) **You must inspect and electrically test each electrical isolation to assure the isolation is adequate.**

OPL failed to test the electrical isolation of each buried pipeline to ensure the isolation from other metallic structures was adequate. Casings are buried metallic structures in close proximity to the pipeline. As described in Item 1 above, OPL has discovered casings and casing test leads on the pipeline that were not on alignment sheets or other cathodic protection records. The electrical isolation of the previously-unrecorded casings was not tested to assure adequate isolation from the pipeline.

#### Proposed Compliance Order

Under 49 United States Code, § 60122, you are subject to a civil penalty not to exceed \$200,000 per violation per day the violation persists up to a maximum of \$2,000,000 for a related series of violations. For violations occurring prior to January 4, 2012, the maximum penalty may not exceed \$100,000 per violation per day, with a maximum penalty not to exceed \$1,000,000 for a related series of violations.

We have reviewed the circumstances and supporting documents involved in this case, and have decided not to propose a civil penalty assessment at this time.

With respect to Items 1 and 2 pursuant to 49 United States Code § 60118, the Pipeline and Hazardous Materials Safety Administration proposes to issue a Compliance Order to OPL. Please refer to the *Proposed Compliance Order*, which is enclosed and made a part of this Notice.

Response to this Notice

Enclosed as part of this Notice is a document entitled *Response Options for Pipeline Operators in Compliance Proceedings*. Please refer to this document and note the response options. Be advised that all material you submit in response to this enforcement action is subject to being made publicly available. If you believe that any portion of your responsive material qualifies for confidential treatment under 5 U.S.C. 552(b), along with the complete original document you must provide a second copy of the document with the portions you believe qualify for confidential treatment redacted and an explanation of why you believe the redacted information qualifies for confidential treatment under 5 U.S.C. 552(b). If you do not respond within 30 days of receipt of this Notice, this constitutes a waiver of your right to contest the allegations in this Notice and authorizes the Associate Administrator for Pipeline Safety to find facts as alleged in this Notice without further notice to you and to issue a Final Order.

In your correspondence on this matter, please refer to **CPF 5-2015-5014** and for each document you submit, please provide a copy in electronic format whenever possible.

Sincerely,

Chris Hoidal  
Director, Western Region  
Pipeline and Hazardous Materials Safety Administration

Enclosures: *Proposed Compliance Order*  
*Response Options for Pipeline Operators in Compliance Proceedings*

cc: PHP-60 Compliance Registry  
PHP-500 C. Allen (Activities: 147690 and 147691)  
WUTC

Pursuant to 49 United States Code § 60118, the Pipeline and Hazardous Materials Safety Administration (PHMSA) proposes to issue to Olympic Pipeline Company (OPL) a Compliance Order incorporating the following remedial requirements to ensure the compliance of OPL with the pipeline safety regulations:

1. In regard to Items 1 and 2 of the Notice, OPL must make the following changes to the Casing Wire Repairs project:
  - a. OPL must schedule the project to mitigate all remaining indications no later than 30 months from the date of the Final Order.
  - b. OPL must determine whether additional casings exist on their pipeline and update maps and records as necessary to ensure all programmatic systems which use this data, including IMP, are accurate.
  - c. The project must prioritize HCAs when scheduling casing investigation digs. All indications within HCAs must be completed no later than 18 months from the date of the Final Order.
  - d. OPL must submit the changes to the Casing Wire Repair project within 30 days after receipt of the Final Order.
2. OPL must submit annual status reports to the Director regarding the status of the Casing Wire Project, with the first report due January 15, 2016.
3. PHMSA requests that OPL maintain documentation of the safety improvement costs associated with fulfilling this Compliance Order and submit the total to Chris Hoidal, Director, Western Region, Pipeline and Hazardous Materials Safety Administration. It is requested that these costs be reported in two categories: 1) total cost associated with preparation/revision of plans, procedures, studies and analyses, and 2) total cost associated with replacements, additions and other changes to pipeline infrastructure.



03-07-15 12:12 RCVD



Donald W. Porter

President  
BP Pipelines (North America) Inc.

BP Pipelines (North America) Inc.  
150 W. Warrenville Road  
Suite 605-3501K  
Naperville, IL 60563

**SENT VIA FED-EX**

August 6, 2015

Mr. Chris Hoidal, P.E.  
Director, Western Region  
Pipeline and Hazardous Materials Safety Administration  
U.S. Department of Transportation  
12300 W. Dakota Avenue, Suite 110  
Lakewood, CO 80228

**Re: Notice of Probable Violation/Proposed Compliance Order CPF 5-2015-5014**

Dear Mr. Hoidal:

This letter is in response to the Pipeline & Hazardous Materials Safety Administration's (PHMSA's) Notice of Probable Violation (NOPV) and Proposed Compliance Order (PCO) dated July 2, 2015, and received by BP on July 7, 2015 that resulted from a hazardous liquid standard inspection that was conducted between August 11 and 29, 2014 on the Olympic Pipe Line Company (OPL) system by representatives from PHMSA and the Washington Utilities and Transportation Commission (WUTC).

BP Pipelines (North America) Inc., operator of OPL, is not contesting the NOPV or PCO but wishes to submit additional information to clarify the alleged findings and PCO remedial requirements and timeframes. For ease of reference, the code citations along with PHMSA and WUTC's findings are restated below in italics and are followed by BP's response.

**Probable Violations**

**1. 49 CFR §195.573 What must I do to monitor external corrosion control?**

**(e) Corrective action. You must correct any identified deficiency in corrosion control as required by Sec. 195.401(b). However if the deficiency involves a pipeline in an integrity management program under Sec. 195.452, you must correct the deficiency as required by Sec. 195.452(h).**

**Finding(s):**

*OPL failed to correct identified deficiencies in corrosion control as required by Sec 195.401(b) and Sec. 195.452(h). After a 2010 in-line-inspection (ILI), OPL found discrepancies in the ILI data that indicated the presence of unrecorded casings on the*

*pipeline system. OPL subsequently performed excavations which revealed casings, sleeves, or half sections of pipe at these locations. Some of these casings OPL knew about, but many were previously unknown by the operator's staff. In 2011, OPL initiated the "Casing Wire Repairs" project to evaluate ILI indications that suggested the presence of these casings, investigate the indications, and either remove the casing or add test leads to inspect and test for casing insulation.*

*Section 195.401(b) requires OPL to correct "any condition that could adversely affect the safe operation of its pipeline system...within a reasonable time." Section 195.452(h) requires OPL to take "prompt action to address all anomalous conditions the operator discovers" in high consequence areas (HCAs). As of August 2014, OPL had mitigated about 100 of the ILI indications, with 97 suspected casings remaining to evaluate. OPL's projected timeline for completion is 2020. OPS alleges that 10 years to correct these anomalies is not a reasonable or prompt schedule. In addition, the written Casing Wire Repair project does not differentiate between HCA versus non-HCA locations when prioritizing casing investigation digs.*

**BP Response:**

Since the August 2014 audit, OPL has further analyzed data to identify the number of remaining sites needing resolution and has found that there were 120 sites in need of further investigation. Through July 2015, OPL has mitigated 74 of 120 possible casing locations, resulting in a total of 46 potential casing locations that require additional investigation to resolve.

Thus far, further investigation including field activities has resulted in the following resolutions:

Already monitored: reconciled/updated data systems	33/120
New test station installed	25/120
Casing removed or did not exist	16/120

The remaining 46 potential casing sites are all in HCA locations (42 Direct HCA, 4 Indirect HCA) and will be scheduled for resolution in accordance with the PHMSA Final Order. Any delays due to permitting approval timeframes, site access/landowner issues, and construction/weather/fish windows that could compromise compliance with the Final Order timeframes will be identified and communicated to PHMSA for awareness on a case-by-case basis and when necessary, will include a request for assistance and extension for time.

**2. 49 CFR §195.575 Which facilities must I electrically isolate and what inspections, test, and safeguards are required?**

- (a) You must electrically isolate each buried or submerged pipeline from other metallic structures, unless you electrically interconnect and cathodically protect the pipeline and the other structures as a single unit.
- (b) You must install one or more insulating devices where electrical isolation of a portion of a pipeline is necessary to facilitate the application of corrosion control.
- (c) You must inspect and electrically test each electrical isolation to assure the isolation is adequate.

Finding(s):

OPL failed to test the electrical isolation of each buried pipeline to ensure the isolation from other metallic structures was adequate. Casings are buried metallic structures in close proximity to the pipeline. As described in Item 1 above, OPL has discovered casings and casing test leads on the pipeline that were not on alignment sheets or other cathodic protection records. The electrical isolation of the previously-unrecorded casings was not tested to assure adequate isolation from the pipeline.

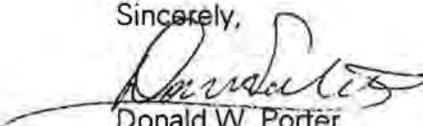
**BP Response:**

As noted in BP's response for item 1 above, not all potential casing locations have been determined to be actual casing locations because of the analysis and field validation that is necessary to provide resolution. OPL is in the process of resolving the remaining 46 sites to determine which sites are actual casing locations and to assure test stations are in place at these sites to test for electrical isolation. While ILI metal loss and deformation tool data is not and cannot be used in determining electrical isolation from metallic structures, it is used to assess pipe integrity at these locations, and to date there have been no pipeline integrity concerns at these locations.

Regarding the Proposed Compliance Order, BP does not have any additional comments or concerns other than unforeseen delays in the permitting, site access, or construction timeframes and will escalate as needed any site that may be at risk of on-time completion.

If you have any questions, please feel free to contact Dave Barnes at (630) 536-3419 or (331) 702-4292.

Sincerely,



Donald W. Porter

President

BP Pipelines (North America) Inc.

cc: Ms. Clorinda Nothstein, Operations Manager, BP Pipelines (North America) Inc.  
File copy

# Enforcement Action Details

## OLYMPIC PIPE LINE COMPANY

Case CPF 520155014

This report lists key information pertaining to a particular enforcement case<sup>(1)</sup>. For cases initiated after January 1, 2007, electronic files of PHMSA's initial notice letter, the operator's initial response letter (if any), and PHMSA's Final Order (if an Order is issued) are provided. PHMSA only issues Final Orders in certain situations. For example, Final Orders are not issued for Warning Letters and most Notices of Amendment.

### Case Summary | Documents

The Response Options for Pipeline Operators in Compliance Proceedings provides a more detailed description of an operator's options in responding to enforcement cases. This document accompanies all NOPV and NOA letters. The document linked here is the current version. The corresponding document at the time the case was opened may differ from the current version.

The set of documents provided here may be incomplete.

Name	Size	Notes
 520155014_Final Order_01132016.pdf	294 KB	scanned version
 520155014_Final Order_01132016_text.pdf	25 KB	accessible version
 520155014_NOPV PCO_07022015.pdf	97 KB	scanned version
 520155014_NOPV PCO_07022015_text.pdf	16 KB	accessible version
 520155014_Operator Response to Notice_08062015.pdf	60 KB	scanned version

**NOTE:** Most documents provided on these pages are in PDF format. To read them, you may need to download a free viewer.

### Also see

- Enforcement Home Page
- Inspection and Enforcement Process Flow Chart
- Additional Information on Regulatory Enforcement Mechanisms and Operator Compliance
- Enforcement Information on a Specific Pipeline Operator
- National Pipeline Mapping System

### Sources

1. PHMSA Safety Monitoring and Reporting Tool (SMART) for the Pipeline Safety Enforcement Tracking System as of February 11, 2016.

## WARNING LETTER

### CERTIFIED MAIL - RETURN RECEIPT REQUESTED

March 27, 2015

Mr. Donald Porter  
President  
Olympic Pipe Line Company  
BP Pipeline NA  
150 W. Warrenville Rd.  
Naperville, IL 60563

CPF 5-2015-5009W

Dear Mr. Porter:

Between August 11, 2014 and August 29, 2014, representatives of the Pipeline and Hazardous Materials Safety Administration (PHMSA) and Washington Utilities and Transportation Commission (WUTC), pursuant to Chapter 601 of 49 United States Code, inspected your Olympic Pipe Line (OPL) system in the States of Oregon and Washington.

As a result of the inspection, it appears that you have committed probable violations of the Pipeline Safety Regulations, Title 49, Code of Federal Regulations. The items inspected and the probable violations are:

1. **§195.573 What must I do to monitor external corrosion control?**
  - (a) **Protected pipelines. You must do the following to determine whether cathodic protection required by this subpart complies with Sec. 195.571:**
    - (1) **Conduct tests on the protected pipeline at least once each calendar year, but with intervals not exceeding 15 months. However, if tests at those intervals are impractical for separately protected short sections of bare or ineffectively coated pipelines, testing may be done at least once every 3 calendar years, but with intervals not exceeding 39 months.**

Olympic Pipe Line Co (OPL) did not comply with §195.573(a)(1) in 2012 and 2013. Prior to our inspection, OPL personnel met with WUTC representatives to disclose that their annual pipe-to-soil potential tests conducted between 2012 and 2013 exceeded the maximum testing interval of 15 months. Our review of OPL's test records for annual pipe-to-soil potential readings, which determine adequacy of cathodic protection (CP), confirmed that the CP inspections exceeded the maximum inspection frequency a total of 121 times between 2012 and 2013.

Specifically, the number of late test readings are as follows:

- 78 late annual pipe-to-soil readings in 2013 for the North Unit of Washington State (Cherry Pt. to Renton Station), and
- 20 late annual pipe-to-soil readings in 2012, and 23 late annual pipe-to-soil readings in 2013 for the South Unit of Washington State (Renton Station to WA/OR State Boundary).

2. §195.573 What must I do to monitor external corrosion control?

(c) Rectifiers and other devices. You must electrically check for proper performance each device in the first column at the frequency stated in the second column.

Device	Check frequency
<b>Rectifier.....</b>  <b>Reverse current switch.</b> <b>Diode.</b> <b>Interference bond whose failure would jeopardize structural protection (critical bond).</b>	<b>At least six times each calendar year, but with intervals not exceeding 2 ½ months</b>
<b>Other interference bond.....</b>	<b>At least once each calendar year, but with intervals not exceeding 15 months.</b>

OPL did not comply with Part 195.573(c) which requires checking the rectifier and critical bond devices for proper performance. OPL personnel met with WUTC representatives to disclose their rectifier and critical bond checks exceeded the time monitoring intervals required by Part 195.573(c). Our review of records confirmed there was a total of six (6) rectifier or bond checks that exceeded the maximum time monitoring intervals for inspection. The late readings are as follows:

- Three (3) late rectifier readings and two (2) late critical bond readings in 2013 for the OPL North Unit of Washington State, and
- One (1) late critical bond readings in 2013 for the OPL South Unit of Washington State

**3. §195.589 What corrosion control information do I have to maintain?**

**(c) You must maintain a record of each analysis, check, demonstration, examination, inspection, investigation, review, survey, and test required by this subpart in sufficient detail to demonstrate the adequacy of corrosion control measures or that corrosion requiring control measures does not exist. You must retain these records for at least 5 years, except that records related to Secs. 195.569, 195.573(a) and (b), and 195.579(b)(3) and (c) must be retained for as long as the pipeline remains in service.**

OPL failed to fully follow their corrosion control procedures, OPL Procedure P195.551.2.2 states, "Any AC interference on pipeline 15 Volts AC or greater will be investigated and remediated as necessary." Furthermore, investigation records were not produced during the inspection to show implementation of your corrosion control procedures. It was noted that OPL did not maintain records for investigating potential AC interference. The number of AC readings that exceeded 15 Volts AC is as follows:

- Four (4) in 2011 and ten (10) in 2013 for the North Unit of Washington State, and Eight (8) in 2011 and six (6) in 2013 for the South Unit of Washington State (primarily in King County).

**4. §195.583 What must I do to monitor atmospheric corrosion control?**

**(a) You must inspect each pipeline or portion of pipeline that is exposed to the atmosphere for evidence of atmospheric corrosion, as follows:**

<b>If the pipeline is located:</b>	<b>Then the frequency of inspection is:</b>
<b>Onshore.....</b>	<b>At least once every 3 calendar years, but with intervals not exceeding 39 months.</b>
<b>Offshore.....</b>	<b>At least once each calendar year, but with intervals not exceeding 15 months.</b>

OPL did not comply with Part 195.583(a) for inspecting each pipeline or portion of pipeline for evidence of atmospheric corrosion. During the field inspection, it was noted that metal jacketed insulation on prover pipe at several of the pump stations prevented actual inspection of the pipeline for atmospheric corrosion. Pipelines with removable insulation jackets or non-removable jackets with inspection ports must be inspected at least once every 3 years (not to exceed 15 months) for evidence of atmospheric corrosion.

Under 49 United States Code, § 60122, you are subject to a civil penalty not to exceed \$200,000 per violation per day the violation persists up to a maximum of \$2,000,000 for a related series of violations. For violations occurring prior to January 4, 2012, the maximum penalty may not exceed \$100,000 per violation per day, with a maximum penalty not to exceed \$1,000,000 for a related series of violations. We have reviewed the circumstances and supporting documents involved in this case, and have decided not to conduct additional enforcement action or penalty assessment proceedings at this time. We advise you to correct the items identified in this letter. Failure to do so will result in Olympic Pipe Line Co being subject to additional enforcement action.

No reply to this letter is required. If you choose to reply, in your correspondence please refer to **CPF 5-2015-5009W**. Be advised that all material you submit in response to this enforcement action is subject to being made publicly available. If you believe that any portion of your responsive material qualifies for confidential treatment under 5 U.S.C. 552(b), along with the complete original document you must provide a second copy of the document with the portions you believe qualify for confidential treatment redacted and an explanation of why you believe the redacted information qualifies for confidential treatment under 5 U.S.C. 552(b).

Sincerely,

Chris Hoidal  
Director, Western Region  
Pipeline and Hazardous Materials Safety Administration

cc: PHP-60 Compliance Registry  
PHP-500 C. Allen and WUTC

Item 1 through 4 – Activity #147690 and #147691

# Enforcement Action Details

## OLYMPIC PIPE LINE COMPANY

Case CPT 520155009W

This report lists key information pertaining to a particular enforcement case<sup>(1)</sup>. For cases initiated after January 1, 2007, electronic files of PHMSA's initial notice letter, the operator's initial response letter (if any), and PHMSA's Final Order (if an Order is issued) are provided. PHMSA only issues Final Orders in certain situations. For example, Final Orders are not issued for Warning Letters and most Notices of Amendment.

Case Summary | Documents

The Response Options for Pipeline Operators in Compliance Proceedings provides a more detailed description of an operator's options in responding to enforcement cases. This document accompanies all NOPV and NOA letters. The document linked here is the current version. The corresponding document at the time the case was opened may differ from the current version.

The set of documents provided here may be incomplete.

Name	Size	Notes
  520155009W_warning letter_03272015.pdf	95 KB	scanned version
 520155009W_warning letter_03272015_text.pdf	20 KB	accessible version

NOTE: Most documents provided on these pages are in PDF format. To read them, you may need to download a free viewer.

### Also see

- Enforcement Home Page
- Inspection and Enforcement Process Flow Chart
- Additional Information on Regulatory Enforcement Mechanisms and Operator Compliance
- Enforcement Information on a Specific Pipeline Operator
- National Pipeline Mapping System

### Sources

1. PHMSA Safety Monitoring and Reporting Tool (SMART) for the Pipeline Safety Enforcement Tracking System as of February 11, 2016.

For comments and questions on the enforcement information presented on this site, please send us feedback.



U.S. Department  
of Transportation

**Pipeline and  
Hazardous Materials Safety  
Administration**

*Check and maintain bond  
at intervals not exceeding 2 1/2 months*

(2)

12300 W. Dakota Ave., Suite 110  
Lakewood, CO 80228

## WARNING LETTER

### CERTIFIED MAIL - RETURN RECEIPT REQUESTED

January 15, 2013

Mr. Steve Pankhurst  
President  
Olympic Pipe Line Company  
150 W. Warrenville Rd.  
Naperville, IL 60563

CPF 5-2013-5001W

Dear Mr. Pankhurst:

On October 30-November 1, 2012, a representative of the Pipeline and Hazardous Materials Safety Administration (PHMSA), pursuant to Chapter 601 of 49 United States Code, inspected your operations and maintenance (O&M) procedures and records in Renton, Washington and performed a field evaluation of your facility in Portland, Oregon.

As a result of the inspection, it appears that you have committed a probable violation of the Pipeline Safety Regulations, Title 49, Code of Federal Regulations. The item inspected and the probable violation(s) are:

**1. §195.573 What must I do to monitor external corrosion control?**

**(c) Rectifiers and other devices. You must electrically check for proper performance each device in the first column at the frequency stated in the second column.**

<u>Device</u>	<u>Check frequency</u>
Interference bond whose failure would jeopardize structural protection.	At least six times each calendar year, but with intervals not exceeding 2 1/2 months

Per §195.573, the operator must electrically check for proper performance each critical bond at least six times each calendar year, but with intervals not exceeding 2 ½ months. At the time of the inspection, records required by 195.589(c) indicated that the check for each critical bond was not performed within the required time interval referenced in 195.573(c). The PD-AR-14 (Portland Delivery) to ARCO records for 2010 show that a critical bond was checked on April 5, 2010 and August 25, 2010. The two and half month maximum time interval between test dates was exceeded by 65 days in 2010. Olympic Pipe Line Company must electrically check at the required time intervals.

Under 49 United States Code, § 60122, you are subject to a civil penalty not to exceed \$200,000 per violation per day the violation persists up to a maximum of \$2,000,000 for a related series of violations. For violations occurring prior to January 4, 2012, the maximum penalty may not exceed \$100,000 per violation per day, with a maximum penalty not to exceed \$1,000,000 for a related series of violations. We have reviewed the circumstances and supporting documents involved in this case, and have decided not to conduct additional enforcement action or penalty assessment proceedings at this time. We advise you to correct the item(s) identified in this letter. Failure to do so will result in Olympic Pipe Line Company being subject to additional enforcement action.

No reply to this letter is required. If you choose to reply, in your correspondence please refer to **CPF 5-2013-5001W**. Be advised that all material you submit in response to this enforcement action is subject to being made publicly available. If you believe that any portion of your responsive material qualifies for confidential treatment under 5 U.S.C. 552(b), along with the complete original document you must provide a second copy of the document with the portions you believe qualify for confidential treatment redacted and an explanation of why you believe the redacted information qualifies for confidential treatment under 5 U.S.C. 552(b).

Sincerely,



Chris Hoidal  
Director, Western Region  
Pipeline and Hazardous Materials Safety Administration

cc: PHP-60 Compliance Registry  
PHP-500 D. Hubbard (#138089)



U.S. Department of Transportation  
Pipeline and Hazardous Materials  
Safety Administration

NOV 23 2009

1200 New Jersey Ave, S.E.  
Washington, D.C. 20590

**VIA CERTIFIED MAIL – RETURN RECEIPT REQUESTED [7009 1410 0000 2464 5775]**

Mr. Steve Pankhurst  
President  
BP Pipelines (North America) Inc.  
U.S. Pipelines and Logistics  
28100 Torch Parkway  
Warrenville, IL 60555

**Re: CPF No. 5-2006-5034**

Dear Mr. Pankhurst:

Enclosed is this agency's decision denying your company's Petition for Reconsideration in this case. The penalty payment terms are set forth in the Final Order. This enforcement action closes automatically upon payment. Your receipt of this Decision constitutes service of that document under 49 C.F.R. § 190.5.

Thank you for your cooperation in this matter.

Sincerely,

Jeffrey D. Wiese  
Associate Administrator  
for Pipeline Safety

Enclosure

cc: Mr. Chris Hoidal, P.E., Director, Western Region, PHMSA

Mr. David O. Barnes, P.E.  
Manager DOT & Integrity  
BP Pipelines (North America) Inc.

SEP 01 2009

Mr. Jim Lamanna  
President  
BP Pipelines (North America) Inc.  
Olympic Pipe Line Company  
28100 Torch Parkway  
Warrenville, IL 60555

**Re: CPF No. 5-2006-5034**

Dear Mr. Lamanna:

Enclosed is the Final Order issued in the above-referenced case. It makes a finding of violation and assesses a civil penalty of \$23,000. It further finds that you have completed the actions specified in the Notice required to comply with the pipeline safety regulations. When the civil penalty is paid, this enforcement action will be closed. Your receipt of the Final Order constitutes service of that document under 49 C.F.R. § 190.5.

Thank you for your cooperation in this matter.

Sincerely,

Jeffrey D. Wiese  
Associate Administrator  
for Pipeline Safety

Enclosure

cc: Mr. Chris Hoidal, Director, Western Region, PHMSA

**CERTIFIED MAIL – RETURN RECEIPT REQUESTED [ 7005 0390 0005 6162 5791]**

**DEPARTMENT OF TRANSPORTATION  
PIPELINE AND HAZARDOUS MATERIALS SAFETY ADMINISTRATION  
OFFICE OF PIPELINE SAFETY  
WASHINGTON, DC 20590**

<b>In the Matter of</b>	)	
<b>BP Pipelines (North America), Inc.,</b>	)	
<b>Respondent.</b>	)	<b>CPF No. 5-2006-5034</b>

**FINAL ORDER**

From February 27 to March 2, 2006, pursuant to 49 U.S.C. § 60117, a representative of the Pipeline and Hazardous Materials Safety Administration (PHMSA), Office of Pipeline Safety (OPS), inspected a 15-mile portion of BP Pipelines (North America), Inc.'s (Respondent's or BP's) Olympic Pipeline and related facilities near Portland, Oregon, as well as Respondent's operation and maintenance records at its Renton, Washington office. Located entirely within a High Consequence Area (HCA),<sup>1</sup> the relevant portion of the Olympic Pipeline originates at the Washington-Oregon border near the Columbia River and transports petroleum products to delivery facilities and terminals along the Willamette River.

As a result of the inspection, the Director, Western Region, PHMSA, issued to Respondent, by letter dated September 8, 2006, a Notice of Probable Violation, Proposed Civil Penalty, and Proposed Compliance Order (Notice). In accordance with 49 C.F.R. § 190.207, the Notice proposed finding that Respondent had violated 49 C.F.R. § 195.432(b), assessing a civil penalty of \$23,000, and ordering Respondent to take certain measures to correct the alleged violation.

BP responded to the Notice by letters dated October 16 and November 9, 2006 (Response). Respondent did not contest the allegation of violation, but provided information concerning the corrective actions it had taken and requested that the civil penalty be reduced or eliminated. Respondent also waived its right to an informal hearing.

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<sup>1</sup> An HCA is defined for purposes of Part 195 as a "commercially navigable waterway, . . . [a] high population area, . . . [a]n other populated area, . . . [or] [a]n unusually sensitive area . . ." 49 C.F.R. § 195.450. A commercially navigable waterway is "a waterway where a substantial likelihood of commercial navigation exists;" a high population area is "an urbanized area, as defined and delineated by the Census Bureau, that contains 50,000 or more people and has a population density of at least 1,000 people per square mile;" an other populated area is "a place, as defined by the Census Bureau, that contains a concentrated population, such as an incorporated or unincorporated city, town, village, or other designated residential or commercial area." *Id.*; and, an unusually sensitive area is "a drinking water or ecological resource area that is unusually sensitive to environmental damage from a hazardous liquid pipeline release." 49 C.F.R. § 195.6.

## FINDING OF VIOLATION

Item 1 of the Notice alleged that BP violated 49 C.F.R. Part 195, which states:

### **§ 195.432 Inspection of in-service breakout tanks.**

(a) ...

(b) Each operator shall inspect the physical integrity of in-service atmospheric and low-pressure steel above-ground breakout tanks according to section 4 of API Standard 653....

The Notice alleged that Respondent violated 49 C.F.R. § 195.432(b) by failing to properly inspect the physical integrity of two in-service atmospheric and low-pressure steel above-ground breakout tanks according to section 4 of API Standard 653. BP has not disputed the allegation. Accordingly, I find that Respondent violated § 195.432(b) by failing to properly inspect the physical integrity of two in-service atmospheric and low-pressure steel above-ground breakout tanks according to section 4 of API Standard 653.

This finding of violation will be considered a prior offense in any subsequent enforcement action taken against Respondent.

## ASSESSMENT OF PENALTY

Under 49 U.S.C. § 60122, Respondent is subject to a civil penalty not to exceed \$100,000 per violation for each day of the violation up to a maximum \$1,000,000 for any related series of violations.

49 U.S.C. § 60122 and 49 C.F.R. § 190.225 require that, in determining the amount of the civil penalty, I consider the following criteria: the nature, circumstances, and gravity of the violation, including adverse impact on the environment; the degree of Respondent's culpability; the history of Respondent's prior offenses; Respondent's ability to pay the penalty and any effect that the penalty may have on its ability to continue doing business; and the good faith of Respondent in attempting to comply with the pipeline safety regulations. In addition, I may consider the economic benefit gained from the violation without any reduction because of subsequent damages, and such other matters as justice may require.

The Notice proposed a total civil penalty of \$23,000 for violation of 49 C.F.R. § 195.432(b). Respondent argues that the proposed civil penalty should be reduced or eliminated. In particular, BP states that its consultant completed an analysis of the two breakout tanks at issue after the OPS inspection, and that the contractor's analysis showed that neither of those tanks posed "an imminent threat to public safety . . ." <sup>2</sup> BP also contends that these post-inspection actions show that it "continues to act within the spirit of the regulations, which are designed to foster continuous improvement of safety

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<sup>2</sup> Response at 2.

programs.”<sup>3</sup> For these reasons, BP argues that a compliance order is not necessary and that a reduction or elimination of the proposed civil penalty is warranted.

Respondent’s arguments are not persuasive. First, BP knew that it had to conduct an engineering evaluation of these two breakout tanks several years prior to the 2006 OPS inspection. Specifically, Respondent’s 2001 inspection records note that the out-of-plane-edge settlement of these tanks did not comply with API’s guidelines, and that an engineering analysis of the tanks was required.

BP did not conduct the recommended engineering analysis for the next five years and only did so when prompted by the OPS inspection. Contrary to Respondent’s assertions, such inaction and delay clearly undermined public safety. While the results of its belated engineering analysis ultimately showed that the nature of the threat was not serious, the fact that Respondent failed to act promptly potentially placed the health and welfare of the public in jeopardy. Respondent’s conduct was not consistent with the text or spirit of the pipeline regulations.

With regard to the statutory factors, the unusual length of time from discovery to remediation aggravates the gravity of this particular offense. It is also true, as BP states, that PHMSA considers the “good faith” of an operator in calculating and assessing civil penalties. However, such good faith is ordinarily limited to only those actions that an operator took in a reasonable attempt to achieve compliance before an inspection or enforcement action. Indeed, once a violation is discovered, PHMSA expects any prudent operator to cooperate in remediating and preventing a reoccurrence of that condition. Respondent also has the ability to pay this penalty without adversely affecting its ability to continue in business.

Accordingly, having reviewed the record and considered the assessment criteria, I assess Respondent a total civil penalty of \$23,000 for failing to perform the necessary engineering analysis or properly evidencing why an analysis was not required at the time of inspection.

Payment of the civil penalty must be made within 20 days of service. Federal regulations (49 C.F.R. § 89.21(b)(3)) require this payment be made by wire transfer, through the Federal Reserve Communications System (Fedwire), to the account of the U.S. Treasury. Detailed instructions are contained in the enclosure. Questions concerning wire transfers should be directed to: Financial Operations Division (AMZ-341), Federal Aviation Administration, Mike Monroney Aeronautical Center, P.O. Box 25082, Oklahoma City, OK 73125; (405) 954-8893.

### **COMPLIANCE ORDER**

The Notice proposed a Compliance Order with respect to Item 1 in the Notice for violation of 49 C.F.R. Part 195.

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<sup>3</sup> *Id.*

Under 49 U.S.C. § 60118(a), each person who engages in the transportation of gas or who owns or operates a pipeline facility is required to comply with the applicable safety standards established under chapter 601. The Director has indicated that Respondent has satisfactorily completed the following actions specified in the Proposed Compliance Order:

1. 49 C.F.R. § 195.432(b) -- With regard to the violation described in Item 1 of the Notice, in its Responses BP included the final reports for the engineering analysis of breakout tanks 105 and 106 that were undertaken after the PHMSA inspection to ensure the out-of-plane settlements were within the specified API 653 limits. The Director, Western Region, PHMSA has reviewed this information and indicated it satisfies the terms of the proposed Compliance Order.

Accordingly, since compliance has been achieved with respect to this violation, the compliance terms are not included in this Order.

Under 49 C.F.R. § 190.215, Respondent has the right to submit a petition for reconsideration of this Final Order. Should Respondent elect to do so, the petition must be received within 20 days of Respondent's receipt of this Final Order and must contain a brief statement of the issue(s). The filing of a petition automatically stays the payment of any civil penalty assessed. However if Respondent submits payment for the civil penalty, the Final Order becomes the final administrative decision and the right to petition for reconsideration is waived. The terms and conditions of this Final Order shall be effective upon receipt

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Jeffrey D. Wiese  
Associate Administrator  
for Pipeline Safety

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Date Issued

FROM:

Janis Philbin Medley  
4609 Somerset Dr SE  
Bellevue, WA 98006

*Janis Medley*

RECEIVED

MAR 15 REC'D

Development Services

TO:

Ms. Heidi Bedwell, Senior Planner  
Land Use Division-Development Services  
City of Bellevue  
450 110<sup>th</sup> Ave NE  
Bellevue, WA 98004

RE:

**Comments on the Phase I Draft EIS for PSE's Energize Eastside Transmission Line Project**  
Submitted on behalf of **CENSE** Coalition of Eastside Neighborhoods for Sensible Energy

March 11, 2016

## CHAPTER 1 INTRO & SUMMARY

### 1.8 / p 1-16 What are Applicants Objectives

*Address PSE's identified deficiency in transmission capacity*

Refer to Laukhart-Schiffler Load Flow Study to see arguments against PSE's claim of deficient transmission capacity.

### Tables 1-2 and 1-3 / p 1-50 to 1-55

*Impact Categories*

The impact categories assume that if all local, state, and federal regulations are followed, then impacts will be minor. This totally dismisses the very real possibility of human error during construction and operation of all alternatives. It also dismisses the very real fact, that Olympic Pipeline has both been sited and fined for a variety of pipeline safety violations, and still has not completed all required repairs required by OPS. (refer to letters submitted with my oral comments at the March 1 Comments Meeting in Bellevue)

### 1.12.3 / p 1-57 Impacts from Project

*Although significant impacts could occur with any alternative, the most controversial impacts relate to concerns about the visual impacts and potential for conflicts between electrical and flammable-liquid pipelines. Fear of these and other impacts led to concerns in the community about reduced property values, degradation of neighborhood character, and public safety. **The Phase 1 Draft EIS acknowledges these concerns and provides the results of relevant studies prepared by local and national experts on the topics.***

Many of the "relevant" studies used in the DESI are very dated. Other comments by CENSE have addressed the inadequacies of the research data used to create the components of Alternative 2, and I refer you to those submitted by EQL.

## CHAPTER 2 PROJECT ALTERNATIVES

### 2.3.2.2 / p 2-21 & 22 Option A: New Overhead Transmission Lines

*While there is not an immediate need for a second 230 kV circuit through the Eastside, **there are cost efficiencies with installing a second circuit transmission facility in the same corridor as the proposed 230 kV line. PSE will consider this as part of efforts to identify the least costly infrastructure to serve its customers.***

If there is a possibility of installing a second 230kV line, will there be another EIS to determine the impacts of construction and operation of that second line? What are the SEPA requirements for installing a second line?

#### 2.3.2.2.1 / p 22 Overhead Transmission Line Locations

***Consideration** is also made to avoid placing poles in environmentally critical areas like wetlands and unstable slopes.*

What does **consideration** mean? Just thinking about avoiding environmentally critical areas and unstable slopes does not avoid damaged areas if not concrete preventative or avoidance actions are taken.

#### 2.3.2.2.2 / p 2-22 Pole Types and Heights for Overhead Lines

*Generally, for a double circuit system, pole heights would range from 85 to 100 feet. In some configurations that could occur under Alternative 1, Option A, a double circuit would incorporate an existing 115 kV line with a new 230 kV line on poles similar to those shown in Figure 2-2. In special cases, such as crossing a ravine or highway, pole heights could be shorter **or taller.***

What would be the maximum height of pole used?

#### 2.3.2.2.3 / p 2-23 Construction Option A-1

*In practice, PSE **may be able to reduce the required clear zone**, in which case impacts would be less than those assumed for this phase of the EIS.*

What would PSE do to reduce the required clear zone? This needs to describe specific actions taken.

*The clear zone for an overhead 230 kV line **could be** approximately 120 to 150 feet wide. The transmission line **could be** located along existing 115 kV easements, which are typically 70 to 100 feet wide. Therefore, this analysis assumes that use of a 115 kV corridor **could require** the corridor to be widened by up to 50 feet. Section 2.3.5 summarizes the clear zone widths and other assumptions used for all alternatives in this EIS.*

The bolded words in the paragraph above are so conditional, they do not give a clear, accurate or honest statement of the range of feet the corridor would be widened. It begs the question if a 230 kV line could also be wider than 150 feet. If a property owner is next to an easement that is currently 70 feet wide, then it could require an additional 80 feet to create a 150 foot wide clear zone, which is 30 feet wider than "could require the corridor to be widened by up to 50 feet.

*Coordination with Olympic Pipeline. If located along the existing 115 kV easement, construction of a 230 kV line has the **potential to disrupt** the Olympic Pipeline. Extensive coordination with the Olympic Pipe Line Company would be required during project design and construction to avoid disruption to the two lines, or to establish relocation procedures.*

What does "potential to disrupt" the Olympic Pipeline mean. The specific disruptions need to be described.

**p 2-23 continued**

*Pole installation. Poles can be directly embedded in the ground or utilize an anchor bolt cage, which is a drilled pier foundation that involves setting the anchor bolt cage in a poured column of concrete. Foundations for new 230 kV poles are typically **augered (drilled) 4 to 8 feet in diameter** with steel reinforcements that **could extend 25 to 50 feet deep depending on the structure type**. Steel poles are set and anchored to the foundations. In some cases, a caisson foundation is used for greater stability. (No foundations are used for wooden poles.) Approximately 100 pole foundations would need to be installed with a typical spacing between poles of 1,000 feet to extend the 18-mile distance between the Sammamish and Talbot Hill substations.*

The drilling activity described in the bolded words would certainly increase the probability of damage to the Olympic pipeline. While construction equipment is listed in Appendix B, there is no indication of the dimensions or weight of each piece of equipment, nor is there a description of where equipment would be located when in use. Would it be operating in the right of way, where would it be in juxtaposition to the pipeline, (above, how many feet away from the pipeline.)?

## **CHAPTER 3 EARTH**

### **3.6.1.5 / p 3-14 Olympic Pipeline**

*In addition to the aforementioned hazards, portions of the existing 115 kV overhead easement corridor are shared with the Olympic Pipe Line Company (OPLC) which operates two steel pipelines that transport petroleum products. The pipelines are 16 inches and 20 inches in diameter and buried approximately 3 to 4 feet below the ground surface. Construction of new transmission lines in the vicinity of the petroleum pipelines or other earthwork activities in or near these pipelines could represent potential hazards from inadvertent contact, causing excessive ground vibrations, or result in damage from erosion. **Although a significant adverse impact could occur during construction near petroleum pipelines, these potential hazards do not constitute a probable impact due to existing regulations and practices in place for pipeline safety. OPLC has stringent construction requirements in the area of its pipelines and would continue close coordination with PSE for all construction activities located adjacent to these pipelines. Therefore, no potentially significant adverse impacts related to work near pipelines are expected under any of the alternatives.***

*and p 8-28*

Because compliance with all applicable requirements would help to reduce the probability of an occurrence to a very low likelihood, potential adverse impacts associated with construction of the project are characterized as minor

Dangerously simplistic thinking to state that potential hazards to not constitute a probable impact because regulations and practices for pipeline safety will eliminate any significant adverse impacts related to work near pipelines. Semantics and statistics do not negate the dangers of digging holes up to 50 feet deep near *the pipelines.*

## **CHAPTER 5 WATER**

### **5.5.1.6 / p 5-12 Potential Pipeline Damage**

*While **unlikely due to measures employed to prevent such accidents, it is possible** that the Olympic Pipeline could be damaged during construction. A pipeline rupture could have significant adverse effects on surface water and groundwater quality, depending on the location, size, and length of time of the rupture.*

Drilling holes 6-8 feet wide and 25 -50 feet deep, using large cranes to install a power pole, then filling the holes with concrete greatly increases the risk of damage to the pipeline. Even if small cracks are not detected during the construction phase, construction activities near the Olympic pipeline might create

a ticking time bomb like occurred in Bellingham. In that case, excessive pressure in the pipeline due to a malfunction of a block valve and human error resulted in a devastating explosion erupting from a construction nick that occurred 5 years earlier.

## CHAPTER 8 ENVIRONMENTAL HEALTH

### 8.2.2.1 / p 8-2 Activities Near Pipelines

*Appendix M provides a list of identified regulations that apply to pipelines, along with response plans implemented by the Olympic Pipeline Company (OPLC) in particular, since OPLC's facilities were identified as a source of concern during EIS scoping. Some of the regulations are described here.*

It is an oversimplification to assume that if all local, state, and federal regulations are followed, then impacts will be minor. This totally dismisses the very real possibility of human error during construction and operation of all alternatives. It also dismisses the very real fact, that Olympic Pipeline has both been sited and fined for a variety of pipeline safety violations, and still has not completed all required repairs required by OPS.

(refer to letters submitted with my oral comments at the March 1 Comments Meeting in Bellevue)

### 8.2.2.1 / p 8-4 Box *Questions on page 5 relate to the following sections*

*To comply with federal regulations, the Olympic Pipe Line Company has an integrity management program, including requirements to regularly inspect and monitor both natural gas and petroleum pipelines. Inspections are performed using a combination of tools to determine the suitability of the pipeline based on any anomalies detected, including corrosion, dents, or actual wall loss (loss of material on the inside or outside of the pipeline due to corrosion) (West, personal communication, 2015).*

### *and* 16.3.3 p 16-11&12 Petroleum Pipelines

*OPLC operates its lines pursuant to its own easements and, where they overlap, subject to agreement with PSE and PSE's prior rights. In entering this agreement with PSE, OPLC agreed to: (1) install its pipeline at a depth and in a manner that would not interfere with PSE's facilities; (2) install and maintain permanent markers to give notice of the location of the pipeline; and (3) adjust and/or relocate the pipeline in the event of a conflict with PSE facilities.*

*Hazardous liquid pipelines are regulated by federal and state rules (see Appendix M, Pipeline Safety Requirements and Plans Relating to Petroleum Pipelines). The standards and enforcement actions are the responsibility of the federal Office of Pipeline Safety (OPS), as described in Chapter 8. Through passage of the Washington Pipeline Safety Act of 2000 (E2SHB 2420), the UTC was directed and obtained the authority from the OPS to inspect interstate hazardous liquid pipelines in Washington State in accordance with federal standards (UTC, 2015). OPLC is subject to full compliance with the applicable provisions of Title 49, CFR Part 195 for hazardous liquid pipelines, and as reinforced by the company's franchise agreements with the study area cities. These regulations address safety in design, construction, testing, operation, maintenance, and emergency response for pipeline facilities. In accordance with 49 CFR Part 195, regular inspections and monitoring of the pipelines are performed using a combination of tools to determine the suitability of the pipeline based on any anomalies detected, including wall loss, corrosion, or dents. The pipelines through the combined study area are currently on a 5-year general inspection schedule. If anomalies were to be detected, this timeframe would be shortened in accordance with federal requirements (West, 2015).*

*If OPLC becomes aware that a third party conducts any excavation or other significant work that may affect the pipeline, the company is required to conduct such inspections and testing as is necessary to determine that no direct or indirect damage was done to the pipeline and that the work did not abnormally load the pipeline or impair the effectiveness of the cathodic protection system (City of Bellevue, 2005; City of Kirkland, 2011; City of Newcastle, 2008; City of Renton, 2006).*

### *and* 16.3.3.1.1 / p 21

*If located along the existing PSE 115 kV easement, construction of a 230 kV line has the potential to disrupt existing natural gas lines or the Olympic Pipeline. Extensive coordination with OPLC would be required during project design to avoid disruption to the two lines, or to establish relocation procedures. For large projects, such as Energize Eastside, OPLC would establish a team to review design, identify any vulnerabilities, and identify measures to avoid potential impacts, in coordination with the project proponent (West, 2015). Construction risks associated with the Olympic Pipeline include potential for compression damage from heavy vehicles or machinery driving or placed above the buried lines, potential for pipe disturbance during excavations for new poles, and potential for pipe disturbance from removal of current poles. Certain machinery, such as auger equipment, can be a*

particular concern because of how heavy the equipment is. If there is a concern, measures can be used to avoid crossing the pipeline by taking a different route, or reducing or eliminating the concern by placing matting or other material to distribute the load to acceptable levels or relocating the pipeline.

- When was the last inspection date for the section of the pipeline that is collocated with EE project?
- Were any anomalies found?
- If found have they been repaired?
- Would the increase from 115 kV to 230 kV require changes in your cathodic protection system?
- If yes, what changes would be required and how and when would they be implemented?
- What percentage of pressure drop in the pipeline is required to set off an alarm in HCA's?
- When a pipeline is located under a street, how is a leak detected?
- What is the minimum acceptable thickness of the pipeline wall to meet all OPS regulations
- On page 16-21 of the DEIS, you stated that construction of a 230kV line has the potential to disrupt existing natural gas lines or the Olympic Pipeline. What exactly do you mean by the word DISRUPT?
- Is it legally possible for OPL to say NO PSE's Energize Eastside Project?
- If not, why not?
- If there were a pipeline explosion during construction, how would liability be assigned to OPL, PSE, Sub contractors other entities?
- How often are Block valves tested? Are results available to public ?

#### 8.2.2.1 / p 8-5

*The combined study area communities (Alternatives 1, 2, and 3 as depicted on Figure 1-4 in Chapter 1) do not directly regulate pipeline safety, but they have the authority to regulate land uses near pipelines within their jurisdictions to protect public health and safety. Some communities encourage co-location of pipelines with other utilities where safe, while others specifically co-location of critical utilities with hazardous fluid pipelines like the Olympic Pipeline.*

Why does Bellevue City Council believe they do not have the authority to regulate land uses near pipelines in their jurisdiction? Yes, they are the "legislative" branch of the city government, but they are also the managers of the "Executive" branch and are elected by the citizens to look after the best interests and safety of our community.

From MRSC - Municipal Resource Service Center in Seattle, WA:

<http://mrsc.org/Home/Explore-Topics/Public-Safety/Special-Topics/Pipeline-Safety/Planning-Near-Pipelines.aspx>

#### **Planning Near Pipelines - Stakeholders**

"Before considering changes to local land use procedures and regulations concerning transmission pipelines, it is necessary to understand who is involved (the stakeholders) and their respective roles in the process.

#### Stakeholders and Their Roles

**Local Governments.** Cities and counties have primary authority to establish land use regulations within their jurisdictions, including all lands crossed by or near transmission pipeline easements.

**Developers.** Developers of residential or commercial projects (both large and small) are frequently

direct landowners or have an ownership interest in properties crossed by or near transmission pipeline easements. They often are not knowledgeable about pipeline safety issues.

**Private Landowners.** They typically own most of the land crossed by the pipeline operators' easements or near the easements. They will be directly affected by any new land use regulations that impose restrictions on development. [Keep in mind that transmission pipeline easements also cross public lands owned by federal, state, local and tribal governments, or use rights of way controlled by local governments.]

**Pipeline Operators.** Easements provide pipeline operators the right to install, operate and repair their pipelines, and to place limits on what can be done by private and public landowners within those easements.

There Are Three Options Open to Local Governments :

- Do nothing and keep your fingers crossed, hoping that no serious pipeline failures occur within your jurisdiction. There are no federal or state "mandates" requiring that you consider these pipeline safety issues.
- Assume the worst and impose draconian regulations to safeguard the public from all possible risk in the event that a pipeline does rupture and ignite.
- Choose from a wide range of "recommended practices" that seek to protect the pipeline from damage and lessen the injuries and damage if a pipeline failure occurs.

Options one and two are extreme positions, and are probably not consistent with the values of your populace. Option three requires that planners and local government officials educate themselves about pipeline safety concerns and the recommended practices discussed here, assess the level of safety concern in their community, then adopt reasonable measures to promote the health and safety of the community.

### 8.2.2.1 / p 8-6

• The City of Kirkland's comprehensive plan includes policies that: establish standards to minimize pipeline damage, prohibit new **high consequence land uses**<sup>1</sup> from locating near a hazardous liquid pipeline corridor, support coordination with the pipeline operator when developments are proposed near the pipeline corridor, and require maintenance of the hazardous liquid pipeline corridor through their franchise agreement and other mechanisms (City of Kirkland, 2015).(City of Newcastle, 2015).

Footnote 1 regarding High Consequence Land Uses is defined in the DEIS as

*1 High Consequence Land Use: A land use that if located in the vicinity of a hazardous liquid pipeline represents an unusually high risk in the event of a pipeline failure due to characteristics of the inhabitants or functions of the use. High consequence land uses include: 1. Land uses that involve a high-density on-site population that are more difficult to evacuate. These uses include: continued on next page*

- *Schools (through grade 12)*
- *Hospitals, clinics, and other facilities primarily for use by the elderly or handicapped, other than those within single-family residences.*
- *Stadiums or arenas.*
- *Day care centers, and does not extend to family day care or adult family homes.*

A list of sensitive areas in the 18 miles transmission corridor follows.

The source is:

FACILITY RESPONSE PLAN pages 6-23 to 6-25

BP Pipelines (North America)

U.S. Pipelines and Logistics

Northwest Pipelines District

Prepared for:

Northwest Pipelines

600 SW 39th Street, Suite 275 Renton, WA 98057

SS2	Seattle - 3	Sole Source Aquifer	Cross Valley Aquifer
HP3	Seattle - 3	Historic Building	North Creek School
HP4	Seattle - 3	Historic Building	Winningham Farm
HP5	Seattle - 3	Historic Building	Bates-Tanner Farm
HP6	Seattle - 3	Historic Building	Bothell Pioneer Cemetery
HP7	Seattle - 3	Historic Building	Chase, Dr. Reuben, House
HP8	Seattle - 3	Historic Building	Hollywood Farm
HP9	Seattle - 3	Historic Building	USCGC FIR
HP10	Seattle - 3	Historic Building	Turner-Koepf House
HP11	Seattle - 3	Historic Building	14th Avenue South Bridge
HP12	Seattle - 3	Historic Building	Cooper, Frank B., Elementary School
HP13	Seattle - 3	Historic Building	Seattle Public Library
HP14	Seattle - 3	Historic Building	Columbia City Historic District
HP15	Seattle - 3	Historic Building	Old Georgetown City Hall
HP16	Seattle - 3	Historic Building	Pacific Coast Company House No. 75
HP17	Seattle - 3	Historic Building	Building No. 105, Boeing Airplane Company
PK12	Seattle - 3	Park	Gold Creek County Park
PK13	Seattle - 3	Park	E Norway Hill Park
PK14	Seattle - 3	Park	Sammamish River Regional Park
PK15	Seattle - 3	Park	Mark Twain Park
PK16	Seattle - 3	Park	Willows Creek Neighborhood Park
PK17	Seattle - 3	Park	Grass Lawn Park
PK18	Seattle - 3	Park	King County Park
PK19	Seattle - 3	Park	Bridle Trails State Park
PK20	Seattle - 3	Park	Cherry Crest Park
PK21	Seattle - 3	Park	Bellevue Highlands Park
PK22	Seattle - 3	Park	Kelsey Creek Park
PK23	Seattle - 3	Park	Bannerwood Park
PK24	Seattle - 3	Park	Woodridge Park
PK25	Seattle - 3	Park	Robinswood Park
PK26	Seattle - 3	Park	Sweyolocken Park
PK27	Seattle - 3	Park	Sunset Ravine Park
PK28	Seattle - 3	Park	Jefferson Park
PK29	Seattle - 3	Park	Eastgate Park
PK30	Seattle - 3	Park	Puget Park
PK31	Seattle - 3	Park	Coal Creek Park
PK32	Seattle - 3	Park	Dearborn Park
PK33	Seattle - 3	Park	Hazelwood Park
PK34	Seattle - 3	Park	Atlantic City Park
PK35	Seattle - 3	Park	May Creek Park
PK36	Seattle - 3	Park	Kennydale Lions Park
PK37	Seattle - 3	Park	Lakeridge Park
SC30	Seattle - 3	School	Sunnyside Preschool and Kindergarten School Lake Stevens Campus
SC31	Seattle - 3	School	East Everett School
SC32	Seattle - 3	School	Cavelero Mid High School
SC33	Seattle - 3	School	Prove High School
SC34	Seattle - 3	School	Swans Trail School
SC35	Seattle - 3	School	Seattle Hill Elementary School
SC36	Seattle - 3	School	Small World Montessori School
SC37	Seattle - 3	School	Archbishop Murphy High School
SC38	Seattle - 3	School	Penny Creek Elementary School

SC39	Seattle - 3	School	Kindercare Learning Center 1707
SC40	Seattle - 3	School	Silver Firs Elementary School
SC41	Seattle - 3	School	Mill Creek Elementary School
SC42	Seattle - 3	School	Nancys Noahs Ark Daycare Center
SC43	Seattle - 3	School	Forest View Elementary School
SC44	Seattle - 3	School	Gateway Middle School
SC45	Seattle - 3	School	Cedar Wood Elementary School
SC46	Seattle - 3	School	Fernwood Elementary School
SC47	Seattle - 3	School	Canyon Creek Elementary School
SC48	Seattle - 3	School	Skyview Junior High School
SC49	Seattle - 3	School	Skyview Junior High School
SC50	Seattle - 3	School	Kokanee Elementary School
SC51	Seattle - 3	School	Canyon Park Montessori School
SC52	Seattle - 3	School	Northshore School District - Special Services
SC53	Seattle - 3	School	Northshore School District Office
SC54	Seattle - 3	School	Woodinville High School
SC55	Seattle - 3	School	Learning Garden School Bothell
SC56	Seattle - 3	School	Woodin Elementary School
SC57	Seattle - 3	School	Woodinville Montessori School North Creek Bothell Campus
SC58	Seattle - 3	School	University of Washington - Bothell Campus
SC59	Seattle - 3	School	Cascadia Community College
SC60	Seattle - 3	School	University of Washington Bothell Campus Building 1
SC61	Seattle - 3	School	University of Washington Bothell Campus Commons
SC62	Seattle - 3	School	Dartmoor School
SC63	Seattle - 3	School	Kids Country Woodinville
SC64	Seattle - 3	School	Woodinville Elementary School
SC65	Seattle - 3	School	C O Sorenson School
SC66	Seattle - 3	School	Bellevue Christian School-Woodinville
SC67	Seattle - 3	School	Kindercare Learning Center 1617
SC68	Seattle - 3	School	Woodinville Montessori School
SC69	Seattle - 3	School	Woodinville Children Center
SC70	Seattle - 3	School	Cedar Park Christian School
SC71	Seattle - 3	School	Evergreen Academy Elementary School
SC72	Seattle - 3	School	Northshore Junior High School
SC73	Seattle - 3	School	Kindercare Learning Center 898
SC74	Seattle - 3	School	Woodmoor Elementary School
SC75	Seattle - 3	School	Lil' People's World Child Care Center
SC76	Seattle - 3	School	Tree of Life Daycare Center
SC77	Seattle - 3	School	Kamiakin Junior High School
SC78	Seattle - 3	School	John Muir Elementary School
SC79	Seattle - 3	School	Elite Kids Preschool Kirkland Center
SC80	Seattle - 3	School	Lake Washington Technical College
SC81	Seattle - 3	School	Lake Washington Technical College Early Learning Center
SC82	Seattle - 3	School	Kindercare Learning Center 1024
SC83	Seattle - 3	School	Springhurst School
SC84	Seattle - 3	School	Mark Twain Elementary School
SC85	Seattle - 3	School	City Kids Preschool

SC86	Seattle - 3	School	Rose Hill Presbyterian Preschool
SC87	Seattle - 3	School	Discovery Center
SC88	Seattle - 3	School	Rose Hill Elementary School
SC89	Seattle - 3	School	Kindercare Learning Center 1053
SC90	Seattle - 3	School	The Orchard Daycare Center
SC91	Seattle - 3	School	Stella Schola Middle School
SC92	Seattle - 3	School	Rose Hill Junior High School
SC93	Seattle - 3	School	Benjamin Franklin Elementary School
SC94	Seattle - 3	School	Benjamin Rush Elementary School
SC95	Seattle - 3	School	Bright Horizons Overlake Daycare Center
SC96	Seattle - 3	School	Cherry Crest Elementary School
SC97	Seattle - 3	School	Bridle Trails Toys and Tots Daycare Center
SC98	Seattle - 3	School	Bellevue Children's Academy
SC99	Seattle - 3	School	Learning Garden School
SC100	Seattle - 3	School	Planet Kids Montessori School
SC101	Seattle - 3	School	America's Child Montessori School
SC102	Seattle - 3	School	The Academic Institute
SC103	Seattle - 3	School	Bel - Red Bilingual Academy
SC104	Seattle - 3	School	Highland Middle School
SC105	Seattle - 3	School	Early World Childrens School
SC106	Seattle - 3	School	A+ Alternative School
SC107	Seattle - 3	School	Dartmoor School
SC108	Seattle - 3	School	Eastside Academic School of Transit
SC109	Seattle - 3	School	Stevenson Elementary School
SC110	Seattle - 3	School	Cedar Park Christian School - Bellevue Campus
SC111	Seattle - 3	School	Odle Middle School
SC112	Seattle - 3	School	Three Cedars Waldorf School
SC113	Seattle - 3	School	Olympus Northwest Middle School
SC114	Seattle - 3	School	Jing Mei Elementary School
SC115	Seattle - 3	School	Bellevue School District Office
SC116	Seattle - 3	School	Wilburton Elementary School
SC117	Seattle - 3	School	Sammamish High School
SC118	Seattle - 3	School	Hyak Junior High School (historical)
SC119	Seattle - 3	School	International School
SC120	Seattle - 3	School	Lake Hills Elementary School
SC121	Seattle - 3	School	Kelsey Creek Home School Center
SC122	Seattle - 3	School	Robinswood Middle School
SC123	Seattle - 3	School	Robinswood High School
SC124	Seattle - 3	School	Robinswood Elementary School
SC125	Seattle - 3	School	Woodridge Elementary School
SC126	Seattle - 3	School	Eastside Christian School
SC127	Seattle - 3	School	Chestnut Hill Academy South Campus
SC128	Seattle - 3	School	Bellevue Community College
SC129	Seattle - 3	School	Learning Garden School Sunset
SC130	Seattle - 3	School	Career Link School
SC131	Seattle - 3	School	John Stanford Center for Educational Excellence
SC132	Seattle - 3	School	Jose Martin Child Development Center
SC133	Seattle - 3	School	Puesta del Sol Elementary School
SC134	Seattle - 3	School	Kimball Elementary School
SC135	Seattle - 3	School	Tyee Middle School

SC136	Seattle - 3	School	Denise Louie Education Center Beacon Hill
SC137	Seattle - 3	School	Kindercare Learning Center 946
SC138	Seattle - 3	School	Eastgate Elementary School
SC139	Seattle - 3	School	Newport Childrens School
SC140	Seattle - 3	School	Mustard Seed Child Care Center
SC141	Seattle - 3	School	Newport High School
SC142	Seattle - 3	School	Asa Mercer Middle School
SC143	Seattle - 3	School	Mercer Middle School
SC144	Seattle - 3	School	Somerset Elementary School
SC145	Seattle - 3	School	Pathfinder K - 8 School
SC146	Seattle - 3	School	Southwest Youth and Family Services
SC147	Seattle - 3	School	Interagency Alder Academy
SC148	Seattle - 3	School	Interagency Camp School
SC149	Seattle - 3	School	Interagency Fairview Academy
SC150	Seattle - 3	School	Interagency King County Jail School
SC151	Seattle - 3	School	Interagency Orion Center
SC152	Seattle - 3	School	Interagency Ryther Center
SC153	Seattle - 3	School	Interagency Southwest Youth and Family School
SC154	Seattle - 3	School	Interagency U District Youth Center
SC155	Seattle - 3	School	Zion Preparatory Academy
SC156	Seattle - 3	School	Sunnyside Montessori School
SC157	Seattle - 3	School	Forest Ridge School of the Sacred Heart
SC158	Seattle - 3	School	Orca Alternative
SC159	Seattle - 3	School	Columbia Elementary School
SC160	Seattle - 3	School	The New School at Columbia
SC161	Seattle - 3	School	Maple Elementary School
SC162	Seattle - 3	School	Saint George Parish School
SC163	Seattle - 3	School	Lake Heights Elementary School
SC164	Seattle - 3	School	Damascus Daycare Center
SC165	Seattle - 3	School	Alternative School Number One
SC166	Seattle - 3	School	Primm ABC Child Care Center and Preschool
SC167	Seattle - 3	School	Dearborn Park Elementary School
SC168	Seattle - 3	School	Newport Hills School
SC169	Seattle - 3	School	Cleveland High School
SC170	Seattle - 3	School	Newport Heights Elementary
SC171	Seattle - 3	School	Saint Edward Parish School
SC172	Seattle - 3	School	Ringdall Junior High School
SC173	Seattle - 3	School	Torah Day School of Seattle
SC174	Seattle - 3	School	Aki Kurose Middle School Academy
SC175	Seattle - 3	School	Sharples Junior High School
SC176	Seattle - 3	School	Gloryland Daycare Center
SC177	Seattle - 3	School	Martin Luther King Junior Elementary School
SC178	Seattle - 3	School	Renton Academy
SC179	Seattle - 3	School	Megumi Preschool Seattle
SC180	Seattle - 3	School	Van Asselt Elementary School
SC181	Seattle - 3	School	Hazelwood Elementary School
SC182	Seattle - 3	School	Seattle Urban Academy
SC183	Seattle - 3	School	Wing Luke Elementary School

SC184	Seattle - 3	School	Tiny Tots Child Development Center Number 1
SC185	Seattle - 3	School	African American Academy
SC186	Seattle - 3	School	Newcastle Elementary School
SC187	Seattle - 3	School	Dunlap Elementary School
SC188	Seattle - 3	School	South Lake High School
SC189	Seattle - 3	School	Rainier Beach High School
SC190	Seattle - 3	School	Seattle School District Office
SC191	Seattle - 3	School	South Shore Middle School
SC192	Seattle - 3	School	Children's House Montessori School
SC193	Seattle - 3	School	Emerson Elementary School
SC194	Seattle - 3	School	Sierra Heights Elementary School
SC195	Seattle - 3	School	Amazing Grace Christian School
SC196	Seattle - 3	School	Saint Paul School
SC197	Seattle - 3	School	Hillcrest Middle School
SC198	Seattle - 3	School	Hillcrest Special Services Center
SC199	Seattle - 3	School	Hillcrest Early Childhood Center
SC200	Seattle - 3	School	McKnight Middle School
SC201	Seattle - 3	School	Kindercare Learning Center 1137
SC202	Seattle - 3	School	Renton Child Care Center
SC203	Seattle - 3	School	Hazen High School
SS3	Tacoma - 4	Sole Source Aquifer	Cedar Valley Aquifer
SS4	Tacoma - 4	Sole Source Aquifer	Central Pierce County Aquifer
TR5	Tacoma - 4	Tribal Lands	Puyallup Reservation
TR6	Tacoma - 4	Tribal Lands	Nisqually Reservation
HP18	Tacoma - 4	Historic Building	Drum, Henry, House
HP19	Tacoma - 4	Historic Building	Masonic Temple Building–Temple Theater
HP20	Tacoma - 4	Historic Building	Wright Park and Seymour Conservatory
HP21	Tacoma - 4	Historic Building	Balfour Dock Building
HP22	Tacoma - 4	Historic Building	Fire Alarm Station
HP23	Tacoma - 4	Historic Building	Fire Station No. 1
HP24	Tacoma - 4	Historic Building	Walker Apartment Hotel
HP25	Tacoma - 4	Historic Building	Yuncker, John F., House
HP26	Tacoma - 4	Historic Building	House at 605 South G Street
HP27	Tacoma - 4	Historic Building	Northern Pacific Office Building
HP28	Tacoma - 4	Historic Building	Old City Hall
HP29	Tacoma - 4	Historic Building	Building at 712–716 Sixth Avenue
HP30	Tacoma - 4	Historic Building	Y.M.C.A. Building
HP31	Tacoma - 4	Historic Building	Old City Hall Historic District
HP32	Tacoma - 4	Historic Building	Lynn, C.O., Co. Funeral Home
HP33	Tacoma - 4	Historic Building	Rhodes Medical Arts Building
HP34	Tacoma - 4	Historic Building	South J Street Historic District
HP35	Tacoma - 4	Historic Building	Bowes Building
HP36	Tacoma - 4	Historic Building	House at 802–804 South G Street
HP37	Tacoma - 4	Historic Building	House at 708–710 South 8th Street
HP38	Tacoma - 4	Historic Building	Rialto Theater
HP39	Tacoma - 4	Historic Building	Pantages Theatre
HP40	Tacoma - 4	Historic Building	Fireboat Station
HP41	Tacoma - 4	Historic Building	Pythian Temple
HP42	Tacoma - 4	Historic Building	City Waterway Bridge
HP43	Tacoma - 4	Historic Building	National Bank of Tacoma
HP44	Tacoma - 4	Historic Building	Mclivaine Apartments

P 8-24

*Construction of the project could theoretically damage the hazardous liquid pipelines operated by OPLC and other gas lines mentioned in Section 8.3.2, creating an explosion risk if safety policies and regulations were not implemented as required. The UTC identifies five major reasons why gas pipelines leak or fail, potentially creating a public safety hazard: (1) third-party excavation damage; (2) corrosion; (3) construction defects; (4) material defects; and (5) outside forces resulting from earth movement, including earthquakes, washouts, landslides, frost, lightning, ice, snow, and damage done by authorized on-site personnel. TMinor - If damage to pipelines could lead to leaks of materials that could be cleaned up and sites fully restored in accordance with applicable regulatory requirements, impacts would be considered minor. Moderate - If implementation of regulatory requirements and project design would address most potential adverse impacts, but there is a reasonable potential for some damage to pipelines that could result in impacts to property or human health, impacts would be considered moderate. Significant—Even with implementation of regulatory requirements and design measures, if substantial damage, injury, or death would likely occur associated with pipeline damage, leaks, or explosions, impacts would be considered significant. P 8-24*

Source:

**GAO Report to Congressional Committee on Pipeline Safety January 2013  
Pipeline Safety: Better Data and Guidance Needed to Improve Pipeline Operator Incident Response**

While prior research shows that most of the fatalities and damage from an incident occur in the first few minutes following a pipeline rupture, operators can reduce some of the consequences by taking actions that include closing valves that are spaced along the pipeline to isolate segments. The amount of time it takes to close a valve depends upon the equipment installed on the pipeline. For example, valves with manual controls (referred to as “manual valves”) require a person to arrive on site and either turn a wheel crank or activate a push-button actuator. Valves that can be closed without a person located at the valve location (referred to as “automated valves”) include both remote-control valves, which can be closed via a command from a control room, and automatic-shutoff valves, which can close without human intervention based on sensor Page 11 GAO-13-168.) Automated valves generally take less time to close than manual valves. PHMSA’s minimum safety standards dictate the spacing of all valves, regardless of type of equipment installed to close them, while integrity management regulations require that transmission pipeline operators conduct a risk assessment for high consequence areas that includes the consideration of automated valves.

From Appendix C-6 Olympic Pipeline System Overview - Report to Dept of Ecology, March 2015

Location of Block Valves and which ones are manually or remotely operated.

FIGURE C.6 – BLOCK VALVE DRIVING DIRECTIONS (CONTINUED)

Anacortes Lateral	Latitude	Longitude	Driving Directions
MP 79 Block Valve 16" (MOV) & 20" Check Valve	47.903305	-122.169114	From I-405, take exit #23 and head north on Hwy 522 to Hwy 9 exit. Turn left (north) on Hwy 9, go approximately 6.9 miles to Lowell-Larimer Rd. and turn west (left) at this light. Go approximately 2 miles to intersection of Marsh/Lowell-Larimer and Seattle Hill Rds. Bear right then turn left back onto Lowell-Larimer Rd. and continue on for approximately 1.4 miles. Watch for the pipeline markers and gated area of the road, the Block Valve site is 200' north of the road down the gravel driveway behind fencing.
MP 80 Block Valve 20" (HOV)	47.895546	-122.169323	From I-5, take exit #186, head east on 128th St/Hwy 96 to 35th Ave. SE. Turn left at light; go north approximately 1 mile to 116th St SE, turn right. Go approximately 0.7 miles to Pinehurst housing development; turn left on 45th Dr SE, then immediately east (right) on 115th PL SE, which eventually turns into 47th Ave SE heading north. Follow 47th Ave till you get to 113th St SE turn west (left) total trip from 116th is 0.3 miles. The Block Valve site will be on your right hand side gated and clearly visible from the road approx. 25'. From I-405, take exit # 26, Bothell-Everett Hwy north (right) on 180th. Left on 35th Ave Se travel north approx 3.5 miles to 116th St SE, turn right. Follow directions as above.
Allen Station to Renton Station	Latitude	Longitude	Driving Directions
Woodinville Station	47.798892	-122.171062	From I-405, take exit # 23 and head north on Hwy 522 to Hwy 9 exit. Turn left (north) at light, head north for 0.7 miles, then turn west (left) at 228th St SE for Approx. 1.4 miles till you reach 45th Ave SE, then turn north (right). Follow 45th Ave 0.5 miles till you come to address 21909 45th Ave SE and turn right at driveway.
MP 89 Block Valve 16" & 20" (MOV)	47.762627	-122.173828	From I-405, take exit # 24 (Beardslee Blvd exit) and head east on NE 195th St. Follow for approx. 0.4 miles to 120th Ave NE, turn south (right). After about 0.5 miles turn left at first driveway of the Archstone apartment complex across from Home Depot and between the Starbucks coffee house and Seattle times parking lot end. Go down new Apartment complex road till you come to pipeline markers (approx. 4 blocks). The Block Valves are north of that location gated and visible from the road (follow dirt road north (left) for access). MP marker 89 is clearly visible from the road.
MP 89.5 16" Check Valve & 20" Block Valve (HOV)	47.75547162	122.1738939	From I-405, to exit # 23 (Hwy 522), go approx. 1 mile to the Woodinville exit and head south (right) on Hwy 202 for 0.2 miles to NE 175th St/Hwy 202 and turn west (right) at the light. Travel 0.3 miles across bridge and railroad tracks and turn west (right) on NE 173rd PL. Follow to the first driveway on right, approx. 0.3 miles - you'll cross over the pipeline at this time before you get to the driveway. Go over the railroad tracks again and turn east (right) and follow to the pipeline crossing approx. 2 blocks, with the Block Valve on the North side within the small island in the parking lot.
MP 95.5 Block Valve 16" & 20" (MOV)	47.67776	-122.158556	From I-405, take exit # 18 (NE 85th St) and head east approx. 1.4 miles, look for the pipeline markers around the 13600 block of NE 85th St. The Block Valve's will be on the south side of the road gated and clearly visible from the road.
MP 98.5 Block Valve 16" & 20" (MOV)	47.63138	-122.159494	From I-405, take exit # 14, Hwy 520, heading east towards Redmond. Take the very first exit on 520 which is Northrup Way and turn east (left) at the light stay in the left hand lane, go about 6 blocks then turn north (left) on 130th Ave NE and go approx. 4 blocks to NE 24th St. Turn east (right) on 24th and go approx. 5 ½ blocks until you come to the pipeline crossing. The Block Valve's will be on the south side of road at the 13500 block clearly gated and visible from the road, approx. 100'.
MP 100.1 Block Valve 20" (HOV)	47.603459	-122.158769	From I-405, take exit # 12 (SE 8th St) and go east approx. 0.4 miles to Lake Hills Connector, take this road east (right) and go approx. 1.5 miles to 140th Ave SE. Turn north (left) on 140th and go 1 block north to SE 7th St and turn west (left), go all the way to the end of the road where it dead ends at a trail. Follow the gravel trail downhill till you come to the pipeline Right of Way which is 1 or 2 blocks of walking, the pipeline Block Valve site is on the south (left) hand side at the bottom of the trail approx. 25'.

FIGURE C.6 – BLOCK VALVE DRIVING DIRECTIONS (CONTINUED)

Allen Station to Renton Station	Latitude	Longitude	Driving Directions
MP 101.8 Block Valve 20" (MOV)	47.588158	-122.158339	From I-405, take exit # 10 (Coal Creek Pkwy) and head east for approx. 0.5 miles to Factoria Blvd/128th Ave SE, turn north (left) at the light. Follow this road for approx. 1.6 miles and stay in your right hand lane when approaching SE 26th St. (you will go underneath I-90). Turn east (right) on SE 26th St (Kamber Rd.) and go approx. 0.3 miles to the pipeline crossing at 13615 SE 26th St. The 16" Block Valve site will be on the south side of the road gated and clearly visible within 50' of the road. The 20" Block Valve site will be on the north side of the road.
MP 102 Block Valve 16" (MOV)	47.587143	-122.158356	From I-405, take exit # 10 (Coal Creek Pkwy) and head east for approx. 0.5 miles to Factoria Blvd/128th Ave SE, turn north (left) at the light. Follow this road for approx. 1.6 miles and stay in your right hand lane when approaching SE 26th St. (you will go underneath I-90). Turn east (right) on SE 26th St (Kamber Rd.) and go approx. 0.3 miles to the pipeline crossing at 13615 SE 26th St. The 16" Block Valve site will be on the south side of the road gated and clearly visible within 50' of the road. The 20" Block Valve site will be on the north side of the road.
MP 103 Check Valve 20"	47.56302	-122.169659	From I-405, take exit 10 and head east on Coal Creek Parkway for .6 miles. Check valve is in a vault in north edge of parking lot.
MP 103 Check Valve 16"	47.571255	-122.157082	From I-405, take exit #10 (Coal Creek Pkwy) and head east and take a left at Factoria Blvd. Right on SE Newport way for .7 miles and turn right at Somerset Blvd Se, left on Somerset Blvd valve is on your left at chain link fence.
MP 105 Block Valve 16" & 20" (MOV)	47.537778	-122.169522	From I-405, take exit # 10 (Coal Creek Pkwy) and head east, continue on Coal Creek Pkwy in a Southeast direction for approx. 2.5 miles. Turn west (right) on SE 69th Way and go .2 miles to the pipeline crossing at the 12800 block, open the Right of Way gate and head south (left) down gravel road for 2 blocks. The Block Valve is approx. 250' south of the gravel road.
MP 106 Block Valve 16" & 20" (MOV)	47.513218	-122.171135	From I-405, take exit # 5 (NE Park Dr/Sunset Blvd) and head east off the freeway, stay on Sunset for approx. 1.8 miles and turn north (left) at Union Ave NE for approx. 0.6 miles then turn west (left) on SE 101st St which eventually becomes SE 100th St. Follow down 101st for 0.3 miles to the pipeline crossing at the 12500-12600 block, then turn left on the gravel road to the clearly visible gated area 100' south of 100th
MP 106 Block Valve 16" & 20" (MOV)	47.513218	-122.171135	From I-405, take exit # 5 (NE Park Dr/Sunset Blvd) and head east off the freeway, stay on Sunset for approx. 1.8 miles and turn north (left) at Union Ave NE for approx. 0.6 miles then turn west (left) on SE 101st St which eventually becomes SE 100th St. Follow down 101st for 0.3 miles to the pipeline crossing at the 12500-12600 block, then turn left on the gravel road to a visible gated area 100' south of 100th St.
MP 110 Block Valve 16" & 20" (MOV)	47.476309	-122.171624	From I-405, take exit # 4 (Maple Valley Hwy) and head east for approx. 0.1 mile, turn northeast (left) on SE 5th St 0.4 miles to the pipeline crossing. The Block Valves are gated and clearly visible on the north side of the road approx. 50' from road.
MP 110.5 Check Valve 16" & 20"	47.473652	-122.176681	From I-405, take exit #2 (Rainier Ave/Hwy 167) north to S Grady Way. Turn right (east) follow for 0.4 miles to Talbot Rd. turn south (right). Take Talbot Rd. for 0.5 miles to S. Puget Dr. and turn southwest (left) and take this for approx. 1.4 miles until you get to the intersection of Royal Hills Dr/Edmonds Dr. SE. Turn northeast (left) onto Royal Hills Dr. for 0.4 miles to new road called Harrington Pl. SE, this is a new development called the Shadow Hawk Town homes (Code Key-Key 0415). Once on Harrington Pl. continue on 0.2 miles to the pipeline crossing, from here the MP marker 110 should be clearly visible. From MP 110 marker go ¼ mile north to the valve sites, which are in concrete vaults.
MP 111 Block Valve 20" (HOV)	47.469956	-122.191586	From I-405, take exit #2 (Rainier Ave/Hwy 167) north for one block and turn west (right) on SW Grady Way and follow for 0.4 miles to Talbot Rd. turn south (right). Take Talbot Rd. for 0.5 miles to S. Puget Dr., turn southwest (left) and follow for approx. 1.4 miles to a PSE service road, which is approx. ½ block from the intersection of Royal Hills/S Puget Dr./Edmonds Dr. SE. Take this service road west (left) for 0.3 miles and look for the pipeline crossing - the Block Valve site is on the south side of the service road approx. 100' in a concrete vault.

FIGURE C.6 – BLOCK VALVE DRIVING DIRECTIONS (CONTINUED)

Allen Station to Renton Station	Latitude	Longitude	Driving Directions
MP 112 Block Valve 20" (HOV)	47.459059	-122.218799	From I-405, take exit # 2 (Rainier Ave/Hwy 167) north one block to SW Grady Way then turn west (left) and go 0.3 miles to Lind Ave SW. Turn south (left) on Lind Ave over the 405 over pass to the first light which is SW 16th St. Turn east (left) and follow approx 0.7 miles (becomes East Valley Rd.) to the pipeline crossing around the 2300 block of East Valley, turn west (right) on driveway to clearly visible and gated area approx. 100' west of the road.
Renton Station	47.458068	-122.224366	From I-405, take exit # 2 (Rainier Ave/Hwy 167) north one block to SW Grady Way, turn west (left), go 0.3 miles to Lind Ave SW and turn south (left). Go 0.9 miles on Lind to the driveway address of 2319 Lind Ave SW on the west side of the road.
Sea-Tac Lateral	Latitude	Longitude	Driving Directions
MP 1.5 Block Valve 12" (HOV)	47.476437	-122.227465	From I-405, take exit # 2 (Rainier Ave/Hwy 167) north, proceed 0.3 miles to SW 7th St. Turn west (left) on 7th 0.1 miles to Hardie Ave SW and turn north (right), follow Hardie Ave for 0.2 miles then turn west (left) on SW 5th PL. Go approx. 0.3 miles and turn west (left) on SW 5th Ct., go 0.1 miles and follow to the left of apartment building "H" driveway of the Avalon Greenbriar Apts. The Block Valve site is on the right side of apartment building "K" slightly downhill and approx. 100' from the driveway.
MP 2 Check Valve 12"	47.481663	-122.226964	From SR 167, heading north take the SR 900/SW Sunset Blvd headed west. Go .5 miles and turn (right) north on Earlington Ave Sw left on SW Langston Rd. Valve site is 450' up the road on your right.
MP 6 Block Valve 12" (MOV)	47.523506	-122.278396	Take I-5, north to exit # 157 (Martin Luther King Jr. Way). Stay in the right hand lane for approx. 1.1 miles and turn east (right) on S Henderson St. proceed on Henderson for 100' and look for pipeline crossing markers, the Block Valve site is on the north (left) side of Henderson St. gated and clearly visible from the road within 50'.
MP 10 Block Valve 12" (MOV)	47.569684	-122.326049	Take I-5, south to exit # 163 (Safeco Field/Spokane St. exit). Once off the exit at the bottom of the ramp at the first light, which is 6th Ave S go 0.1 miles heading west on Spokane St. to the first left hand "U" turn heading east on Spokane St. Go 0.1 miles back to 6th Ave S then turn south (right) on 6th and follow for 0.1 miles, the Block Valve site on the SE corner of 6th and Charlestown approx. 50' from 6th Ave S.
MP 1.5 Block Valve	47.476356	-122.227467	From SR 167 and I 405 intersections take Rainer Ave S North for .18 miles and turn left and go straight onto Stevens Ave Sw. Turn left on SW 5th st. Valve is located down the hill in yard.
MP 2 Check Valve	47.48767	-122.22697	From SR 167 and I 405 intersections take Rainer Ave S North for .66 miles and turn left on SR 900/Sunset Blvd. Go .11 miles and turn right on Hardie Ave Sw and keep left onto Langston. CV will be on your right at .38 miles.
MP 6 Block Valve (MOV)	47.523506	-122.278397	From I-5 south bound take exit 158 and turn left on Boeing Access rd. Turn left onto Martin Luther King Jr Way South. Go for .95 miles and turn then right onto South Henderson St. Valve site will be on your left. From I-5 North bound take exit 157 and go straight onto Martin Luther King Jr Way South for 1.72 miles and turn then right onto South Henderson St. Valve site will be on your left.
MP 10 Block Valve (MOV)	47.56966	-122.32604	From I-5 South bound take exit 163A and go straight on West Seattle Freeway ramp. Take the South Spokane St ramp and head east on South Spokane St and turn right onto 6th Ave South and then turn left onto South Charlestown St. Valve will be on your right. From I-5 North bound take exit 163 and keep left on South Spokane St ramp. Turn left onto 6th Ave South and then turn left onto South Charlestown St. Valve will be on your right.
Seattle DF	47.582619	-122.351571	From I-5, north take exit # 163 the West Seattle Freeway exit, on the West Seattle Freeway go for approx. 0.9 miles to the Harbor Island/11th Ave SW exit. Once the exit is made go 0.6 miles staying in the middle lane to Klickitat Ave SW. Turn north (right) on Klickitat Ave SW and continue on for 0.6 miles until you reach SW Lander St. and turn east (right). Follow Lander for 0.1 mile and turn north (left) on 13th Ave SW, follow 13th for 0.2 miles to the address of 2444 13th Ave SW on the east (right) side of the road.

# Fire Engineering

## JET FUEL

10/01/2002

By Frank L. Fire

Commercial jet fuel is essentially kerosene that has been hydrotreated to improve its burning properties. Hydrotreatment is a process proprietary to the producer of the fuel utilizing a particular catalyst. It will contain some additives to produce the anti-icing, anti-oxidation, anti-corrosion, and anti-static properties required.

Kerosene is a mixture of aliphatic (straight-chain alkanes or saturated) hydrocarbons, usually beginning with octane (eight carbons in the chain) and going up to hexadecane (16-carbon hydrocarbon). Alkanes have the general formula  $C_nH_{2n+2}$ . The  $n$  stands for the number of carbons in the chain, so hexadecane's molecular formula would be  $C_{16}H_{34}$ . Kerosene is formulated to fit the definition of a combustible liquid rather than a flammable liquid. The flash point of kerosene is controlled to be 100°F, or 37.8°C, to be classified as a combustible liquid.

Commercial jet fuel has many synonyms and trade names, including Jet A or JP-8. It is also known as aviation kerosene, Jet A-1, Jet A-50, Jet B, jet kerosene, jet kerosine, Turbo fuel A, and Turbo fuel A-1. Kerosene may also be called kerosine.

Commercial jet fuel is a pale yellow liquid with a petroleum odor. It has an auto-ignition temperature of 410°F (210°C). Its explosive limits are from 0.6 to 4.7 percent by volume in air. Coupled with its flash point, this means that at 100°F there is enough vapor in the air to reach the lower explosive limit so that even if an ignition source is not present and the fuel reaches a temperature of 410°F (and this is considerably below all common ignition sources), an explosion will occur.

Commercial jet fuel has a vapor density of 5.7 (where air = 1.0), which means the vapors are extremely heavy relative to air and will fall to the lowest point in the terrain and "hang" together for a long time where there is no appreciable breeze. These vapors will flow a considerable distance as if they were seeking an ignition source. They always find one.

Its specific gravity is 0.87, and it is not soluble in water. This means that the liquid will float on top of any water it contacts.

A flash point of 100°F means that it must be warmed to that temperature before it will produce enough vapors to burn (or explode). Any airplane with fuel in it is a flying bomb. If it crashes accidentally into the ground or on purpose as at the World Trade Center (WTC), the friction of the crash produces enough heat energy to ignite the fuel (which has been released by the crash) in a spectacular explosion. Even though the explosion is violent, all of the fuel is not involved, since much of it will be hurled away from the original point of energy release. At the WTC, after the initial explosion, some of the fuel was expelled from the building, but the remaining walls and windows confined much of it.

Hydrocarbons are essentially all fuel, since both the carbon and hydrogen will burn. There is a tremendous amount of energy tied up in the covalent bonds holding the hydrogen atoms to the carbon atoms in the hydrocarbon chain. When these bonds are broken, the energy is released in the fire as the fuel's heat of combustion. This is defined as the total amount of energy released as a fuel burns completely. Jet fuel has a heat of combustion of more than 19,000 Btus per pound of fuel, or more than 128,000 Btus per gallon of fuel. Multiply this by the amount of fuel in the airliner, and even though some of it was involved in the original explosion, you can understand that there was a tremendous amount of energy released in a short period of time during the ensuing fire of the remaining fuel. The burning jet fuel, plus whatever combustibles were present in the area of impact, produced more than enough heat to raise the temperature of the structural steel above its softening point, causing the floor or floors above the fire to collapse pancake style. There probably can be no tall building built that would withstand the heat generated by the quantity of jet fuel present in the WTC attack. If one can be built, no one would be able to pay for it.

Many victims probably were incinerated in the fireballs of jet fuel that roared through the upper floors of the towers. Many others were dismembered in the crashes or the collapses that followed. Firefighters and others at the scene have reported finding few intact bodies.

"The heat of the fire—estimated by FEMA at 1,700 degrees—would make identification difficult because it consumed smaller body parts," said Dr. Steven Symes, a professor of forensic pathology at the University of Tennessee.—"NY Shifts from Rescue to Recovery," Richard Pyle, AP writer with contribution from AP reporter Diego Ibarra, Sept. 17, 2001

**FRANK L. FIRE** is executive vice president, marketing and international, for Americhem, Inc. in Cuyahoga Falls, Ohio. He is an instructor of hazardous-materials chemistry at the University of Akron as well as an adjunct instructor of haz mats at the National Fire Academy. Fire is the author of Common Sense Approach to Hazardous Materials (first and second editions) and an accompanying study guide; The Combustibility of Plastics; and Chemical Data Notebook: A User's Manual, published by Fire Engineering. He is an editorial advisory board member of Fire Engineering.

Dear Elected Councilmember,

date 2/24/16

By electing NOT to include the Energize Eastside project in the regional transmission plan, PSE avoids FERC Order 1000 compliance and side-steps NEPA review.

PSE has simply chosen to have Energize Eastside accomplish the goal of permitting more transmission capacity to Canada without asking for cost contributions from BPA, SCL, and others. If PSE is required to include Canadian Entitlement power in their load flow studies, then shouldn't PSE also be required to submit the Energize Eastside project as part of the regional transmission plan for cost allocation purposes? <https://www.columbiagrid.org/download.cfm?DVID=2157> (pg 15 of 21)

Why are PSE customers being asked to solely pay for electricity grid enhancements? Sincerely,

*Tom W. Bromwell*



TO: Mayor John Stokes  
450 110th Ave. NE  
P.O. Box 90012  
Bellevue, WA  
98009

## Did You Know?

Can PSE have it both ways—claim it is required to include Canadian Entitlement electricity in power flow studies, then turn around and elect to have Energize Eastside OMITTED from regional transmission planning for cost allocation purposes?

Power flows to Canada *“are required to be included in the PSE load flow studies.... It is not optional.”* (PSE)

*“...neither Puget Sound, nor any other eligible party, requested to have the project selected in the regional transmission plan for purposes of cost allocation....”* (FERC ruling)

### “Energize Eastside” Is NOT A Done Deal

Voice Your Concerns to  
BELLEVUE CITY COUNCIL

March 5, 2016

To: Heidi Bedwell, Energize Eastside EIS Program and Manager

From: Judy Cui

Dear Ms. Bedwell,

I am very concerned about Puget Sound Energy's "Energize Eastside" project, which proposes to build 18 miles of high-voltage transmission lines through four Eastside cities ( Alternative 1A).

PSE tries to justify the need for the project using an impossible scenario that could cause regional blackouts, according to the Lauckhart- Schiffman Load Flow Study, Available at CENSE.org. Also the Project may cause health problems for people living around the area.

Alternative 1A would place new lines and poles much too close to aging petroleum pipelines. Responsible safety standards require at least a 50 foot separation. A construction or operational accident could cause a catastrophic pipeline explosion like the one that killed three Bellingham residents in 1999. This risk is NOT adequately addressed in the EIS.

Alternative 2, the Integrated Resources Approach, is a safer and less costly alternative. But the solution described in the EIS was NOT developed or reviewed by independent experts that have suitable experience with modern electrical grid technologies, including Demand Side Management and Distributed Energy Resources. The costs and capabilities are based on inaccurate and obsolete studies. As the Northwest Power Council's Seventh Power Plan makes clear, a carefully developed plan would easily beat alternative 1A in cost, safety, and support for the environment.

Ratepayers are asked to spend more than a billion dollars over the lifetime of PSE's transmission line.

Moreover, high voltage transmission line may damage human DNA, cause cancers , Leukemia. Neurodegenerative disease and Miscarriage problem from studies.

The Draft EIS must answer these basic questions in order to convince residents that we are getting the possible plan for our energy future.

Judy(Qi) Cui

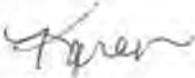


4543 135th ave SE, Bellevue WA 98006

March 9, 2016

The attached map titled Environmental property map illustrates steep slopes of 40 % plus in one section of the Somerset neighborhood. (colored in brown)

The blue squiggly line drawn down the PSE easement between 135th Ave SE and Somerset Drive SE identifies a **rain creek**. The neighbors on 135th Avenue SE have all taken care to control the rain run-off - either by digging a trench filled with rocks or bordered with railroad ties or by diverting it by other means. In extreme rain storms catching ponds retain the water - one above ground and one below. This creek starts up hill at Somerset Place and continues down to Somerset Drive. This creek has not been mentioned in the DEIS.



Karen Esayian

CENSE Board Member

4601 135th Ave SE  
Bellevue, WA 98006

KEsayian@aol.com

RECEIVED  
MAR 14 2016  
Development Services

Attachment: Environmental map of property (City of Bellevue, nwmaps.net)

There is a rain creek the full length of the easement between 135th Ave SE and Somerset Drive, because of steep slopes it flows from north to south,

Enter an Address, a Parcel Number or Place of Interest:

4601-135th Ave SE Bellevue

Search

Legend Base Measure Selection Tools Map Markup Parcel Notification Jump to City

- Zoning and Property
- Permits and Construction
- Parks and Trails
- Commercial Property
- Environmental**
- Geology
- Community Information
- Demographics
- Transit



X there are underground water basins known to neighbors

Submitted by  
Karen Esayian  
4601-135th Ave SE  
Bellevue, WA 98006

-5-  
1

March 9, 2016

The following comments will address **Residential and Environmental Impacts** that are associated with the proposed PSE Alternative 1 Option A in Energize Eastside as outlined in the DEIS. Chapter 10.1 Key Findings states that "of the action alternatives, Alternative 1, Option A has the greatest potential to create significant adverse land use and housing impacts." This is a definite understatement! Chapter 6.6.3.1.1 states that with PSE preferred plan of new overhead transmission lines, the new corridor for a 230 kV line would be approximately 120-150 feet wide, wider than a 115kV line at 30-40 feet. Trees would be removed in this corridor, along with trees posing a threat to transmission lines outside the corridor. There could be up to 327 acres of vegetation and up to 131 acres of tree canopy cover removed under this option.

In addition to this, Chapter 11.6.3.5.1 states that under Alternative 1 Option A, a "**permanent clear zone** would be required." "Because the clear zone would create views of the transmission line, placing a new transmission line in a residential area.....would have a significant impact on the visual character of the area adjacent to it." In this description the greater Eastside would have an 18 mile, 150 foot wide clear zone marring and destroying the natural environment which in turn would ruin the livability of our neighborhoods.

The concern for endangered species, nesting birds, fish habitat, is noted in Chapter 6, Plants and Animals. Section 6.4.1.5 describes the forested riparian corridor and diverse fish and wildlife habitat provided by the Coal Creek Park Natural area. Cutting a **clear zone** through this Coal Creek Basin which is already **overburdened** with the Olympic Pipeline and existing overhead 115kV transmission lines would eliminate any previous positive environmental goal.

Chapter 6.6.4.2 states that with a *distributed generation component*, construction could result in only short term impacts on plants and animals. It could be added that the impact on humans (i.e. residents of neighborhoods) would also be short term using Alternative 2.

Chapter 10.7.3.1.2 acknowledges that using an existing corridor may require widening to accommodate the new utility -" up to 50 feet of additional clear zone would be needed through the corridor. This would require removal of some structures, including housing, and would reduce the availability of vacant land for additional housing..." Further stated:" *High Consequence Land Use* is a use which, if located in the vicinity of a hazardous liquid pipeline, would present an unusually high risk in the event of pipeline failure due to its function, including utilities providing regional service." The Alternative 1 A routes proposed run through residential neighborhoods and would co-locate with the Olympic Pipeline - a high pressure pipeline described in detail in Chapter 16. WHY would any governing body allow the **high consequence of pipeline failure** in addition to removal of residential homes in well maintained neighborhoods and risk the disenfranchisement of its citizens.

Chapter 11.1 - Key Findings:" Alternate 1 and 3 could cause significant impacts on views and visual resources due to vegetation removal and obstruction of scenic views. Overhead wires have the greatest potential to affect residential views. The addition of 230kV lines would have the greatest impact." Because of the hilly terrain on the Eastside and the hilly proposed PSE

routes for Energize Eastside, the potential 130 foot high power poles will be seen for miles and miles - impacting more than individual neighborhoods, impacting the downtowns (Bellevue) also. The DEIS minimizes the impact on property values; there are no reports from those involved with residential real estate. It must be remembered that the reason most of us live on the Eastside, in Bellevue in particular, is because of the "livability" - the ambiance of neighborhood character. Power poles, **130 feet in height** and potentially 3 to 6 feet in diameter at the base, belong in an industrial setting - NOT in *anyone's* neighborhood. The City of the future should be looking for 21st Century solutions for any potential electric power deficiency.

Our home for the past 40 years is in Somerset - along the easement for the PSE 115kV transmission line. The Olympic Pipeline runs down the middle of the street a half block away. We have landscaped our property to hide the view of the power poles as much as possible; this will not be possible with industrial sized poles needed for 230kV overhead transmission lines. The potential use of a route through Somerset would devastate the livability of the Somerset community. This is a community of intensely supportive and involved residents. There are other communities along the proposed PSE preferred route that could be described in the same way. It is incumbent for those making the decisions on this proposal to keep in mind the citizens they represent.

Chapter 2.3.2.2.2 describes the Alternate 1 monopoles to likely be steel or wood with a width at the base between 2-4 feet in diameter while "typical *corner and termination poles* may need to be **4-6 feet in diameter at the base.**" In the Somerset neighborhood where the current 115kV transmission lines make a turn, these PSE proposed 230kV line, 6 foot in diameter poles would be on both sides of Somerset Blvd. One or two would straddle the tennis courts on the Somerset Recreation property. This property also sits on a steep slope. It should be obvious that this potential siting ranks high in residential and environmental impact.

It has been mentioned that the old 115kV transmission lines would be removed if the proposed 230kV monopole transmission lines were built, but there is **no** specific construction analysis regarding this in the DEIS.

Chapter 8.6.1.3 describes natural phenomena and acknowledges "*lightening strikes* directly to electrical infrastructure could occur" and that "transmission lines located near gas pipelines (such as in the existing corridor where PSE's 115kV transmission line co-exists with **OPLC's petroleum lines**) could pose a particular safety concern." The paragraph continues: "energized transmission lines on the ground after an *earthquake*, lightning strike....could send electric current to anything else metal in the vicinity, such as utilities (including pipelines)." (One such incident occurred early this year in the Bridle Trails area.) This scenario would definitely have a major environmental and residential impact.

The continued concern about pipeline safety is documented by Dr. Frank Cheng: *Criteria for Pipelines Co-Existing with Electric Power Lines.* (Dr. Cheng's report was submitted by Don Marsh, president of CENSE, at the March 1, 2016 DEIS Comment session in Bellevue, WA.)

Chapter 16.3.7 discusses pipeline corrosion stating that "a consequence of high-voltage power lines and buried **petroleum pipelines** sharing a corridor is that *electromagnetic interference* can be introduced on the pipelines, which can cause corrosion on the pipeline over time."  
"Corrosion accounts for about 23 percent of the significant failures in both hazardous liquid and gas pipelines (Baker, 2008)."

Chapter 8.5.1.3 titled Public Safety Risks, natural phenomena, only talks about an earthquake happening during construction - **not** about risks associated with 230kV power lines permanently situated in the same corridor as the Olympic Pipeline.

Chapter 8.6.1.2 titled Public Safety Risks, activities near pipelines states: "ongoing maintenance activities during operation could theoretically damage or break the **OPLC pipelines** or other pipelines in the area, leading to a chemical release or explosion...." It continues: "if transmission lines were improperly designed or located relative to pipelines, or if pipelines themselves were not properly designed with cathodic protection, pipelines could be damaged by stray electric current, leading to risk of chemical release or explosion."

Chapter 16.6.3.1.1 states that with Alternative 1 Option A (PSE's suggested plan) and if located along the existing PSE 115kV easement, construction of a 230 kV line has the potential to disrupt existing natural **gas lines or the Olympic Pipeline**. On **March 9, 2016 a PSE natural gas pipeline exploded in Seattle**. Jet fuel, which the Olympic Pipeline carries, is much more volatile than natural gas - it needs less oxygen and a lower temperature to ignite. The potential to disrupt is **not** an imagined consequence.

Compared with Alternative 1 A - Chapter 16.6.4.3 in describing *Distributed Generation Components*, states" there may be *minor* impacts to existing buried or overhead utilities if present."

Chapter 8.5.4.2.2 referring to **Alternative 2 Distributed Generation Component** states: "the risks during construction of distributed generation facilities would be lower than with Alternative 1 because there would be greater flexibility in location the facilities away from pipelines."

The Olympic Pipeline is mentioned throughout the DEIS, but its significance as a potential source of disaster is minimized - the conclusion being that current regulations and best practices and coordination will take care of any safety concerns. One small error will have a **major impact** on the environment and residential areas along the Eastside.

If there is no immediate pending disaster need for redundancy in the electrical system supplying Bellevue and eastside cities, as supported by the *Lauckhart-Schiffmann Load Flow Study* - then why are we as a City not supporting 21st Century resolutions for our electrical system. (The *Lauckhart-Schiffman Load Flow Study* was submitted by Don Marsh on March 1, 2016 at the DEIS Comment session in Bellevue, WA.) The **Alternative 2** options would give greater flexibility with proven technologies that can be added incrementally to meet any increased demand for electricity. These *alternatives need to be studied further*, by consultants with a proven track record in smart grid solutions.



Karen Esayian  
CENSE Board Member

4601 135th Ave SE  
Bellevue, WA 98006  
KEsayian@aol.com

Attachments: **Figure 12b** Landslide and Seismic Hazard Areas (City of Bellevue); **Figure 16-1** Existing Electric Transmission and Natural Gas/Petroleum Pipelines (DEIS); **Property Environmental Map** - [nwmaps.net](http://nwmaps.net) (City of Bellevue); **Coal Creek Natural Area** park map.

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### Figure 16-1 Existing Electric Transmission and Natural Gas/Petroleum Pipelines

Users may use the "plus" (+) button on the map to zoom in from a regional scale to a neighborhood scale (1:24,000). At a larger scale (more zoomed in) subject matter data and legend will not be displayed. Accuracy and completeness of the information on this map is not guaranteed.

**Legend**

- Existing Substations**  
■
- Gas Main**  
—
- Combined Study Area Boundary**  
⏏
- Pipeline**
  - Olympic Pipeline Company
  - Northwest Pipeline (Natural Gas)
  - PSE Gas Main
- Existing 230kV**
  - Existing 230kV (PSE)
- Existing 115kV (PSE)**  
—
- Seattle City Light Corridor (230kV)**  
—



*Submitted by  
Karen Esayian  
4601 - 135th Ave SE  
Bellevue, WA  
98006*

*Coal Creek Basin*

Select Language ▾

Click, hold and drag on the map to pan. Use the tabs below to toggle map themes.

Zoning and Property

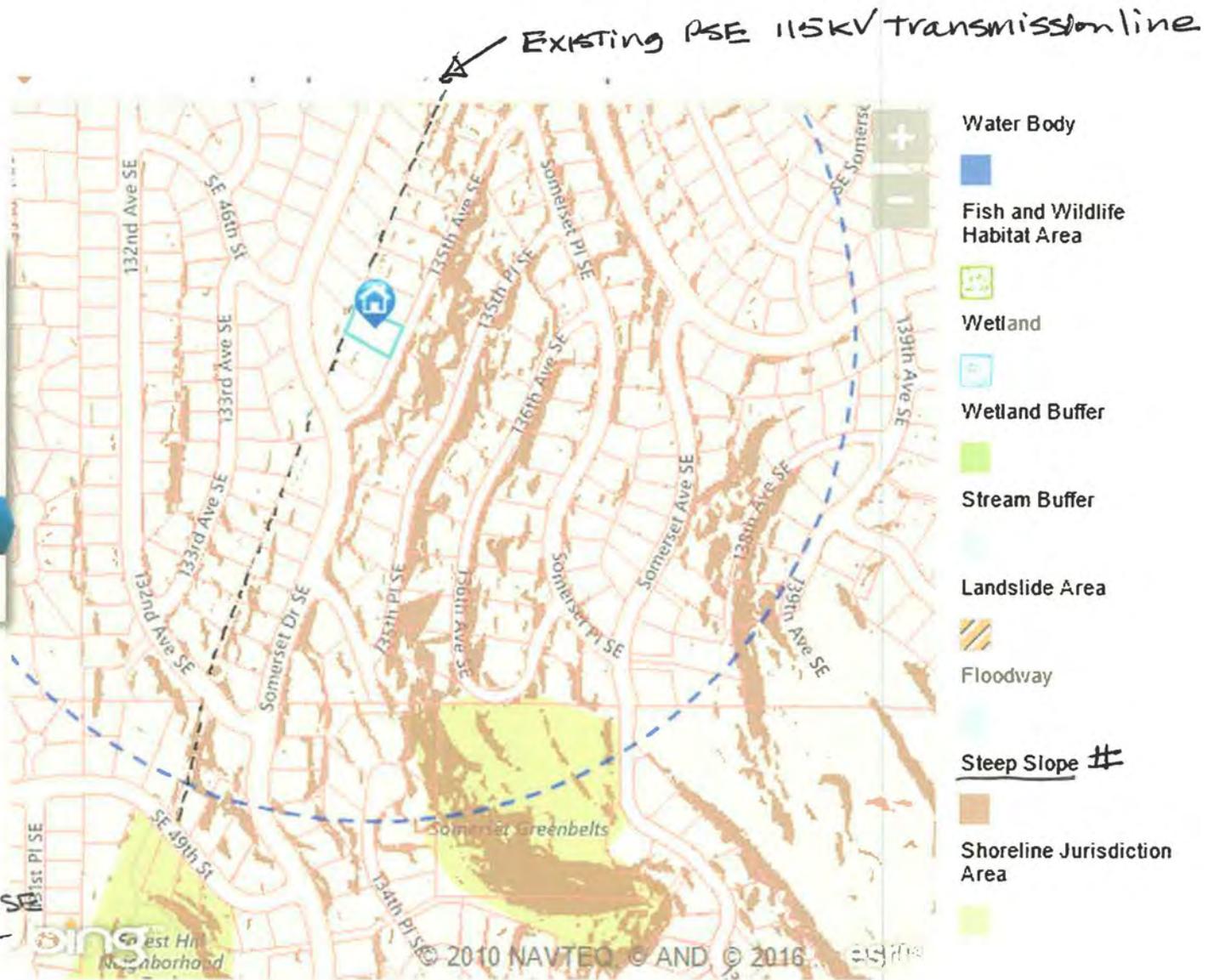
Permits and Construction

Parks and Trails

Commercial Property

Environmental

Community Information



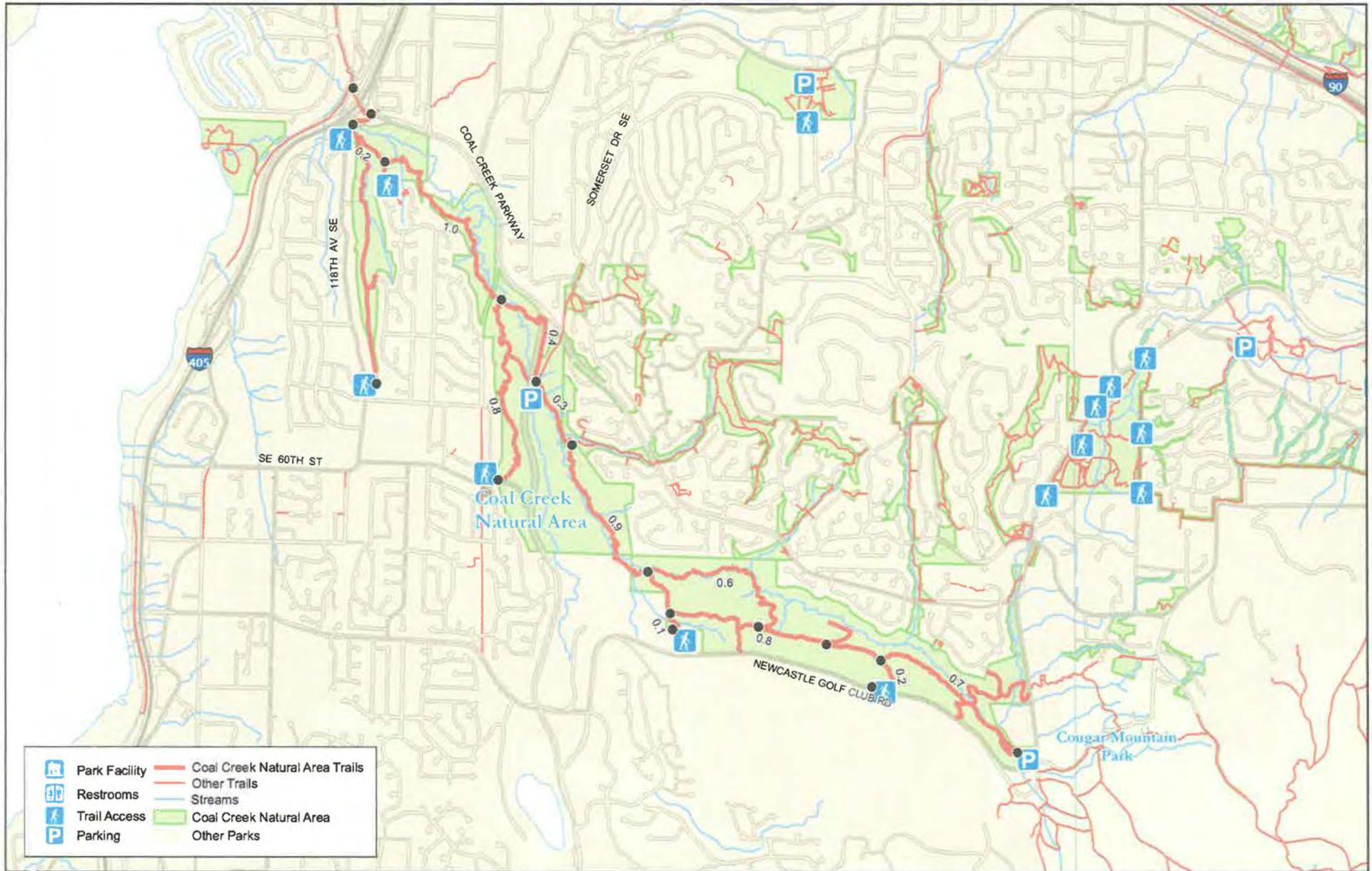
4601-135<sup>th</sup> Ave SE  
Bellevue, WA  
98006

Submitted by  
Karen Esayan

From [nwmaps.net](http://nwmaps.net)  
a service of [earty.gov.net](http://earty.gov.net)

# Please note steep slope areas  
which result in large amount  
of rain run off.

# Coal Creek Natural Area



= 0.5 miles

Submitted by  
Karen Esayian  
4601 - 135<sup>th</sup> Ave SE  
Bellevue, WA 98006



Submitted by:  
 Karen Esajian  
 4601 - 135th Avenue SE  
 Bellevue, WA  
 98006

Shoreline jurisdiction boundaries depicted on this map are approximate. They have not been formally delineated or surveyed and are intended for planning purposes only. Additional site specific evaluation may be needed to confirm/verify information shown on this map.



Coal Creek Basin

## Landslide and Seismic Hazard Areas Lake Washington, Mercer Slough, and Kelsey Creek

City of Bellevue Shoreline Master Program

Figure 12b



- Slopes Over 40%
- Moderate to High Hazard Liquefaction Zones (King County)
- Lakes
- Seismic Hazard Areas (King County)
- City Boundary
- Shoreline Jurisdiction
- Highways
- King County Landslide Hazard Areas
- Ordinary High Water Mark
- Major Streets

March 9, 2016

These comments for the DEIS concern the **Coal Creek Basin**. The Coal Creek Natural Area is an integral part of Bellevue's Parks and Recreation system; the Lake Washington Watershed (WRIA 8) totals 3,990 total acres (11% of the City). The dense forest protects water quality and erosion. The drainage jurisdiction(s): 2,181.7 acres in Bellevue; 1,275.7 acres in King County and 532.1 acres in Newcastle. Coal Creek: State Stream #08-0268.

This basin supports habitat for Chinook, Rainbow and Cutthroat trout, Coho, Sockeye and Steelhead. (Chinook and Coho are listed as species of Local Importance: *Bellevue Land Use Code 20.25H.150A*) (Chinook is listed as a Federal Endangered Species).

The tree canopy in the Coal Creek basin varies between 58%-85%. Chapter 6.4.1.5 describes Coal Creek Park Natural area as providing a forested riparian corridor adjacent to Coal Creek - a diverse fish and wildlife habitat. (reference: MyParksandRecreation.com)

**Figure 16-1**, illustrates Existing Electrical Transmission and natural gas/petroleum pipelines. This map shows the convergence of the Olympic Pipeline with the overhead existing PSE 115kV line. If the proposed 230kV PSE Energize Eastside overhead lines, as suggested in Alternative 1 - Option A, were approved - they would also intersect in the Coal Creek Basin. This natural area is already **overburdened** with transmission lines and pipelines. Good judgment would dictate avoiding any additional burden on this Basin.

**Figure 3-1**, illustrates Landslide and Erosion Hazard Areas. Note the high hazard zone around the Coal Creek Basin.

Chapter 5.5.3.1.4 acknowledges the potential impact on water resources from heavy machinery and excavation for the installation of 100 foot power poles. Please think again of what this could do to an area like the Coal Creek basin.

Chapter 5.5.3.1.6 regarding Potential Pipeline Damage: "The Olympic Pipeline, which parallels one of PSE's 115kV transmission lines, could be damaged during construction under Alternative 1, Option A." It continues: "a rupture could have significant adverse effects on groundwater quality and other surrounding water resources depending on the location, size and length of time of the rupture."

There is continued concern about pipeline safety as documented by Dr. Frank Cheng: *Criteria for Pipelines Co-Existing with Electric Power Lines*. (Dr. Cheng's report was submitted by Don Marsh, President of CENSE, on March 1, during the DEIS comment meeting in Bellevue.)

Chapter 5.5.4 referring to *Alternative 2* states that an integrated resource approach has a lower potential for impact to water resources than Alternative 1 A, because construction would be smaller in scale.

Chapter 6.6.3.1.1 states that Alternative 1 Option A - the "construction of new overhead transmission lines would result in permanent impacts on plants and animals and their habitats." A new corridor for a 230kV line would be approximately 120-150 feet wide, wider than a 115kV line at 30-40 feet. Trees would be removed in this corridor, along with trees posing a threat to

transmission lines outside the corridor. There could be up to 327 acres of vegetation and up to 131 acres of tree canopy cover removed with this option. These facts are clearly acknowledged in the DEIS. Bellevue, the *City in a Park*, deserves better than this.

Key findings in Chapter 6: Alternative 1 and 3 have the most potential to cause significant impacts on plants and animals.

Chapter 11.6.3.6.1 states that under Alternative 1 Option A **permanent clear zones would be required**. The clear zones would be between 120 and 150 feet wide requiring clearance of up to 327 acres of vegetation. Surely a *City in a Park* deserves better than this!

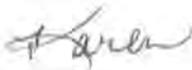
Chapter 6.6.4.2 states that with a distributed generation component (Alternative 2) construction could result in only short term impacts on plants and animals.

In addition to this - it was just in late 2014 that the *Coal Creek Parkway Culvert and Bridge* replacement was finished. This was built to provide a pedestrian walkway connected to the trail but the stream was also restored to improve salmon passage. (from the City of Bellevue website)

Over and over again the DEIS states that a new overhead line will create significant and unavoidable adverse impacts to our environment, plants and animals. No amount of mitigation can counter the impact of the PSE's preferred Alternative 1 A proposal. There cannot be enough small areas or parks that could counter the damage through 18 miles of neighborhoods.

On top of this, if there indeed is no immediate pending disaster need, as supported by the *Lauckhart-Schiffman Load Flow Study* - why are we as a City not supporting 21st Century resolutions for our electrical system. (The *Lauckhart-Schiffman Load Flow Study* was submitted by Don Marsh, President of CENSE, on March 1 during the DEIS comment session in Bellevue.)

As a Board Member of CENSE, I support the documents submitted by Don Marsh, President CENSE, at the March 1, 2016 Comment Meeting in Bellevue, WA.



Karen Esayian  
CENSE Board Member

4601-135th Ave. SE  
Bellevue, WA 98006

KEsayian@aol.com

Attachments: **Figure 16-1** Existing Electric Transmission and Natural Gas/Petroleum Pipelines (DEIS); **Figure 12b** Landslide and Seismic Hazard Areas (City of Bellevue); **Coal Creek Basin map** (City of Bellevue)



# Coal Creek Basin

Lake Washington Watershed (WRIA 8)  
State Stream #08-0268

## LAND CHARACTERISTICS

Basin Area: 3,990 Total Acres (11% of the City)  
Drainage Jurisdiction(s):  
2,181.7 Acres - in Bellevue  
1,275.7 Acres - in King County  
532.1 Acres - in Newcastle

Highest Elevation: 1,561 Ft  
Lowest Elevation: 18 Ft

Total Length of Open Channel: 85,838 Ft  
Total Length of Storm Drainage Pipes: 266,341 Ft  
Built Rain Storage Volume per Acre of Impervious Surface:  
Less than 0.5 Inches

## SALMON PRESENT in BASIN

Chinook\*+  
Rainbow & cutthroat trout  
Coho+  
Sockeye  
Steelhead

\* Listed Federal Endangered Species  
+ City Species of Local Importance (Bellevue Land Use Code 20.25H.150A)

## POPULATION

City Basin Population (2000): 10,144 (9.1% of the City)  
Basin Population Density: 1,852 People/Square Mile  
Number 3 of 26 Basins (One is the lowest density)

## LAND USE (within Bellevue city limits)

Public Right of Way:	9.16%	365.38 Acres
Commercial/Office:	0.03%	0.6 Acres
Industrial:	0.01%	0.3 Acres
Institutional/Government:	3.06%	66.8 Acres
Mixed Use/Misc:	3.77%	82.2 Acres
Multi-Family Residential:	1.44%	31.4 Acres
Open Space/Park:	10.89%	237.7 Acres
Single Family Residential:	50.14%	1,093.9 Acres

## LAND COVER

Impervious:	20%
Tree Canopy:	58%
Impervious in 100 Ft Stream Buffer:	8%
Tree Canopy in 100 Ft Stream Buffer:	85%



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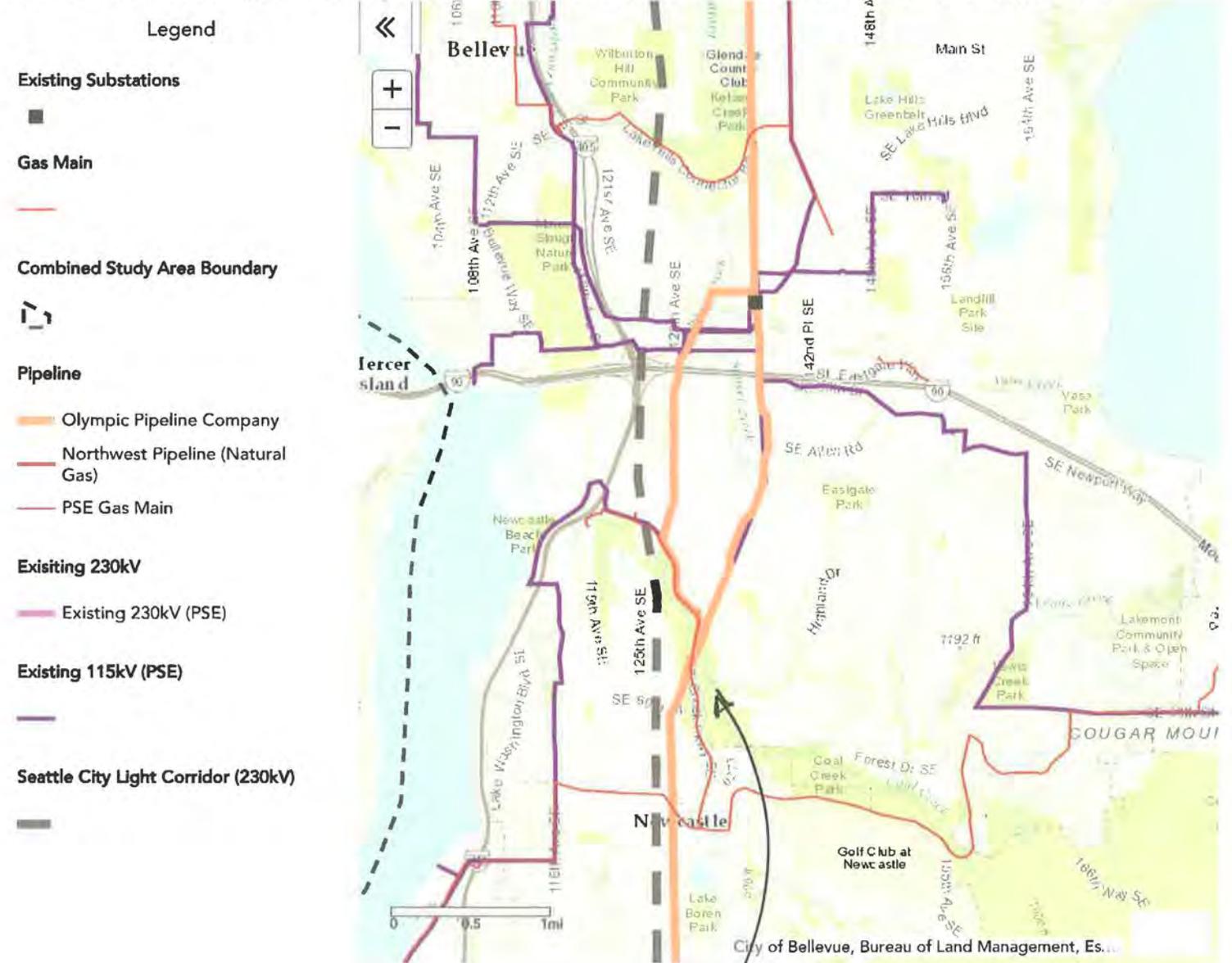
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### Figure 16-1 Existing Electric Transmission and Natural Gas/Petroleum Pipelines

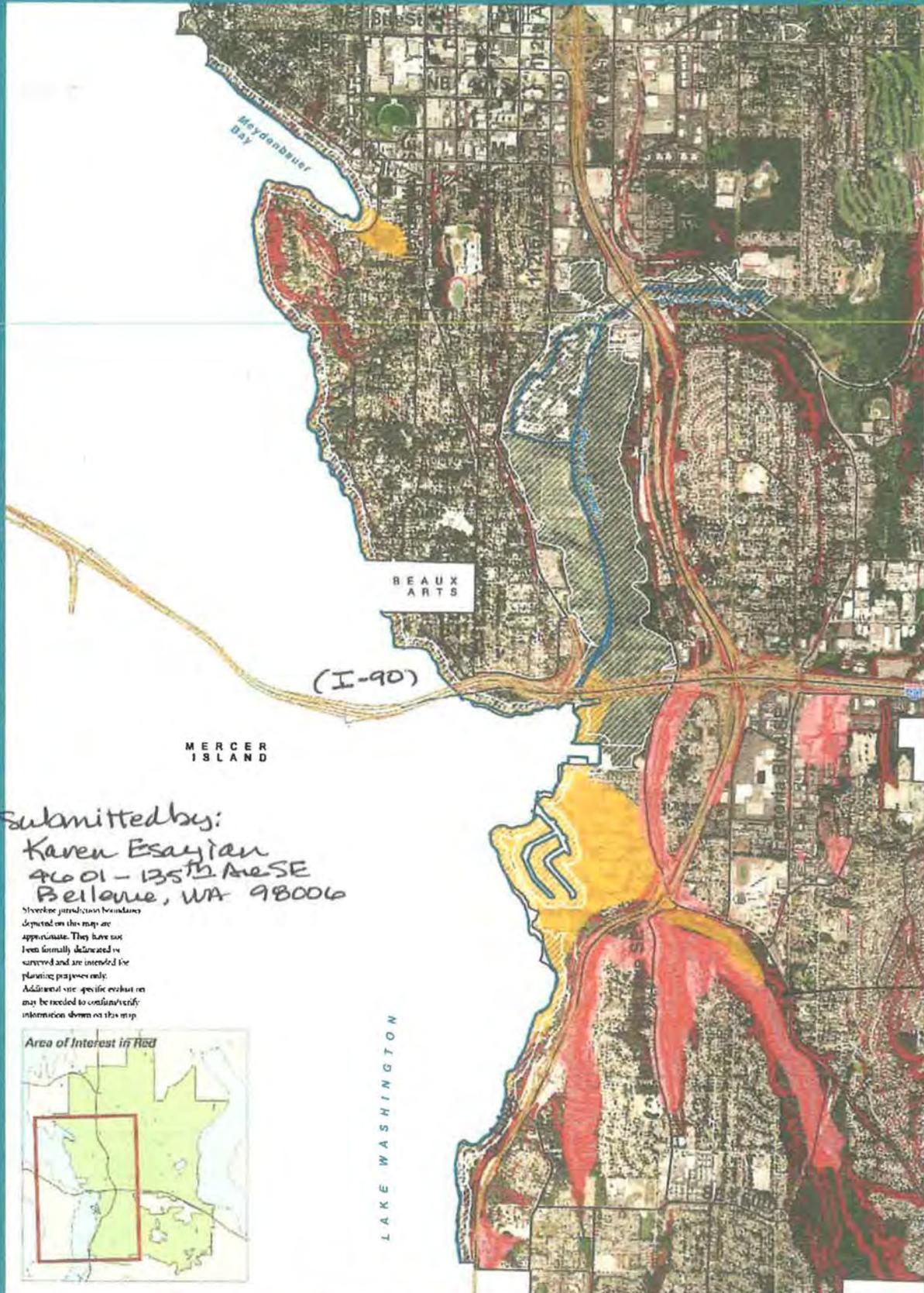
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Submitted by:  
Karen Esayian  
4601-135th Ave SE  
Bellevue, WA 98004

Coal Creek Basin

Select Language ▼



Submitted by:  
 Karen Esajian  
 46001 - 135th Ave SE  
 Bellevue, WA 98006

Shoreline jurisdiction boundaries depicted on this map are approximate. They have not been formally delineated or surveyed and are intended for planning purposes only. Additional site specific research may be needed to confirm/verify information shown on this map.

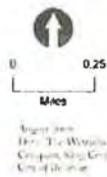


Coal Creek Basin

## Landslide and Seismic Hazard Areas Lake Washington, Mercer Slough, and Kelsey Creek

City of Bellevue Shoreline Master Program

Figure 12b



- Slopes Over 40%
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- Liquefaction Zones (King County)
- City Boundary
- King County Landslide Hazard Areas
- Shoreline Jurisdiction
- Highways
- Ordinary High Water Mark
- Major Streets

Subj: **DEIS Comments**  
 Date: 3/12/2016  
 To: [info@energizeeastsideeis.org](mailto:info@energizeeastsideeis.org)

March 8, 2016

Don Marsh comments to Bellevue council members,

CENSE would like the opportunity to dispute some of the "facts" stated by PSE representative Keri Pravitz before the Bellevue City Council on March 7, 2016.

### 1. "1,500 MW exported to Canada is a normal planning requirement for Northwest utilities."

There are many times of year when 1,500 MW can be transmitted to Canada without a problem. However, this level of flow is **not required during peak consumption**. This is clear from the Memorandum of Agreement signed by PSE, BPA, and Seattle City Light in January 2012: *"When large amounts of energy are being delivered [from] the Puget Sound area through the Northern Intertie to Canada, transmission lines at times become congested. To relieve this congestion and avoid unplanned power interruptions to customers, BPA currently limits or curtails the amount of energy Puget Sound-area utilities and Canadian utilities can deliver across certain transmission lines."*

This quote mentions a curtailment solution that BPA has used for nearly a decade: reduced energy flow to Canada. If BPA and PSE want to avoid such curtailments, PSE's customers should not have to bear the entire cost. There are many less expensive solutions to our local needs that don't require a 230 kV line to be constructed through heavily residential areas.

Further, the Lauckhart-Schiffman study clearly shows that it would take an additional line across the Cascades to deliver 1,500 MW to Canada on a cold winter day. There are no plans to build such a line.

### 2. "The 1,500 MW doesn't flow through Bellevue."

CENSE has never said that the entire 1,500 MW flows through Bellevue. However, some portion of this flow does go through Bellevue, and it adds stress to our local infrastructure. PSE says this is just a distraction. If it isn't a central issue, then PSE should have no objection to removing this assumption from the load flow study, as USE did (and almost all of the overloads on PSE's equipment disappeared).

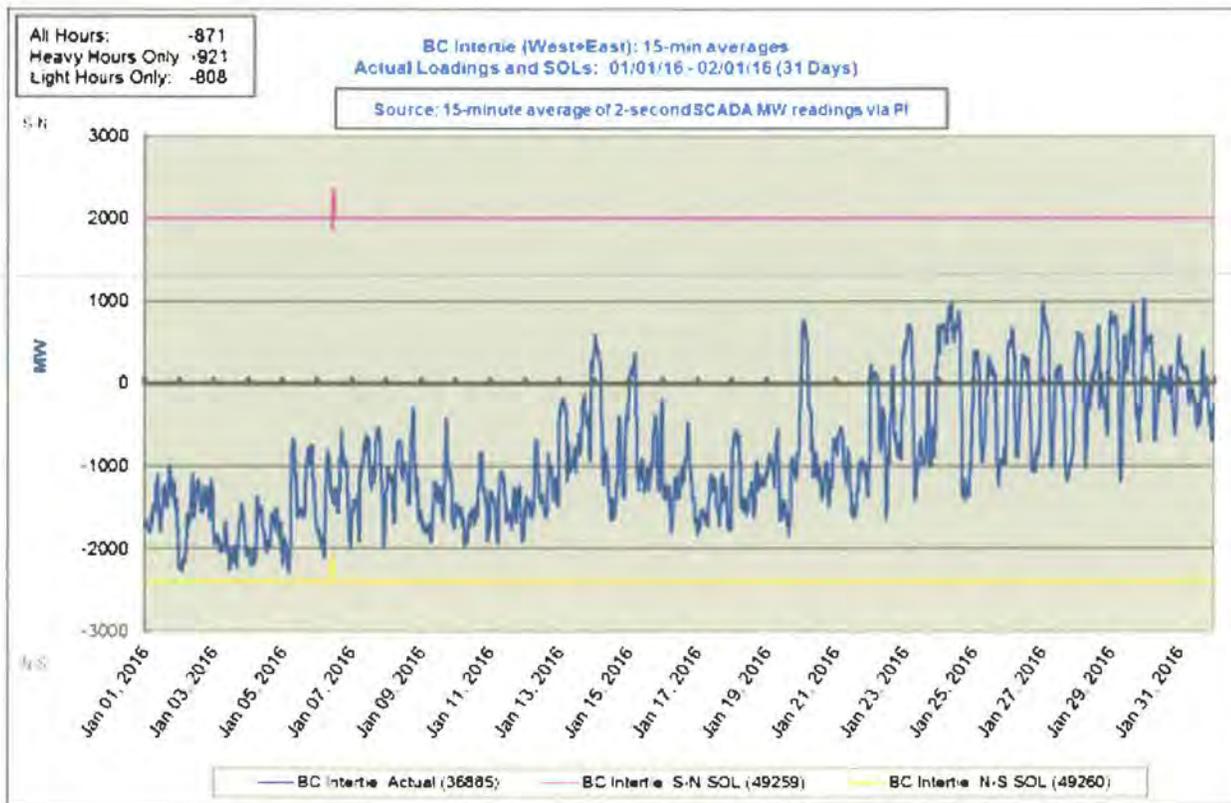
### 3. "1,500 MW is assumed in base cases."

Lauckhart and Schiffman started with the same WECC Heavy Winter Base Case for 2017-18 that PSE used in the Eastside Needs Assessment. The amount of electricity exported to Canada in that Base Case is 500 MW. Does PSE dispute this?

### 4. Reality check

Do large amounts of electricity actually flow to Canada when temperatures are low in the Puget Sound area? There is a BPA web site where anyone can look at electricity flow on the Northern Intertie. Let's

check what happened in January 2016, when the region had very cold weather for the first half of the month:



In the above graph, the squiggly line indicates flow on the transmission lines that connect the Northwest to British Columbia. Any time the line is below the central black line, energy is flowing from Canada to the US. You can see that for most of the month, Canada was delivering electricity to our region, not vice versa.

We have looked at data for the last decade, and it is very rare for electricity to flow northwards during the cold winter scenarios that PSE uses as a basis for Energize Eastside. If the flow were reversed in any dramatic way, the 11 transmission lines that deliver electricity to the Puget Sound from central Washington would not be able to satisfy the demand.

We conclude that Energize Eastside is being justified using a fantasy scenario that cannot happen in real life.

Don Marsh, President  
CENSE.org

submitted by Karen Esayian, CENSE Board member, 4601 135th Ave SE Bellevue WA 98006

Subj: **DEIS Comments**  
 Date: 3/12/2016  
 To: [info@energizeeastsideels.org](mailto:info@energizeeastsideels.org)

Don Marsh comments to Bellevue council members 2016

Kevin Wallace asked a very critical question during discussion of the CENSE study request last Monday night: Who has the authority to question the need for Energize Eastside?

When CENSE asked the Federal Energy Regulatory Commission to help us clarify the need, FERC responded,

*Regardless of Complainants' arguments, we could not grant this requested relief because much of the "activity with respect to" the project, such as transmission siting and permitting, is not subject to the Commission's jurisdiction.*

In other words, a strictly local project must be regulated at the local level. We won't argue with that. But does the authority reside at the state or city level?

Before FERC issued its ruling, we asked the Washington Utilities and Transportation Commission to investigate the need for the project. In an email dated March 30, 2015, Commissioner Ann Rendahl responded,

*[T]he UTC does not usually engage in pre-approval or pre-review of utility plant investment and relies on the utility to bring the matter forward to the UTC, nor does it have statutory authority over transmission siting, or a formal role in the transmission planning process. ... [I]nquiries are performed when the utility requests recovery in rates for investments it has built and placed into service.*

So, no help from PSE's regulators at the state level. If the city concludes that it also has no authority to clarify the need for Energize Eastside, it would become clear that such authority does not exist at the federal, state, or city level. In such a case, it is up to citizen organizations like CENSE to defend the welfare of those who would be burdened by a project whose need has only been validated by a company which will benefit from increased revenue.

CENSE is, in fact, willing to get a study without the city's participation. However, we think we might get a different answer from the council after new councilmembers are elected. Obviously, getting conflicting answers is not our preferred outcome.

Councilmembers are justifiably concerned about the possibility of a lawsuit from PSE if the study comes to a contrary conclusion regarding the need for the project. However, the fear of a lawsuit does not justify ignoring the questions of the community. If PSE files a lawsuit, we have an idea about how the city could respond quickly and at zero cost. For obvious reasons, we would prefer to share this idea in private at this time.

We have heard a concern that another study could be controversial. If CENSE can vet the consultant beforehand (remember that we expressed strong reservations about Utility System Efficiencies), we will not criticize the outcome of the study, even if it produces results counter to our expectations. We still have plenty to say about smarter, cheaper alternatives if the study finds that a real need exists. But it is difficult to judge the viability of alternatives if we don't have a clear idea of the need, so this study will provide valuable information even if need is clearly demonstrated.

submitted by Karen Esayian CENSE Board member; 4601 135th Ave SE Bellevue WA 98006

Subj: **DEIS Comment**  
Date: 3/12/2016  
To: [info@energizeeastsideeis.org](mailto:info@energizeeastsideeis.org)

January 27, 2016

Don Marsh comments to Newcastle Planning Commission members,

Tonight I'd like to propose a land use code of importance to Newcastle. This code would improve the safety of the utility corridor shared by the Olympic Pipeline and PSE's high-voltage transmission lines. For all future development of this corridor, we would require a minimum distance of 50 feet between the power lines and the two pipelines. Earlier this month, CENSE requested the City of Bellevue to adopt the same code.

Our goal is to reduce the risk of devastating pipeline fires. There are three different ways these fires can occur:

1. A pipeline can be damaged during a construction project. A minor nick in one of the pipelines caused a devastating fire that claimed three lives in Bellingham in 1999.
2. Electricity flowing from a downed power line can damage the pipeline. Bellevue resident Lloyd Arnesen described such an incident during an EIS Scoping Meeting last May.<sup>[1]</sup>
3. Electricity can arc from wires to power poles and then into pipelines, as described in a BPA safety guide available on the web.<sup>[2]</sup>

Now I will describe each of these scenarios in a little more detail.

A construction accident is not hard to visualize. PSE will install poles that are at least 85 feet tall in a corridor that is, in some cases, only 100 feet wide between houses. PSE will dig foundations 15 to 50 feet deep. The excavation will require heavy equipment that will create vibration and stress on pipelines that are 40 to 50 years old. This would already be a challenging task, but there is another potential complication. The Energize Eastside website says that the existing power lines won't be removed until after the new lines are installed.<sup>[3]</sup> Workers will guide the new poles into position while dodging power lines above, active pipelines below, and poles and houses on either side. Deadly mishaps have happened in less complex situations, like the explosion that happened in Texas in 2010, when a subcontractor hit a pipeline while digging holes for a new transmission line.<sup>[4]</sup> The heat from the explosion that took his life was felt half a mile away.

Even if no significant damage occurs during construction, Newcastle and other Eastside cities will still be exposed to operational dangers. Lloyd Arnesen described what happened when electricity from a downed power line near his yard began arcing into the nearby pipeline. In this case, the flow of electricity was cut off before the pipeline casing was breached. However, the damage was severe enough that the Olympic Pipeline Company had to shut down the pipeline and replace the damaged section of pipe. Mr. Arnesen and his neighbors were lucky that an explosion was avoided. But what might have happened if Energize Eastside had been built and four times the amount of power were flowing through that wire?

Our concerns on this point are validated by an October 2015 report by the respected industry risk analyst DNV-GL. According to the report, "A direct arc to a collocated or crossing pipeline is possible, which can result in coating damage, or arc damage to the pipe wall up to the point of burn-through. Even if an arc is not sustained long enough to cause burn through, a short duration elevated current

can cause molten pits on the pipe surface that may lead to crack development as the pipe cools.”<sup>[5]</sup>

The DNV-GL report contains advice about ways to mitigate risk: “The separation distance between the pipeline and transmission line is a significant variable controlling the level of induced AC potential influencing the pipeline.” The report explain that “induced AC potential” increases risk of accelerated corrosion. We view this report as an excellent survey of the most recent scientific knowledge on the risks of collocated transmission lines and pipelines, and we encourage you to read it.

BPA’s safety guide explains the concern of that agency: “Proper positioning of underground utilities is required to prevent an accident in an extreme case when an unusual condition might cause electricity to arc from the high-voltage wire to the tower and then to ground. This could produce a dangerous voltage on underground piping...”

BPA recommends a minimum separation of 50 feet between power lines and pipelines to reduce risk of dangerous voltages on the pipeline. The Chevron Company, which operates a 157-mile long pipeline in Eastern Washington, recommends a separation of at least 25 feet. The Municipal Research & Services Center of Seattle has developed a model ordinance for cities.<sup>[6]</sup> The ordinance calls for a minimum setback of 50 feet from the pipeline, although electrical infrastructure is not specifically mentioned.

The author of the Seattle study, Jim Doherty, has six recommendations for residents. His first recommendation is, “Don’t wait for the federal government to tell you what risks are acceptable for your community – bring the issue to your planning commission and start the process for enacting reasonable land use regulations that will minimize risks to your residents.” Tonight, we are following this recommendation.

A week after CENSE requested Bellevue to incorporate the BPA-recommended separation between power poles and pipelines, PSE told the city council that there are a variety of ways to mitigate risk with careful design and engineering. CENSE is skeptical that engineering alone can reduce risk of all three scenarios we have described. Physical separation is a better way to reduce risk. Engineered solutions can be compromised through age or accidental damage. Physical separation does not degrade over time and is easily verified by anyone with a tape measure. Perhaps that is why there are no exemptions for engineered solutions in BPA’s safety guide or other ordinances we’ve seen.

It’s clear that Newcastle residents will be safer with a separation requirement such as we are proposing. It’s also true that it will be more difficult for PSE to build Energize Eastside with more stringent safety codes in place. How will that impact Newcastle residents?

PSE says that its Newcastle customers will experience “risk of power outages” if Energize Eastside is not built. In a map included in PSE’s Eastside Needs Assessment, PSE shows parts of Newcastle located within an area of 16,000 customers that are at risk of outages.<sup>[7]</sup> But PSE has not been clear in public forums about what the true likelihood of a power outage is.

According to the Eastside Needs Assessment, Energize Eastside is needed to address peak loads that “occur just a few hours per year.”<sup>[8]</sup> When do these peak hours occur? When the temperature falls



below 23 degrees Fahrenheit, and only on weekdays during morning or evening peak usage hours (7-10 AM and 5-8 PM). Historically, those conditions have occurred during less than 0.2% of all service hours.

To be clear, the Eastside grid has plenty of capacity to meet customer needs even in extremely cold weather. The problem described by PSE occurs only if two of the four big transformers that serve the Eastside fail at the same time winter peak loads are occurring. There have never been two such simultaneous failures that we are aware of.

So how many Newcastle customers would lose power in this very unlikely event? Surprisingly, **no customers will lose power**. As the company describes in the Eastside Needs Assessment, Corrective Action Plans would be used to prevent overloads or outages. PSE says an outage would occur if a transmission line fails while the Corrective Action Plans are in place, but this is adding yet another unlikely scenario on top of a situation that is nearly impossible.<sup>[9]</sup>

Newcastle must balance the risk of a catastrophic pipeline fire with the need for electrical reliability in the unlikely circumstances PSE has imagined.

We don't use the term "catastrophic" lightly. This is the word used by the Bellevue Fire Department to describe the impacts of a pipeline incident in the department's Standards of Response Coverage: "Given that pipeline incidents continue to occur in this country, and many for undetermined reasons, the community is still at risk. The combination of: a highly flammable liquid, in large quantities, and in urban environment translates into a significant consequence risk that approaches the 'catastrophic' level."<sup>[10]</sup>

The Fire Department goes on to state that it does not have sufficient "response and mitigation abilities" to extinguish a pipeline fire. The pipeline has the capacity to deliver approximately 5,900 gallons of fuel per minute into a burning fire. Even if the pipeline is shutdown with "near-immediate" responsiveness, "well over ten thousand gallons" of fuel may burn within the first few minutes of ignition. With houses located closer than 50 feet to the pipeline, the potential for death and destruction without warning is of great concern to us.

Since the Bellevue Fire Department serves the City of Newcastle, these cautionary statements should be heeded by Newcastle planners when considering separation of electrical infrastructure and the pipeline.

In conclusion, we have laid out substantive and specific concerns regarding the safety of locating pipelines and transmission lines in close proximity. We urge the Newcastle Planning Commission to begin the process of creating a land use code that specifies a minimum separation to protect your residents from potentially lethal pipeline fires. During this process, PSE and the Olympic Pipeline Company will be able to present their own facts, and useful public debate can occur. If a land use code is not considered, the concerns we have raised tonight will not be adequately investigated. Residents will be left to wonder if their lives and loved ones are being jeopardized to deliver phantom reliability improvements promised by PSE.

Sincerely,

Don Marsh, President  
CENSE.org

submitted by Karen Esayian, CENSE Board member, 4601 135th Ave SE Bellevue WA 98006

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- [1] [http://www.energizeeastsideeis.org/uploads/4/7/3/1/47314045/phase\\_1\\_draft\\_eis\\_scoping\\_comment\\_record\\_report\\_rev.pdf](http://www.energizeeastsideeis.org/uploads/4/7/3/1/47314045/phase_1_draft_eis_scoping_comment_record_report_rev.pdf), p. 655
  - [2] <http://www.bpa.gov/news/pubs/GeneralPublications/lusi-Living-and-working-safely-around-high-voltage-power-lines.pdf>, p. 6
  - [3] <http://energizeeastside.com/construction>
  - [4] <http://www.wfaa.com/story/news/2014/08/09/13587360/>
  - [5] <http://www.ingaa.org/File.aspx?id=24732>, p. 19
  - [6] <http://mrsc.org/getmedia/321384AC-DB51-448E-B4FD-5A8EC4EBF7B1/jdsetbacks.aspx>, p. 21
  - [7] [http://energizeeastside.com/Media/Default/Library/Reports/Eastside\\_Needs\\_Assessment\\_Final\\_Draft\\_10-31-2013v2REDACTEDR1.pdf](http://energizeeastside.com/Media/Default/Library/Reports/Eastside_Needs_Assessment_Final_Draft_10-31-2013v2REDACTEDR1.pdf), p. 14
  - [8] *ibid.*, p.38
  - [9] [http://energizeeastside.com/Media/Default/Library/Reports/Eastside\\_Needs\\_Assessment\\_Final\\_Draft\\_10-31-2013v2REDACTEDR1.pdf](http://energizeeastside.com/Media/Default/Library/Reports/Eastside_Needs_Assessment_Final_Draft_10-31-2013v2REDACTEDR1.pdf), p. 13
  - [10] [http://www.bellevuewa.gov/pdf/Fire/Standards\\_of\\_Coverage.pdf](http://www.bellevuewa.gov/pdf/Fire/Standards_of_Coverage.pdf), p. 66
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Subj: **DEIS Comments**  
Date: 3/12/2016  
To: [info@energizeeastsideeis.org](mailto:info@energizeeastsideeis.org)

November 30, 2015 Comments to Bellevue Council by Don Marsh

At the last council meeting before Thanksgiving, PSE delivered a marketing presentation to the city council rather than addressing the technical questions that CENSE has raised repeatedly. Instead of telling councilmembers why it's reasonable to send large amounts of electricity to Canada during an N-1-1 power emergency on the Eastside, or why PSE would turn off most of its local generators during that emergency, PSE simply says, "This is the backbone of the Eastside and we haven't upgraded it for 55 years." This is not accurate.

By calling these lines the backbone of the Eastside, PSE conveniently ignores the fact that the company has installed a number of parallel transmission lines through Bellevue during the past 55 years. One heads northwest from the Mercer Slough, one goes along 116th Ave. NE, and a third line follows 140th Ave. NE. With these additional lines in place, PSE has the capacity to serve its customers even if the so-called "backbone lines" are out of service.

PSE's advertising about this backbone may have convinced a couple of business owners to testify in support of Energize Eastside at the last council meeting. They told the council their companies and the economic vitality of Bellevue are at risk if Energize Eastside isn't built soon.

Let's examine the facts. On page 47 of the report produced by Bellevue's independent analyst, the condition that PSE seeks to fix with Energize Eastside occurs only once every 3 to 30 years. During the next decade, Energize Eastside will prevent at most 3 outages totaling about 6 hours. During that same period, business owners in downtown Bellevue will suffer 20 outages totaling more than 40 hours. There are areas of the city outside the downtown core with even more frequent outages, none of which will be prevented by Energize Eastside.

Business owners don't want to pay higher electricity rates to finance a project that won't make a significant difference in reliability. Energize Eastside is a boondoggle that degrades our neighborhoods, harms the environment, and increases the risk of devastating pipeline fires.

The council should encourage PSE to spend our money on projects that improve our communities and make a real difference in the reliability of our electricity.

submitted by Karen Esayian, CENSE Board member

4601 135th Ave SE Bellevue, WA 98006

Subj: **DEIS Comments**  
 Date: 3/12/2016  
 To: [info@energizeeastsideeis.org](mailto:info@energizeeastsideeis.org)

#### November 2015 Comments to Bellevue Council by Don Marsh

My name is Don Marsh, vice president of CENSE, the Coalition of Eastside Neighborhoods for Sensible Energy. During the past two years, I've helped analyze PSE's Energize Eastside project, and I've led a search for more cost-effective and less environmentally destructive solutions to power future growth of the Eastside.

During the past 2 months, citizens have spoken to the council on a range of related topics, such as:

- The reliability of our electric grid.
- The safety hazard of locating high-voltage power lines and petroleum pipelines in close proximity.
- The Shuffleton power plant, which provided emergency power to the Eastside until PSE dismantled it and sold the property for a profit.
- How a small peaker plant could meet our future needs.
- Demand Side Management, an even better solution to peak load problems.
- And we asked the council to participate in a more realistic study of Eastside need.

Residents have told us that these presentations have helped them understand our local energy needs and opportunities. But one question still comes up. "Why would PSE propose a project like this if there are better solutions?"

There is a financial explanation.

PSE was acquired in 2009 by a private equity fund named Macquarie Infrastructure Partners, managed by an Australian investment bank and three Canadian Retirement funds. Soon after the acquisition, the company was hit with a triple whammy: 1) The recession, 2) increasing energy efficiency, and 3) falling gas prices. This graph shows the dramatic impact on the company's revenues, as reported on PSE's Form 10K. Electricity revenue is mostly flat and gas revenue has declined significantly. Last year, the company's combined revenue from energy sales, (the orange line), was 6% less than it was 5 years ago.



PSE is under pressure to increase profits for its shareholders. As a result, PSE is predisposed to build large infrastructure projects rather than less profitable alternatives preferred by residents. State regulations encourage this outcome by allowing PSE to collect a 10% return on infrastructure investments.

CENSE believes these state regulations must be amended to reward the implementation of 21st century energy technologies, rather than building expensive transmission systems that are much larger than

the local need requires.

States such as New York and California have already demonstrated that such reforms are possible. We ask that Bellevue and other Eastside cities press the legislature to reform our regulations so that utility companies can make a decent profit from smart solutions that establish the Eastside as an energy leader, rather than erecting grossly-oversized solutions from the last century.

submitted by Karen Esayian, CENSE Board member  
4601 135th Ave SE Bellevue, WA 98006

Subj: **DEIS Comments**  
Date: 3/12/2016  
To: [info@energizeeastsideeis.org](mailto:info@energizeeastsideeis.org)

March 7, 2016 comments to Bellevue Council members by Don Marsh

I hope you've all had a chance to look at the Lauckhart-Schiffman Load Flow Study I provided to you a couple of weeks ago. Last week, we submitted the study into the Draft EIS comment process.

Although PSE hasn't provided any specific objections to the Lauckhart-Schiffman report, the company criticizes the study for not complying with federal reliability standards. CENSE responds by citing a study of an "Extra Heavy Winter Flow" scenario performed by ColumbiaGrid in 2013. In this study, ColumbiaGrid simulated 1,500 MW of electricity flowing to Canada, and many of the local generation plants in the Puget Sound area turned off. If these assumptions sound familiar, it's because those are the same assumptions PSE made in the Eastside Needs Assessment to justify Energize Eastside.

ColumbiaGrid says these extreme conditions were studied only to test the limits of the 11 transmission lines that carry electricity from central Washington to the Puget Sound. These are the same lines that Lauckhart and Schiffman also found unable to carry the load under these extreme conditions. ColumbiaGrid concludes that this scenario exceeds NERC reliability standards and therefore transmission capacity across the Cascades does not need to be increased. Logic dictates these conditions also exceed NERC standards when PSE uses them to justify Energize Eastside.

Although PSE and CENSE do not agree on which studies should determine the need for Energize Eastside, there is an objective way to resolve the dispute. Richard Lauckhart has offered to share his computer model with PSE, and he wants to see PSE's data to understand the details of the company's objections. As you may know, Mr. Lauckhart previously received CEII clearance from the federal agency FERC and has now filed a second CEII application with PSE. He has not received a response. I am now seeking this clearance for myself. I expect PSE to grant both my application and Mr. Lauckhart's without delay.

At this point, questions of scale and timeline for this project have never been greater. The Draft EIS simply repeats PSE's assertion that the need has already been demonstrated by studies that do not answer the questions raised by the Lauckhart-Schiffman Study. Phase 1 of the EIS must be finalized and considered by a Hearing Examiner before phase 2 begins. It would be a waste of time and resources for all parties involved, including PSE, to spend a year studying specific solutions to a problem which is not well defined. Our next speaker will explain why it is permissible for the council to ask for finalization of Phase 1.

submitted by Karen Esayian, CENSE Board member, 4601-135th Ave SE Bellevue, WA

Subj: **DEIS Comments**  
Date: 3/12/2016  
To: [info@energizeeastsideeis.org](mailto:info@energizeeastsideeis.org)

February 22, 2016 comments to Bellevue Council by Don Marsh

Tonight I'd like to present to you the results of a new load flow study of PSE's Energize Eastside project. A load flow study is a detailed simulation of how an electric grid functions in a given scenario.

The two analysts who ran this study are Richard Lauckhart, former VP of power planning for PSE, and Roger Schiffman, an industry expert who has run many load flow studies during his career.

Lauckhart and Schiffman acquired a license to use the same analysis software PSE uses, and they obtained the same base case data from the Western Electricity Coordinating Council.

However, Lauckhart and Schiffman's results differ from PSE's. When PSE's assumptions were entered into the computer model, namely three times as much energy going to Canada, and most of the local generation plants located in the Puget Sound area turned off, Lauckhart and Schiffman discovered something pretty shocking. These assumptions would boost the amount of electricity required from central Washington to exceed the capacity of the 11 transmission lines that cross the Cascades. Let me repeat that – the transmission lines crossing the Cascades would become overloaded, not our transmission lines on the Eastside. PSE's proposal wouldn't make any

difference at all, and PSE's scenario would put the Puget Sound area from Olympia to Bellingham at risk of blackouts.

Well, that's what the simulation says would happen. In reality, grid operators would never allow that scenario to occur. They would simply turn on local generation plants and reduce the optional flow of electricity to Canada. In that case, what would happen to us during an N-1-1 failure occurring simultaneously with heavy winter peak loads? Lauckhart and Schiffman ran another simulation to find out. And their answer is: nothing unusual would happen -- no overloads and no blackouts. In fact, Lauckhart and Schiffman estimate we have 20 to 40 years before any risk develops.

We have more good news. A new analysis from EQL Energy shows PSE and the EIS consultants have made significant errors in their analysis of alternative technologies. There are solutions available right now that would be much more economical than transmission lines. We will have that study from EQL ready for release in about a week.

At this point, I have a question for you. Do you personally feel that you are well-qualified to judge between the opposing facts being put forward by PSE's experts and those of CENSE? If not, we would like to propose another possibility. Why not move this case to the state agency EFSEC, the Energy Facility Site Evaluation Council? We believe it is well within your power to require an evaluation of PSE's proposal by a state agency that specializes in this

kind of question. CENSE believes EFSEC is in a better position to make these technical evaluations than most city councils.

submitted by Karen Esayian, CENSE Board member

4601 135th Ave SE, Bellevue WA 98006

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Subj: **DEIS Comment**  
Date: 3/12/2016  
To: [info@energizeeastsideeis.org](mailto:info@energizeeastsideeis.org)

February 1, 2016 comments to Council members,

CENSE appreciates being invited to comment on the Draft EIS for Energize Eastside.

Tonight let's look at the broad picture. The Draft EIS presents three alternatives for our energy future.

The first alternative is a 230 kV transmission line through the Eastside. Four variations are studied: two different overhead lines, an underground line, and a line submerged in Lake Washington. Let us be clear. Because of the state tariff on undergrounding enforced by the Washington Utilities and Transportation Commission, only the overhead lines operated by PSE or Seattle City Light are economically feasible. Since Seattle City Light removed their line from consideration, PSE's transmission line is the only serious option under Alternative 1.

Alternative 2 uses innovative technology and policy solutions to address the peak load problem PSE says we have. This is the smart way to grow our electric system.

Alternative 3 would build three times as many transmission lines all over the Eastside. No one considers this to be a realistic option, and it is included just to make the first alternative look less horrific. Gamesmanship like this makes residents cynical about the EIS process.

Having identified the red herrings in the EIS, let's look at the two remaining options: Alternative 1, PSE's transmission line, and Alternative 2, the smart technology solution.

PSE's transmission line is a solution that is vastly bigger than we need. The line will have a capacity exceeding 1,000 megawatts when only 70 megawatts are required in the foreseeable future, according to PSE's graphs. CENSE has reason to believe even this figure has been exaggerated to justify the project. The transmission line option would put all our eggs in one basket. Ratepayers would finance a huge upfront cost of more than a quarter billion dollars to build a transmission line that has reliability and security risks. The transmission line would be vulnerable to extreme weather, fires, landslides, terrorism, solar flares, pipeline accidents, and errors of human judgment. If only one power pole falls, a big piece of our electricity supply would be out of service.

Alternative 2, the smart solution, envisions a 21<sup>st</sup> century distributed energy network that is much more flexible and adaptive. It's more reliable, because multiple elements can fail without impacting overall reliability.

It's also more attractive financially, because it can be built incrementally. We can make smart decisions about how much additional infrastructure we need each year. For example, if the economy slows down and electricity demand plummets like it did in 2009, the level of investment could be adjusted to match the new consumption pattern. If a new kind of battery comes along that solves our problems more efficiently, it could be incorporated into the energy grid. This strategy would better support local companies like Mukilteo-based UniEnergy, which is developing batteries that will be used by utilities all over the country. By contrast, there is no local company that makes the steel monopoles used in PSE's transmission line.

Be ready for PSE's arguments against the smart solution. PSE prefers building transmission lines because it is more profitable for them. The company has disparaged Demand Response, a proven way to handle peak loads. The power plan about to be released by the Northwest Power and Conservation Council says, "Under a wide range of future conditions, energy efficiency consistently proved the least expensive and least economically risky resource. In more than 90 percent of future conditions, cost-effective efficiency met *all* electricity load growth through 2035. It's not only the single largest contributor to meeting the region's future electricity needs, it's also the single largest source of new winter peaking capacity."

Energize Eastside is all about winter peaking capacity, but PSE argues that the Eastside is an anomaly in its service area, that growth has brought us to the brink of a crisis, and a larger transmission line is our only solution.

Citizens do not want a solution that despoils our neighborhoods, cuts down our trees, and increases risk of devastating pipeline fires. Instead we want an energy solution that is forward-looking, reliable, safe, cost-effective, and environmentally sound. The only alternative in this EIS that fills these criteria is Alternative 2.

Thank you. Don Marsh

submitted by Karen Esayian, 4601 135th Ave SE Bellevue, WA 98006  
Cense Board member

Subj: **DEIS Comments**  
 Date: 3/12/2016  
 To: [info@energizeeastsideeis.org](mailto:info@energizeeastsideeis.org)

Don Marsh comments to Bellevue Council November 16, 2015

My name is Don Marsh, and I'm the vice president of CENSE, the Coalition of Eastside Neighborhoods for Sensible Energy. During the past two years, I've helped analyze PSE's Energize Eastside project, and I've led a search for more cost-effective and environmental solutions to power future growth of the Eastside.

During the past 2 months, citizens have spoken to the council on a range of related topics. Patricia Magnani spoke about reliability of our electric grid. Janis Medley explained the safety hazard of locating high-voltage power lines and petroleum pipelines in close proximity. Gary Albert related the story of the Shuffleton power plant, which provided emergency power to the Eastside until PSE dismantled it and sold the property for a profit. John Merrill explained how a small peaker plant could meet our future needs. Lindy Bruce described Demand Side Management, an even better solution to peak load problems. Edward Chung asked the council to participate in a more realistic study of Eastside need.

Residents have told us that these presentations have been helpful for them to understand our local energy needs and opportunities. But one question still comes up. "Why would PSE propose a project like this if there were better solutions?"

There is a financial explanation.

As you know, PSE was bought in 2009 by a private equity fund, Macquarie Infrastructure Partners, which is managed by an Australian investment bank. But soon after the acquisition was completed, the company was hit with a triple whammy. The recession, increasing energy efficiency, and falling gas prices have had a dramatic impact on the company's revenues. In this graph, revenue reported on PSE's Form 10K shows mostly flat electricity revenue, and revenue from gas has declined significantly. Last year, the company's combined revenue from energy sales, shown in orange in this graph, was 6% below where it was 5 years ago.



PSE is under tremendous pressure to increase profits, and state regulators won't allow the company to hike energy prices enough to substantially raise revenue. In fact, state regulations allow only one way for PSE to boost earnings, and that's by collecting a generous 10% return on infrastructure

investments. This predisposes the company to prefer expensive solutions to problems that could be solved with cheaper alternatives.

CENSE has no problem with compensating PSE for projects that improve the safety and livability of our cities and advance our environmental goals. But this will only happen if outdated state regulations are amended to align PSE's financial incentives with consideration for the environment and the public good. States such as New York and California have already demonstrated that this is possible.

We would like Bellevue and other Eastside cities to take a leadership role in calling for change of these outdated state regulations.

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submitted by Karen Esayian, CENSE Board member,

4601 135th Ave SE Bellevue, WA 98006

Good evening everyone:

My name is Katherine Ma and I live at 13912 SE 44th ST, Bellevue with my family. We have two kids, one is 11 in middle school and the younger one will turn to 5 this month. We moved here from Chicago in summer 2014. We decided to settle down in Bellevue because of its excellent education system, diverse communities, lots of trees, flowers and beautiful views. Tonight I am here to OPPOSE PSE's Energize Eastside project from my own experience and safety for our kids.

The first time I learned about high-voltage power line was last June when I drove my son to King County Aquatic Center in Federal Way. While waiting for his swimming practice, I took a jog along a trail next to the Aquatic Center. There were high-voltage power lines above the trail. I felt scared because I heard lots of buzzing and saw sparks from tall metal tower power lines. It looked like dry grass underneath could catch fire at any moment. There were neither trees nor houses under those power lines.

It is such an ABSURD idea to build a high-voltage transmission line through residential areas. NO one, even the National Cancer Institute, can say high-voltage power lines are safe to humans, especially to vulnerable kids. Professionals in eletromagnetic fields suggest the safety distance from high-voltage power lines is 1000 feet or more. Somerset elementary school, Tye middle and Newport High have more than 3000 students together. Yet these three schools are either on or next to PSE proposed routes. As a mom, I plead: please do NOT sacrifice our children's' safety and health for money when we have other choices.

Tonight, now, my son's school is having a concert and he is the second chair in violin. It should be a night for a mom to be proud of and to enjoy music. I HATE to miss it. I said to my son "mommy is really really sorry to miss your concert. But mommy have to stand up to protect our communities, to protect YOU and your friends". My son totally supports me. Please help a mom do something for our next generations: stand up with me to OPPOSE PSE's Energize Eastside plan.

Thank you for your time and good night!



Ms. Heidi Bedwell, Senior Planner  
Land Use Division-Development Services  
City of Bellevue  
450 110<sup>th</sup> Avenue NE  
Bellevue, WA 98004

Dear Ms. Bedwell:

The following comments are intended to represent the interests of residents in the Olympus neighborhood of Newcastle. As you know, a number of our residents are extremely concerned about environmental/safety impacts of the potential installation of 230 kV transmission lines through our neighborhood, which are currently identified as “Negligible to Minor” in the Phase I report (pages 1-50 and 1-53). We are concerned that this is dramatically understating the risks involved. Some municipalities “have policies or regulations that could specifically prohibit combining new or expanded transmission lines with hazardous material pipelines” (page 10-25). We also have concerns with the housing and visual impacts, both having potentially significant impact in the Phase I report. Olympus residents are particularly interested in a thorough, detailed, and objective evaluation of these risks and impacts.

Alternative 1A would have significantly greater construction and operational impacts than other alternatives, including risk of explosion or hazardous emissions if the new transmission line were constructed adjacent to the existing fuel pipeline through Olympus. Given the high level of concern in Olympus about fuel pipeline safety, we believe specific and detailed measures that would be taken to prevent a pipeline rupture or to prevent hazardous emissions or explosion if a rupture occurred inadvertently, should be discussed, since these are potential significant impacts of Alternative 1A. (WAC 197-11-794(2) states: “An impact may be significant if its chance of occurrence is not great, but the resulting environmental impact would be severe if it occurred.”) We believe these important safety issues (prevention and mitigation) need to be addressed in detail the Phase 2 EIS to include vibration, corrosion, earthquakes, and lightning strikes.

Alternative 1A would also have potentially significant housing and view impacts. First, in order to construct the towers in a safe manner, a clear zone approximately 120 to 150 feet wide may be necessary (page 2-23). The current easement in the Olympus neighborhood would not be sufficient to meet those standards so homes would likely be eliminated as well as additional land needed for clear zones in this project. While costs may be outside the scope of the EIS process, PSE objectives state that costs should be “reasonable” (page 1-16), and the cost of “relocation assistance”, and the purchasing of necessary homes and land for clear zones, should be included in the evaluation of this project. Second, the views in the Olympus neighborhood (including Mt. Rainier) of a substantial amount of homes would be impacted which currently are unobstructed from the current height of the towers. This seems inconsistent with the desire to preserve “Visual Character” on the eastside. Third, we believe that the degradation to home values would be significantly affected even outside the view area due to the “comps” valuation method that realtors utilize in determining purchase prices. The above three impacts should be specifically quantified in the phase 2 report.

Good Evening, my name is **Kelly Bach** at 12519 NE 29<sup>th</sup> Street. I am a second generation Bellevue/Bridle Trails resident who loves this city and cherishes the character of the neighborhood I live in. My husband and I, although we both work in Seattle, intentionally chose to live on the Eastside and raise our 3 children here.

Energize Eastside Alternative 1A's clear cutting of 327 acres of vegetation is devastating. These trees are not replaceable. Visibly- it will forever change the landscape of our city, not to mention the 85-100ft poles that will be replacing them; our already fragile ecosystem will also be impacted- animals will lose their homes, storm water will no longer be absorbed by the earth and air quality will decrease without the natural "purifier" that trees offer. Bellevue prides itself on the image of a "city in a park"- by agreeing to this proposed plan by PSE we are compromising the value and character of our city for the financial gain of this company. I believe that each and every one of you are intelligent people, so I'm not going to spend time on the fact that these proposed lines will be on top of two major petroleum gasoline lines- that's just a no brainer that this is a terrible idea. It is also obvious to me that you cannot mitigate all the neighborhood concerns that are related to alternative 1A.

On previous occasions, I have shared with you my background as a pediatric nurse. I have also shared with you my concerns of

the impact on the health of our citizens due to the increased EMF by the proposed 230 KV line. On multiple occasions I have read and heard the DEIS downplay of this impact on citizen health. However much this disappoints me to read these unsubstantiated findings, this does not surprise me. These people have a vested financial interest in this project. I do not. For me, professional success is not determined by a paycheck or closing of a deal. It is by caring for and curing those who seek medical care. Here's the hard thing about cancer, cardiac conditions, seizures and other health problems- although our scientists work hard, we don't have all of the answers. The answers come after decades of work in identifying a common thread in the patients. Sometimes it impacts subsequent generations.

What I ask of you is to not downplay the health impact of these lines. It is real. Take a quiet moment and look at yourself in the mirror. Ask yourself this question. Is the financial gain of this "deal" worth the health and well-being of the citizens who make up this city? If your parent, your spouse or your child is looking back at you in that mirror- is **their** health and well-being worth the risk?

A few nights ago I was at work. I hugged a mom as she cried after learning of the cancer diagnosis of her child. For a multitude of reasons I am so mad at the thought of PSE coming at Bellevue with such force on this issue. What is the value of a life? Paying off a hedge fund? These people aren't part of our

community, and show no regard to those who are in it. What is the value of health? What is the value of you not being that mom or dad, grandma or grandpa, sibling or patient who I will take in my arms as YOU learn of that life altering medical diagnosis. Think about it.....

Kelly Bach

12519 NE 29<sup>th</sup> Street

Bellevue, WA

98005

425-861-7978

MARCH 2, 2016

To: Heidi Bedwell, Energize Eastside EIS Program Manager  
From: Kenneth Yamamoto

Dear Ms. Bedwell,

I am very concerned about Puget Sound Energy's "Energize Eastside" project, which proposes to build 18 miles of high-voltage transmission lines through four Eastside cities (Alternative 1A).

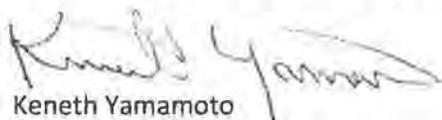
PSE tries to justify the need for the project using an impossible scenario that would cause regional blackouts, according to the Lauckhart-Schiffman Load Flow Study, available at CENSE.org.

Alternative 1A would place new lines and poles much too close to aging petroleum pipelines. Responsible safety standards require at least a 50 foot separation. A construction or operational accident could cause a catastrophic pipeline explosion like the one that killed three Bellingham residents in 1999. This risk is not adequately addressed in the EIS.

Alternative 2, the Integrated Resources Approach, is a safer and less costly alternative. But the solution described in the EIS was not developed or reviewed by independent experts that have suitable experience with modern electrical grid technologies, including Demand Side Management and Distributed Energy Resources. The costs and capabilities are based on inaccurate and obsolete studies. As the Northwest Power Council's Seventh Power Plan makes clear, a carefully developed plan would easily beat alternative 1A in cost, safety, and support for the environment.

The other transmission line options (1B, 1C, 1D and Alternative 3) are not practical for financial or political reasons.

Ratepayers are asked to spend more than a billion dollars over the lifetime of PSE's transmission line. The Draft EIS must answer these basic questions in order to convince residents that we are getting the best possible plan for our energy future.

  
Kenneth Yamamoto

4551 135<sup>th</sup> Ave. SE

Bellevue, Wa, 98006

**From:** Patricia M. <pamagnani@gmail.com>

**To:** Steve O'Donnell <sdofour@aol.com>

**Subject:** Fwd: Comments from Kim West, Area Maintenance Engineer, Olympic Pipeline, re: PSE EE proposal

**Date:** Tue, Feb 9, 2016 3:27 pm

**Attachments:** Letter\_from\_Kim\_West.docx (232K)

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Here it is!

----- Forwarded message -----

**From:** Patricia M. <pamagnani@gmail.com>

**Date:** Wed, Jul 16, 2014 at 11:27 PM

**Subject:** Fwd: Comments from Kim West, Area Maintenance Engineer, Olympic Pipeline, re: PSE EE proposal

**To:** Keith Collins <keithc@seanet.com>, Russell Borgmann <rborgmann@hotmail.com>, Steve O'Donnell <sdofour@aol.com>, "donmarshworks ." <don.m.marsh@gmail.com>

Hi all,

Attached is the Kim West letter for the Communication/Convince me tool kits. Great idea!

Patricia

**From:** [davidtedmonds@comcast.net](mailto:davidtedmonds@comcast.net)

**Subject:** Comments from Kim West, project manager for Olympic Pipeline

**Date:** February 26, 2014 at 9:43:11 PM PST

Hello Olympus residents, and Newcastle City Council Members and Employees:

There was a formatting problem with the previous message from Kim West, project manger for Olympic Pipeline. I have forwarded her comments to me in the enclosed attachment. She, along with District Operations Manager, Edward Cimaroli, were at the Olympus HOA meeting on Monday, February 24. PSE Vice President of Corporate Affairs, Andy Wappler, gave the presentation and answered questions from Olympus residents. When I asked what Olympic Pipeline thought about the project, we were told that we were out of time and they were unable to present their case in full. As you can see from the attached comments from Ms. West, Olympic has concerns about safety, impact upon landowners and customers. (Highlights are mine) It is interesting that PSE did not invite Olympic to be part of they Community Advisory Group process--when they clearly are a key player in this. It seems apparent that Olympic Pipeline is presenting an opinion that PSE did not want to be part of public discussion. I would urge Newcastle City Council members to call Ms, West or Mr. Cimaroli to find out more about their concerns--especially their safety concerns. If possible, I think if would be a good idea to have Olympic Pipeline to present information about their concerns of locating PSE's 230KV power-lines along the existing Olympic Pipeline at the next Newcastle City Council meeting.

Please forward these comments and Kim West's letter to anyone you think should see them.

Thank You  
David Edmonds  
CAG Representative, Olympus Newcastle  
[\(206\) 409-9417](tel:2064099417) (cell)

#### Olympic Pipeline Contact Information

Edward Cimaroli  
District Operations Manager  
Olympic Pipeline  
[edward.cimaroli@bp.com](mailto:edward.cimaroli@bp.com)  
[\(425\) 227-5213](tel:4252275213) (direct)  
[\(630\) 386-3241](tel:6303863241) (mobile)

Kim West  
Area Maintenance Engineer  
Olympic Pipeline  
[kim.west@bp.com](mailto:kim.west@bp.com)  
[\(425\) 981-2541](tel:4259812541) (direct)  
[\(425\) 864-1315](tel:4258641315) (mobile)

February 22, 2016

Ms. Heidi Bedwell, Senior Planner  
Land Use Division-Development Services  
City of Bellevue  
450 110<sup>th</sup> Ave. NE  
Bellevue, WA 98004

Dear Ms. Bedwell:

I am a homeowner in The Olympus Development, Newcastle, WA. My late husband and I worked hard and long to own and maintain our beautiful home. Now Puget Sound Energy propose to increase the voltage lines to 230kV voltage supported by steel monopoles that could reach 130 feet tall – this would be so close to my home it scares me to the point my health is effected.

Added into this nightmare of high voltage towers you have The Olympic Pipe Line sitting just a few feet under! The Olympic Pipe Line must be so concerned as they do not want a repeat of 1999 in Bellingham, WA. I am sure Olympic Pipe Line do not want to be responsible for deaths by excruciating burns. No one can say 100% that gas explosions will not take place – I don't know very many people who would want people to die because of corporate greed. How do you live with that on your conscience?

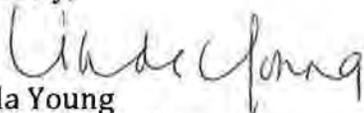
It has been proven that Puget Sound Energy's plan is not needed and really the big winner in all of this will be the foreign-based Hedge Fund in Australia. We the customers of Puget Sound Energy get to pay for this and also suffer huge consequences.

Have you read the 700 plus page Puget Sound Energy document where it even mentions that homes will have to be destroyed along with thousands of trees? Ms. Bedwell how would you like to see a bulldozer aiming for your home that is filled with memories? I had always thought The Eastside was proud of their trees and open spaces for people to enjoy.

Thousands of people will be affected by Puget Sound Energy's disastrous plans – these people matter, they create and maintain communities and they cannot be cast aside.

Have you read and studied the materials put together by CENSE? Brilliant minds and dedicated people who have given their time to make others see the folly of Puget Sound Energy's plans. Are you aware of the countless people who attend every meeting fighting against Puget Sound Energy? Don't we count for something? It is time to stop and re-think and not be pushed and bullied by a foreign owned company – after all last time I checked this is America and we are Americans.

Sincerely,



Linda Young  
12813 SE 80<sup>th</sup> Way  
Newcastle, WA 98056

Speaker # 6 Public Hearing Phase 1 DEIS  
Bellevue 3.1.16

March 1, 2016

Comments on Energize Eastside EIS

To: Heidi Bedwell, Program Manager

From: Lindy Bruce

I am Lindy Bruce, 13624 SE 18<sup>th</sup> St., Bellevue 98005 speaking tonight on behalf of the Sunset Community Assn. , which has six neighborhoods that border PSE's right-of-way in central Bellevue. I was an alternate to PSE's CAG and currently serve on the board of CENSE.

I wholeheartedly endorse the comments and recommendations of CENSE president, Don Marsh. While PSE consistently refused the CAG and the DEIS to consider need, we now have studies and comments suggesting fundamental questions of need, reliability and appropriate solutions have not been adequately addressed.

More specifically, I would like you to address some of the construction issues that will affect our neighborhoods if PSE's preferred Alternative 1A were to proceed. Here are a few facts for Segment E which runs through our neighborhoods:

1. The City of Bellevue Critical Hazards Map shows the ROW from SE 24<sup>th</sup> St. north to SE 2<sup>nd</sup> St as a Very Severe Soil Erosion Hazard. We already know that the neighborhoods lowest down the hill deal with underground streams that percolate down College Hill towards Richards Creek. These streams produced huge quantities of mud when Parkland Estates was built a few years ago.
2. The ROW is already occupied by Olympic Pipeline's 20" and 16" pipes that carry millions of gallons of jet and gasoline fuels per day to Seattle and Portland airports. Olympic Pipeline is currently under a Final Order to rectify deficiencies in their corrosion control program. PSE's 230kv lines produce EMF's that accelerate corrosion. [See Dr. Frank Cheng's comments "Safety of Co-location of Electric Power Lines and Pipelines" at CENSE.org. See DEIS Ch. 16.3.7]
3. When PSE rolled out Energize Eastside, they told us that the two sets of "H" poles would be replaced by a single monopole. Much later, they admitted one set of "H" poles might be retained. Later yet, at a neighborhood meeting, PSE's expert from Power Rangers Utility Consultants told us that wherever the pipeline is in the middle of the ROW, they would need a tandem set of the tall monopoles. The pipeline is in the middle of much of the ROW. BPA recommends poles should be at least 50' from pipelines
4. During construction, PSE must retain both sets of "H" poles to continue distributing electricity in Bellevue. So we will have 4 65-foot wooden poles, 2 85-135-foot steel poles and excavating equipment building cement support

bases for the poles. All this in an area with an aging, corroding pipeline and sodden soils, as well as homes and our neighborhood park. [See DEIS Ch. 16.6.1.3 See also DEIS Ch. 5.5.3.1.6 See also DEIS Ch. 11.6.3.5.3]. We don't yet know where they will stage all the materials and vehicles, but there's limited street access to the ROW.

5. For safety reasons, some parts of the entire ROW will have to be expanded by as much as 50 feet. Some homeowners have already been advised that their houses may be condemned or parts of their property will have to be added to the ROW. Uses on property near the 230kv lines can be restricted – again, for safety reasons. [See DEIS Ch. 10.7.3.1.2 See also Ch. 11.6.3.5.1]
6. The cause of the 1999 Olympic Pipeline explosion in Bellingham was traced to a 1 mm chip out of the pipe that occurred when a maintenance truck hit the pipe 5 years before the explosion. Our corridor will be crowded with poles, excavating machinery, construction equipment and pipelines. How long will we have to wait before we feel safe? [The Bellingham Herald, June 7, 2009]

Energize Eastside is a massive infrastructure project with enormous impacts for its 18-mile length. Even good intentions, careful engineering and adherence to code haven't prevented Brightwater, Bertha or even Sound Transit's tunnel digger, Pamela, from causing soil subsidence, gaping sinkholes and huge delays.

Are we really ready for those possibilities when our new information suggests that Alternative 2 can provide electrical reliability for less cost, has almost no adverse impacts on land use, housing, tree canopy, parks and schools, and has no new safety risks? [See DEIS Ch. 10.7.1].

I would like to see a specific study of all construction-related issues and any precedents for overburdening the ROW in a dense urban corridor as Alternative 1A would most certainly do.

Thank you.

Submitted at  
Kirkland public  
hearing 2-22-16.

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**From:** Loretta Lopez  
**Sent:** Friday, February 19, 2016 11:01 AM  
**To:** CHelland@bellevuewa.gov  
**Subject:** PSE Refusal to provide information

Carol,

Don Marsh has repeatedly asked for information from PSE. See the stream of email messages below. PSE has not provided the information.

The information Don Marsh is requesting is necessary for citizens to understand the basis of PSE's assertions. The City has a responsibility to require PSE to provide information to support its position that there is a need for the proposed project.

PSE refusal to respond to Don's question is unacceptable. PSE cannot assert that its position is true and expect citizens to accept without question.

We request that you, as the Environmental Coordinator for this EIS, require PSE to respond to Don's requests.

Thank you.

Loretta

**From:** Nedrud, Jens V [<mailto:jens.nedrud@pse.com>]  
**Sent:** Thursday, February 11, 2016 11:19 AM  
**To:** 'Don Marsh' <[don.m.marsh@hotmail.com](mailto:don.m.marsh@hotmail.com)>; Pravitz, Keri <[Keri.Pravitz@pse.com](mailto:Keri.Pravitz@pse.com)>  
**Cc:** [council@bellevuewa.gov](mailto:council@bellevuewa.gov); [BMiyake@bellevuewa.gov](mailto:BMiyake@bellevuewa.gov); [MKBerens@bellevuewa.gov](mailto:MKBerens@bellevuewa.gov)  
**Subject:** RE: Two questions regarding Eastside need

Don -

It is apparent from your response that we are at a point where continued email exchanges are not helpful. I have done my best to explain complex issues in a way that you can understand, and clearly that is not working. All the experts agree that the need has been established.

On other issues you may wish to engage in the public process - currently there is a public comment period for Phase I of the Draft Environmental Impact Statement in which you can participate - please see the cities' [EnergizeEastsideEIS.org](http://EnergizeEastsideEIS.org) website.

Sincerely,  
Jens

/

**Jens Nedrud, P.E.**

Senior Project Manager

**energizeEASTSIDE**

PUGET SOUND ENERGY

PO Box 97034, EST03W, Bellevue, WA 98009

d (425) 462-3818 | c (425) 533-5307 | [jens.nedrud@pse.com](mailto:jens.nedrud@pse.com)

The Energize Eastside project is undergoing environmental review, which includes preparation of a Washington State Environmental Policy Act (SEPA) Environmental Impact Statement (EIS). The City of Bellevue is leading the EIS process in cooperation with Kirkland, Newcastle, Redmond and Renton. The City of Bellevue and the coordinating jurisdictions published the Phase 1 Draft EIS on Jan. 28, 2016. The public comment period for the Phase 1 Draft EIS ends on Monday, March 14, 2016. For more information on the EIS and to submit comments to be included as part of the EIS and the public record, please visit [EnergizeEastsideEIS.org](http://EnergizeEastsideEIS.org).

**Please note:**

- The City of Bellevue is leading the SEPA EIS process. **No comments or questions submitted to Puget Sound Energy will be considered part of the EIS.** To submit comments as part of the EIS, please visit [EnergizeEastsideEIS.org](http://EnergizeEastsideEIS.org).
- For background information about the Energize Eastside project, please visit [pse.com/energizeeastside](http://pse.com/energizeeastside) or refer to the project's [Frequently Asked Questions](#).

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**From:** Don Marsh [<mailto:don.m.marsh@hotmail.com>]

**Sent:** Friday, January 29, 2016 8:25 AM

**To:** Nedrud, Jens V; Pravitz, Keri

**Cc:** [council@bellevuewa.gov](mailto:council@bellevuewa.gov); [BMiyake@bellevuewa.gov](mailto:BMiyake@bellevuewa.gov); [MKBerens@bellevuewa.gov](mailto:MKBerens@bellevuewa.gov)

**Subject:** RE: Two questions regarding Eastside need

Dear Jens,

Thank you for your lengthy (and quick) response. You have explained a bit of your methodology. However, there are still some things that are not made clear in your answers or the studies you mention:

1. Did you or your team personally review each of the 6.25 million contingency cases that you simulated to determine the system capacity line?
2. If not, how many of the cases were reviewed?
3. Was the system capacity determined by the worst case you observed, or did you combine some number of cases to calculate the capacity?
4. In any system that has a limited capacity, the limit is usually determined by one or two "weak links." For example, my car engine may be able to go 100 mph, but if my tires are only rated for 90 mph, that's as fast as my car can go. I must ask again, is the system capacity limited by the two 230 kV transformers that are overloading, or is there some other component of the system that is limiting the total capacity?

2

Your answers to these questions are important, because neither PSE, Quanta, Utility System Efficiencies, nor Stantec has described the methodology used to produce the result. If the need for the project is as obvious as you claim, and if the methodology is as solid as you imply, then we should be satisfied as soon as we know these details.

We seem to have different interpretations of the FERC ruling on our complaint. You have focused on one part of FERC's ruling, but we think the following conclusion is important: "The record before us shows that the Energize Eastside Project is located completely within Puget Sound's service territory, ... and that neither Puget Sound, nor any other eligible party, requested to have the project selected in the regional transmission plan for purposes of cost allocation; therefore, the project is not subject to the Order No. 1000 regional approval process." In other words, FERC dismissed the case at least partly because the commission lacked jurisdiction. FERC did not say PSE is correct in its assertion that it must transmit electricity to Canada under all conditions. In fact, FERC seems to think that the project will play no significant role in regional transmission.

Your email says PSE must participate in "regional power flows" that are not optional. Your consultant, Mark Williamson, told the Newcastle Planning Commission that the project has nothing to do with Canada, and that there are better ways to transmit energy to Canada than pushing it through the Eastside. Can you explain these apparent contradictions?

It is also puzzling to us that you seem unaware that the NERC Reliability Coordinator headquartered in Vancouver, Washington would cut power flows to Canada within minutes if an N-1-1 emergency occurred during peak winter loads. Do you assert that the coordinators responsible for grid reliability would force you to overload your transformers to continue transmitting a large flow of electricity to Canada when it isn't required to keep lights on in British Columbia?

Sincerely,

Don Marsh

**From:** Nedrud, Jens V [<mailto:jens.nedrud@pse.com>]

**Sent:** Thursday, January 28, 2016 4:24 PM

**To:** 'Don Marsh' <[don.m.marsh@hotmail.com](mailto:don.m.marsh@hotmail.com)>; Pravitz, Keri <[Keri.Pravitz@pse.com](mailto:Keri.Pravitz@pse.com)>

**Cc:** [council@bellevuewa.gov](mailto:council@bellevuewa.gov); [BMiyake@bellevuewa.gov](mailto:BMiyake@bellevuewa.gov); [MKBerens@bellevuewa.gov](mailto:MKBerens@bellevuewa.gov)

**Subject:** RE: Two questions regarding Eastside need

Don,

I am sorry you do not think we have answered your questions; I do know that we have discussed these very issues with you and your CENSE colleagues several times. Perhaps this is a case of not understanding the answers. Therefore, in an effort to explain our answers to you again, I have addressed each question below.

**Question 1:** "Is this capacity determined by adding the capacities of the two 230/115 kV transformers that would serve the Eastside in the event of an N-1-1 outage of the other two transformers?"

3

**ANSWER: The simple, non-technical answer is No.** The system capacity lines on the graph were NOT determined by the ratings of the two 230 kV transformers. They were determined from power flow studies as a result of simulating approximately 6.25 million contingencies. As we have previously discussed, the "system capacity" or "level of concern" shown on the graph relates to system performance primarily under N-1-1 or N-2 contingency conditions as required by federal mandates. After my colleagues met with John Merrill and Steve O'Donnell some time ago, you even acknowledged your understanding of this in emails you exchanged with us.

The system capacity range of 688 MW to 708 MW is based on power flow studies. PSE's power flow studies are conducted pursuant to mandatory federal regulations with the assistance of nationally recognized system planning experts using industry established study protocols. There is no simple "adding" of nameplate capacities of transformers in power flows studies. Power flow equations are non-linear which requires a numerical iterative solution to solve such equations. The equations use complex numbers (vectors), which include magnitudes and phase angles in determining the power flows.

Also, your continued insistence that PSE can eliminate the power flows to Canada shows your misunderstanding of electric system planning and its mandatory regulations. All regional power flows are included in the base cases from WECC and ColumbiaGrid. They are required to be included in PSE's load flow studies, as the electrical system serving the Eastside is part of the regionally integrated electric system. It is not optional. We have explained this to you numerous times and FERC agreed with our methodology in dismissing your complaint regarding our planning process.

**Question 2:** "...is about the "Customer Demand" level shown at approximately 580 MW in 2014. Is this number based on a measurement of the demand on the two transformers calculated by a load flow simulation of the N-1-1 contingency? Or is it the summation of loads on individual Eastside substations?"

**ANSWER: The 2014 customer demand value is NOT based on loads on the remaining two 230 kV transformers or the summation of loads on substation transformers.** Customer Demand value is a **forecasted** value; please note the chart is labeled as "Customer Demand Forecast." As we have explained multiple times, PSE's corporate load forecast process has been performed for many years and the results have served PSE customers well. Our forecasts are a complex econometric model that takes into account not just historical data but a variety of other inputs, such as information about regional and national economic growth, demographic changes, weather, prices, seasonality, and other customer usage and behavior factors. Growth data used in the studies were primarily provided by **third party agencies**, such as the PSRC and Eastside jurisdictions. The usage data appropriate to producing a valid electric load forecast is incorporated, along with all other appropriate forecasting data, in the PSE load forecast. The same data has been reviewed by Bellevue's consultant, Utility System Efficiencies, Inc. (USE), as part of the "Independent Technical Analysis of Energize Eastside" commissioned by Bellevue for reviewing the project. The result of their analysis is consistent with PSE's load forecasts and confirmed the need for the project.

To explain further, the data is split: Actuals in winter 2013-14 and Forecasted in winter 2014-15. You can see this more clearly in USE's report, page 33, Figure 6.19. Due to the split, PSE considers the graph you have attached for 2014 Customer Demand Forecast as a **Forecast**, and is labeled as such. To clarify

further, actuals for 2013 and before are noted in USE's Report on page 33. It is the actual peak loadings of substations on the Eastside. The specific list of substations and their peak loadings is confidential.

I cannot emphasize enough, the Forecasted customer demand is what we are required to use in meeting our mandatory federal planning requirements. Your list of questions regarding electric system planning and customer demand forecast leads me to believe you misunderstand the regulatory requirements regarding how utilities study and plan electric power systems. You appear to be confusing the operation of the electric system with planning of the electric system. PSE is required to comply with mandatory planning standards, which includes planning to **Forecasted numbers**. Independently, PSE's electrical operations department operates the system on a day-to-day basis based on actual conditions and expected load levels.

Regarding your request for experts to see the data and results, this has been accomplished. Multiple experts in power system engineering and transmission planning have reviewed, studied and confirmed the need for this project. Five total studies have been completed, three of which were publically funded. USE, Bellevue's analyst, was one of those five and not only reviewed PSE's studies (as mentioned previously in this response) but also performed studies of their own which showed there was a clear need for the project, and even if you change some of the assumptions, there are still overloads.

As previously stated, the Federal Energy Regulatory Commission (FERC), dismissed your complaint and determined that PSE complied with the mandatory federal requirements in evaluating the Energize Eastside project. In short, the experts have reviewed the studies and confirmed that the project is needed.

I truly hope this provides some clarity for you.

Sincerely,

Jens

**Jens Nedrud, P.E.**

Senior Project Manager

energize**EASTSIDE**

PUGET SOUND ENERGY

PO Box 97034, EST03W, Bellevue, WA 98009

d (425) 462-3818 | c (425) 533-5307 | [jens.nedrud@pse.com](mailto:jens.nedrud@pse.com)

The Energize Eastside project is undergoing environmental review, which includes preparation of a Washington State Environmental Policy Act (SEPA) Environmental Impact Statement (EIS). The City of Bellevue is leading the EIS process in cooperation with Kirkland, Newcastle, Redmond and Renton. For more information on the EIS, please visit [EnergizeEastsideEIS.org](http://EnergizeEastsideEIS.org).

**Please note: Inquiries made to Puget Sound Energy will not be included as part of the EIS process.**

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**From:** Don Marsh [<mailto:don.m.marsh@hotmail.com>]

**Sent:** Tuesday, January 26, 2016 10:11 AM

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**To:** Nedrud, Jens V; Pravitz, Keri  
**Cc:** [council@bellevuewa.gov](mailto:council@bellevuewa.gov); [BMiyake@bellevuewa.gov](mailto:BMiyake@bellevuewa.gov); [MKBerens@bellevuewa.gov](mailto:MKBerens@bellevuewa.gov)  
**Subject:** RE: Two questions regarding Eastside need

Dear Jens,

Your reply did not answer our specific questions.

We are asking to what extent the system capacity line is determined by the ratings of the two operational transformers. We are also asking what the **2014** customer demand value is based on: loads on the remaining two 230 kV transformers or the summation of loads on substation transformers?

The answers to these questions are not contained in your previous replies or the studies you mentioned. Bellevue's analyst, USE, performed a load flow study that showed four of the five overloads identified in the Quanta study were eliminated if 1,500 MW of energy transmitted to Canada were removed from the study assumptions. Other than that interesting finding, USE only examined the *process* used to produce the Eastside Needs Assessment, not the underlying *data*. Stantec performed no independent analysis of the data, but again rubber-stamped the process.

The questions we ask are practically the most basic questions that one can ask about this graph. They should not be hard to answer.

The ratepayers who will pay nearly a billion dollars for this project over the next 40 years deserve to understand the case you are making for the need. If you believe the data and the methodology are too complex for us to understand, you must allow our experts to verify that.

**Please respond more precisely or grant our experts clearance to see your data.**

Sincerely,

Don Marsh

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**From:** Nedrud, Jens V [<mailto:jens.nedrud@pse.com>]  
**Sent:** Monday, January 25, 2016 12:43 PM  
**To:** 'Don Marsh'; Pravitz, Keri  
**Cc:** [council@bellevuewa.gov](mailto:council@bellevuewa.gov); [BMiyake@bellevuewa.gov](mailto:BMiyake@bellevuewa.gov); [MKBerens@bellevuewa.gov](mailto:MKBerens@bellevuewa.gov)  
**Subject:** RE: Two questions regarding Eastside need

Don,

Perfect timing, I was just hitting send on my response. Regarding your latest inquiry, our team has provided responses to these same questions for you in the past; the answers have not changed.

As we previously told you, the "system capacity" or "level of concern" shown on the graph relates to system performance primarily under N-1-1 or N-2 conditions as required as part of the federal mandates. The N-1-1 and N-2 system capacity level is dependent on system conditions and system topology as it is anticipated to exist at the time of modeled contingencies. This is explained in the Needs Assessment. The usage data appropriate to producing a valid electric load forecast is incorporated,

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along with all other appropriate forecasting data, in the PSE load forecast. The same data has been reviewed by Bellevue's consultant U.S.E. as part of the "Independent Technical Analysis of Energize Eastside" commissioned by Bellevue for reviewing the project. The result of their analysis is consistent with PSE's load forecasts and confirmed the need for the project.

And, as we have previously advised you many times, the customer demand you ask about is "Customer Demand Forecast." PSE's corporate load forecast process has been performed for many years and the results have served PSE customers well. As we have discussed before, the process utilizes historic data and the latest information available at the time as well as captures achievable conservation potential. Growth data used in the studies were primarily provided by third party agencies, such as the PSRC and Eastside jurisdictions. PSE's studies are conducted pursuant to mandatory federal regulations with the assistance of nationally recognized system planning experts using industry established study protocols. As you also may know, the Federal Energy Regulatory Commission confirmed this in its ruling in dismissing CENSE's complaint and stating PSE complied with the transmission planning responsibilities in proposing and evaluating the Energize Eastside Project.

The need for Energize Eastside has not changed; the need is driven by PSE's responsibility to comply with federal rules. Five studies have been completed – two by PSE and three by independent consultants – that all confirm the need for the Energize Eastside project.

Respectfully,

Jens

**Jens Nedrud, P.E.**

Senior Project Manager

energize**EASTSIDE**

PUGET SOUND ENERGY

PO Box 97034, EST03W, Bellevue, WA 98009

d (425) 462-3818 | c (425) 533-5307 | [jens.nedrud@pse.com](mailto:jens.nedrud@pse.com)

The Energize Eastside project is undergoing environmental review, which includes preparation of a Washington State Environmental Policy Act (SEPA) Environmental Impact Statement (EIS). The City of Bellevue is leading the EIS process in cooperation with Kirkland, Newcastle, Redmond and Renton. For more information on the EIS, please visit [EnergizeEastsideEIS.org](http://EnergizeEastsideEIS.org).

**Please note: Inquiries made to Puget Sound Energy will not be included as part of the EIS process.**

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**From:** Don Marsh [<mailto:don.m.marsh@hotmail.com>]

**Sent:** Monday, January 25, 2016 12:39 PM

**To:** Nedrud, Jens V; Pravitz, Keri

**Cc:** [council@bellevuewa.gov](mailto:council@bellevuewa.gov); [BMiyake@bellevuewa.gov](mailto:BMiyake@bellevuewa.gov); [MKBerens@bellevuewa.gov](mailto:MKBerens@bellevuewa.gov)

**Subject:** RE: Two questions regarding Eastside need

Dear Jens and Energize Eastside team,

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Seven days ago, I sent you two basic questions about a graph showing the Eastside Customer Demand Forecast. This is the graph PSE has been used to illustrate the need for Energize Eastside for the past two years. It still appears on the Energize Eastside website today:

<http://www.energizeeastside.com/need>.

I am puzzled why I haven't received a response. No acknowledgment of my email. No estimate of when you will provide answers. Just silence.

Since this graph is fundamental to our understanding of the project need, it is important for people to know what they're looking at. We need a level of transparency and critical review that has not yet happened. We have asked PSE to allow well-qualified industry experts engaged by CENSE to examine your data and verify that the need exists. Only then can we be satisfied that this project (or a less expensive, less damaging alternative) benefits the Eastside.

Sincerely,

Don Marsh, President  
CENSE.org

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**From:** Don Marsh [<mailto:don.m.marsh@hotmail.com>]

**Sent:** Monday, January 18, 2016 8:49 AM

**To:** 'Nedrud, Jens V'; 'Pravitz, Keri'

**Cc:** [council@bellevuewa.gov](mailto:council@bellevuewa.gov); [BMiyake@bellevuewa.gov](mailto:BMiyake@bellevuewa.gov); [MKBerens@bellevuewa.gov](mailto:MKBerens@bellevuewa.gov)

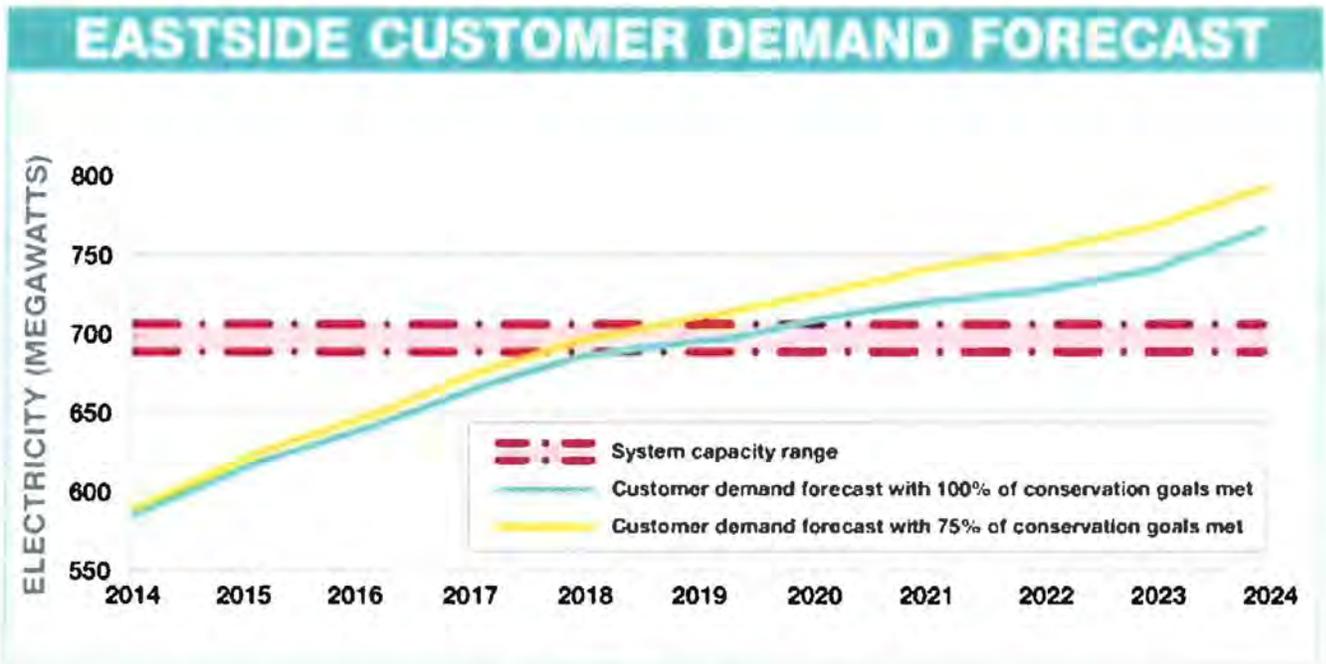
**Subject:** Two questions regarding Eastside need

Dear Jens and Energize Eastside team,

In preparation for the release of the Draft EIS later this week, we have two basic questions regarding the Eastside Customer Demand Forecast. I am copying council members and the city manager on this email, so we can all appreciate the timeliness and thoroughness of your response.

Our first question is about the "System Capacity" line shown at approximately 700 MW in this graph:

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Is this capacity determined by adding the capacities of the two 230/115 kV transformers that would serve the Eastside in the event of an N-1-1 outage of the other two transformers?

Our second question is about the “Customer Demand” level shown at approximately 580 MW in 2014. Is this number based on a measurement of the demand on the two transformers calculated by a load flow simulation of the N-1-1 contingency? Or is it the summation of loads on individual Eastside substations? If so, which substations were included in this summation? Were those loads measured on a particular date, or calculated as a peak or average of some number of samples?

We seek timely answers to these questions of methodology because we have a limited time to comment on the Draft EIS after it is issued this week. As you know, this phase of the EIS establishes the need for the project and the viability and desirability of project alternatives. Transparent information is needed so that all stakeholders can be sure we are appropriately addressing our need for reliable power and properly evaluating solutions that maximize cost effectiveness and environmental responsibility.

Sincerely,

Don Marsh, President  
CENSE.org

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Submitted Renton Phase 1  
DEIS public hearing 2.25.16

FROM: Lori Elworth  
TO: Eastside City Councils  
DATE: 25 February, 2016  
RE: Energize Eastside DEIS Public Comment

One aspect of the project that has not been addressed in the DEIS is the need. It states on page 1-56 that the purpose of the DEIS is not to determine that the project is needed as if that is a given however I question that claim and believe that PSE has done a poor job establishing the necessity of the Energize Eastside project.

CENSE a citizens group asked nationally recognized power and transmission planners Richard Lauckhart and Roger Schiffman who have specific knowledge of the Northwest power grid to study this project. On November 18, 2015 they concluded their study of the project titled *Load Flow Modeling for Energize Eastside*. The study found that the current system has sufficient capacity and will continue to meet customer demands until the year 2058, without any improvements. Unless PSE can offer a legitimate explanation for where they got their assumptions, and why they claim that customer demand will exceed the system capacity in 2018 then the need remains in question. This project should be paused until need is demonstrated.

Continuing on with a project without a need established is a pointless exercise that serves no purpose other than to waste the time of the cities and tax payer money.

My question for the City Councils is why was the need not addressed in the DEIS and in light of recent conflicting studies will a independent Load Flow Study be performed?

Thank you for your time,



Lori Elworth  
8605 129th Ct SE  
Newcastle, WA 98056

Comments at Redmond Public  
Hearing DEIS 2.29.15

FROM: Lori Elworth  
TO: Eastside City Councils  
DATE: 29 February, 2016  
RE: Energize Eastside DEIS Public Comment

My comments tonight are directed mainly at Alternative 1, option A. I live with my husband and our two kids just a few miles from where we grew up in Newport Hills, and where our parents still live. The PSE/Olympic Pipeline corridor ~~has~~ allows us to easily walk and bike over to their houses while avoiding the busy streets and traffic along Coal Creek Parkway. My 90 year old mother takes advantage of the corridor to go on 4 mile round trip walks to the Newcastle Safeway. She has been doing this daily for the last 25 years, and it has helped her remain in excellent health. But we are not the only people who enjoy use of the utility corridor. Countless other families, bikers, dog walkers, and even some horse riders all can be found out and about getting their exercise along the pipeline at all times of the day.

The utility corridor is a significant part of the Newcastle trail system. Every resident that enjoys making use of it will be negatively impacted by any restrictions of access that the Energize Eastside project will cause. The DEIS fails to adequately or reasonably address how much this project will adversely affect these people. We live in a hilly area that sees more and more traffic every day. The flat, sheltered trail that is the corridor is a blessing for senior citizens, people with young children or strollers. I know this first hand. I have lived here my entire life.

Never mind all the beautiful trees that will be destroyed, and the many houses that will need to be condemned to ensure that the power lines are installed at a safe distance from the gas pipeline. This unnecessary project will destroy some of the neighborhood character that makes this area a great place to live.

Thank you,



Lori Elworth  
8605 129th Ct SE  
Newcastle, WA 98056

FROM: Lori Elworth, CENSE Member  
TO: Eastside City Councils  
DATE: 11 March, 2016  
RE: Energize Eastside DEIS Written Public Comment

I am a current resident of the Olympus neighborhood in Newcastle, where I have lived with my husband for 28 years. We chose to live in a new housing development, where we could be close to our families and raise our children. I grew up in Bellevue and have lived on the Eastside my whole life. This is our home. Please see attached pictures.

### **DEIS FACT State of Washington Department of Ecology**

*Q: Are there page limits for an EIS?*

*A: Yes, the text of an EIS shall not exceed 75 pages, except for proposals of unusual scope or complexity, which shall not exceed 150 pages [WAC 197-11-425(4)]. If appendices and background material exceed 25 pages and together the entire EIS would exceed 100 pages, they must be bound in a separate volume.*

Energize Eastside DEIS is 715 pages.

**PSE's preferred plan Alternative 1 Option A, Energize Eastside** is a **230kV extra high voltage** electric transmission line replacing the existing wooden poles of 115kV high voltage power lines with metal poles 85'- 100' in height (essentially lightning rods). These new metal poles would require footings 24'- 50' deep along a shared easement with two aging high pressure jet-fuel gas pipelines.

**230kV extra high voltage electric transmission lines which are used for long distance, very high power transmission.** 230kv high voltage electric transmission lines should not be installed next to an aging high pressure jet-fuel pipeline operated by Olympic Pipeline Company (OPC). The OPC has a number of safety violations currently. Does the city investigate these safety standards? What is being done about current violations?

230kV high voltage electric transmission lines should not be installed in a highly densely populated housing area through neighborhood communities and schools. Does the city have knowledge of other cities of similar living standards (city in a park) allowing this?

To safely collocate 230kV electric powerlines with two high pressure jet-fuel gas pipelines should be determined. Who will determine this? What are the set-backs used to safely collating these utilities within a residential neighborhood? CENSE has provided the report "*Safety of Collocation of Electric Power Lines and Pipelines*" by Dr Frank Cheng. There is extensive testing that should be done to assure this to be safe.

**DEIS Fact Sheet FS-1** Project Description states the purpose of this project is to address a projected deficiency in transmission capacity resulting from growth in electrical demand, which could affect the future reliability of electrical service for the Eastside. This statement is not factual and should not be stated as such.

### **DEIS Construction Timing For The Project FS-iii**

PSE studies show that Eastside customer demand will reach a point when the capacity of electric transmission system on the Eastside could experience a deficiency as early as winter 2017 -2018. To be an effective solution, a project must be completed and in service by identified target need date. This statement is not factual and a matter of opinion. An audit should be done to determine the demand forecast. A DEIS must be factual and scientific. This is another statement that doesn't belong here unless it has been properly determined, this states what PSE's studies show. The timing for Energize Eastside will not meet the objective. Today's date is 3/11/16.

**DEIS Chapter 1 Introduction and Summary** I do not understand the purpose and need statement in the DEIS. The need for Energize Eastside is questionable. If there isn't a need, then the purpose is irrelevant. It is important to have facts. The process must be unbiased. I understand that the city of Bellevue is the lead agency of the five cities involved. Bellevue is responsible for making the EIS an unbiased process. I have the understanding that all of my questions will be answered in this SEPA process by Senior Planner Heidi Bedwell. Providing effective comments requires the public to understand the purpose and need, and the responsibilities of the lead agency, the city of Bellevue. I have read this 716 page document. My comments are relevant as a property owner, concerned citizen, and rate payer of PSE.

**DEIS Chapter 1 What is Purpose and Need?** 1.3 *This EIS will not be used to reject or validate the need for the proposal. Rather, the EIS is intended to identify alternatives that could attain or approximate PSE's objectives at a lower environmental cost.* I am on the Executive Board of CENSE. I agree with, and attach my name to the public comments of supporters of cense.org. This grassroots effort has spent many hours of volunteer time providing review and comment on PSE studies. Bellevue EIS, Bellevue Comp Plan; and providing education and outreach through community meetings, testimonials, talking with neighbors, and lobbying. CENSE hired technical, legal and PR experts. Their expertise expanded our knowledge and credibility on complex issues. CENSE has submitted EIS and EQL documents, and the *Lauckhart Schiffman Load Flow* study. CENSE will continue to pursue the best for *Eastside*. 1-2 *Eastside Customer Demand Forecast* on page 1-6 represents an assumption by PSE (10 years, 2014- 2024) The *Lauckhart Schiffman Demand Forecast* graph shows the System capacity (from transformer capacity) above 900 megawatts with the demand growth well under this capacity over the same ten year period from 2014- 2024. These Demand Forecasts are very different. Will the city of Bellevue have an *independent* load flow study done, not a load flow study using numbers given by PSE (as in the case before), to determine the need? Continuing on a project without a need established is a pointless exercise that serves no purpose other than to waste the time of cities and tax payer money. I keep coming back to need because it is important. To comment effectively on a DEIS the public must understand the purpose and the need.

**DEIS Chapter 2 Project Alternatives** Alternative 1 Option A is PSE's preferred option and very expensive. There were so many alternatives in scoping. We live in a beautiful parklike area populated by educated, forward thinking people. The *7th Northwest Power Plan* released by *NW Energy Council* published 2/10/16 and an article in *The Seattle Times* dated 02/16/16 *Forecast: Conservation can meet most NW Power Needs* confirms we can look ahead to the near future and plan to save power and money. CENSE believes this can be done by an integrated approach on the Eastside. We can maximize cost effective energy efficiency with the proper alternatives. Alternatives mentioned in the DEIS just aren't using the technologies that are both effective and forward thinking. Alternative 1 Option A is old technology and expensive. Alternative 2 has not been designed well, done properly the integrated research approach is a much better solution. An article in *Consumer Reports* magazine "Power Struggles- Energy efficiency is good for the planet and your wallet, but behind the scenes, industry forces want consumers to foot the bill for lost revenues", issue date of October 2015. Instead of building massive infrastructure utilities are working with their communities and regulators to come up with innovative solutions. Utilities can be forward thinking with new technologies. This seems a better fit for our Eastside cities. We are diverse, intelligent, and technology motivated. Bellevue has the opportunity and resources to think

globally and act locally. A citizens group, CENSE, a grassroots effort with environmental awareness. CENSE has found answers by engaging with industry experts. Unfortunately a few questions asked of PSE about their demand forecast have remained unanswered.

**DEIS Chapter 3 Earth** The Seattle Fault-line is less than five miles from our neighborhood. The high pressure gas pipelines and the electric power lines running parallel in a shared corridor cross perpendicular to the the fault-line The height of 130 foot pole, the weight and size of the lines, with 230kv of power next to an aging pipeline going through any community in range of this earthquake zone is not safe. An earthquake could occur anytime and liquefaction through the Eastside needs to be properly evaluated. There is significant risk in this area. At the Newcastle Public Comment meeting on 2/27/16 public comments spoke of this concern. Steve O'Donnell, CENSE has also referred to the significance of earthquakes and safety.

**DEIS Chapter 4 Greenhouse Gas Emissions** Alternative 1 Option A creates a permanent clear zone. The elimination of 18 miles along the route. Trees, 8000 mature trees are not easily replaced. The vegetation and undergrowth will suffer. Trees reduce our emissions. The quality of our air will suffer. We need trees, large trees, to reduce emissions. The carbon dioxide is absorbed by these 8000 trees. The DEIS implies there is no significant or unavoidable adverse impacts because carbon credits can be purchased and more vegetation will be planted. This is not a true statement. Small trees do not replace large mature trees. The DEIS fails to adequately address the value of trees. The city of Bellevue has the responsibility to protect and to demonstrate ownership of it's city in a park concept. The clear zone would destroy many trees. Please take the lead in adequately placing value on our beautiful trees.

**DEIS Chapter 5 Water Resources** Alternative 1 Option A The terrain in Newcastle is sloping along the easement and a few streets are down slope from the easement. There are properties along 129th St SE in Olympus constantly draining water, underground streams of water, or groundwater as referred to in the DEIS. At the time of construction the basements of two homes were flooding due to the constant flow of groundwater, where the easement runs parallel to the two streets. This would be a problem area. The DEIS refers to this as insignificant and will use "best management practices". Digging and placing the foundations for the metal poles can change the flow of groundwater. It bothers me that construction negligence could cause the groundwater to flood homes.

5.5.3.1.6 Potential Pipeline Damage. The DEIS considers this unlikely due to to the measures that PSE and the pipeline operator employ. Is the city of Bellevue aware of the violations each of these companies have on record in Washington. This is not at all reassuring. Neither of these companies are safe. Significant adverse effects depending on how large the rupture.

**DEIS Chapter 6 Plants and Animals** Alternative 1, Option A The impact of significance.

**DEIS Chapter 7 Energy -Natural Resources** Alternative 1, Option A The impact of significance.

**DEIS Chapter 8 Environmental Health** Alternative 1, Option A is not safe. The 50 foot corridor owned by the Olympus Homeowners and the 25' easement into private properties on either side totals 100 feet. There are two aging gas pipelines, one of the two gas pipes is located in the center of the easement between our homes. These pipelines pump jet fuel 1000-pounds-per square-inch pressure in this shared easement. This is the same aging

pipeline which exploded in Bellingham in June 1999 killing three people. The placement of new 100 foot metal 230kV high voltage electric power poles has not been determined. The Olympic Pipeline Company representative at the Olympus Homeowners Association meeting on 2/24/2015 stated they were not at all in favor of the construction of PSE's Energize Eastside project on this easement corridor co-located with the gas pipeline. An email from Olympic Pipeline by Kim West to Dave Edmunds of Olympus was read at the Public Scoping meeting in Renton on 5/14/15 and entered into the record by my neighbor Sue Stronk. A report by Dr Frank Cheng, an expert in Pipeline Engineering, report on "Safety of Collocation of Electric Power Lines and Pipelines" dated 2/15/16. This document was submitted to the record by CENSE and further validates PSE's preferred plan is not safe.

**DEIS Chapter 9 Noise** Alternative 1, Option A, I have heard the sound of buzzing, corona discharge, from the 230kV powerlines on a foggy day. Some people are more sensitive to this noise. It is very annoying and doesn't belong in a densely populated area. Neighborhood character is important to uphold. The corona discharge isn't going to occur everyday but with the moist climate in the pacific northwest it does happen frequently. There are people who avoid outdoor activity anywhere near the 230kV high voltage powerlines due to the corona discharge. This would be significant impact if this was near my home. The DEIS 9.6.3.1.1 finds the corona noise to be negligible. I disagree as I am sensitive to the buzzing sound.

**DEIS Chapter 10 Land use and Housing** Alternative 1, Option A It bothers me property and homes in my neighborhood of Olympus will be destroyed to make room for a PSE's Energize Eastside project when the need has not been determined. This should be vetted properly and transparently. PSE is promoting a scheme to make money. The numbers don't correspond to the trend of energy use. Safety is also a concern. PSE has changed the numbers again. The Tables 1-2, and 1-3 Construction Impacts Comparison on page 1-50 and page 1-51 Question: Is a No-Action Alternative Impact Negligible? That is wrong and not fact. Question: Is Alternative 1, Option 2 Impact Minor or Moderate? This chart has assumptions, not factual. These are opinions that do not belong in an EIS. Table 1-3 Operation Impacts page 1-53 showing the No Action Alternative has minor or moderate impacts. This is questionable. These appear to be opinions.

10.7.1 Alternative 1 Option A Will have **significant** adverse land use and housing impacts.

10.7.3.1 Alternative 1 Option A States the impact could range from **minor to significant** depending on location.

10.7.3.1.2. Alternative 1 Option A Using an existing corridor may require widening to accommodate the new utility; up to 50 feet of additional clear zone would be needed through the corridor. This could require removal of some structures (houses). **High** consequence land use, if located in the vicinity of a hazardous liquid pipeline, would present **an unusually high** risk in the event of a pipeline failure.

Alternative 1 Option A has either **significant or high consequence** and is PSE's preferred plan.

**DEIS Chapter 11 Views and Visual** Alternative 1, Option A Table 1-2 Construction Impacts Comparison and Table 1-3 Operation Impacts Comparison A "clear zone" with an 130 ft Electric Fence along 18 miles of the Eastside will be a significant visual impact from the territorial view standpoint. This will make a scar on the view looking from the SpaceNeedle east or Mt Si west. It will be noticeable for years as the "clear zone" will remain bare of trees. The Eastside, with the reputation of being parklike will appear more prison-like, industrial blight might be a better term.

**DEIS Chapter 12 Recreation** Alternative 1, Option A -My husband and I chose our home in Newcastle for the location on the Eastside. We have lived on the Eastside since the early 1960's. Our parents, our children's grandparents, live in the houses we grew up in just a few miles from us in Newport Hills. We often walk or bike the five mile round trip, much of this along the shared corridor of our Olympus Trail system.

Picture attached: Olympus Trail

Alternative 1 Option A would have **significant** impacts on our trail in Olympus. This is a trail used daily by residents. 230kV lines buzz when there is moisture in the air which is frequent in this area. The trail is heavily lined with trees and shrubs and according to the DEIS this area would be widened and cleared impacting the beautiful maintained trail used daily. Imagine an 18 mile clear zone, 150' wide destroying the Eastside making room for the electric infrastructure resembling a prison fence.

**DEIS Chapter 13 Historic and Cultural** Alternative 1, Option A

Where in the DEIS is it addressed how to work around the Historic Newcastle Cemetery? Newcastle has a rich history, it is one of the oldest cemeteries in our area. The corridor passes on a hilly terrain above where it slopes down toward the cemetery. In consideration of families that would be effected by disturbances or impacts at the burial ground of relatives and loved ones buried there, will they be notified? Who notifies them? How will they be notified?

**DEIS Chapter 14 Transportation** Alternative 1, Option A, How does the 18 mile project get divided so the significant unavoidable adverse impacts are properly, and appropriately mitigated? How and when will the new poles (80- 130' metal poles) be transported? This is a concern.

**DEIS Chapter 15 Public Services** Alternative 1, Option A Safety is a number one concern. There have been three gas leaks in as many days recently (Greenwood, Lynnwood, and Tukwilla). In Greenwood there was a huge explosion which sent seven fireman to the hospital. The firefighters were waiting for PSE to arrive at the scene because they are the experts and it is up to them to shut off the gas. Our first responders are put at risk. The emergency response time for PSE and the Olympic Pipeline Co is critical. What are the safety measures?

**DEIS Chapter 16 Utilities** Alternative 1, Option A The 230kV poles are 4-8' diameter and extend approximately 25-50 ' deep. DEIS 16.6.3.1.2 Accidental Disruption -If a gas ruptures during construction due to an accident there would be a disruption of service. This seems relevant but the DEIS downplays the significance of this because PSE and OPLC follow industry standards and regulatory requirements.

**DEIS 16.6.3.2.1 Utility Conflicts and Service Disruption Rebuilding of the Maple Valley-SnoKing 230kV** ColumbiaGrid's preferred Maple Valley SnoKing reconductor project option. Why did PSE scrap that plan and decide "Energize Eastside" was the need? Is it more profitable? Is this PSE's need and purpose. I have a feeling MOB could shed some light on that one. MOA Contract #11TX-15450 page 5 of 12 (d) *Preferred Plan Project Not Planned for Construction Based on the Construction of the Puget Preferred Plan Projects* document negates the need for the construction of the Maple Valley to SnoKing Reconductor Project. This was the original plan of PSE back in 2010 when the first "Energize PSE" preferred plan was being planned.

**DEIS Alternative 2: Integrated Resource Approach** demonstrates a lack of knowledge or thoughtful consideration to develop an adequate alternative. There are new technologies being used elsewhere and this alternative doesn't expertise or experience to properly

Is PSE regulated? The UTC partially regulates them. As far as need and design of the Energize Eastside proposal PSE appears to be unregulated. FERC has determined Energize

Eastside is a "local" project and decisions regarding the project are left with the city of Bellevue, and ultimately PSE.

Safety is the number one concern. During the scoping public comments there were a number of people concerned with Safety. PSE's spokesperson, Mark Williamson from Wisconsin has told the Newcastle City Council that it is safer to collocate PSE's electric powerlines with the Olympic Pipeline Company gas pipelines. PSE has had several occurrences over the last three days of a pipeline explosion due to gas leak in the Greenwood area of Seattle, the powerline falling down and causing the fire of two homes in Lynnwood, and the gas leak at the mall in Tukwilla.

The City of Newcastle issued a moratorium. Safety is a concern for Newcastle residents and the city.

The DEIS Chapter 1.14 Figure 1-7 *Environmental Impact Statement Process* Why does the city not issue a final draft for Phase 1 of the EIS before Phase 2 begins? CENSE has requested of the city to finalize Phase 1. Is it common for the city of Bellevue to process an EIS in this manner? Has this schedule been done before where Phase 2 begins before there is a final of Phase 1? This is clearly in favor of PSE, and therefore biased. CENSE has requested the city to pause. The Bellevue City Council has asked some really good questions. I have attend many of the meetings. At the meeting of 2/22/16 I watched as the council asked questions of the staff. It bothers me they are not making comments because the city staff has told them not to comment. Has the council engaged legal council on this? There has been questions by the council at other meetings and I am not sure if the city staff has followed up their questions with answers. The DEIS does not support the need statement, the housing impact is not fully disclosed, impact of pipeline induced AC corrosion mitigation completely ignored. Can at the city substantiate the unsupported assertions in the DEIS. Get the facts and the not opinions of PSE. The DEIS does not meet the criteria set forth by the state.

PSE's recommendation Alternative 1, Option A does not demonstrate improvements in reliability. The comp plan must demonstrate improvement in reliability and cost benefit. Impacts are detrimental to the public (cost, lost homes, safety, blight/view "city in a park", and property value).

~~W. Elworth [elworth@comcast.net](mailto:elworth@comcast.net)~~  
Subject: 3-10-16 Olympus Elworth Home Newcastle  
Date: March 11, 2016 11:07:54 AM PST  
~~W. Elworth [elworth@comcast.net](mailto:elworth@comcast.net)~~  
1 Attachment, 2.8 MB

FIGURE 1



From: ~~Jon Elworth <jelworth@comcast.net>~~  
Subject: **3-11-16 Olympus Trail shared easement between Neighbors (Elworth Home)**  
Date: March 11, 2016 11:11:50 AM PST  
To: ~~Jon Elworth <jelworth@comcast.net>~~  
▶ 1 Attachment, 2.5 MB

*FIGURE 2*



FROM: Lori Elworth  
TO: Eastside City Councils  
DATE: 25 February, 2016  
RE: Energize Eastside DEIS Public Comment

*CENSE member Jle*

One aspect of the project that has not been addressed in the DEIS is the need. It states on page 1-56 that the purpose of the DEIS is not to determine that the project is needed as if that is a given however I question that claim and believe that PSE has done a poor job establishing the necessity of the Energize Eastside project.

CENSE a citizens group asked nationally recognized power and transmission planners Richard Lauckhart and Roger Schiffman who have specific knowledge of the Northwest power grid to study this project. On November 18, 2015 they concluded their study of the project titled *Load Flow Modeling for Energize Eastside*. The study found that the current system has sufficient capacity and will continue to meet customer demands until the year 2058, without any improvements. Unless PSE can offer a legitimate explanation for where they got their assumptions, and why they claim that customer demand will exceed the system capacity in 2018 then the need remains in question. This project should be paused until need is demonstrated.

Continuing on with a project without a need established is a pointless exercise that serves no purpose other than to waste the time of the cities and tax payer money.

My question for the City Councils is why was the need not addressed in the DEIS and in light of recent conflicting studies will a independent Load Flow Study be performed?

Thank you for your time,

Lori Elworth  
8605 129th Ct SE  
Newcastle, WA 98056

FROM: Lori Elworth  
TO: Eastside City Councils  
DATE: 29 February, 2016  
RE: Energize Eastside DEIS Public Comment

*CENSE member lde*

My comments tonight are directed mainly at Alternative 1, option A. I live with my husband and our two kids just a few miles from where we grew up in Newport Hills, and where our parents still live. The PSE/Olympic Pipeline corridor has allows us to easily walk and bike over to their houses while avoiding the busy streets and traffic along Coal Creek Parkway. My 90 year old mother takes advantage of the corridor to go on 4 mile round trip walks to the Newcastle Safeway. She has been doing this daily for the last 25 years, and it has helped her remain in excellent health. But we are not the only people who enjoy use of the utility corridor. Countless other families, bikers, dog walkers, and even some horse riders all can be found out and about getting their exercise along the pipeline at all times of the day.

The utility corridor is a significant part of the Newcastle trail system. Every resident that enjoys making use of it will be negatively impacted by any restrictions of access that the Energize Eastside project will cause. The DEIS fails to adequately or reasonably address how much this project will adversely affect these people. We live in a hilly area that sees more and more traffic every day. The flat, sheltered trail that is the corridor is a blessing for senior citizens, people with young children or strollers. I know this first hand. I have lived here my entire life.

Never mind all the beautiful trees that will be destroyed, and the many houses that will need to be condemned to ensure that the power lines are installed at a safe distance from the gas pipeline. This unnecessary project will destroy some of the neighborhood character that makes this area a great place to live.

Thank you,

Lori Elworth  
8605 129th Ct SE  
Newcastle, WA 98056

*See Trail*



FROM: Lori Elworth  
TO: Eastside City Councils  
DATE: 1 March, 2016  
RE: Energize Eastside DEIS Public Comment

*CENSE member  
Lori Elworth*

I'm bothered by the DEIS claims that the need for the project has already been determined. How have the city councils established that this project is necessary? Have they done an independent load flow study to confirm the veracity of PSE's claims? CENSE performed their own study despite PSE's refusal to share their data regarding the project and found that the assumption put forth by PSE are at best faulty, and possibly even fraudulent.

If PSE fails to provide new information to explain themselves, or if an independent study done by the cities does not corroborate with PSE's claims then this project must be paused immediately.

PSE's preferred route, Alternative 1, has **significant** impacts for my neighborhood Olympus, Newcastle. I am grateful to the city of Newcastle issuing a moratorium two weeks ago on permit applications for new transmission lines in our city and to give the Newcastle Planning Commission time to review its utility codes. This demonstrates that the Newcastle city council is listening to the people.

I live in one of the 51 homes along the 100 ft corridor in Olympus, next to the existing high-pressure jet fuel pipeline. PSE's preferred plan would be to install 230kV lines on 85-100 ft metal poles (essentially lightning rods) along the aging pipeline.

**Chapter 10.7.1 Alternative 1 Option A** Will have **significant** adverse land use and housing impacts.

**Chapter 10.7.3.1 Alternative 1 Option A** States the impact could range from minor to **significant** depending on location.

**Chapter 10.7.3.1.2. Alternative 1 Option A** Using an existing corridor may require widening to accommodate the new utility; up to 50 feet of additional clear zone would be needed through the corridor. This could require removal of some structures (houses). **High** consequence land use, if located in the vicinity of a hazardous liquid pipeline, would present an unusually high risk in the event of a pipeline failure.

**Alternative 1 Option A** has either **significant** or **high** consequence and is PSE's preferred plan.

How will this process be mitigated? When I lose my home, when my neighbors lose their homes, we will be leaving behind our neighborhood. We have been active, engaged neighbors in a community much like that of a family, we have invested time with our neighbors, community, our family. How is this addressed in the DEIS? This is what some of us will face\_ we will be displaced, and no longer have our homes, depression, impacts related to relocation, trying to find a home where housing is already limited. How do we find a place where we have the community and support that has taken us 28 years to create? How will we be compensated for this loss? Shouldn't this be addressed in this DEIS?

Thank you for your time.

Lori Elworth  
8605 129th Ct SE  
Newcastle, WA 98056

March 1, 2016

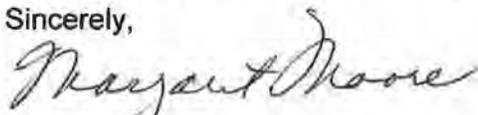
Ms. Heidi Bedwell, Senior Planner  
Land Use Division-Development Services  
City of Bellevue  
450 110th Avenue NE  
Bellevue, WA 98004

Dear Ms. Bedwell,

Please find enclosed my comments regarding the PSE EnergizeEastside project currently under DEIS review. It is imperative that smarter heads prevail at City Hall to be sure that we are not railroaded into something that is not needed in its current form and is certain to be highly dangerously placed and destructive to our prized Eastside environment.

I hope you can use your leverage to ensure that Bellevue takes a courageous role in stopping this runaway project before it is beyond retrieve.

Sincerely,



Margaret Moore  
4707 135th PL SE  
Bellevue, WA 98006  
425-747-1388  
mmooreii@comcast.net

March 2016

RE: Proposed PSE Energize Eastside Project

The Proposed PSE project which is now in Phase 1 of the DEIS process is of great concern to me and all citizens who live on the Eastside. In addition to having enormous environmental impact on the entire region, it is increasingly being disproven as a necessary project. Touted by PSE - an off-shore consortium - as critical to future needs, it is designed to enhance its investment and ensure emergency power to Canada at the expense of rate-payers throughout our region. Better methods to meet future needs are available and will continue to be developed before our Eastside requirements become crucial.

1. Of primary significance to the current EIS process, **the ENVIRONMENTAL IMPACT is enormous**. Over the 18 mile length of the plan, thousands of trees and numerous homes must be destroyed to make way for the required easement for 240kV wires on up to 135 foot poles. This is to say nothing of the archaic, ugly towers required to complete the installation. Far better ways exist to meet future needs than to revert to this old-fashioned method of power transmission. New, proven ways are happening – new technologies are coming on line, utility efficiencies are developing, to say nothing of people and businesses reducing their consumption voluntarily and/or through pricing schedules.
2. It is **unthinkable to ignore the public SAFETY issues** around constructing these heavy-duty transmission wires over an existing, aging pipeline carrying high octane jet fuel under great pressure. In this active earthquake zone so much could happen to damage both the fuel line and the transmission towers/lines. It's hard enough to think about the existing situation, let alone consider having the new lines involved with the Olympic Pipeline in a seismic event. We have had ample evidence of the unthinkable happening in similar situations to not be extremely concerned about the possibility here and do everything we can to prevent it.
3. Finally, **the NEED is not there** for the foreseeable future. PSE has created a scenario to enhance their investment within the window in which they must divest, thereby increasing profits for Australian and Canadian investors. Who pays for this \$215 million dollar project? We the rate-payers will, while they continue to receive their guaranteed 9.84% ROI. PSE selected and edited data to enhance their request. It refused to allow a citizen's panel offer solutions or comments that were outside PSE's preferred scenario. (A surprising number of citizens on that review panel refused to sign the final report because it was shaped by PSE and did not allow a truly open process.) PSE has refused to acknowledge the Lauckhart-Schiffman load-flow study created by experts in energy planning – indeed Lauckhart previously was PSE's expert!

It is very important that the current DEIS review pay attention to all data and information available and come to a conclusion that truly reflects more than the self-serving rationale presented by PSE. When a recommendation is made now, it should closely reflect Alternative 2 – an option that truly considers more than 20th century thinking about how to continue power flowing to the Eastside far into the future.

Sincerely,

  
Margaret R. Moore  
4707135th PL SE  
Bellevue, WA 98006  
425-747-1388

## How you can make your comments most effective



Check out the Department of Ecology Citizen's Guide to SEPA Review and Commenting at [EnergizeEastsideEIS.org/sepa-review](http://EnergizeEastsideEIS.org/sepa-review).

**Be clear, concise, and organized.** Decide what you need to say before you begin. If you have a number of points, group your comments in a logical order.

**Be specific.** Give support to your comments by including factual information. For instance, compare how things *were*, to how they *are*, to how you believe they *will be* in the future—and why.

Refer to Comprehensive Plans, development regulations, information on similar projects or situations, and other environmental laws or documents. Be as accurate as possible.

**Identify possible solutions.** Suggestions on reasonable mitigation—conditions to avoid, minimize, or reduce adverse impacts—can help influence how a project is ultimately built. After identifying your concern, suggest possible solutions.

—fold here—

### Comments on the Phase 1 Draft EIS of PSE's Energize Eastside Project

Name Deborah Hayes Address\* 4208 137<sup>th</sup> Ave NE  
Belleuve WA 98005

\* You must provide your physical mailing address to be considered a "party of record," eligible to appeal the adequacy of the EIS.

Re: EIS for Energize Eastside

I would like to voice my concern about this project. It is an overly costly project with regard to charges to PSE customers, the lost of property values and homes, habitat and trees. Alternative 2 will have a much ~~less~~ less impact on all concerned. Even though I feel we can completely avoid this whole project with conservation and higher tech methods that do not use massive power poles - if we must improve our electrical grid, I urge Alt. 2.

Thank you  
Deborah Hayes

Name: Maria Vlachopoulou

Speaker #29 Public Hearing Phase 1  
DEIS Bellevue 3.1.16

Address: 14708 SE 15th Pl., Bellevue, WA 98007

### EIS public comment (3/1/2016)

Thank you for giving us the opportunity to express our concerns about the Energize Eastside project.

A quick summary of my background; I am an electrical and computer engineer who worked at the Pacific Northwest National Lab here in WA state. While at the lab, I worked as an energy researcher on various projects including energy forecasting. My team worked with various utilities, like ~~PGE~~ BPA in WA state, Pacific Gas and Electric (PG&E) of Northern California, Southern California Edison, e.t.c.

I moved to Bellevue two years ago, and PSE's Energize Eastside project immediately caught my attention. I have been following PSE's, Quanta's, USE's, Startec's, and CENSE's postings and comments on the project. I have real concerns about the methodology PSE has followed to justify the necessity of this project; an at-least 215-million-dollar project that we the citizens will have to pay for.

To start, I would like to point out that PSE's simulation is for an extreme weather condition scenario of a very cold winter day (23°F) and peak electricity load conditions. The scenario projects for the year 2017-2018. While it is expected for a utility to simulate extreme weather conditions, PSE simultaneously simulates pushing 1500MW of energy to Canada. Usually, under such conditions utility operators significantly reduce additional energy outflows to secondary areas. PSE has not done that on their simulation. Why does even simulate a 1500MW flow to Canada in the first place?

Additionally, PSE simulated six local generators being out-of-service. I don't see how and why those generators would not be functional. Even more concerning, it has been pointed out that PSE ran the simulation using summer normal conditions for the transformers. That would drastically change the results of the simulation, and it would be just flat out wrong.

I ask PSE to give us access to the input data they used to run their simulation. The Federal Energy Regulatory Commission (FERC) has already determined we have a legitimate need to access the data PSE used to set up the simulation, since we pose no security threat.

Finally, why is PSE using a 2.4% energy demand growth for the eastside, while they could use their own estimate of 0.5% energy demand growth for their entire 8 county area? The power grid is interconnected, so large <sup>energy</sup> demands on one side of the grid usually do get compensated by other parts of it.

To: Heidi Bedwell, Energize Eastside EIS Program Manager  
Feb 26, 2016  
From: Mel and Helen Zoerb  
8408 129th Ave SE  
Newcastle, (Olympus Section), 98056

**Dear Ms. Bedwell,**

My wife and I are very concerned about Puget Sound Energy's "Energize Eastside" project, which proposes to build 18 miles of high-voltage transmission lines through four Eastside cities (called Alternative 1A). Part of this project would be adjacent to our home in the Olympus area of Newcastle.

**Energize Eastside's Attempted Justification**

PSE tries to justify the need for the project by using totally unreasonable (virtually, if not completely impossible), scenarios and therefore claiming that not building this line system would cause regional blackouts. However, according to a Lauckhart-Schiffman Load Flow Study of the area's power needs, available at CENSE.org., the PSE scenarios are not realistic and should not be used. Reasonable power demand assumptions on the other hand show clearly that this entire project is not necessary.

We therefore request a Study to include a full face-to-face coordination effort between the appropriate PSE representatives and Lauckhart-Schiffman regarding Load Flow Studies for this area to develop reasonable conclusions in support of the EIS effort. We submit that if PSE has valid data to justify their proposal they should not be afraid to share the details of it with Lauckhart-Schiffman and appropriate members of Cense.

**The Right of Way Width Problem**

Alternative 1A would place new lines and poles much too close to aging petroleum pipelines. A construction or operational accident could cause a catastrophic pipeline explosion like the one that killed three Bellingham residents in 1999. An equivalent accident in our highly congested area would have vastly greater and more serious consequences. This risk is not adequately addressed in the EIS and alone is sufficient justification to rule out Alternative 1A from any further consideration. The current PSE declaration of acceptable widths is not adequate, nor have they been willing to share their rationale.

We request a new Study of the right of way issue to include not only PSE representatives but citizens from Cense and especially Olympus to establish technically viable width requirements. Again, if PSE has a logical technical position they should not be afraid to share it.

**The Threat of Home Condemnation(s)**

In addition to the above, Alternative 1A by virtue of right of way lateral (width) constraints will require purchase and removal of certain homes near the right of way according to PSE statements which say that "only" five (5) homes will have to be removed. This is outrageous in any situation – but especially so considering that a reasonable power demand requirement (as noted above) does not warrant the proposed power line development. If the line is ultimately built then routings must be adjusted so that no homes are threatened with condemnation/removal action. This must become an integral part of the EIS effort. Removal of homes is an unacceptable impact on our local environment.

PSE has not been willing to identify which specific homes are threatened yet we area residents are expected to comment intelligently on the DEIS. This is all but impossible.

We request a definition of homes that are threatened in current PSE plans to be supplied before the DEIS comment period closes.

Letter to Heidi Bedwell, EIS Program Manager, continued

**Other Alternatives**

It is understood that there are other alternatives such as Alternative 2 (a safer and less costly alternative) which have not received appropriate attention in the EIS. This must be corrected so that Alternative 2 is addressed in proper detail in a coordinated manner involving all affected entities to avoid the problems inherent in Alternative 1. For PSE to consider home condemnation for the power line system upgrade without considering practical alternatives such as Alternative 2 is unbelievably arrogant towards our area residents.

An honest Study of Alternative 2 is required with coordination and involvement of PSE and the proper Cense/ Olympus representatives.

Thank You

Handwritten signatures of Mel Zoerb and Helen D. Zoerb. The signature on the left is 'Mel Zoerb' and the signature on the right is 'Helen D. Zoerb'.

Mel and Helen Zoerb

Pat Hansen 3851 136 ave NE Bellevue 98005 Bellevue  
Speaker #3 Public Hearing Phase 1 DEIS  
3.1.16

For the record, I am a member of Cense and the Bridle Trails Comm. Club.

My comments apply to **EIS Chapter 8 - Environmental Health, Chapter 10 - Land Use and Housing and Chapter 11 - Views and Visual Resources**

We have had testimony re technical aspects of project Energize Eastside.

I would like to share with you a more emotional/relationship side of this project.

During the CAG process it was easy to figure out where PSE planned to put these new lines. The pictures they showed were very telling -- they pictured neighborhoods encumbered by wires in front of homes. Then they showed how it would look in Bridle Trails area where there is more land and the open space looked less encumbered.

Telling it like it really is for this property owner w/PSE line encumbrance, plus BP high pressure gasoline lines (2), it certainly is a burden because we cannot use our property in a way others nearby can. We have maintenance crews for both easements at will. PSE seems at any time to be able to add things in this easement, such as communication lines, give permission for certain cell tower use and needed equipment, also potentially additional petroleum lines.

These electrical lines at times give way and fall to the ground I know of two such incidents (one involving our property) both in Bridle Trails. Imagine if you or someone else was under the line that fell - or an animal/pet! Could this ignite the high pressure gasoline line? Will this take legal action for property rights and resolve -- if we survive? I might mention there are others directly affected by these easements--those who live adjacent to those of us with these easements!

When speaking about necessity, it is being proved that the need now is not present and won't be for a number of years, if then. There are so many advancements in technology that might not require these imposingly tall structures.

Should those of us who've been carrying this burden of use and safety, property devaluation and so forth be the ones to continue carrying this burden for all for

the next 90 years or more--the easement was granted in 1929 when it was country and undeveloped land?

Just so you know, PSE and BP do not compensate the property owners burdened, and yet they are allowed to control so much and enjoy financial gain to their Australian/Canadian hedge fund. Adding lines is one major way they increase their profit.

When we mention the possibility of undergrounding if this work is needed in the future, they remind us that we would then be responsible for the exorbitant charges for the work. Do they show appreciation to those of us who have been providing the land they need?

Personally, I believe the City of Bellevue and their staff should be looking out for the safety and welfare of all Bellevue communities, not just the growing downtown business and condo community (where electrical services are underground and sub-stations are not viewed) and then there's the Spring District! When Bellevue brings in new areas requiring new and updated services, Bellevue should require those new areas/developments to provide the additional needed services rather than look to existing communities to carry the burden.

Thank you for your time this evening. I would ask that you think about and consider the testimony you hear throughout this EIS process, that you think out of the box on ways to solve this problem. In my opinion, 100Ft plus poles in residential areas is not beautiful, not park like and does not fit a City in a Park theme of Bellevue. Stringing up Bellevue should be against the law!



birding  
conservation  
education

11 March 2016

Development Services Department  
Att'n: Heidi Bedwell, Energize Eastside EIS Project Manager  
City of Bellevue  
450 10<sup>th</sup> Ave. NE  
Bellevue, WA 98004

**Subject:** Comments on Phase 1 Draft EIS, Energize Eastside Project

Dear Ms. Bedwell:

We are writing to offer some comments and questions on the Phase 1 document. As this phase is programmatic rather than site-specific, our comments are fairly general in nature. We expect to have more detailed ones for the Phase 2 project-level DEIS. For now, we are seeking to become part of the project record and obtain standing to participate in later phases.

Eastside Audubon is a chapter of the National Audubon Society, with approximately 1100 members living in east King County. Many of our members live near the transmission lines being considered in the DEIS. Some of them have participated in the public workshops PSE conducted over the past two years for this project.

We understand that public comments on a DEIS are intended to clarify the draft document, suggest additional ways to mitigate impacts, and possibly to help narrow down the alternatives. If indeed there is a need to increase power supplies in east King County, we would likely prefer the alternatives with the fewest new towers and transmission lines, such as the underground lines in

308 Fourth Avenue S.  
Kirkland, WA 98033  
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Kirkland, WA 98083-3115  
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eastsideaudubon.org  
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Alternative 1 C or the Integrated Resource Approach in Alternative 2. These would seem to least disturb the existing habitat for birds and wildlife.

The balance of this letter focuses on the following aspects of the Phase 1 document:

- Project Alternatives and Options
- Electromagnetic Radiation, EMF impacts
- Impacts on Plants and Animals
- Impacts on Recreation

### **Clarification of Alternatives and Options**

Alternative 1, Option B, is described as using 15 miles of Seattle City Light's 230 KV overhead transmission lines through the Eastside study area. Page 2-26 says PSE has explored the idea of using this Seattle City Light corridor, although PSE does not own it. SCL has stated it needs the line to serve its customers. This would appear to be a deal-breaker, but the option is included in the DEIS" ....so that, if conditions change, this option will remain open....."

It is hard to see if it is a serious alternative worth spending time to understand, or just a "straw man" sort of option being proposed just so it can be described in negative terms and then eliminated. What seems to be missing here is some idea of what might allow or cause conditions to change. Adding 230 KV lines and towers in an existing corridor that is already established through the service area seems so intuitively sensible, the reader wonders why PSE didn't probe the idea further. Is there a way to make the idea more appealing to SCL? Is there some kind of legal precedent for making greater use of an existing corridor? Could the PSE lines and towers be constructed in the SCL corridor without interrupting SCL's continued use?

Section 2.3.2.3.1 says the replacement line may need to be constructed adjacent to the existing [SCL] line and placed into service prior to removing the existing structures and conductor. Does this suggest a possibility that with some widening of the existing corridor that both SCL and PSE transmission lines might co-exist in the existing corridor for the longer-term future? Would a change to state or city statutes make the deal more feasible, if the environmental benefits were substantial?

The 4<sup>th</sup> paragraph in Section 2.3.2.3 on page 2-26 says the re-build of the SCL line was estimated "...to provide sufficient capacity for a period of less than 10 years ...but it could otherwise attain or approximate PSE's objectives...." Does this mean that a whole different project would then need to be located somewhere else to serve growing power needs, or could further capacity be developed in the same SCL corridor? The DEIS should be clarified to explain whether Alternate 1, Option B is just a short-term temporary fix, or whether it could serve in the longer term.

## **Electromagnetic Radiation, EMF**

One power line effect that could vary between alternatives is electromagnetic radiation (EMF). Chapter 8 of the DEIS describes the many years of research that have been invested to determine if transmission lines actually have EMF-related health effects (e.g. childhood leukemia) on nearby residents. Chapter 8 of the DEIS conclusively states that “no impacts are anticipated from EMF or Corona Ionization”. But the text of Chapter 8 describes decades of research that does not unanimously support that statement. Since Alternative 1/Option A would introduce 18 more miles of new transmission lines than Option B, the DEIS should be modified to point out that if EMF hazards are ever verified, then Option A would have a greater adverse impact than Option B. The same comment applies to the 4<sup>th</sup> alternative that would introduce 60 miles of new 115KV transmission lines and towers more widely throughout the service area.

PSE cannot just conclude that decades of EMF research have been decided in its favor, without at least clearly acknowledging that EMF hazards, if verified, would be higher with its Proposed Action, and with the 4<sup>th</sup> alternative mentioned in the above paragraph.

## **Impacts on Plants and Animals**

The text on page 1-28 says overhead transmission lines under both Options A and B of Alternative 1 could result in significant impacts to threatened or endangered species or species of concern from collisions or electrocution. While the differences between Options A and B may be spelled out more completely elsewhere in the document, readers of this passage could easily get the impression that both options are very similar. But in fact PSE’s preferred Option A would introduce approximately 18 miles of new towers and 230 KV transmission lines, while Option B would utilize or replace Seattle City Light’s existing facilities, therefore introducing little or no new bird collision or electrocution hazards.

## **Impacts on Recreation**

The overview of recreation on pages 1-39 and 12-3 lists a number of opportunities that can be enjoyed in the study area’s 235 recreation sites. In addition to the activities listed such as hiking, biking, horseback riding, etc., we suggest the addition of birding. The Phase 1 DEIS authors may have assumed birding is part of the “nature viewing” category, but it is different in important ways.

This suggestion is not merely because birding is Eastside Audubon’s main interest, but because the Energize Eastside project consists of 18 miles of towers and lines at a typical height of 85 to 100 feet. Therefore birds are particularly affected by the project, as are the recreation and educational pursuits related to them. In this respect they are quite different from activities like

hiking, biking and horseback riding which could coexist with the project, though perhaps at some diminished level of enjoyment. Bird impacts, on the other hand, could be much more negative in the vicinity of the transmission lines and towers. For this reason we think the Phase 2 DEIS recreation impacts should highlight birding as a distinctive subject of concern.

Table 12-2 on page 12-6 listing recreation sites in various jurisdictions could be made more complete by adding the Cross Kirkland Trail to Kirkland's inventory. The same can be said about the full length of the Eastside Rail Corridor that King County is now planning and for which a Draft EIS is in public review. In the Phase 2 DEIS where site-specific impacts will be discussed, these linear open space corridors will be important. The corridors are bordered by some high-quality woodlands and wetlands, so any habitat fragmentation caused by transmission facilities could be significant.

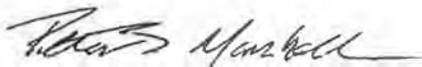
### **Conclusion**

Thank you for the opportunity to comment on the Phase 1 DEIS. Please keep us informed of future public meetings, project reports, and publication of the Phase 2 document. If you have any question about the comments in this letter, please contact us at (425) 576-8805.

Sincerely,



Jan McGruder, President



Peter Marshall, Conservation Chair

DEIS comments presentation: NEED

My name is **Richard Kane** and I'm a member of CENSE. I live at 6025.....

In Chapter 1.3 of the DEIS, PSE determines that "there is a need to construct a new 230kV bulk electrical transmission line." Despite their assertions, it is NOT a foregone conclusion that this project is needed. PSE states they ran thousands of scenarios. They have had independent analysis that shows they used the correct variables. However, the data they used in those variable slots was not reviewed and is, in fact, incorrect.

The Lauckhart-Schiffman load-flow study that has been provided to you highlights multiple flaws:

- 1) PSE submitted to the Western Electric Coordinating Council (WECC) a rate of growth in electrical demand of **0.5% per year**. Yet in their justification for Energize Eastside they used 2.4% per year. This is almost 5 times greater than what they submitted to the federal agencies.
- 2) Transformer capacity is limited by overheating. The amount of electricity a transformer can handle is significantly less in the summer than in the colder winter months. PSE used **summer normal** load numbers which limit the electrical load to 700mW. By contrast, if **winter emergency** loads are used the peak load increases to 930mW.
- 3) It should also be noted that during this winter emergency, PSE has NONE of its 6 local generation plants in service. The 1,400mW of energy they generate is more than enough to cover any shortage.
- 4) PSE has included sending **1,500mW North to Canada** during this emergency scenario. This is an untenable assumption on many fronts. Most models use 500mW and there is no federal mandate that requires this exaggerated amount of energy to be transferred North in an N-1-1 emergency. But the most absurd aspect of this scenario is that sending that much energy North during an emergent situation would cause blackouts in the entire Puget Sound Region, not just the Eastside. The WECC would never allow this to happen.

YOU WON'T GET ENOUGH CAPACITY ACROSS THE CASCADES TO KEEP THE LIGHTS ON + SEND THAT MUCH ENERGY NORTH

As Lauckhart-Schiffman illustrates, when the proper data is plugged into the variable slots of the modeling programs, there is **no shortage until 2058**. Energize Eastside is the wrong project and is aimed at the wrong issue. The only way it makes sense is if the primary goals are profit and the transmission of energy North-South. Perhaps that gives a better understanding of this memo dated 2/21/2013 from the ColumbiaGid to the WECC stating the Project Purpose is to "Improve South-to-North transfer capability between the Northwest and British Columbia" as the primary goal. THESE MEMOS: THE FIRST

REPORT TO WECC REFERRING TO THE 2011 REPORT ON TRANSMISSION EXPANSION TO SUPPORT WINTER S-N TRANSFERS. ~~THIS IS THE DECISION STATE~~

Suddenly, the NO BUILD option seems the most ...sensible!



February 21, 2013

Kent Bolton  
Staff Engineer  
Western Electricity Coordinating Council  
155 North 400 West, Suite 200  
Salt Lake City, UT 84103-1114

Dear Mr. Bolton:

The WECC Project Coordination Process states that project sponsors can use Subregional Planning Groups to meet its requirements: "a project sponsor may use TEPPC or a Subregional Planning Group to meet the requirements of Project Coordination Process in lieu of forming an independent PCRG for the project." The projects summarized below used the ColumbiaGrid planning process via the Puget Sound Area Study Team to meet the requirements of the WECC Project Coordination Process. The ColumbiaGrid planning process provided for open participation and included all the interested transmission owners and other interested stakeholders. These projects have been reviewed by the Puget Sound Area Study Team and a consensus has been reached that they are the best solution for the area. Project reports are available from ColumbiaGrid at [www.columbiagrid.org](http://www.columbiagrid.org).

1. **Project Name:** Reconductor Bothell – SnoKing 230 kV lines
  - a. **Project Purpose:** Improve South-to-North transfer capability between the Northwest and British Columbia.
  - b. **Facility Owners:** Seattle City Light, Bonneville Power Administration
  - c. **Project Description:** Reconductor the double circuit Bothell-SnoKing 230 kV lines with high temperature conductor.
  - d. **Estimated In-Service Date:** 2016
  
2. **Project Name:** Reconductor Delridge-Duwamish 230 kV line
  - a. **Project Purpose:** Improve South-to-North transfer capability between the Northwest and British Columbia.
  - b. **Facility Owners:** Seattle City Light
  - c. **Project Description:** Reconductor the Delridge – Duwamish 230 kV line.

d. **Estimated In-Service Date:** 2016

3. **Project Name:** Lakeside 230/115 kV Substation

a. **Project Purpose:** Improve South-to-North transfer capability between the Northwest and British Columbia. Provide a 230/115 kV source to Puget Sound Energy customer load service.

b. **Facility Owners:** Puget Sound Energy

c. **Project Description:** Rebuild both of the Sammamish-Lakeside-Talbot 115 kV lines to 230 kV. Energize one line at 230 kV and the other at 115 kV. Build a 230 kV bus and 230/115 kV transformer at Lakeside Substation.

d. **Estimated In-Service Date:** 2017

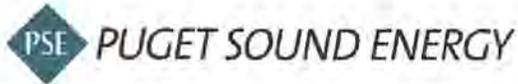
Please feel free to contact me or Jonathan Young at (503) 943-4957 if you have any questions.

Sincerely,

*Jeffrey C. Miller*

Jeffrey C. Miller  
ColumbiaGrid, Vice President and Manager of Planning  
(503) 943-4951 office  
(503) 975-4969 cell

Speaker # 23 Public Hearing Phase 1  
DEIS Bellevue 3.1.16



March 1, 2013

Mr. David Franklin, Chairman  
WECC Technical Studies Subcommittee  
Southern California Edison  
1 Innovation Way  
Pomona, CA 91768-2560

Mr. Enoch Davies  
WECC Technical Staff  
155 North 400 West, Suite 200  
Salt Lake City, Utah 84103-1114

**2013 ANNUAL PROGRESS REPORT**

In accordance with reporting guidelines by the WECC Planning Coordinating Committee (PCC), please find attached Puget Sound Energy's 2013 Annual Progress Report on significant additions and changes to our system. Please call me at (425) 462-3171 if you have any questions.

Sincerely,

Puget Sound Energy, Inc.

By Peter M. Jones, PE  
Senior Engineer, PSE

Enclosure

cc: Joe Seabrook  
John Phillips  
TSS Members

## **2013 Annual Progress Report to WECC**

### **Puget Sound Energy**

The following projects will be reported in the 2013 “Existing Generation and Significant Additions and Changes to System Facilities” report in accordance with pages III-110 through III-119 of the “WECC Progress Report Policies and Procedures”. These projects do not have regional impacts to the WECC Interconnected System.

#### **Recently Completed Projects**

##### **1. Sedro Woolley 230 kV Transformer Addition**

The project added a second 230-115 kV transformer and two 115 kV, 21-MVAR shunt capacitor banks at the Sedro Woolley Substation. PSE requested a waiver of significant transmission project status for this project. This project addresses NERC planning criteria and provides additional capacity to serve the projected load growth in Skagit and Island Counties. It has no impact to the WECC or any neighboring electric systems.

#### **Transmission Additions and Changes**

##### **Request for waiver of “Significant Transmission Project” Status**

##### **2. Eastside 230 kV Transformer Addition and Line**

**Estimated Date of Operation: 2017**

This project had been titled “Lakeside Substation 230 kV Transformer Addition” in prior years’ progress reports.

The project will involve installation of a 230-115 kV transformer at Lakeside Substation. This project includes rebuilding the Sammamish-Lakeside-Talbot 115 kV lines, energizing one or both at 230 kV to provide a source to Lakeside Substation and transmission capacity. This is more effective for local load service and transmission reliability than the alternative of installing a 230-115 kV transformer at Lake Tradition Substation. This transformer will address NERC planning criteria and provide additional capacity to serve the projected load growth in north central King County and surrounding areas.

ColumbiaGrid is a Subregional Planning Group in the Pacific Northwest and has open participation in its planning meetings and the Puget Sound Area Study Team (PSAST). This project has been developed by and has achieved consensus via the ColumbiaGrid PSAST, which included all the transmission owners that could be impacted by this project. The “Eastside 230 kV Transformer Addition and Line Rebuilds” project began to be studied by the PSAST in mid-2009, and was in PSE’s Annual Progress Report last year. The most recent report is entitled “**Updated Recommended Transmission Expansion Plan for the Puget Sound Area to Support Winter South-to-North Transfers**”, June 17, 2011. The report recommends this project and four other transmission improvements, and is available from ColumbiaGrid [www.columbiagrid.org](http://www.columbiagrid.org). The requirements of project coordination review for this project have been met through the ColumbiaGrid acting as a Subregional Planning Group.

The attached document, “WECC Comprehensive Project Coordination Review Letter\_PSAST 2-21-13.pdf”, describes the coordinated ColumbiaGrid study efforts.

## **2013 Annual Progress Report to WECC Puget Sound Energy**

### **Request for waiver of “Significant Transmission Project” Status, cont.**

#### **3. Starwood-Tideflats 115/110 kV Transformer Removal Estimated Date of Operation: 2013**

With Tacoma Power increasing its sub-transmission voltage schedule from 110 kV to 115 kV in 2013, the existing ‘step down’ Starwood transformer will no longer be necessary. A bypass of the existing bank is therefore planned for summer of 2013 to coincide with the timing of Tacoma Power’s voltage schedule increase. This project is a combined engineering effort between PSE and Tacoma Power; it has no impact to the WECC or any additional neighboring electric systems.

### **Waiver of “Significant Transmission Project” has been granted on the following -**

#### **4. Thurston County Transformer Addition Estimated Date of Operation: 2013**

The project is to install a 230-115 kV transformer at St. Clair Substation and build a 5-mile 230 kV transmission loop between St. Clair and the existing BPA Olympia – S. Tacoma 230 kV line. PSE requests a waiver of significant transmission project status for this project. The project is intended to provide additional capacity to serve the projected load growth in Thurston County and surrounding areas. It has no impact to the WECC or any neighboring electric systems.

#### **5. Pierce County Transformer Addition and Line Reroutes Estimated Date of Operation: 2015**

The project is to install a 230-115 kV transformer at Alderton Substation and build 8 miles of 230 kV transmission line from White River Substation to Alderton Substation, as well as re-routing 115 kV lines. PSE requests a waiver of significant transmission project status for this project. The project is intended to provide additional capacity to serve the projected load growth in Pierce County and surrounding areas. It has no impact to the WECC or any neighboring electric systems.

#### **6. Tono Transformer Improvements Estimated Date of Operation: 2015**

This project will involve replacement of limiting current transformers at the Tono bank. This improvement will increase capacity from the existing limit of 398 MVA up to 546 MVA. The project is intended to increase reliability for serving approximately half of the existing load in Thurston County. It has no impact to the WECC or any neighboring electric systems.

#### **7. West Kitsap Transmission Project Phase II Estimated Date of Operation: 2018**

The project is to install a 230-115 kV transformer at Foss Corner Substation, and build a 230 kV line from Foss Corner to a future line bay position in the BPA Kitsap 230 kV Substation. PSE requests a waiver of significant transmission project status for this project. The project is intended to provide additional capacity to serve the projected load growth in Kitsap County and surrounding areas. It has no impact to the WECC or any neighboring electric systems.

City of Bellevue

MAR 14 2016

Service First Desk

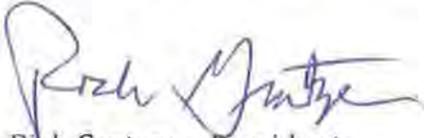
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Ms. Heidi Bedwell, Senior Planner  
Land Use Division – Development Services, City of Bellevue  
450 110<sup>th</sup> Avenue NE  
Bellevue, WA 98004

Dear Heidi,

I am submitting the attached comments to the Draft Environmental Impact Statement (DEIS) for the Energize Eastside (EE) Project on behalf of the Somerset Recreation Club. You may have received these comments in an e-mail but we wanted to also deliver them to you in written hard copy form.

Thank you for your consideration of our inputs and concerns regarding EE and its potential significant impacts to our recreation club.



Rick Gratzner – President  
Somerset Recreation Club  
4445 Somerset Blvd SE  
Bellevue, WA 98004

Somerset Recreation Club  
4445 Somerset Blvd SE, Bellevue, WA 98006  
March 10, 2016

City of Bellevue  
Development Services Department  
450 110th Ave NE  
Bellevue, WA 98004

Attn: Heidi Bedwell

The Somerset Recreation Club (SRC), has been a community hub for Somerset and surrounding neighborhoods since 1963. We have been following the Energize Eastside (EE) project closely since its inception and are trying to determine the impacts on SRC if the new high voltage lines are installed along the existing PSE corridor. The current PSE power lines bisect the northwest corner of our property and are directly over our 2 tennis courts. Additionally, there are 4 PSE poles (in pairs of two) located on our property that support the current power lines.

Somerset Recreation Club is concerned about the contents of the DEIS not addressing the significant environmental and operational impacts of the PSE proposed project, especially Alternative 1, on the club. It should also be noted that there were no mitigation measures that will provide significant solutions to SRC for both short term construction and long term location and operational/maintenance impacts due to the potential removal of the 115kv poles and/or transmission lines, and replacement with 230kv poles and transmission lines.

As a result, we have reviewed the Phase 1 Draft EIS and are providing the City of Bellevue and PSE with our comments (see below) on the documents for the key and relevant sections of the DEIS, as they pertain to SRC.

#### **Alternative 1- Location of the proposed new powerline upgrade through the Somerset Residential Neighborhood**

We would like to know more details on PSE's preferred alternative (Alternative 1) and the specific plans with regard to locating the 85' to 130' poles that would support the new, higher voltage power lines. Specifically, where precisely the poles would be located (vis-a-vis the existing PSE power poles on SRC property). Will the existing poles be removed or retained? If so, how much more of our property would be taken and/or what effect would the larger poles/wires have on our Clubhouse/pool? Can our existing tennis courts stay below the new, higher voltage lines? According to the DEIS in Chapter 12. Recreation (Section 12.5.3.1), the new higher voltage power lines will require a widening of the existing corridor by as much as 50' and that no buildings or houses will be allowed within the easement and/or below the lines. If this is true, then the Somerset Recreation Club, a recreation facility that has been in use for more than 50 years, may literally have to close its doors, because we would not be able to

comply with the new expanded corridor requirements as our current clubhouse, tennis courts and possibly our pool would sit below these lines. As a result of these impacts to SRC, what mitigation will you provide?

### **Chapter 1 Section 2.3**

In Section 2.3, the alternatives were presented and the overhead transmission lines and pole location were discussed. The DEIS did not mention ways to mitigate through design, location, and/or minimize the impacts associated with the removal of the 115 kV system and upgrading it to 230kv. This upgrade has significant impacts such as: the foundation location and size and the pole height on the SRC which is located in the existing transmission corridor.

The following are comments on each of the following Elements of the Environment that are included or should have been included in the DEIS.

## **ELEMENTS OF THE ENVIRONMENT**

### **Natural Environment**

#### **Chapter 3. Earth**

SRC (and the Somerset Community) is on a steep hill and adjacent to the Fault that is located along I-90. Based on our review of this element, the DEIS does not identify major issues nor provide significant mitigation measures to prevent damage to the SRC facility from poles and powerlines collapsing and the Olympic pipeline breaking due to significant seismic and/or storm events. In addition, construction impacts due to removing the old poles, the access to locations where the poles are located, and replacing them in the same location may adversely impact the SRC property/facility. Since SRC was not mentioned as a key facility in the region, no proposed mitigation measures were offered. Vibration (e.g. air and ground vibration) is a significant issue, due to the proximity of the poles to all the SRC structures (buildings, pool, and tennis courts). Also, the underground gas pipeline could be affected. The DEIS stated on page 3-14 that "no potentially significant adverse impacts related to work near pipelines are expected under any of the alternatives". This seems to be an inaccurate statement, since the location of SRC is both near the Olympic pipeline and along the PSE corridor. We should be protected from immediate construction impacts, as well as any future impacts as a result of the construction activities, such as: the relocated poles (e.g. removing old poles and/or locating new poles, expanding the foundation of the new poles, easement encroachment, etc.).

#### **Chapter 5. Water Resources**

SRC has been impacted by a significant amount of storm water runoff from the hill/roadway along Somerset Blvd. This issue has undermined the SRC facility (e.g. Tennis Courts) and potentially the pole/pipelines that exist in close proximity to the facility. It may also adversely impact the potential location of the new and larger poles that may be placed adjacent to SRC. An analysis of this issue needs to be evaluated before any further action is taken.

## **Chapter 6. Plants and Animals**

The DEIS did not include an overview of the aquatic and terrestrial habitat within the entire study area. In addition, it failed to mention the impact of the potential removal of 8000 trees in the region due to the proposed action/alternatives. The SRC facility also has a number of mature trees around its perimeter that have been there for decades and would potentially be eliminated if the poles are removed and/or replaced. Historically, Bellevue has a problem with its canopy being reduced. As a result, PSE's actions should not contribute to this ongoing long term problem and it needs to enhance, not eliminate the tree canopy.

## **Chapter 7. Energy & Natural Resources**

Per the DEIS Section 7.2, it stated the "none of the study area communities have control over how PSE uses energy to provide power. However, all of the study area communities have comprehensive plan energy goals or policies that lead them to encourage, facilitate, promote, or participate in actions addressing climate change sustainability, or energy conservation and efficiency, or reduction of greenhouse gases". Since the City of Bellevue is the Lead Agency for the EIS process why are they allowing PSE to propose a project that has detrimental impacts on our individual and collective community. This project may eliminate the SRC facility or seriously impact it due to the size and location of the new power poles. As well as the adverse impacts or elimination of homes along the corridor in Somerset (thus reducing our overall membership base).

Lastly, the DEIS states that they anticipated no cumulative or significant adverse impacts (Section 7.8 and 7.9) to natural resources from any of the alternatives. This is incorrect and needs to be reevaluated, per the comments provided above.

## **Built Environment**

### **Chapter 8. Environmental Health**

The environmental health for this proposed project includes Electric Magnetic Radiation, Hazardous Materials, Corona Ionization, and Noise. The DEIS concluded that there were "No cumulative adverse impacts to environmental health as anticipated" (page 8.46). However,

based on the contents of this section, this statement is inconsistent and in opposition with the information provided.

The following sections will provide an overview of the impacts. These issues are of particular concern to SRC due to our proximity to the PSE corridor and the fact that SRC has a heated pool (adjacent to) and tennis courts (directly below) the existing corridor. The EIS does not cover this, but we believe the proximity to water may increase the diverse effects and enhance the health hazard.

#### **Electric Magnetic Radiation (EMR)**

The DEIS stated that epidemiological and other studies have reported an increased cancer risk associated with the estimates of magnetic field exposure. The EMR's, Noise and/or the Olympic Pipeline may have cumulative effects that caused these significant maladies.

**Corona Ionization:** The effects of corona ionization are also of particular concern for SRC, both physically and psychologically:

1) Given the humid air/rain in the PNW and the additional humidity provided by the heated pool area, the buildup and discharge of the corona ions as "static discharge" will most certainly have adverse impacts on SRC club members, in particular in an around the pool deck area.

2) The audible cracking and popping of the discharge along the lines and line-to-pole connections will also have negative impacts, as it should be obvious that electricity and water don't mix and therefore are important factors in how members enjoy their experience at the SRC.

3) It was also stated in the EIS that the corona ions adhere to other particles (airborne pollution, etc.) and can then be inhaled. Given the SRC pool and tennis courts are very near the power lines, these impacts most certainly apply.

**Hazardous Materials:** The Olympic Pipeline and its alignment with the transmission lines needs to be assessed to ensure that the pipelines is in good condition in Somerset and on/near SRC. Also, there is significant risk if the transmission lines through Somerset are upgraded. PSE and Olympic Pipeline must ensure that the residents are protected from construction and operation/maintenance impacts that may cause ruptures or damage to the pipeline and adjacent residences and facilities.

#### **Chapter 9. Noise (Per SEPA, this Category should be listed under Environmental Health)**

There is a significant noise issue ("it is not a relatively low noise level "per the DEIS) that is emitted from the PSE power lines. Members of the SRC (e.g. individuals using the SRC facility) and many of the residents that live along the corridor (who are also SRC members) often comment on the noise issue. The DEIS stated (page 1-33) that the existing transmission lines "may be audible...at adjacent sensitive land uses" such as homes and facilities, like SRC.

#### **Chapter 10. Land Use & Housing**

As highlighted in the DEIS, the changes in Land Use in the proposed alignments will cause significant impacts in the region. As stated in other sections of this letter, there have been numerous erroneous statements, such as on Page 1-36: "construction of action alternatives would be relatively short duration at any one location with negligible land use impacts". The impacts may be in short duration, but land use impacts could be significant if the new pole placement and supporting structures impede on the existing SRC pool and structures.

On page 10-18, it was stated that the study area communities would have to "determine whether to designate the project as an EPF (Essential Public Facility) as part of the project-specific application process". Since this is the programmatic DEIS, it does not provide for a comprehensive analysis. However, we would like to state that based on contents of the DEIS and its attachments, and the information provided through community meetings, etc.; that the PSE's proposed EE project is not needed nor required to sustain the energy requirements of the region and that the potential alignment through Somerset has significant, adverse, and permanent impacts to the community and they cannot be mitigated.

On page 10-20, a discussion on the project's effect on land uses and housing would occur and "Specific designs for the project would need to be reviewed by each community to determine compliance with applicable zoning codes and regulations". SRC and the community have already reviewed the preliminary design and relevant document for this project and its alternatives and we would like to state that they are not in compliance with the COB codes and regulations.

On page 10-26, it provides a list of Study area communities, but it does not include the City of Bellevue and states that if it is not listed in the table it would "appear to either allow the alternative outright or as a conditional use in all zones". Why was the COB's information not included in this table since they are the Lead agency for this DEIS? What is the COB list of restrictions in the Somerset area?

Also, SRC is currently partnering with the Forest Ridge School of the Sacred Heart (FRS) (also located in the Somerset neighborhood) to completely renovate the SRC facility, and PSE/COB indicated through previous contacts with both entities that there would not be any problems with the SRC's proposed architectural design for the renovation. However, based on the proposed action outlined in the DEIS, this now seems incorrect, and the \$7 - 10 million renovation jointly proposed by SRC and FRS may be in jeopardy if Alternative 1 (Energize Eastside) is chosen. This information has never been directly conveyed by PSE or COB to the Somerset Rec Club and/or the Forest Ridge School.

## **Chapter 11. Views & Visual Resources**

The Somerset Community was developed in the early 1960's and the views of Mt. Rainier to the Cascades from the areas homes and SRC are significant. This view has attracted and helped retain members at SRC for decades. The view is one of the reasons why our facility is full on sunny days and evenings with beautiful sunsets. In Section 11.3.2, 11.3.3 and 11.3.4, a list of

visual resources and key viewpoints are provided, but the Somerset community/SRC were not included and should have been mentioned in these sections. Also, the private views were probably not included for the Somerset area as noted in Figure 11-12. There are 100's of homes and SRC that have views on both side of the hill. Any view blockage at SRC would minimize our financial viability, which is an economic issue that can be quantified.

On page 11-1- it stated that "the importance of visual resources is subjective, based on the viewer's perspective". Also, in Section 11.1.2- it stated that "differences in actual assessed values are not useful for this evaluation because the data were inconclusive as to whether the reason parcels were valued differently was because of use restrictions within a power line easement, because of visual impacts, or for some other reason." However, realtors in the area have information that they can provide COB about types of views in the area and the home values with full, partial views, views of the power lines, and without views. This difference is significant and also has an affect the property values too. The greater the price of the home the greater the property value and contribution to the region for school levies, road improvements, etc. This issues should be addressed in the Economic section of the future EIS.

## **Chapter 12. Recreation**

SRC's facility and other key private/community recreation facilities were not included to avoid placing overhead lines in recreation sites. "The enjoyment of recreation sites can be linked to visual quality and natural resources". Based on this statement, the power lines across Somerset and SRC should not be permitted per the COB's policies. Section 12.6 stated that "new infrastructure is located within recreation sites ... it will reduce user enjoyment of a recreation site through noise or visual impacts or changes to the resource- changes in light and shade; access to a recreation site, or disruption of informal recreation activities". The DEIS stated that the Phase 2 EIS will address these impacts. However, SRC and even the Somerset community would like to request that since our facility and the community has been impacted by the existing power line system for over 53 years, any further expansion/upgrade to the system would a significant and adverse impact and no proposed mitigation could compensate for the cumulative impacts to date. Section 12.7.1 offers another option, it states that "if recreation sites are affected and cannot be restored, they would be relocated and replaced as required; for example property could be purchased and a new recreation facility created".

In Section 12.5.1, it stated that if SRC is "unusable or access is completely blocked during peak use, then impacts are considered significant". Based on our review of the DEIS, "significant" impact would occur for all construction activities between May and September that would generate noise and aesthetics issues (see Chapter 14 below). Furthermore, any construction taking place on SRC property during peak use months of May through September that would block use of the SRC in any way could result in a loss of membership, and a decline in membership for even one summer season would be deleterious to the SRC's future financial viability. The SRC cannot underscore enough the criticality that any construction on SRC property must be done when the SRC is not open for business.

### **Chapter 13. Historic & Cultural Resources**

SRC was built in 1963, and therefore because it is over 50 years old, it should be considered as a historic structure per Washington State Department of Archaeology and Historic Preservation, King County Historic Preservation Program and the following registers: National Register of Historic Places, Washington Heritage Register, and King County Landmark. Per the DEIS, currently no structure in the Somerset area has been listed. In addition, per the DEIS (Section 13.7), if “operational impacts to above ground resources may include noise, vibration, and views... The impacts of each identified historic resource will need to be assessed individually to determine mitigation measures, which may include redesign options or measures to minimize noise and vibration impacts”. SRC and the Somerset Community will investigate further to determine the mitigation measures that would be proposed.

### **Chapter 14. Transportation**

SRC is located on Somerset Blvd. in the middle of the Somerset Community. The key potential transportation impacts to the SRC facility would be to access the facility and the parking lot(s). There is limited parking at our facility, so that potential construction impacts and long term operational impacts need to be reviewed and assessed to minimize impacts during our summer season and the swim team meets (There are often 100's of people parking around the pool a day or two a week from May- July for these and other events.).

### **Chapter 15. Public services**

In order for SRC to operate per governmental requirements, Police, Fire, and Emergency Response services must be able to access SRC facilities. So any and all potential construction activities will have to ensure access to the site and the facility.

### **Chapter 16. Utilities**

The comments on the preceding Elements of the Environment cover our current basic issues and concerns. Both the existing transmission lines and proposed transmission line upgrade as well as the co-located Olympic Pipeline have to be evaluated further, with potential impacts/mitigation measures discussed. In addition, there is a telecommunications – Cell Tower (T-Mobile) on a PSE pole on SRC's site and this system needs to be protected due to any proposed action, since it provides cell coverage in the area and rental income essential to SRC operations. The natural gas, other telecommunications systems, water, and wastewater utilities in the area have not been identified and will potentially be impacted.

### **Elements of the Environment that were not included- Economics**

Economic analysis is often included in a DEIS and is an allowed part of the SEPA process. The DEIS (Section 10.7.1.4) stated that “the effect of transmission lines on property values is an economic rather than environmental issue as defined by SEPA”. This implies that it is not a criterion that would be allowed in the SEPA process. This is incorrect; Economics is an Element of the Environment in many SEPA EIS's.

Also, Section 11.6.14 stated that the data was inconclusive about the reasons for different valuations set by Assessors and the degree to which various factors negatively impacted the property assessment. These statements are incorrect and an economic analysis would provide accurate and proven conclusions based on similar studies performed in the west.

Due to the EE significant impacts, it is essential that COB include in an economic analysis in the next EIS. SRC is also concerned about the economic impact on our Club, if construction of EE takes place on our property during the summer months when we are open.

The DEIS also does not accurately state how property values are assessed. King County's property tax assessment is based on the statute. However, the market value is dependent on the economy and what potential buyers are willing to pay. If 85-100 foot towers are placed in a property owner's back yard and possibly on two locations at SRC and they both block views and access to the property, then this will result in lower property values. It will also reduce SRC membership to a point that we may have to close the facility. In addition to the effects of the transmission line upgrade, EE is proposing to upgrade and co-locate the new towers with the Olympic Pipeline corridor and this may also affect our property values and a construction issue may result in a hazardous event in the community.

**Additional note - Outreach and Coordination**

PSE has never met with the Somerset Rec Club's Board of Directors regarding EE's impact on our Club. It is a concern that due to the significant impact to SRC, we have not been given any information on the mitigation measures (e.g. potential reimbursement) that we would receive from PSE due to the impacts to our Club.

Thank you for reviewing this comment letter. We look forward to receiving comments through the EIS process that adequately address our questions and concerns.

Regards,

Somerset Recreational Club and its Members

*Robert & Karen Gillespie*  
731 97th Avenue S.E., Bellevue, Washington 98004  
206-719-6234 Gillespie1000@msn.com

March 3, 2016

The Honorable John Stokes  
Mayor-The City of Bellevue  
450 110<sup>th</sup> Avenue N.E.  
Bellevue, Washington 98004

Re: Energize Eastside

Dear Mayor Stokes,

In my lifetime, Washington's population has increased by 4.4 million residents. It will hit 10 million by 2030. We can expect another 375,000 of those residents in King County and most of these people will create new electrical demand in Puget Sound Energy's (PSE) eastside service area.

The population served by the powerlines in the Energize Eastside project has increased seven-fold since the old transmission line was built in 1963 and that demand is pushing the powerlines to their limits. Relying on a 60-year-old equipment to keep our lights on is poor public policy and I want to add my voice to those supporting the PSE proposal. A handful of homeowners (only 200; please see their Facebook page) are putting in jeopardy the power needs of the approximately 300,000 customers who are served in the circuits fed by this transmission corridor.

This isn't a power supply issue as the opponents claim. This is about delivering power in sufficient quantities through the "pipeline" that carries our electricity. Your own advisory committee said that an upgrade is needed. The utility's significant research has documented the need. Even the Federal Energy Regulatory Commission has dismissed (10/5/15) the opponents' objections as "misapplied".

The visual impact of the new lines will be significantly lessened for 95% of the residents living along the route; fewer poles, farther apart, with line placement above the usual sightlines.

This EIS process has shown that failing to upgrade this line creates the possibility of sub-regional, rolling, blackouts. I don't want to experience power blackouts so that someone who moved adjacent to an existing transmission line is spared some minor impact on his or her view.

With decades of experience in the area of public affairs, I realize that the majority is rarely heard; a few loud voices always seem to dominate the conversation. But, thoughtful voices should be respected as well. I hope you will arrive at a decision supporting the recommendations of Energize Eastside.

Very truly yours,

  
Robert L. Gillespie

✓ Cc: Heidi Bedwell, EIS Program Mgr. - City of Bellevue  
Councilmembers of Kirkland, Renton, Redmond and Newcastle

To: The Mayor and Council Members of the City of Bellevue.

February 8, 2016

Subject: A summarized concern about renewal of the B P Olympic Pipeline easement and its co-residence with the Puget Sound Energy 18 mile 'Energize Eastside' project.

My name is Ronald Bromwell, I moved with my family to Bellevue in 1966 and for the past 31 years we have lived in the Bridle Trails area in a home sharing our back yard with seven Puget Sound Energy electric cables and two B P Olympic pressurized gasoline pipes, one 16 inches and one 20 inches in diameter. The two energy utilities share a 100 foot easement to the west of our home, the pipeline sub-leases 15 feet along the western edge of the easement.

However: "PSE holds senior property rights for much of the shared corridor (including the 18 mile segment at issue) and may attempt to pursue certain legal remedies to request that Olympic relocate the pipelines if they interfere with PSE's legitimate project requirements" as stated in a letter from Donald W. Porter, President of BP Pipelines (North America) Inc. June 2015.

As a result of the planned Puget Sound Energy 'Energize Eastside' project we have written to express our concern for the danger implied by the co-existence of high voltage electricity and pressurized gasoline to a number of interested parties including: BP Olympic Pipeline, The Seattle Times, The King County Executive and the Mayors of each of the five cities included in the project. Copies of the letters are attached to this summary.

Our concerns are as follows:

1. The easement location is a wind tunnel during winter months as it is contained in a channel within trees as high as 140 feet or more. Cables have been broken due to wind damage and fallen to touch the ground which when wet conducts electricity.
2. The proposed replacement cables will be carrying High Voltage electricity at an increased height from the present 40 feet to perhaps 120 feet, this will increase the wind effect and add to vibration at ground level. There will be a need to locate the poles in large concrete foundations and to bury the grounding cables for several hundred feet within the easement to absorb lightning strikes and short circuiting.
3. BP Olympic Pipeline Company in its 'Important Safety Information' brochure contains the following messages; "Because even relatively minor excavation activities like landscaping or fencing can cause damage to a pipeline, its protective casing and/or buried utility lines"... and, "Even a small disturbance to a pipeline's integrity may cause a future leak due to subsequent corrosion. A gouge, scrape, dent or crease is cause enough for the company to inspect and repair the damage".

Note: A local event was reported on May 24, 2004, that: "A pinhole-sized leak caused by wear, unleashed thousands of gallons of gasoline that fueled the Olympic Pipeline fire and explosion near Bellingham, Washington, causing three deaths and considerable damage".

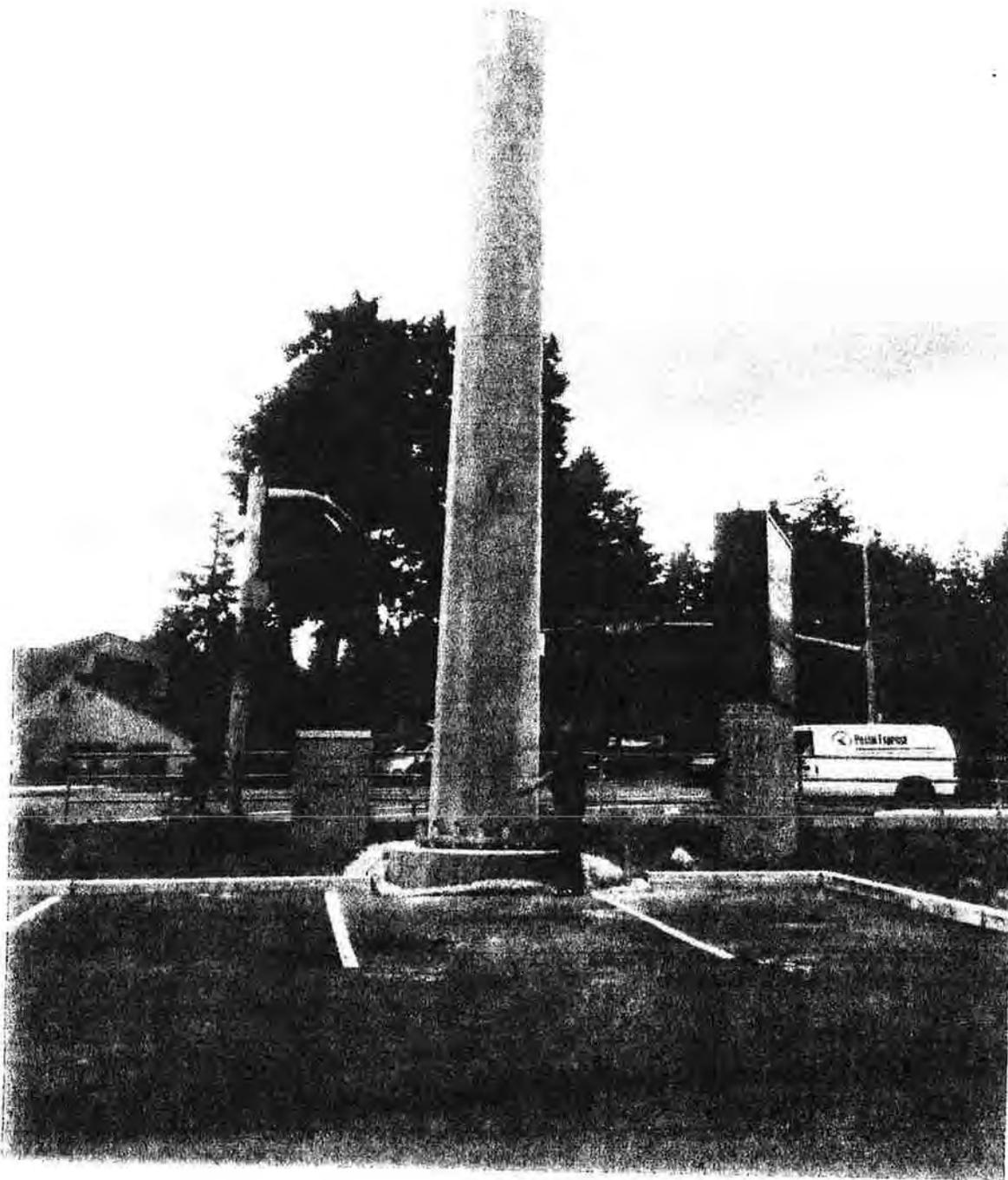
4. PSE has only 85 feet of easement to work in which means that the new poles or towers, with their associated cables may be located within only 40 feet or so of the pipelines. At an estimated spacing of ¼ mile between towers this means that 72 construction sites will be needed for the 18 miles of the PSE project, each one creating potential for an immediate or future accident.

Note: Bonneville Power Administration bans any construction within 50 feet of an energy Right of Way - "Pipes and cables should not be installed closer than 50 feet to a BPA tower, any associated guy wires or grounding systems. These grounding systems are long, buried wires that are sometimes attached to the structures and can run up to 300 feet along the right-of-way."

5. Earthquake potential in the Pacific Sound area has recently become a serious topic for discussion. Sandi Doughton, Science Reporter for the Seattle times has described the potential in her book 'Full-Rip 9.0' THE NEXT BIG EARTHQUAKE IN THE PACIFIC NORTHWEST. It does not bear thinking about the catastrophic result of mixing high voltage electricity and gasoline in even a minor earthquake situation.

Your attention to these concerns will be much appreciated by many residents of the five cities included in this review.

Thank you, Barbara, Joanne & Ron Bromwell



## Call before you dig IT'S FREE, AND IT'S THE LAW!

811 is a federally-mandated number designated by the FCC to consolidate all local "Call Before You Dig" numbers and help save lives by minimizing damages to underground utilities. One easy phone call to 811 starts the process to get your underground pipelines and utility lines marked for **FREE**. When you call 811 from anywhere in the country, your call will be routed to your state One-Call Center. Once your underground lines have been marked for your project, you will know the approximate location of your pipelines and utility lines, and can dig safely. More information regarding 811 can be found at [www.call811.com](http://www.call811.com).



Because even relatively minor excavation activities like landscaping or fencing can cause damage to a pipeline, its protective casing and/or buried utility lines, always contact your state One-Call Center before engaging in any construction or digging activities on your property. In fact, most serious damage done to pipelines is done when a third party inadvertently excavates, blasts or drills within a pipeline right-of-way. By simply contacting the One-Call Center first, this type of damage can be prevented. Once the One-Call Center has been contacted, local pipeline and utility operators will come out to locate and properly mark their pipelines at the excavation site.



## Use your SENSES

### How would you recognize a pipeline leak?

Although pipeline leaks are rare, knowing how to recognize and respond to a possible leak is a key component in pipeline safety. Trust your senses. You may recognize a pipeline leak by:

- **Sight:** Liquid pools, discolored or abnormally dry soil/vegetation, continuous bubbling in wet or flooded areas, an oily sheen on water surfaces, and vaporous fogs or blowing dirt around a pipeline area can all be indicative of a pipeline leak. Dead or discolored plants in an otherwise healthy area of vegetation or frozen ground in warm weather are other possible signs.
- **Sound:** Volume can range from a quiet hissing to a loud roar depending on the size of the leak.
  - An unusual smell, petroleum odor, or gaseous odor will sometimes accompany pipeline leaks.
    - *Gas transmission/gas gathering pipelines are odorless, but may contain a hydrocarbon smell.*
    - *Highly Volatile Liquids (HVL's) can be odorless and colorless in their natural state and most are considered irritants to eyes and nose. Commercial odorants are added to many HVL's to assist in detection of a leak.*
    - *Gas distribution systems are odorized with the chemical Mercaptan or other similar chemicals.*
      - *Mercaptan is a harmless non-toxic chemical that is added to make it easier to detect a gas leak due to its skunk like odor.*
    - *Landfill gas, which is becoming a popular source of natural gas, has a more pungent and unpleasant odor similar to the smell of rotting garbage.*

### What to do in the event a leak were to occur

The following guidelines are designed to ensure your safety and the safety of those in the area if a petroleum product or natural gas pipeline leak is suspected or detected:

- **Leave the area** by foot immediately. Try to direct any other bystanders or unsuspecting individuals to leave the area. Attempt to stay upwind.
  - *HVL vapors are heavier than air and can collect in low areas such as ditches, sewers, etc.*
- If known, from a safe location, notify the pipeline operator immediately and **call 911** or your local emergency response number. The operator will need your name, your phone number, a brief description of the incident, and the location so the proper response can be initiated.
- **Turn off** any equipment and eliminate any ignition source, if able to do so without risk of injury.

### What not to do in the event a leak were to occur

- **DO NOT** come into direct contact with any escaping liquids or gas.
- **DO NOT** attempt to operate any pipeline valves yourself. You may inadvertently route more product to the leak or cause a secondary incident.
- **DO NOT** cause any open flame or other potential source of ignition such as an electrical switch, vehicle ignition, light a match, etc. Do not start motor vehicles or electrical equipment. Do not ring doorbells to notify others of the leak. Knock with your hand to avoid potential sparks from knockers.
- **DO NOT** drive into a leak or vapor cloud while leaving the area.
- **DO NOT** attempt to extinguish a petroleum product or natural gas fire. Wait for local firemen and other professionals trained to deal with such emergencies.

For more information regarding pipeline safety and an overview of the pipeline industry please visit the following Web sites:

#### Pipeline Resources and Information

- Pipeline 101 - [www.pipeline101.com](http://www.pipeline101.com)
- Association of Oil Pipe Lines (AOPL) - [www.aopl.org](http://www.aopl.org)
- American Petroleum Institute (API) - [www.api.org](http://www.api.org)
- In the Pipe - Newsletter from the Oil Pipeline Industry - [www.enewsbuilder.net/aopl/](http://www.enewsbuilder.net/aopl/)
- Interstate Natural Gas Association of America (INGAA) - [www.ingaa.org](http://www.ingaa.org)
- American Gas Association (AGA) - [www.aga.org](http://www.aga.org)
- Dig Safely - [www.digsafely.com](http://www.digsafely.com)
- Common Ground Alliance (CGA) - [www.commongroundalliance.com](http://www.commongroundalliance.com)

#### Regulatory Agencies

- Department of Transportation (DOT) - [www.dot.gov](http://www.dot.gov)
- DOT Research and Special Programs Administration (RSPA) - [www.dot.gov/affairs/rspaid.htm](http://www.dot.gov/affairs/rspaid.htm)
- Office of Pipeline Safety (OPS) - [phmsa.dot.gov](http://phmsa.dot.gov)
- National Transportation and Safety Board (NTSB) - [www.nts.gov](http://www.nts.gov)
- Federal Energy Regulatory Commission (FERC) - [www.ferc.gov](http://www.ferc.gov)
- Federal Energy Regulatory Commission (FERC - Oil Pipelines) - [www.ferc.gov/industries/oil.asp](http://www.ferc.gov/industries/oil.asp)
- Occupational Safety & Health Administration (OSHA) - [www.osha.gov](http://www.osha.gov)
- National Fire Protection Association (NFPA) - [www.nfpa.org](http://www.nfpa.org)

To view this information on the Web or to take our online survey, go to [www.pipelinesafetyinfo.com](http://www.pipelinesafetyinfo.com)

The information provided in this brochure, including but not limited to, One-Call center information, Web sites, state laws, regulatory agencies, has been gathered using the most up to date information available, and provided for informational purposes only. All matter is subject to change without notice. The Paradigm Group, Inc. made an attempt to verify all information contained herein as to its accuracy, and is not liable

13650 NE 34<sup>th</sup> Place, Bellevue, WA 98005

425 883 165

Chief Executive Officer

May 26, 2015

B P Pipelines (North America)  
150 W. West Warrenville Road,  
Naperville, IL 60563).

**Subject: Potentially hazardous development at Olympic Pipeline location**

Dear Sir:

The residents of five cities in Washington State have been asked for input in the form of an EIS (Environmental Impact Statement), on the significant environmental issues which will be affected by an 18 mile new energy development being promoted by Puget Sound Energy (PSE). The project will install high voltage power lines and share an easement with the existing Olympic Pipelines dual gasoline pipes which are located in the area.

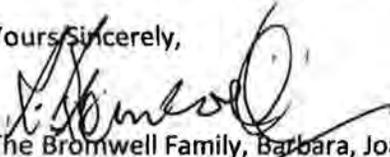
We are sharing this information with you as we have not seen or heard representatives from Olympic Pipelines at the various meetings which have been taking place. The safety of the pipeline is of vital importance to many residents in the five cities along the route of the projected development as in many cases it runs very close to their homes, less than 50 feet in cases. Therefore, we wish to have an opinion from your company concerning the safety of the pipelines considering the major construction which will take place to install many large towers 100 feet or more in height, with associated very large concrete foundations, then the on-going vibration and earth movements caused by strong wind factors, and possible lightning strikes.

This project known as Energize Eastside has created a major wave of objections for a number of reasons, but the strongest critics have been speakers with knowledge of geological issues relating to earthquake and other earth movement factors who cited the extreme dangers of installing such a project across a known earthquake fault line and within feet of a major gasoline pipeline.

We bring this matter to your attention in the hope that your company will understand this development as potential for a disaster in the making and will insist that the Energize Eastside project be subjected to a re-evaluation with particular relevance to pipeline safety. At the very least we expect that a different route will be selected. We have provided additional details as an attachment to this letter.

A timely response will be much appreciated and your assistance in providing clarification on the steps contemplated by Olympic Pipeline to avoid potential dangers resulting from the subject Energize Eastside project will be welcomed by a large number of residents of the five cities affected.

Yours Sincerely,



The Bromwell Family, Barbara, Joanne and Ronald  
13650 NE 34<sup>th</sup> Place, Bellevue, WA 98004

Background to EIS response - Energize Eastside.

On Tuesday, May 7 2015 a meeting was held at the City Hall, City of Bellevue, Washington; more than 200 people were present to participate in the first phase of an EIS (Environmental Impact Statement) relating to the proposed PSE project known as 'Energize Eastside'. Bellevue is the lead city in the development being the largest of the five cities and has 9 of the 18 miles of construction to deal with.

At the meeting many speakers representing opposition to this project questioned the need for the project including the major disruption it will cause in the loss of several thousand trees, the installation of giant poles with associated cables up to 100 feet in height, and the financial cost to the local community when it seems to many that the real motive is to serve out of state customers in Canada and California; and to develop income for PSE from state infrastructure incentives. It was also made clear that new alternative power sources are rapidly coming on-line which will make additional grid development unnecessary.

Despite the fact that many very large concrete piers will need to be constructed within feet of the pipeline to support the towers there has been no visible effort on the part of Olympic Pipeline to be present at the many meetings which have been held, therefore we question if Olympic is fully aware of the project or, it may imply that Olympic agrees with PSE that no danger is to be expected from heavy construction activity along the 18 mile section, when even at a spacing of say 300 yards between towers almost 100 towers would need to be constructed, or that the ongoing presence of high voltage power cables suspended at 100 feet could cause vibration from wind issues or other earth movement.

For clarification purposes the Olympic Pipeline was constructed in 1973, it is 42 years of age and has received no visible maintenance during the past 30 years according to residents in the area. It is located within an easement of 100 feet shared with PSE. The pipes are located less than 50 feet from the center of the easement with currently only a 16 feet set-back from the first electrical cable. The combined easement forms a narrow corridor lined on both sides by homes or buildings and in some areas by very large trees many of which are over 100 feet high; resulting in the creation of a wind tunnel effect during winter storms when trees and branches are frequently blown down and cause power outages, even a recent cable breakage. (See plat diagram enclosed).

The pipes are buried in the ground but only at a shallow level of three or four feet, their location is marked with posts bearing notices not to dig **"Because even relatively minor excavation activities like landscaping or fencing can cause damage to a pipeline, it's protective casing and / or buried utility lines"** as it says in the Olympic Pipelines safety brochure.

Residents of this area are very much aware of pipeline infrastructure problems such as a local event on May 24, 2004 – It was reported that: **"A pinhole-sized leak caused by wear, unleashed thousands of gallons of gasoline that fueled the Olympic Pipeline fire and explosion near Bellingham, Washington"**; this accident caused three deaths and considerable danger and damage. It was one of many such accidents in recent years. Wikipedia, the free Internet encyclopedia has documented a list of 503 pipeline accidents and failures which have occurred in the United States in the last 15 years, not including the latest disaster of May 20, 2015, in Santa Barbara, California.

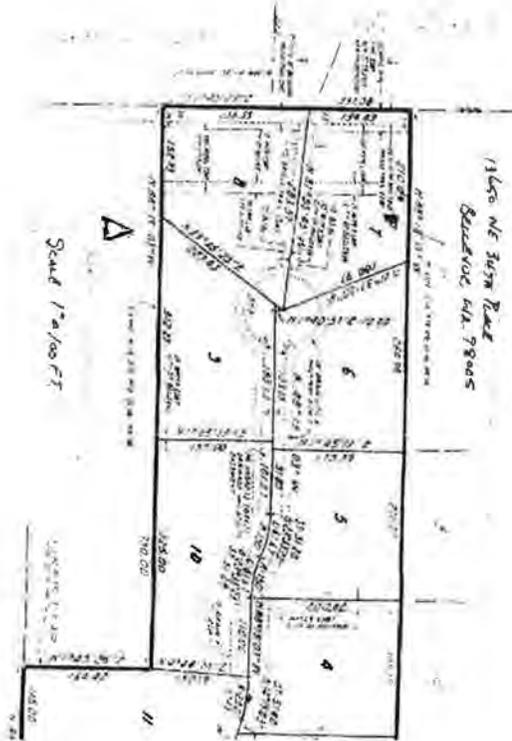
We note that the business statement of BP Pipelines states - **"We strive to be an operationally excellent organization that has the right resources, skills, processes and tools to consistently deliver best-in-class performance."** We sincerely hope that this Modus Operandi will be demonstrated in the resolution of this event.

Major public protests against this development are recorded at a local website <Cense.org> (Coalition for Eastside Neighborhoods for Sensible Energy). (See brochure enclosed).

In order to ensure that this project is fully investigated by the appropriate organizations responsible for the oversight of pipeline safety copies of this letter have been sent to the following regulatory agencies listed in the Olympic Pipelines safety brochure:

Pipeline and Hazardous Material Safety Administration (PHMSA)

Federal Energy Regulatory Commission (FERC).



[sdoughton@seattletimes.com](mailto:sdoughton@seattletimes.com)<[sdoughton@seattletimes.com](mailto:sdoughton@seattletimes.com)>;

Earthquakes, gasoline under pressure and high voltage electricity; a witches' brew?

My family lives in Bellevue within a few feet of the PSE/Olympic Pipeline - it goes right through our backyard. Having read of your interest and study of earthquakes we thought we would seek your advice on preventing a potential catastrophe if Puget Sound Energy has its way and builds 'Energize Eastside' a new high voltage electric power line within the same narrow 100 foot easement as the existing double-pipe Olympic gasoline pipeline.

As you may be aware the Energize Eastside project is causing great concern to many residents in each of the five cities which will be affected if the project is permitted to continue. Puget Sound Energy (PSE) has done an admirable job of selling the thought that a major effort is needed to cope with the anticipated increase in power required as the population rises, but there are many who believe there are better ways to solve this problem as technology is rapidly overtaking the old solutions of more and more cables and poles. At this very time there are major local developments promoting solar energy, back-up power cells, improved 'Peak load' mitigation techniques, and the simple promotion of large scale implementation of LED lamps which reduce electric consumption by an astonishing 84%?

Another major reason to 're-think' the project is safety. PSE has shown us maps and declared them to be the result of community advisory groups. However; they have not discussed the fact that a principal path for the new H V (high voltage) cables requires them to be installed side by side with the Olympic Pipeline gasoline pipes which carry aircraft fuel under pressure to SeaTac Airport. It appears that the existing easement is attractive to PSE because it is cheaper than a new route and Olympic Pipeline holds only a subordinate role in the easement and cannot protest the dangers without having to consider a re-location. The pipes are buried in the ground but only at a shallow level of three or four feet, their location is marked with posts bearing notices not to dig **"Because even relatively minor excavation activities like landscaping or fencing can cause damage to a pipeline, it's protective casing and / or buried utility lines"** as it says in the Olympic Pipelines safety brochure.

Residents of this area are very much aware of pipeline infrastructure problems such as a local event on May 24, 2004 – It was reported that: **"A pinhole-sized leak caused by wear, unleashed thousands of gallons of gasoline that fueled the Olympic Pipeline fire and explosion near Bellingham, Washington"**; this accident caused three deaths and considerable danger and damage. It was one of many such accidents in recent years. Wikipedia, the free Internet encyclopedia has documented a list of 503 pipeline accidents and failures which have occurred in the United States in the last 15 years, not including the latest disaster of May 20, 2015, in Santa Barbara, California.

Despite this background PSE plans to dig large holes using heavy equipment within about 40 feet of the pipeline, the combined easement is 100 feet wide.

Over the 18 miles of construction it will be necessary to install a large number of poles or towers, perhaps as many as 72 at ¼ mile spacing, or even more. To help visualize the effort and vibration involved please watch this short video of the installation of poles of similar height, about 120 feet, used in windmill construction.

[https://www.youtube.com/embed/84BeVq2Jm88?feature=player\\_detailpage](https://www.youtube.com/embed/84BeVq2Jm88?feature=player_detailpage)

Yes, windmills need to be very strong and stable, but so do power poles carrying the weight of heavy cables at 70 to 100 feet above the ground, which are subject to strong wind pressure during several months of the year. There are the problems of lightning strikes with electrical surges being conducted down the poles into trailing grounding cables buried in the soil for several hundred feet adjacent to the pipelines. The combined easement forms a narrow corridor lined on both sides by homes or buildings and in some areas by very large trees many of which are over 100 feet high; resulting in the creation of a wind tunnel effect during winter storms when trees and branches are frequently blown down and cause power outages, even a recent cable breakage. (See plat diagram enclosed). And then there is the fear of earthquakes, the Pacific Northwest is considered to be a significant earthquake danger zone.

Clearly the planned Olympic Pipeline / PSE easement is not the place for the location of high voltage power lines. Even if the project could be installed without damage the ongoing fear of a major catastrophic event and the potential for serious damage to homes, businesses and even lives is almost beyond imagination.

If this subject is of interest to you please contact Cense.org 'Coalition of Eastside Neighborhoods for Sensible Energy' a website set up to educate elected officials and the public with reference to the PSE Energize Eastside project.

Sincerely,

Barbara, Joanne & Ron Bromwell

A handwritten signature in black ink, appearing to be a cursive script, positioned above the typed name 'Barbara, Joanne & Ron Bromwell'. The signature is somewhat stylized and difficult to decipher.

13650 NE 34<sup>th</sup> Place, Bellevue, WA 98005

425 883 1655 [rbromwell13650@hotmail.com](mailto:rbromwell13650@hotmail.com)

Mr. Dow Constantine,  
King County Executive  
401 5<sup>th</sup> Avenue, Suite 800,  
Seattle, WA 98104

July 30, 2015

**Subject: Earthquake, gasoline and High Voltage electricity, a toxic mix.**

Dear Executive Constantine:

I am sending this letter to you and to the Mayors of the five King County cities which are involved in the 'Energize Eastside' proposal from Puget Sound Energy (PSE). You are surely aware that this high voltage power project is causing great concern to many residents in each of the five cities which will be affected if this plan is permitted to continue as currently proposed. PSE has done an admirable job of selling the thought that a major effort is needed to cope with the anticipated increase in electrical power required as the population rises, but there are many who believe there are better ways to solve this problem as technology is rapidly overtaking the old solutions of more and more cables and poles. At this very time there are local developments at the state and city levels promoting solar energy, there is the availability of new back-up power cells, improved 'Peak load' mitigation techniques, and the simple promotion of large scale implementation of LED lamps which alone reduce electric consumption by an astonishing 84%.

**The facts show major expense to the customers of PSE along with an unsightly forest of more high towers and cables are probably not needed at this time.**

Another significant reason to 'Re-think' the project is safety. PSE has shown us maps and declared them to be the result of community advisory groups. However, they have not discussed the fact that a principal path for the new H V (high voltage) poles and cables requires them to be installed alongside two Olympic Pipeline gasoline pipes, each approximately 16 inches in diameter, which carry aircraft fuel under pressure to SeaTac Airport. It appears that the existing easement is attractive to PSE because it is cheaper than a new route and as Olympic Pipeline holds only a subordinate role in the easement 'Right of Way' it cannot protest the dangers without having to consider a re-location. Olympic Pipelines has published the fact that pipe lines are very sensitive to vibration "*even digging for a fencepost can cause problems*". The local Bellingham pipeline explosion which killed three people was reportedly caused by "*a pin-hole leak caused by abrasion*".

Over the 18 miles of construction it will be necessary to install a large number of poles or towers, perhaps as many as 72 at ¼ mile spacing, or even more, using heavy equipment within about 40 feet of the pipeline, the combined easement is only 100 feet wide, and cannot be widened due to the close proximity of homes and buildings. My family knows this because it runs through our backyard.

Page 2

To help visualize the effort and vibration involved please watch this short video of the installation of poles of similar height, about 100-120 feet, used in windmill construction.

[https://www.youtube.com/embed/84BeVq2Jm88?feature=player\\_detailpage](https://www.youtube.com/embed/84BeVq2Jm88?feature=player_detailpage)

Yes, windmills need to be very strong and stable, but so do power poles to resist vibration causing earth movement and to carry the weight of heavy cables which are subject to strong wind pressure at 70 to 100 feet above the ground. Then there are the problems of lightning strikes with the electrical surge being conducted down the poles into trailing grounding cables buried in the soil for several hundred feet adjacent to the pipelines. Another factor is trees in our neighborhood reach 140 feet high and have been known to fall on the existing power lines. Finally, we are currently hearing about the Cascadian Fault a major earthquake zone adjacent to the Puget Sound area with a suspected fault line along the Interstate 90 freeway route.

Clearly, the planned Olympic Pipeline / PSE easement is not the place for the addition of high voltage power lines. Even if the project could be installed without damage the ongoing fear of a major catastrophic event would destroy the value of homes and increase the insurance premiums of businesses along the route.

The Olympic pipe line is 40 years old and the history of pipe lines is not without blemish as there have been 504 incidents of pipe line safety across the country over the past 15 years. Pressurized gasoline and high voltage electricity are not compatible and it is surely a dangerous decision to risk the consequences of even a 'small' event.

Please consider the safety of your citizens and the economic consequences of a disaster waiting to happen by taking steps to stop this project being built in the proposed location. More information may be obtained at CENSE.org (Coalition of Eastside Neighborhoods for Sensible Energy).

Sincerely,



Ron Bromwell

Cc Mayor of Kirkland, Mayor of Redmond, Mayor of Bellevue, Mayor of Newcastle, Mayor of Renton.

Dear Elected Councilmember,

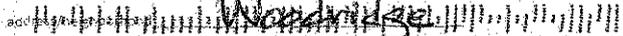
The current EIS process creates a potential conflict of interest. The City of Bellevue may feel pressure to avoid a NEPA review and "shortcut" the path to issuing permits for Energize Eastside. The PROCESS yields the opportunity for misappropriation and perceptions of impropriety. The PROCESS puts one individual in a difficult, and potentially compromising, position—to make a SEPA-only determination, side-stepping NEPA review, providing an opportunity for Bellevue Development Services Department to fund their budget to the tune of millions of dollars in permit fees. Shouldn't the PROCESS be changed to allow for more transparency and independent assessment? For a project of this size and scope of Energize Eastside, SEPA vs. NEPA review must be determined by an independent panel/commission that includes detailed local, state, and federal review.

Sincerely,

name

Russell Borzmann

Wardbridge



FEB 22 2016

CITY COUNCIL

Councilmember  
Kevin Wallace  
50 110th Ave. NE  
P.O. Box 90012  
Bellevue, WA  
98009

(fold)

(tape)

## Did You Know?

Bellevue's Development Services Department is funded from permit fees, not from tax revenues? The Development Services Department stands to generate significant review from the issuance of permit fees for the Energize Eastside project.

**Sadly, the EIS PROCESS is deeply flawed.**

The City should issue a Final Decision on the Phase 1 "Programmatic" EIS and submit to the Hearing Examiner **BEFORE** proceeding to a Phase 2 "Project" EIS.

**"Energize Eastside" Is NOT A Done Deal**

Voice Your Concerns to  
**BELLEVUE CITY COUNCIL**

(tape)

(cut)

(cut)

(tape)

Dear Elected Councilmember,

date 2/4/16



By electing NOT to include the Energize Eastside project in the regional transmission plan, PSE avoids FERC Order 1000 compliance and side-steps NEPA review.

PSE has simply chosen to have Energize Eastside accomplish the goal of permitting more transmission capacity to Canada without asking for cost contributions from BPA, SCL, and others. If PSE is required to include Canadian Entitlement power in their load flow studies, then shouldn't PSE also be required to submit the Energize Eastside project as part of the regional transmission plan for cost allocation purposes? <https://www.columbiagrid.org/download.cfm?DVID=2157> (pg 15 of 21)

Why are PSE customers being asked to solely pay for electricity grid enhancements? Sincerely,

name Joanne Bromwell

address/neighborhood BRIDLE TRAILS

TO: Mayor John Stokes  
450 110th Ave. NE  
P.O. Box 90012  
Bellevue, WA  
98009

## Did You Know?

Can PSE have it both ways—claim it is required to include Canadian Entitlement electricity in power flow studies, then turn around and elect to have Energize Eastside OMITTED from regional transmission planning for cost allocation purposes?

Power flows to Canada "are required to be included in the PSE load flow studies.... It is not optional." (PSE)

"...neither Puget Sound, nor any other eligible party, requested to have the project selected in the regional transmission plan for purposes of cost allocation...." (FERC ruling)

## "Energize Eastside" Is NOT A Done Deal

Voice Your Concerns to  
BELLEVUE CITY COUNCIL

Dear Elected Councilmember,

- Peak Load hours occur during a 6-hour period (6am-9am and 5pm-8pm)
- Over the past 16-year period, the region's temperature dipped to 23F, or below, on 70 days
- Of those 70 days, only 44 days occurred on weekday work days (non-weekend, non-holiday)
- 44 days x 6 hours = 264 hours vulnerable to Peak Demand outages, worst case
- During that same 16-year period, 139,992 hours are not vulnerable to Peak Demand outages

Assuming Energize Eastside avoided a power outage during every peak usage hour (264 hrs), Energize Eastside provides a maximum reliability improvement of 0.2%. (264hrs / 139,992 hrs). The City of Bellevue has a fiduciary duty to its citizens to analyze how to make measureable, meaningful improvements to the electricity grid. Sincerely,

address/neighborhood Woodridge

RECEIVED  
FEB 12  
CITY COUNCIL

TO: Councilmember  
John Chelminiak  
450 110th Ave. NE  
P.O. Box 90012  
Bellevue, WA  
98009

## Did You Know?

Are PSE customers being asked to overpay for reliability to falsely insure against an improbable climax of events—NINE events occurring simultaneously (N-9)? FERC and NERC require infrastructure investments to avoid N-2 situations. In reality, how much will Energize Eastside actually increase our reliability?

Energize Eastside provides a theoretical maximum reliability improvement of 0.2%

Energize Eastside will cost customers close to \$1 billion over 40 years

## "Energize Eastside" Is NOT A Done Deal

Voice Your Concerns to  
BELLEVUE CITY COUNCIL

Comments on the 18 mile Energize Eastside transmission line:

Living in Northwest earthquake country we all know that "the big one" is coming. We have been hearing that for years. We get reminders in the news about the landslides, tsunamis and ground ruptures that will occur when the Cascadia subduction zone quake occurs but we get complacent about these warnings. On July 20, 2015 The New Yorker published an article "The Really Big One" by Kathryn Schulz. I have enclosed a copy of this article which should be read by anyone contemplating installing 18 miles of 230 kV lines alongside a petroleum pipeline (the article is also available online). In her article, Schulz enables us to understand the scenario that will take place and it is very, very frightening.

One of PSE's consultants, Mark Williamson, has stated in discussing running the 230 kV lines along the petroleum pipeline "If you are more than 50 feet from a lattice tower or more than 25 feet from a single monopole you don't need to do any engineering studies. That's far enough that you can just be laissez-faire and let it go." The definition of laissez-faire is "a policy or attitude of letting things take their own course, without interfering".

This attitude is not acceptable considering the high risk involved in running the 230kV power lines together with the petroleum pipeline in a part of the country where a 9.0 earthquake is expected to occur in the near future. The people of the Eastside deserve to see a thorough study of this situation.

Sallie Herling  
13825 Somerset Lane SE  
Bellevue, Wa. 98006  
425-746-9072

*Sallie Herling*  
*Feb. 25, 2016*

## THE REALLY BIG ONE

*An earthquake will destroy a sizable portion of the coastal Northwest. The question is when.*

BY KATHRYN SCHULZ

When the 2011 earthquake and tsunami struck Tohoku, Japan, Chris Goldfinger was two hundred miles away, in the city of Kashiwa, at an international meeting on seismology. As the shaking started, everyone in the room began to laugh. Earthquakes are common in Japan—that one was the third of the week—and the participants were, after all, at a seismology conference. Then everyone in the room checked the time.

Seismologists know that how long an earthquake lasts is a decent proxy for its magnitude. The 1989 earthquake in Loma Prieta, California, which killed sixty-three people and caused six billion dollars' worth of damage, lasted about fifteen seconds and had a magnitude of 6.9. A thirty-second earthquake generally has a magnitude in the mid-sevens. A minute-long quake is in the high sevens, a two-minute quake has entered the eights, and a three-minute quake is in the high eights. By four minutes, an earthquake has hit magnitude 9.0.

When Goldfinger looked at his watch, it was quarter to three. The conference was wrapping up for the day. He was thinking about sushi. The speaker at the lectern was wondering if he should carry on with his talk. The earthquake was not particularly strong. Then it ticked past the sixty-second mark, making it longer than the others that week. The shaking intensified. The seats in the conference room were small plastic desks with wheels. Goldfinger, who is tall and solidly built, thought, No way am I crouching under one of those for cover. At a minute and a half, everyone in the room got up and went outside.

It was March. There was a chill in the air, and snow flurries, but no snow on the ground. Nor, from the feel of it, was there ground on the ground. The earth snapped and popped and rippled. It was, Goldfinger thought, like driving

through rocky terrain in a vehicle with no shocks, if both the vehicle and the terrain were also on a raft in high seas. The quake passed the two-minute mark. The trees, still hung with the previous autumn's dead leaves, were making a strange rattling sound. The flagpole atop the building he and his colleagues had just vacated was whipping through an arc of forty degrees. The building itself was base-isolated, a seismic-safety technology in which the body of a structure rests on movable bearings rather than directly on its foundation. Goldfinger lurched over to take a look. The base was lurching, too, back and forth a foot at a time, digging a trench in the yard. He thought better of it, and lurched away. His watch swept past the three-minute mark and kept going.

Oh, shit, Goldfinger thought, although not in dread, at first: in amazement. For decades, seismologists had believed that Japan could not experience an earthquake stronger than magnitude 8.4. In 2005, however, at a conference in Hokudan, a Japanese geologist named Yasutaka Ikeda had argued that the nation should expect a magnitude 9.0 in the near future—with catastrophic consequences, because Japan's famous earthquake-and-tsunami preparedness, including the height of its sea walls, was based on incorrect science. The presentation was met with polite applause and thereafter largely ignored. Now, Goldfinger realized as the shaking hit the four-minute mark, the planet was proving the Japanese Cassandra right.

For a moment, that was pretty cool: a real-time revolution in earthquake science. Almost immediately, though, it became extremely uncool, because Goldfinger and every other seismologist standing outside in Kashiwa knew what was coming. One of them pulled out a cell phone and started streaming videos from the Japanese broadcasting

station NHK, shot by helicopters that had flown out to sea soon after the shaking started. Thirty minutes after Goldfinger first stepped outside, he watched the tsunami roll in, in real time, on a two-inch screen.

In the end, the magnitude-9.0 Tohoku earthquake and subsequent tsunami killed more than eighteen thousand people, devastated northeast Japan, triggered the meltdown at the Fukushima power plant, and cost an estimated two hundred and twenty billion dollars. The shaking earlier in the week turned out to be the foreshocks of the largest earthquake in the nation's recorded history. But for Chris Goldfinger, a paleoseismologist at Oregon State University and one of the world's leading experts on a little-known fault line, the main quake was itself a kind of foreshock: a preview of another earthquake still to come.

Most people in the United States know just one fault line by name: the San Andreas, which runs nearly the length of California and is perpetually rumored to be on the verge of unleashing "the big one." That rumor is misleading, no matter what the San Andreas ever does. Every fault line has an upper limit to its potency, determined by its length and width, and by how far it can slip. For the San Andreas, one of the most extensively studied and best understood fault lines in the world, that upper limit is roughly an 8.2—a powerful earthquake, but, because the Richter scale is logarithmic, only six per cent as strong as the 2011 event in Japan.

Just north of the San Andreas, however, lies another fault line. Known as the Cascadia subduction zone, it runs for seven hundred miles off the coast of the Pacific Northwest, beginning near Cape Mendocino, California, continuing along Oregon and Washington, and terminating around Vancouver Island, Canada. The "Cascadia" part of its name

comes from the Cascade Range, a chain of volcanic mountains that follow the same course a hundred or so miles inland. The “subduction zone” part refers to a region of the planet where one tectonic plate is sliding underneath (subducting) another. Tectonic plates are those slabs of mantle and crust that, in their epochs-long drift, rearrange the earth’s continents and oceans. Most of the time, their movement is slow, harmless, and all but undetectable. Occasionally, at the borders where they meet, it is not.

Take your hands and hold them palms down, middle fingertips touching. Your right hand represents the North American tectonic plate, which bears on its back, among other things, our entire continent, from One World Trade Center to the Space Needle, in Seattle. Your left hand represents an oceanic plate called Juan de Fuca, ninety thousand square miles in size. The place where they meet is the Cascadia subduction zone. Now slide your left hand under your right one. That is what the Juan de Fuca plate is doing: slipping steadily beneath North America. When you try it, your right hand will slide up your left arm, as if you were pushing up your sleeve. That is what North America is not doing. It is stuck, wedged tight against the surface of the other plate.

Without moving your hands, curl your right knuckles up, so that they point toward the ceiling. Under pressure from Juan de Fuca, the stuck edge of North America is bulging upward and compressing eastward, at the rate of, respectively, three to four millimetres and thirty to forty millimetres a year. It can do so for quite some time, because, as continent stuff goes, it is young, made of rock that is still relatively elastic. (Rocks, like us, get stiffer as they age.) But it cannot do so indefinitely. There is a backstop—the craton, that ancient unbudgeable mass at the center of the continent—and, sooner or later, North America will rebound like a spring. If, on that occasion, only the southern part of the Cascadia subduction zone gives way—your first two fingers, say—the magnitude of the resulting quake will be somewhere between 8.0 and 8.6. *That’s* the big one. If the entire zone gives way at once, an event that seismologists call a full-

margin rupture, the magnitude will be somewhere between 8.7 and 9.2. That’s the very big one.

Flick your right fingers outward, forcefully, so that your hand flattens back down again. When the next very big earthquake hits, the northwest edge of the continent, from California to Canada and the continental shelf to the Cascades, will drop by as much as six feet and rebound thirty to a hundred feet to the west—losing, within min-



utes, all the elevation and compression it has gained over centuries. Some of that shift will take place beneath the ocean, displacing a colossal quantity of seawater. (Watch what your fingertips do when you flatten your hand.) The water will surge upward into a huge hill, then promptly collapse. One side will rush west, toward Japan. The other side will rush east, in a seven-hundred-mile liquid wall that will reach the Northwest coast, on average, fifteen minutes after the earthquake begins. By the time the shaking has ceased and the tsunami has receded, the region will be unrecognizable. Kenneth Murphy, who directs FEMA’s Region X, the division responsible for Oregon, Washington, Idaho, and Alaska, says, “Our operating assumption is that everything west of Interstate 5 will be toast.”

In the Pacific Northwest, everything west of Interstate 5 covers some hundred and forty thousand square miles, including Seattle, Tacoma, Portland, Eugene, Salem (the capital city of Oregon), Olympia (the capital of Washington), and some seven million people. When the next full-margin rupture happens, that region will suffer the worst natural disaster in the history of North America. Roughly three thousand people died in San Francisco’s 1906 earthquake. Almost two thousand died in Hurricane Katrina. Almost three hundred died in Hurricane Sandy. FEMA

projects that nearly thirteen thousand people will die in the Cascadia earthquake and tsunami. Another twenty-seven thousand will be injured, and the agency expects that it will need to provide shelter for a million displaced people, and food and water for another two and a half million. “This is one time that I’m hoping all the science is wrong, and it won’t happen for another thousand years,” Murphy says.

In fact, the science is robust, and one of the chief scientists behind it is Chris Goldfinger. Thanks to work done by him and his colleagues, we now know that the odds of the big Cascadia earthquake happening in the next fifty years are roughly one in three. The odds of the very big one are roughly one in ten. Even those numbers do not fully reflect the danger—or, more to the point, how unprepared the Pacific Northwest is to face it. The truly worrisome figures in this story are these: Thirty years ago, no one knew that the Cascadia subduction zone had ever produced a major earthquake. Forty-five years ago, no one even knew it existed.

In May of 1804, Meriwether Lewis and William Clark, together with their Corps of Discovery, set off from St. Louis on America’s first official cross-country expedition. Eighteen months later, they reached the Pacific Ocean and made camp near the present-day town of Astoria, Oregon. The United States was, at the time, twenty-nine years old. Canada was not yet a country. The continent’s far expanses were so unknown to its white explorers that Thomas Jefferson, who commissioned the journey, thought that the men would come across woolly mammoths. Native Americans had lived in the Northwest for millennia, but they had no written language, and the many things to which the arriving Europeans subjected them did not include seismological inquiries. The newcomers took the land they encountered at face value, and at face value it was a find: vast, cheap, temperate, fertile, and, to all appearances, remarkably benign.

A century and a half elapsed before anyone had any inkling that the Pacific Northwest was not a quiet place but a place in a long period of quiet. It took another fifty years to uncover and in-

terpret the region's seismic history. Geology, as even geologists will tell you, is not normally the sexiest of disciplines; it hunkers down with earthly stuff while the glory accrues to the human and the cosmic—to genetics, neuroscience, physics. But, sooner or later, every field has its field day, and the discovery of the Cascadia subduction zone stands as one of the greatest scientific detective stories of our time.

The first clue came from geography. Almost all of the world's most powerful earthquakes occur in the Ring of Fire, the volcanically and seismically volatile swath of the Pacific that runs from New Zealand up through Indonesia and Japan, across the ocean to Alaska, and down the west coast of the Americas to Chile. Japan, 2011, magnitude 9.0; Indonesia, 2004, magnitude 9.1; Alaska, 1964, magnitude 9.2; Chile, 1960, magnitude 9.5—not until the late nineteen-sixties, with the rise of the theory of plate tectonics, could geologists explain this pattern. The Ring of Fire, it turns out, is really a ring of subduction zones. Nearly all the earthquakes in the region are caused by continental plates getting stuck on oceanic plates—as North America is stuck on Juan de Fuca—and then getting abruptly unstuck. And nearly all the volcanoes are caused by the oceanic plates sliding deep beneath the continental ones, eventually reaching temperatures and pressures so extreme that they melt the rock above them.

The Pacific Northwest sits squarely within the Ring of Fire. Off its coast, an oceanic plate is slipping beneath a continental one. Inland, the Cascade volcanoes mark the line where, far below, the Juan de Fuca plate is heating up and melting everything above it. In other words, the Cascadia subduction zone has, as Goldfinger put it, "all the right anatomical parts." Yet not once in recorded history has it caused a major earthquake—or, for that matter, any quake to speak of. By contrast, other subduction zones produce major earthquakes occasionally and minor ones all the time: magnitude 5.0, magnitude 4.0, magnitude why are the neighbors moving their sofa at midnight. You can scarcely spend a week in Japan without feeling this sort of earthquake. You can spend a lifetime in many parts of the Northwest—several, in fact, if you had

them to spend—and not feel so much as a quiver. The question facing geologists in the nineteen-seventies was whether the Cascadia subduction zone had ever broken its eerie silence.

In the late nineteen-eighties, Brian Atwater, a geologist with the United States Geological Survey, and a graduate student named David Yamaguchi found the answer, and another major clue in the Cascadia puzzle. Their discovery is best illustrated in a place called the ghost forest, a grove of western red cedars on the banks of the Copalis River, near the Washington coast. When I paddled out to it last summer, with Atwater and Yamaguchi, it was easy to see how it got its name. The cedars are spread out across a low salt marsh on a wide northern bend in the river, long dead but still standing. Leafless, branchless, barkless, they are reduced to their trunks and worn to a smooth silver-gray, as if they had always carried their own tombstones inside them.

What killed the trees in the ghost forest was saltwater. It had long been assumed that they died slowly, as the sea level around them gradually rose and submerged their roots. But, by 1987, Atwater, who had found in soil layers evidence of sudden land subsidence along the Washington coast, suspected that that was backward—that the trees had died quickly when the ground beneath

them plummeted. To find out, he teamed up with Yamaguchi, a specialist in dendrochronology, the study of growth-ring patterns in trees. Yamaguchi took samples of the cedars and found that they had died simultaneously: in tree after tree, the final rings dated to the summer of 1699. Since trees do not grow in the winter, he and Atwater concluded that sometime between August of 1699 and May of 1700 an earthquake had caused the land to drop and killed the cedars. That time frame predated by more than a hundred years the written history of the Pacific Northwest—and so, by rights, the detective story should have ended there.

But it did not. If you travel five thousand miles due west from the ghost forest, you reach the northeast coast of Japan. As the events of 2011 made clear, that coast is vulnerable to tsunamis, and the Japanese have kept track of them since at least 599 A.D. In that fourteen-hundred-year history, one incident has long stood out for its strangeness. On the eighth day of the twelfth month of the twelfth year of the Genroku era, a six-hundred-mile-long wave struck the coast, levelling homes, breaching a castle moat, and causing an accident at sea. The Japanese understood that tsunamis were the result of earthquakes, yet no one felt the ground shake before the Genroku event. The



*"Perhaps I've said too much."*

wave had no discernible origin. When scientists began studying it, they called it an orphan tsunami.

Finally, in a 1996 article in *Nature*, a seismologist named Kenji Satake and three colleagues, drawing on the work of Atwater and Yamaguchi, matched that orphan to its parent—and thereby filled in the blanks in the Cascadia story with uncanny specificity. At approximately nine o'clock at night on January 26, 1700, a magnitude-9.0 earthquake struck the Pacific Northwest, causing sudden land subsidence, drowning coastal forests, and, out in the ocean, lifting up a wave half the length of a continent. It took roughly fifteen minutes for the Eastern half of that wave to strike the Northwest coast. It took ten hours for the other half to cross the ocean. It reached Japan on January 27, 1700: by the local calendar, the eighth day of the twelfth month of the twelfth year of Genroku.

Once scientists had reconstructed the 1700 earthquake, certain previously overlooked accounts also came to seem like clues. In 1964, Chief Louis Nookmis, of the Huu-ay-aht First Nation, in British Columbia, told a story, passed down through seven generations, about the eradication of Vancouver Island's Pachena Bay people. "I think it was at nighttime that the land shook," Nookmis recalled. According to another tribal history, "They sank at once, were all drowned; not one survived." A hundred years earlier, Billy Balch, a leader of the Makah tribe, recounted a similar story. Before his own time, he said, all the water had receded from Washington State's Neah Bay, then suddenly poured

back in, inundating the entire region. Those who survived later found canoes hanging from the trees. In a 2005 study, Ruth Ludwin, then a seismologist at the University of Washington, together with nine colleagues, collected and analyzed Native American reports of earthquakes and saltwater floods. Some of those reports contained enough information to estimate a date range for the events they described. On average, the midpoint of that range was 1701.

It does not speak well of European-Americans that such stories counted as evidence for a proposition only after that proposition had been proved. Still, the reconstruction of the Cascadia earthquake of 1700 is one of those rare natural puzzles whose pieces fit together as tectonic plates do not: perfectly. It is wonderful science. It was wonderful *for* science. And it was terrible news for the millions of inhabitants of the Pacific Northwest. As Goldfinger put it, "In the late eighties and early nineties, the paradigm shifted to 'uh-oh.'"

Goldfinger told me this in his lab at Oregon State, a low prefab building that a passing English major might reasonably mistake for the maintenance department. Inside the lab is a walk-in freezer. Inside the freezer are floor-to-ceiling racks filled with cryptically labelled tubes, four inches in diameter and five feet long. Each tube contains a core sample of the seafloor. Each sample contains the history, written in seafloorese, of the past ten thousand years. During subduction-zone earthquakes, torrents of land rush off the continental slope, leaving a permanent

deposit on the bottom of the ocean. By counting the number and the size of deposits in each sample, then comparing their extent and consistency along the length of the Cascadia subduction zone, Goldfinger and his colleagues were able to determine how much of the zone has ruptured, how often, and how drastically.

Thanks to that work, we now know that the Pacific Northwest has experienced forty-one subduction-zone earthquakes in the past ten thousand years. If you divide ten thousand by forty-one, you get two hundred and forty-three, which is Cascadia's recurrence interval: the average amount of time that elapses between earthquakes. That timespan is dangerous both because it is too long—long enough for us to unwittingly build an entire civilization on top of our continent's worst fault line—and because it is not long enough. Counting from the earthquake of 1700, we are now three hundred and fifteen years into a two-hundred-and-forty-three-year cycle.

It is possible to quibble with that number. Recurrence intervals are averages, and averages are tricky: ten is the average of nine and eleven, but also of eighteen and two. It is not possible, however, to dispute the scale of the problem. The devastation in Japan in 2011 was the result of a discrepancy between what the best science predicted and what the region was prepared to withstand. The same will hold true in the Pacific Northwest—but here the discrepancy is enormous. "The science part is fun," Goldfinger says. "And I love doing it. But the gap between what we know and what we should do about it is getting bigger and bigger, and the action really needs to turn to responding. Otherwise, we're going to be hammered. I've been through one of these massive earthquakes in the most seismically prepared nation on earth. If that was Portland"—Goldfinger finished the sentence with a shake of his head before he finished it with words. "Let's just say I would rather not be here."

The first sign that the Cascadia earthquake has begun will be a compressional wave, radiating outward from the fault line. Compressional waves are fast-moving, high-frequency waves, audible



*"I'll do what everybody does—sell this startup just before we have to hire a female employee."*

## GIVING AND GETTING

*I like that*, he said in the hospital, where I was rubbing his feet which were dry and smelled a bit.

*Abh*, he said, *abhh*, as I worried what the nurse in the corridor might think,

pushing my thumbs into the pads and calluses,  
the skin that had grown leathery and hard  
over a lifetime of streets and shoes—

and me trying but unable to forget  
some of the things he had done

over the course of our long friendship.  
Rubbing his feet was like reaching into some

thick part of my heart that couldn't feel  
and kneading away at it—

Blame caught inside the love  
like a fishhook, or a bug in honey.

It is in my character, this  
persistent selfishness—

one of my hands offering the gift, the other  
trying to take something back.

Giving and getting  
like two horses arriving at the same time

from opposite directions  
at the stone gate

that will allow only one to pass.

—Tony Hoagland

to dogs and certain other animals but experienced by humans only as a sudden jolt. They are not very harmful, but they are potentially very useful, since they travel fast enough to be detected by sensors thirty to ninety seconds ahead of other seismic waves. That is enough time for earthquake early-warning systems, such as those in use throughout Japan, to automatically perform a variety of lifesaving functions: shutting down railways and power plants, opening elevators and firehouse doors, alerting hospitals to halt surgeries, and triggering alarms so that the general public can take cover. The Pacific Northwest has no early-warning

system. When the Cascadia earthquake begins, there will be, instead, a cacophony of barking dogs and a long, suspended, what-was-that moment before the surface waves arrive. Surface waves are slower, lower-frequency waves that move the ground both up and down and side to side: the shaking, starting in earnest.

Soon after that shaking begins, the electrical grid will fail, likely everywhere west of the Cascades and possibly well beyond. If it happens at night, the ensuing catastrophe will unfold in darkness. In theory, those who are at home when it hits should be safest; it is easy and relatively inexpensive to seismically safe-

guard a private dwelling. But, lulled into nonchalance by their seemingly benign environment, most people in the Pacific Northwest have not done so. That nonchalance will shatter instantly. So will everything made of glass. Anything indoors and unsecured will lurch across the floor or come crashing down: bookshelves, lamps, computers, canisters of flour in the pantry. Refrigerators will walk out of kitchens, unplugging themselves and toppling over. Water heaters will fall and smash interior gas lines. Houses that are not bolted to their foundations will slide off—or, rather, they will stay put, obeying inertia, while the foundations, together with the rest of the Northwest, jolt westward. Unmoored on the undulating ground, the homes will begin to collapse.

Across the region, other, larger structures will also start to fail. Until 1974, the state of Oregon had no seismic code, and few places in the Pacific Northwest had one appropriate to a magnitude-9.0 earthquake until 1994. The vast majority of buildings in the region were constructed before then. Ian Madin, who directs the Oregon Department of Geology and Mineral Industries (DOGAMI), estimates that seventy-five per cent of all structures in the state are not designed to withstand a major Cascadia quake. FEMA calculates that, across the region, something on the order of a million buildings—more than three thousand of them schools—will collapse or be compromised in the earthquake. So will half of all highway bridges, fifteen of the seventeen bridges spanning Portland's two rivers, and two-thirds of railways and airports; also, one-third of all fire stations, half of all police stations, and two-thirds of all hospitals.

Certain disasters stem from many small problems conspiring to cause one very large problem. For want of a nail, the war was lost; for fifteen independently insignificant errors, the jetliner was lost. Subduction-zone earthquakes operate on the opposite principle: one enormous problem causes many other enormous problems. The shaking from the Cascadia quake will set off landslides throughout the region—up to thirty thousand of them in Seattle alone, the city's emergency-management office estimates. It will also induce a process called liquefaction, whereby seemingly solid ground starts behaving like a liquid, to



the detriment of anything on top of it. Fifteen per cent of Seattle is built on liquefiable land, including seventeen day-care centers and the homes of some thirty-four thousand five hundred people. So is Oregon's critical energy-infrastructure hub, a six-mile stretch of Portland through which flows ninety per cent of the state's liquid fuel and which houses everything from electrical substations to natural-gas terminals. Together, the sloshing, sliding, and shaking will trigger fires, flooding, pipe failures, dam breaches, and hazardous-material spills. Any one of these second-order disasters could swamp the original earthquake in terms of cost, damage, or casualties—and one of them definitely will. Four to six minutes after the dogs start barking, the shaking will subside. For another few minutes, the region, upended, will continue to fall apart on its own. Then the wave will arrive, and the real destruction will begin.

Among natural disasters, tsunamis may be the closest to being completely unsurvivable. The only likely way to outlive one is not to be there when it happens: to steer clear of the vulnerable area in the first place, or get yourself to high ground as fast as possible. For the seventy-one thousand people who live in Casca-

dia's inundation zone, that will mean evacuating in the narrow window after one disaster ends and before another begins. They will be notified to do so only by the earthquake itself—"a vibrate-alert system," Kevin Cupples, the city planner for the town of Seaside, Oregon, jokes—and they are urged to leave on foot, since the earthquake will render roads impassable. Depending on location, they will have between ten and thirty minutes to get out. That time line does not allow for finding a flashlight, tending to an earthquake injury, hesitating amid the ruins of a home, searching for loved ones, or being a Good Samaritan. "When that tsunami is coming, you run," Jay Wilson, the chair of the Oregon Seismic Safety Policy Advisory Commission (OSSPAC), says. "You protect yourself, you don't turn around, you don't go back to save anybody. You run for your life."

The time to save people from a tsunami is before it happens, but the region has not yet taken serious steps toward doing so. Hotels and businesses are not required to post evacuation routes or to provide employees with evacuation training. In Oregon, it has been illegal since 1995 to build hospitals, schools, firehouses, and police stations in the inun-

dation zone, but those which are already in it can stay, and any other new construction is permissible: energy facilities, hotels, retirement homes. In those cases, builders are required only to consult with DOGAMI about evacuation plans. "So you come in and sit down," Ian Madin says. "And I say, 'That's a stupid idea.' And you say, 'Thanks. Now we've consulted.'"

These lax safety policies guarantee that many people inside the inundation zone will not get out. Twenty-two per cent of Oregon's coastal population is sixty-five or older. Twenty-nine per cent of the state's population is disabled, and that figure rises in many coastal counties. "We can't save them," Kevin Cupples says. "I'm not going to sugarcoat it and say, 'Oh, yeah, we'll go around and check on the elderly.' No. We won't." Nor will anyone save the tourists. Washington State Park properties within the inundation zone see an average of seventeen thousand and twenty-nine guests a day. Madin estimates that up to a hundred and fifty thousand people visit Oregon's beaches on summer weekends. "Most of them won't have a clue as to how to evacuate," he says. "And the beaches are the hardest place to evacuate from."

Those who cannot get out of the inundation zone under their own power will quickly be overtaken by a greater one. A grown man is knocked over by ankle-deep water moving at 6.7 miles an hour. The tsunami will be moving more than twice that fast when it arrives. Its height will vary with the contours of the coast, from twenty feet to more than a hundred feet. It will not look like a Hokusai-style wave, rising up from the surface of the sea and breaking from above. It will look like the whole ocean, elevated, overtaking land. Nor will it be made only of water—not once it reaches the shore. It will be a five-story deluge of pickup trucks and doorframes and cinder blocks and fishing boats and utility poles and everything else that once constituted the coastal towns of the Pacific Northwest.

To see the full scale of the devastation when that tsunami recedes, you would need to be in the international space station. The inundation zone will be scoured of structures from California to Canada. The earthquake will have wrought its worst havoc west of the Cascades but caused damage as far away as

Sacramento, California—as distant from the worst-hit areas as Fort Wayne, Indiana, is from New York. FEMA expects to coordinate search-and-rescue operations across a hundred thousand square miles and in the waters off four hundred and fifty-three miles of coastline. As for casualties: the figures I cited earlier—twenty-seven thousand injured, almost thirteen thousand dead—are based on the agency's official planning scenario, which has the earthquake striking at 9:41 A.M. on February 6th. If, instead, it strikes in the summer, when the beaches are full, those numbers could be off by a horrifying margin.

Wineglasses, antique vases, Humpty Dumpty, hip bones, hearts: what breaks quickly generally mends slowly, if at all. OSSPAC estimates that in the I-5 corridor it will take between one and three months after the earthquake to restore electricity, a month to a year to restore drinking water and sewer service, six months to a year to restore major highways, and eighteen months to restore health-care facilities. On the coast, those numbers go up. Whoever chooses or has no choice but to stay there will spend three to six months without electricity, one to three years without drinking water and sewage systems, and three or more years without hospitals. Those estimates do not apply to the tsunami-inundation zone, which will remain all but uninhabitable for years.

How much all this will cost is anyone's guess; FEMA puts every number on its relief-and-recovery plan except a price. But whatever the ultimate figure—and even though U.S. taxpayers will cover seventy-five to a hundred per cent of the damage, as happens in declared disasters—the economy of the Pacific Northwest will collapse. Crippled by a lack of basic services, businesses will fail or move away. Many residents will flee as well. OSSPAC predicts a mass-displacement event and a long-term population downturn. Chris Goldfinger didn't want to be there when it happened. But, by many metrics, it will be as bad or worse to be there afterward.

On the face of it, earthquakes seem to present us with problems of space: the way we live along fault lines, in brick buildings, in homes made valuable by their proximity to the sea. But,

covertly, they also present us with problems of time. The earth is 4.5 billion years old, but we are a young species, relatively speaking, with an average individual allotment of three score years and ten. The brevity of our lives breeds a kind of temporal parochialism—an ignorance of or an indifference to those planetary gears which turn more slowly than our own.

This problem is bidirectional. The Cascadia subduction zone remained hidden from us for so long because we could not see deep enough into the past. It poses a danger to us today because we have not thought deeply enough about the future. That is no longer a problem of information; we now understand very well what the Cascadia fault line will someday do. Nor is it a problem of imagination. If you are so inclined, you can watch an earthquake destroy much of the West Coast this summer in Brad Peyton's "San Andreas," while, in neighboring theatres, the world threatens to succumb to Armageddon by other means: viruses, robots, resource scarcity, zombies, aliens, plague. As those movies attest, we excel at imagining future scenarios, including awful ones. But such apocalyptic visions are a form of escapism, not a moral summons, and still less a plan of action. Where we stumble is in conjuring up grim futures in a way that helps to avert them.

That problem is not specific to earthquakes, of course. The Cascadia situation, a calamity in its own right, is also a parable for this age of ecological reckoning, and the questions it raises are ones that we all now face. How should a society respond to a looming crisis of uncertain timing but of catastrophic proportions? How can it begin to right itself when its entire infrastructure and culture developed in a way that leaves it profoundly vulnerable to natural disaster?

The last person I met with in the Pacific Northwest was Doug Dougherty, the superintendent of schools for Seaside, which lies almost entirely within the tsunami-inundation zone. Of the four schools that Dougherty oversees, with a total student popula-

tion of sixteen hundred, one is relatively safe. The others sit five to fifteen feet above sea level. When the tsunami comes, they will be as much as forty-five feet below it.

In 2009, Dougherty told me, he found some land for sale outside the inundation zone, and proposed building a new K-12 campus there. Four years later, to foot the hundred-and-twenty-eight-million-dollar bill, the district put up a bond measure. The tax increase for residents amounted to two dollars and sixteen cents per thousand dollars of property value. The measure failed by sixty-two per cent. Dougherty tried seeking help from Oregon's congressional delegation but came up empty. The state makes money available for seismic upgrades, but buildings within the inundation zone cannot apply. At present, all Dougherty can do is make sure that his students know how to evacuate.

Some of them, however, will not be able to do so. At an elementary school in the community of Gearhart, the children will be trapped. "They can't make it out from that school," Dougherty said. "They have no place to go." On one side lies the ocean; on the other, a wide, roadless bog. When the tsunami comes, the only place to go in Gearhart is a small ridge just behind the school. At its tallest, it is forty-five feet high—lower than the expected wave in a full-margin earthquake. For now, the route to the ridge is marked by signs that say "Temporary Tsunami Assembly Area." I asked Dougherty about the state's long-range plan. "There is no long-range plan," he said.

Dougherty's office is deep inside the inundation zone, a few blocks from the beach. All day long, just out of sight, the ocean rises up and collapses, spilling foamy overlapping ovals onto the shore. Eighty miles farther out, ten thousand feet below the surface of the sea, the hand of a geological clock is somewhere in its slow sweep. All across the region, seismologists are looking at their watches, wondering how long we have, and what we will do, before geological time catches up to our own. ♦



Speaker #16 Newcastle Public  
Hearing 2.27.16

# Intel catches the wind with rooftop micro-turbine array

*By Pete Carey*



*SANTA CLARA -- Intel is turning the roof of its Santa Clara headquarters into a mini-wind farm with what it says is one of the largest micro-turbine arrays in the country.*

The V-shaped formation of 58 wind-powered turbines, being installed this week, is expected to generate about 65 kilowatt-hours of power that will be used to provide electricity to the conference center in the rambling Robert Noyce Building on Mission Boulevard.

The chipmaker called the micro-turbines a "proof of concept" project.

"We are trying to understand how this type of technology integrates into Intel and where are the best locations for it around the world," said Marty Sedler, director of Intel's global utilities and infrastructure.



JLM Energy crew members install their Zefr micro wind turbines on the rooftop of Intel Corporation's Headquarters in Santa Clara, Calif., on Thursday, May 21, 2015. (LiPo Ching/Bay Area News Group)

"We'll share the data and share the information so other people can apply it to their own businesses and homes," he said.

The micro-turbines are 6 to 7 feet tall, weigh about 30 pounds each and are positioned at the roof's edge where they can gather the most wind, which averages about 8 to 9 miles per hour in the area. They share the roof with an array of solar panels.

"This is just another prong adding to our sustainability program," Sedler said

Intel's new wind turbines arrive at a time when major tech companies are turning to green power. Apple and Google announced green projects in February. Apple is building a solar farm in Monterey County and Google is developing a forest of wind turbines on Altamont Pass near Livermore.

*Intel says it has been green for years, and was recently recognized by the U.S. Environmental Protection Agency, for the seventh year in a row, as the largest voluntary purchaser of green power in the country. It has solar installations on 12 Intel campuses in the U.S., Israel and Vietnam that generate more than 12 million kilowatt-hours of power per year of clean energy, as well as a solar hot water system that supplies nearly all the needs of Intel's two campuses in India.*

*The new array "is one of the largest we've identified anywhere," Sedler said. "One of the things Intel does that's a little different from other companies is that all the projects we have done to date have been on our campuses. It's not the answer, it's one of the answers. The key is to get off the grid."*

Contact Pete Carey at 408-920-5419. Follow him on [Twitter.com/petecarey](https://twitter.com/petecarey).

[http://www.mercurynews.com/business/ci\\_28164774/intel-catches-wind-rooftop-micro-turbine-array](http://www.mercurynews.com/business/ci_28164774/intel-catches-wind-rooftop-micro-turbine-array)





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A pilot project of the  
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Real Estate  
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Microsoft

Speaker #34 Public Hearing Phase 1  
DE-1s Bellevue 3.1.16  
Steve Odonell

Hi David,

I would like to offer my sincere thanks and appreciation for inviting us to your Olympus Homeowners Association meeting on Monday, February 24. It is a rarity when people have the opportunity to gather together and communicate their differences face to face. It was an opportunity for us to learn about our shared concerns over the future projects in Newcastle. As a follow-up to the meeting, I would like to recap some of the highlights that Mr. Ed Cimaroli, Vice President of Olympic Pipe Line Company discussed.

Olympic has two pipelines that run approximately the entire length of segments C, E, J, and M in a shared easement within Puget Sound Energy's electric transmission corridor. The location of the pipelines may be found anywhere within the easement from the center of the Right-Of-Way to either side and can run together or separate.

The route selection will be our prime concern for a variety of reasons including safety, impact to landowners, future maintenance, and customer impacts to name just a few. Therefore we feel that segments B, F, H, and L best address the concerns mentioned above.

Should the pipeline be required to relocate, the pipeline design and precise impacts cannot be determined until PSE selects a final route and develop a final design. The schedule and timeline are also dependent on the route selection and as a recent example, a pipeline reroute was required because of the city of Bellevue's culvert relocation project at Coal Creek. It took over four years from conception to construction completion and involved many hours of working with property owners, permitting through wetlands and parks before we could complete the project. It is important to note that anytime a permit is required there can be a reiteration of the design before the final design can be created which can push out the project schedule.

Unfortunately we were running out of time at the end of the meeting and I wanted to mention that a source for locating pipelines in the state of Washington can be found at the Washington Utilities and Transportation, Pipeline Safety map website at: <http://www.utc.wa.gov/regulatedIndustries/transportation/pipeline/Pages/pipelineMaps.aspx>

Hopefully this email will be the first step in a process to work toward a project of mutual concern. Again, I would like to thank you for extending an invitation for us to hear your Homeowner's concerns. Please feel free to forward these discussion points forward to whomever you feel would benefit from knowing more about the Olympic Pipeline. I look forward to working together on this project.

Kindest regards,

**Kim**

Kim L. West,  
Area Maintenance Engineer

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***No Accidents, No Harm to People, No Damage to the Environment***

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Sue Stronk  
12917 SE 86th Place  
Newcastle, WA 98056

The DEIS states the “need” for the project is already determined. The Lauckhart Schiffman load flow study disagrees. This process should be halted now and reviewed by a Hearing Examiner to determine the **NEED** before proceeding.  
No need—no problem! No project!

When the story changes, so does the need!  
PSE said 1500 MW of power was needed to Canada. Dan Koch said this project is not about Canadian power—that would be sent outside this area. The USE study said without power to Canada there may be a shortage of 74 MW. Alternatives can supply this minimal power **safely**—without condemning homes, destroying neighborhoods and degrading home values.  
**Technical expertise** in evaluating alternatives is lacking in this DEIS.

Hiring PSE contractors to make this document is a conflict of interest. PSE footprints are all over this 715 page document. PSE’s favored route through Olympus is rated “**significant**” **impact** in many categories—however with a few tiny words—all is dismissed. Such as **safety risk** along the gas pipelines is minimized by saying “**safe practices will be employed**”.

The Olympus corridor is “**most significantly**” affected by home acquisition. Yet mitigation says “**PSE will assist in relocation**”.

Experts in electromagnetic interference, causing pipeline corrosion, need to be hired. Power and pipes —running parallel

— is off the charts at 5000 feet for causing corrosion—yet PSE's favored solution will parallel this scenario for 16 of the 18 miles.

If EMF's corrode pipes—then there has to be EMF damage to humans. What are safe distances from wires to homes—especially now that poles are lowered to 85 feet?

It is obvious already— the document is biased—that Alternative 1-option A will be the DEIS favorite to proceed for construction.

**Define the NEED first— before you fast forward to a solution.**

An over-scaled, over-priced, unnecessary project— paid for by ratepayers — **is nothing short of consumer fraud!**

I am a CENSE member and Board member!

Sue Stronk—12917 SE 86th Place— Newcastle, WA 98056

My neighbors are here tonight —the Elworths. We live 100' apart— adjacent to the Olympic Pipeline corridor in Newcastle and have been neighbors for the past 28 years. If PSE has their way—**one of us will stay— and one will go!**

—I have watched Lori and her husband, Brian, raise their two kids— Daniel and Mary—from infants through high school and college graduation. **That is a generation!**

—We have been there for each other over the years and work together on the Olympus Homeowners Board.

—We re-established Block Watch and put on the annual neighborhood garage sale.

—We share outdoor movies and evenings around a campfire—in the back yard or camping on Hood Canal.

—We host neighbors, for the National Night Out event, on our front lawns as well as drink wine together at the annual Wine, Women, and White Elephant party at Christmas.

—We are friends!

This is Neighborhood Character that PSE will shatter!

PSE's favored route along this corridor will take one of our homes— and probably another 25— to accomplish an un-needed project. It is the **duty** of the DEIS and Bellevue's **obligation** to halt this process and have Rich Lauckhart — meet with PSE's experts— before the WA state EFSEC—to settle the NEED of this project once and for all. You cannot accept blindly that PSE speaks the truth— when there is evidence to the contrary.

**Be accountable now or face this in court.**

Neighborhood destruction rates “**Significant**” in your impact rating!

“**Unacceptable**” is our response. PSE’s favored route is the most dangerous and most destructive of all the plans by placing the project along the pipelines— mixing tall towers and deep footings underground all in an earthquake fault zone. “**INSANE**”-is the word!

If rate payers are charged for an over-scaled, over-priced and unnecessary project—it is nothing short of **consumer fraud!**

Lori and I sign Birthday and Holiday cards as “your neighbor for life”.

**AND we intend to remain that way!**

March 2016

Comments from:  
Sue Stronk  
12917 SE 86th Place  
Newcastle, WA 98056

My comments on PSE Energize Eastside DEIS.

I am a CENSE Board member and I am incorporating by reference to CENSE documents submitted by CENSE President Don Marsh.

First and foremost—This project is **NOT NEEDED!** Lauckhart-Schiffman load flow study proves that and DEIS needs to address and answer NEED! This DEIS needs to pause and have a Hearing Examiner now review and determine if this project should continue to save time and money for all involved. PSE cannot continue to hide—they need to be transparent and should welcome our concerns since we will be paying for the project. If all is above board—PSE should have no worries. Honesty is always the best policy.

Answer now or answer in court. If this project proceeds over-scaled, over-priced and unnecessary—it will be nothing short of consumer fraud! Access to PSE's load flow study cannot continue to be denied.

**I will address the DEIS. My comments are mostly related to the insanity of Alternative 1 - Option A —co-locating new wires and related construction within an existing pipeline corridor, in an earthquake fault zone, all within a dense residential area!! INSANE!!! This is where I live!**

**I AM DEEPLY CONCERNED ABOUT ALTERNATIVE 1-OPTION A**—overhead solution using the existing PSE 115kV power corridor paralleling the Olympic Gas Pipelines. Both cut through my Olympus neighborhood and adjacent to my house. Safety is the primary concern! If this "preferred route" of PSE's is chosen, I stand to loose my house as well as a row of 25 more homes adjacent to this corridor as outlined in this EIS summary in the Olympus neighborhood alone. Maybe 2 rows of homes will go—since it is not identified how or where PSE would be obtaining the defined extra 20'-50' of right of way space to accomplish this construction since the gas pipelines run the center. The EIS study defines this corridor as able to be "safely" mitigated. I totally disagree!

Any construction of this magnitude along this corridor— even with widening the ROW —will not be safe in this close proximity to residents with construction vehicle weight over these aged gas lines and the drilling of footings 25'-50' deep along this corridor with poles 85'-100' in height. The result, in this residential neighborhood, is totally out of character—this area is zoned residential not industrial. With so many options outlined here—this will be one of the most dangerous and costly to execute—hard to argue eminent domain of our properties. You have other less destructive choices—IF this is NEEDED at all!

My comments are directed to how my neighborhood and the city of Newcastle will be impacted by such an ambitious, unnecessary, over-scaled, and expensive project—which will be charged back to us—the PSE ratepayers—at a rate of return of almost 10%—granted by the WUTC!

Wouldn't we all like that return for our investments. PSE—a foreign owned entity from Australia —will award their shareholders at our expense. PSE could care less if they spend more money —they will just profit more in the end. But the only oversight they see is AFTER the project is completed—they go before the WUTC—which can deny project costs if not prudent and reasonable. Which the UTC has never done—until perhaps this project will result in a lawsuit at that level if it gets that far. PSE however, has had many safety violations imposed on them by the WUTC—I'm sure they are on their radar!

Here is a list:

- ❓ 2007: the UTC fines PSE \$1 million for illegally selling 65,000 customers' private data to an outside marketing firm;
- ❓ 2008: the UTC fines PSE \$1.25 million for intentionally falsifying gas pipeline safety inspection records over the course of 4 years, the biggest fine ever imposed on a utility in Washington State;
- ❓ 2008: PSE settles with the UTC for \$500,000 for failing to resolve 67 gas pipeline safety violations dating back to 2003;
- ❓ 2010: fined again \$250,000 for violating an order to correct specific customer accounts;
- ❓ 2011: fined again another \$104,300 for continuing the same violations among low-income customers;
- ❓ 2012: fined again \$430,000 for improperly charging residential disconnect-visit fees;
- ❓ 2013: fined again \$275,000 for violating gas-safety rules when responding to gas leaks in Seattle, where due to those violations a family's house exploded -- fortunately, nobody was killed;
- ❓ 2014: just last month, December 14, the Attorney General sued PSE, claiming this "private utility's ... profit margins are unjustifiably high. Customers are collectively being *overcharged by about \$35 million a year.*"
- ❓ PSE generates nearly a third of the energy it sells to ratepayers via the Colstrip dirty coal plant in Western Montana, making PSE a major air polluter and the 8th largest greenhouse gas emitter in the U.S.

Google "WUTC fine" and you'll find most hits are about PSE. PSE is a serial bad actor not to be trusted. It may go bankrupt from the AG's lawsuit and Colstrip fines or shutdown alone. No wonder PSE is so frantic to get this project permitted ASAP.

How can we trust them with safety and honesty? Their track record doesn't instill confidence, especially in a time where US utilities are building infrastructure solely for profit—see Wall Street Journal article in 2014—“Utilities' Profit Recipe: Spend More”—outlines exactly what this project is—a money maker by building un-needed infrastructure. We will prove this before built!

I have followed this project since the first postcard I received—December 2013, through the manipulated CAG process, from the PR “campaign style” tactics of Mark Williamson—of Madison Wisconsin, hired by PSE to get this “project completed and done on time” before “rolling blackouts” hit the Eastside. The story has since changed from the CAG—now all of a sudden there is no talk of 1500 MW of power needed to send to Canada as stated by Dan Koch of PSE at the Newcastle Planning Commission meeting in December 2015—we have it on tape!!

Dan Koch of PSE, along side of Mark Williamson, told Newcastle Planning Commission that EE was not about power to Canada—if power was sent to Canada it would go outside this area. We have that on tape. Just last week, Todd Anderson video taped Mark Williamson at the Bellevue DEIS comment event saying—this is about power to Canada! You can’t have a local project—like FERC ruled it was “local” in the FERC complaint by CENSE—and have power going to Canada. PSE can’t get their own story straight—so how can you know what the need is?

City of Bellevue hired **U.S.E.** to do a study—and they only verified the PSE process and did not do a load flow study on their own. This is documented in Bellevue City meeting when USE presented to the council. The Mayor was livid! Either the city didn’t ask for the right info or USE did not perform—it would be interesting if USE got paid their \$100K for that worthless information. However, in the study—USE said without 1500 MW of power to Canada—there was only a small amount of **shortage of 74MW!** So what is the **NEED?** You can’t propose a project until you know the scale —then determine the solution accordingly.

More about story change—Just March 4, 2016 at the WUTC meeting in Olympia—PSE presented their IRP. Guess what? PSE now changes their growth forecast from 1.7% annually to .7% annually—that is a 60% decline in projections. That should change the parameters of this project also. The web of lies and deceit continues to grow!

So in Bellevue City Council meeting March 7, Keri Pravitz, PSE employee, addressed the council in comment period—that indeed the 1500MW of power to Canada is real and needed. So PSE, when you get your story straight—let the public know please!! Both of these employees are on tape—fun time in court for PSE to explain their confusion!

**So if it is about 74 MW of power that can be solved in number of 21st century Alternatives without wires—ways PSE would not profit by \$1-2 billion in the life of this project at our expense.**

There is a huge **conflict of interest** in hiring Stantec, a PSE contractor, to write this DEIS. This document has PSE bias all over it. Stantec also is not an expert in 21st century Alternatives—You need to hire someone that can provide workable solutions to the smaller problem that is now defined by PSE. Solutions that work for cities and communities safely without risking total destruction. Any risk on pipeline accidents is too grave. Alternative solutions are the only way to incrementally scale this project—no one knows what the future holds in power resources. We should not invest in a solution that is from the 20th century. That is why only an expert specialized in these alternatives can offer viable solutions that will work. Alternative 2 in the DEIS are not the best solutions available.

PSE always said they could construct in the existing 100' right of way. Now that changes—we all knew better—120'-150' ROW —says AEP OHIO as you state in the DEIS. That is great—but that distance is for one 230kV project —not two!! And not with 2 high pressure hazardous liquid pipelines in the same ROW all along an active earthquake fault zone. There is no place in the US that has this dangerous situation exists in combo in a small ROW amongst a dense neighborhood. I contacted David Parrish, Manager of Transmission Line Standards, of AEP Ohio, he said if 2-230kV lines are in a ROW—there would have to be more space allotted than the 120'-150'. When I told him there are two pipelines down the center —he said that would need more independent study to address that risk. When I told him the power lines follow the pipelines for 16 miles of this project—**he said that is definitely a concern** and studies would have to be done by experts in EMF around gas lines for sure. Also the risk of pipelines and towers with deep footings needs to be addressed by seismic experts. This easement is overburdened as is. This needs to be studied by PHMSA—which I contacted the Western Regional office and they were very concerned about electromagnetic interference —corroding the pipelines. Which now we find Olympic pipeline has been on notice since 2014 to fix corrosion. We need to find out where and the severity of this situation already existing with the Olympic Gas Lines before any consideration of construction can be made of any kind around them.

What needs to happen—is that PSE needs to sell their easement to Olympic Pipeline and the only construction allowed is for PSE to vacate this corridor and not continue to cause corrosion problems—and remove the 60' tall wooden poles here currently with 115kV power. Then the pipeline company needs to install new pipes to get the jet fuel to the airports in this ROW safely. PSE needs to relocate power somewhere else or co-locate with Seattle City Light as in FERC order 1000—where companies need to work together as one to solve regional problems. Then combine alternatives for future growth management.

When I say PSE footprints are over the DEIS —we all know PSE wants Alternative 1—Option A —as all through DEIS—most significant impacts are in this particular option—yet all goes away with “safe practices”—like the risk of horrendous pipeline explosions—UNACCEPTABLE! If PSE was an honorable company —they would not ever think of constructing near this aging pipeline in the a densely populated area—the 5th largest city/area in Washington State.

Why no cost estimates in DEIS on any Alternatives? Hard to imagine trying to evaluate honestly without costs—unacceptable to review without costs. Costs needs to be included. Now that many homes are going to need to be torn down in my neighborhood alone—Cost become a major factor. When PSE purchases 26 homes to widen the ROW by 20'-50' or more—that cost would equal the cost to underground. Or would PSE just prefer to pull our homes from us! Again, PSE great stewards of the environment!! Also the under-grounding technique PSE or Stantec discusses is not the most cost effective. Everything in this DEIS favors a wired solution just like PSE favors a wired solution! Poor job of cover-up in this DEIS. As to cost—if overhead wires are \$4 million per mile to construct—times 18 miles—that would be \$72 million project estimate. However PSE throws around \$250 million project cost—guess they are able to buy many homes for that dollar amount!! And make more money in the long run.

Also to eminent domain in PSE's desire to take our homes—there are attorneys lined up to argue this case. With the proof we have this project is not needed—there are no worries my home or others will be taken. **Without Need—you have no case.** The City of Newcastle will

never let you construct in our city along these gas pipelines and destroy our neighborhood and city.

### **Addressing DEIS by sections:**

My comments are in brackets( ). **Text is copied directly from the EIS document under sections as noted in bold text.**

#### **RE: DEIS: Intro and Summary section:**

(EIS is flawed —should have Hearing Examiner evaluate project after this phase—would save time and money not to continue project review. We can limit further discussion, time, money of studying alternatives that are not needed, over-built and over-budget based with facts found to date and submitted by CENSE. —ie. the Load Flow study (Lauckhart-Schiffman) CENSE's submittal disproves the NEED of Energize Eastside—contrary to what PSE claims! They never thought a citizens group would pursue as far as CENSE has gone to date!)

#### **Stantec prepared a memorandum evaluating the stated need for the project, and confirmed that PSE's Eastside Needs Assessment was conducted in accordance with industry standards for utility planning (Stantec, 2015)**

( This is conflict of interest —Stantec involved in the EIS as they have worked for PSE interests in the past and now hired to prepare DEIS—obviously slanted to this Alt.1- Option A solution. Stantec should not be involved in the EIS as PSE pays for their services routinely—why would they not be biased in favor of PSE—their business profits from this relationship. When something is deemed of "significant" impact—always it is rated no concern by DEIS!!—Safety around gas pipeline and earthquakes—which I'll say more later is downplayed as being of no significance when this is clearly the biggest risk factor in this DEIS.)

**This EIS will not be used to reject or validate the need for the proposal.** (Disagree—The NEED has not been established according to a "local" project. Also the story continues to change—define the need, then find suitable solution.)

**Without adding at least 74 megawatts (MW) of transmission capacity for local peak periods in the Eastside, a deficiency could develop as early as winter of 2017 - 2018 or summer of 2018, putting customers at risk of load shedding (forced power outages) (Stantec, 2015).** (Your words—no 1500MW to Canada!)

**PSE is a regulated utility that serves approximately 1.1 million customers** (Who has oversight over PSE before a project is built? I want that answer. Who reviews their ROW distance with gas pipelines, pole heights, deep footings in an earthquake fault zone—all within a neighborhood of homes? I will not take PSE's word for establishing safety! The ratepayers will pay for a bogus project that will profit PSE between \$1-\$2 billion over the life of the project. Nothing short of consumer fraud if this project gets built as proposed. The project has been overblown for profit and or perhaps why SCL did not want to get involved with their sham from the onset. You can't have power to Canada and also have "local" project. You can't have it both ways. PSE ratepayers will pay the bill to fulfill a BPA treaty agreement/and or Columbia Grid agreement. PSE always says FERC has oversight—then use FERC order 1000 to work and rebuild SCL corridor like PSE said they originally wanted to do —if by any remote chance there

is any way an overhead solution is required. Order 1000 requires all utility companies in a region to work as one in planning infrastructure and cost sharing. This would save both utilities time and money in upgrading that corridor—share costs since SCL says they want to upgrade it in the future. No homes or right of way space has to be acquired—will **save project costs** immensely since **cost is a major factor determining alternatives** in this EIS process. If PSE proceeds with this bogus expensive, over-scaled project along their existing 115kV corridor—it will result in consumer fraud and will be challenged. There is no way this project can pass the test of eminent domain—PSE will spend years trying to negotiate with people and destroy our neighborhood, build unsafely along hazardous gas pipelines with 25'-50' footings in close proximity along hazardous gas pipelines along major earthquake fault zone. PSE will not recoup project costs from UTC if project placed along the existing 115kV corridor. PSE may be challenged also at WUTC to recoup costs of these bogus claims for all CAG costs, EIS process, and all PR expenses and promotional advertising in trying to push this EE project through—if this project is not NEEDED and we were lied to.

**The plan is reviewed annually with periodic updates to the plan. PSE's revised plan was submitted to the UTC November 30, 2015, but was not included in this Draft EIS because it was completed too late in this EIS process. It will be considered in Phase 2. The 2015 Integrated Resource Plan (PSE, 2015) is available for review on PSE's website at <https://www.pse.com/aboutpse/EnergySupply/Pages/Resource-Planning.aspx>.** (IRP states that PSE has now revised their growth from 1.7% to 7%—thus again changing the project parameters!! A 60% reduction in NEED!! PSE— go back and start over with new graphs and charts—those shown to date are obsolete!)

**The Eastside Cities (Bellevue, Kirkland, Newcastle, Redmond, and Renton) determined that a Phased EIS (WAC 197-11-060(5)), supported by the EIS Consultant Team and in collaboration with the applicant, PSE, would be the best approach to adequately evaluate the proposal.**

(Nice PSE gets so much input on an important part of this process—why does PSE determine the rules?—Explain that please! There should be Hearing Examiner review now after this EIS comment period—which could shut down or severely alter this project or force it to start over. This EIS process is not standard—why? Because it supports PSE getting their way! This will be visited by a court of law. The public will not stand for your mis-steps to protect PSE and PSE calling the shots in their own review process! Obviously PSE thinks if they pay for this EIS process—they get to slant it their way.)

**The project is proposed by PSE, a regulated utility. Therefore, PSE developed the project objectives and helped to define alternatives that would attain or approximate the proposal's objectives, as required by SEPA.** (However no oversight by any agency verifying their studies—Which CENSE finds bogus and over-stated with generators turned off to affect results of PSE's load flow study. Hints to collusion and corruption in many power agencies working together in a coverup. Why should taxpayers and citizens spend their money to prove deceit and fraud when government agencies should be doing this for the public? It is interesting if PSE worked on this DEIS selecting "acceptable alternatives"—they came up with so many that would fit their project objective—INCLUDING—a NO ALTERNATIVE solution!—thus proving Alt. 1-Option A —along the existing 115kV line —would not meet a satisfactory requirement of eminent domain to take ROW space and property. You said it here!! So interesting you send notices of your meetings to those along this corridor—but you don't notify residents along the SCL corridor that their properties and homes could be in jeopardy and make them aware to

make public comment!! Nice public relations! When PSE takes the SCL corridor for construction—you will not have adequately notified those residents—and your process will need to start all over again! Or did you never notify people along that corridor because you already knew you'd never use it?)

**1.7 HOW HAS PUBLIC INPUT BEEN INCORPORATED INTO THE EIS PROCESS?** (We had to fight in the Scoping meetings to include SAFETY which should be the number one factor in a project—and to include Property Values and View Hindrances—something PSE could care less about and will not compensate—both is of SIGNIFICANT IMPORTANCE TO RESIDENTS. Again DEIS—downplays what is important to the residents requests—Trying to ignore what we, the people, feel is most important to us! The PSE train keeps rolling down the tracks!)

**The purpose and need for the project, summarized in Section 1.3, helped to define PSE's broad objectives for the project, which are as follows:**

- **Address PSE's identified deficiency in transmission capacity;** (Disproven by CENSE load flow study experts Lauckhart and Schiffman)
- **Find a solution that can be feasibly implemented before system reliability is impaired;** (Obviously many solutions —so it is easy to site—115kV corridor is not the only nor the best solution by far.)
- **Be of reasonable project cost;** (Interesting that no cost estimates are given for these alternatives—so we are kept in the dark—hard to analyze objectively —cost estimates should be provided at his time—since cost is a major factor in the EIS—another EIS flaw.)

- **Meet federal, state, and local regulatory requirements;** ( Please provide what all these requirements are—and who if anyone has oversight over PSE before a project is built?—besides residents using their own time and money to get to the truth! We can find no oversight except this flawed EIS process—doing a great job of protecting PSE wishes and not listening to those giving input and those affected. If only the birds, squirrels and trees could speak.)

- **Address PSE's electrical and non-electrical criteria for the project (described in further detail in Chapter 2).** ( how about reviewing the profit gained by a foreign owned company for building infrastructure at 10% UTC

approved return—Where can I sign up for that? Read Article from Wall Street Journal 2014—of utilities building infrastructure for profit—since power sales are flat! Also in Macquarie/First Trust Global Infrastructure/ Utilities Dividend & Income Fund Annual Report—states on page 5 —November 30,2015, -Underperformance from Pipeline sector, —Weakness from the Electric Utility and Transmission sectors; and -Positive performance from Toll Road and Water Sectors.)

- **PSE's broad objectives for the project, which are as follows:**

**Be of reasonable project cost** (Major point to get WUTC rate INCREASE PASSED ON TO RATEPAYERS TO PAY FOR COVERING PROJECT COSTS! PSE may get stuck covering their costs on EE!)

**Summary of Impacts by Alternative: ALTERNATIVE 1 — Risk of accidental rupture and explosion of Olympic Pipeline would increase during construction but be minimize by employing best management practices.** ("Significant Risk"—played down by EIS—no problem

—everyone will be careful during construction—no worries—then why when PSE replaced a pole behind my house years ago—The worker told me the day the work would be done and suggested I not be home that day! What will PSE do when working here for weeks—ask us to all leave during construction for our safety? Maybe weekly trips to Disneyland should be in our mitigation package? Or Tahiti trips?)

**From Introduction and Summary sections:**

**This set of facilities is proposed in order to address a deficiency in electrical transmission capacity during peak periods that has been identified by PSE ///power outages or system damage during peak power events due to cold or hot weather/// Discussions between partner Cities and PSE determined that the proposal is likely to have significant adverse environmental impacts**(EIS is flawed —should have Hearing Examiner evaluate project after this phase—would save time and money not to continue project review.)

**The EIS Consultant Team, represented by Stantec (an electrical system planning and engineering subconsultant working in support of the Energize Eastside EIS effort), has reviewed this background information and studied the process used by PSE to establish a need for the proposed Energize Eastside Project. Stantec prepared a memorandum evaluating the stated need for the project, and confirmed that PSE’s Eastside Needs Assessment was conducted in accordance with industry standards for utility planning (Stantec, 2015)**

( This is conflict of interest Stantec involved in the EIS as they have worked for PSE interests in the past and now hired to prepare EIS—obviously slanted to this Alt.1-Option A solution. Stantec should not be involved in the EIS as PSE pays for their services —why would they not be biased in favor of PSE—their business profits from this relationship)

**This EIS will not be used to reject or validate the need for the proposal.** (Disagree—until you define the need—there can be no solutions to propose. CENSE challenges the need PSE states.)

**The deficiency in transmission capacity on the Eastside //Arises from a changing regulatory structure that requires a higher level of reliability than was required in the past.** ( Not N-9 reliability! So what is that change that has taken place—let’s get that in writing from the source and date of change PSE states as significant.)

**By the end of the 10-year forecast period, a large number of customers would be at risk, and the load shedding requirement could be as high as 133 MW (Stantec, 2015).** ( USE study said 74MW—another need conflict!)

**PSE is a regulated utility that serves approximately 1.1 million customers** (The ratepayers will pay for an bogus project that will profit PSE between \$1-\$2 billion over the life of the project. Nothing short of consumer fraud if this project gets built as proposed.

**PSE’s electric delivery system is regulated and coordinated by several state and federal agencies, including FERC, North American Electric Reliability Corporation (NERC), Western Electricity Coordinating Council (WECC), and Washington Utilities and**

**Transportation Commission (UTC). PSE cooperates and supports ColumbiaGrid in its regional planning processes.**

(In the FERC Complaint filed by CENSE—FERC said this was a "local" project—therefore 1500 MW power PSE always mentioned in the CAG process for Canada—is not a valid use for this corridor project. Therefore we are talking about 74 MW of power. or 133 MW per Stantec above.

The project has been overblown for profit and or perhaps why SCL did not want to get involved with their sham from the onset. You can't have power to Canada and also have it be "local" project. You can't have it both ways. PSE ratepayers will pay the bill to fulfill a BPA treaty agreement/and or Columbia Grid agreement. PSE always say FERC has oversight—then use FERC order 1000 to work and rebuild SCL corridor like PSE said they originally wanted to do if by any remote chance there is any way an overhead solution is required. Order 1000 requires all utility company in a region to work as one in planning infrastructure and cost sharing. This would save both utilities time and money in upgrading that corridor—share costs since SCL says they want to upgrade it in the future, no homes or right of way space has to be acquired—will **save project costs** immensely **since cost is a major factor determining alternatives** in this EIS process. If PSE proceeds with this bogus expensive, over-scaled project along their existing 115kV corridor —it will result in consumer fraud and will be challenged. There is no way this project can pass the test of eminent domain—PSE will spend years trying to negotiate with people and destroy our neighborhoods, build unsafely along hazardous gas pipelines with 25'-50' footings in close proximity along hazardous gas pipelines all within a major earthquake fault zone.)

**The Eastside Cities (Bellevue, Kirkland, Newcastle, Redmond, and Renton) determined that a Phased EIS (WAC 197-11-060(5)), supported by the EIS Consultant Team and in collaboration with the applicant, PSE, would be the best approach to adequately evaluate the proposal.**

(Why PSE gets so much input on an important part of this process—why does PSE determine the rules?)

**The project is proposed by PSE, a regulated utility. Therefore, PSE developed the project objectives and helped to define alternatives that would attain or approximate the proposal's objectives, as required by SEPA.** ( However no oversight by any agency verifying their studies—Which Cense finds bogus and over-stated with generators turned off to affect results of their load flow study. Hints to collusion and corruption in many power agencies working together in a coverup. Why should taxpayers and citizens spend their money to prove deceit and fraud when government agencies should be protecting the public? It is interesting if PSE worked with you on this EIS selecting **acceptable alternatives**—they came up with so many that would meet their project objectives—thus proving Alt. 1-Option A —along the existing 115kV line/Pipeline — could not meet a satisfactory requirement of eminent domain to take ROW space and property. There are plenty of other options and with energy developments now in the near future. Putting off this project will benefit all of us.)

### **3 Earth:**

#### **Significant Unavoidable Adverse Impacts summary:**

- **Under all alternatives there is an unavoidable seismic risk. New facilities built to current standards reduce risks, and “no significant impacts are likely.”** (What you say about Seismic later is staggering—there will very likely be seismic activity that could severely affect the life of this project—how can you gloss over this unsafe situation of tall poles and deep underground footings so close to pipelines and homes! Where is the logic in a reasonable person?)

### **4 Greenhouse Gas Emissions:**

#### **Summary of Impacts by Alternative**

##### **ALTERNATIVE 1**

- **Option A could result in CO2 sequestration losses from tree removal that exceed the state’s GHG reporting threshold and could be a potentially significant adverse impact.**

##### **Mitigation Measures:**

- **Vegetation replacement could reduce sequestration losses under Alternative 1-Option A, and Alternative 3 to a moderate level.**

**If mitigation measures are employed, there would be no significant and unavoidable adverse impacts related to GHG emissions associated with any of the project alternatives.** (Really—how do you mitigate removing aged trees with shrubs not growing taller than 15’? Another example—where you are falsely ignoring impact to suit PSE objective.)

### **5 Water Resources:**

(In the middle of the Olympus neighborhood in Newcastle—there are springs or source of water runoff that makes the pipeline /115KV corridor swampy almost all year. Basements have flooded from this and will make driving of heavy equipment difficult as well as locating power poles in the soil next to hazardous gas lines and in close proximity to homes. PSE soil tests were not done in this area—south of SE 84th Street in the Olympus neighborhood.)

### **6 Plants & Animals:**

##### **ALTERNATIVE 1**

- **Construction of any of the Alternative 1 options could cause minor to significant impacts from: habitat alteration; interference with critical survival activities; or direct injury, death, or harassment of some species. Impacts would depend on the scale of habitat alteration and species disturbance, and species affected.** (We have deer, coyote, bobcat, owls in the large fir trees, raccoons that frequent this greenbelt area and our neighborhood in Olympus—we love our wild animals—also Newcastle is a noted “Tree City” proud of our green spaces we have—and do not want our tree cover disturbed.)

- **Significant Unavoidable Adverse Impacts with**

**Alternative 1 could result in significant unavoidable impacts due to habitat loss, and if threatened or endangered species or species of concern are affected.** (This is an EIS—you can’t mitigate plants and animals sufficiently—it is “Significant”—deemed by the EIS statement.)

### **7 Energy & Natural Resources:**

#### **Affected Environment:**

**-The Energy Independence Act of Washington State requires that PSE must obtain 15 percent of its electricity from new renewable resources by 2020, as well as undertaking cost-effective energy conservation.** (Get on with it! No better time too start.)

## 8 Environmental Health:

### Affected Environment:

-Hazardous materials are likely in electrical infrastructure (e.g., oil-containing transformers, High Pressure Fluid-Filled [HPFF] power lines used in some underground lines).

-Pressurized flammable petroleum products transported in the Olympic Pipeline, which shares a corridor with a PSE transmission line, and is located in other portions of the combined study area.

-Some risk of fire or explosion at substations or transmission lines exists due to damage from earthquakes or lightning strikes.

-Power lines, electrical wiring, and appliances produce EMF and corona ionization is likely occurring around existing transmission lines; associated health risks for both have not been definitively identified through ongoing research.

(Any risk of above is too much! No construction of this corridor should happen with power, fuel and earthquakes in combo in close proximity to homes. Accidents are called accidents because they are not planned—RISK is too great!!)

**Risk to the public is not likely from constructing or operating the project near pipelines due to extensive safety policies and regulations.** (Again EIS—dismissing the potential of a huge catastrophic event—even with the slightest chance of accident—could result in huge loss of life and property that is unnecessary. Other options are available with less risk. Earthquakes or lightning strikes could damage transformers or drop power poles or lines, but potential public safety risks are not likely and you say-“negligible to minor” impacts could be expected.

DISAGREE)

- **-Risk of accidental rupture and explosion of Olympic Pipeline would increase during construction but be minimize by employing best management practices.** (Huge catastrophic possibility—downplayed by soft words—“best practices”. Accidents are never planned.)

- **-With new equipment being installed, greater potential for spills of hazardous materials during construction and operation.** (Why risk any type of potential accident along a gas pipeline.)

**Mitigation: Use best management practices for spill containment and cleanups.** (A bit hard to stop a high pressure jet fuel pipeline spill—again gloss over by EIS— the worst nightmare that could possibly happen—a pipeline explosion. You have other solutions less risky—and cheaper. How much insurance does PSE and Olympic Pipeline have to carry in case of a disaster during construction—\$500 million enough?)

**Local governments and PSE would further evaluate the PIPA recommendations to determine if any additional safety practices could be implemented for Energize Eastside Project.** (Yes—nice to include—Pipeline safety!! Let us know what they say about a combo of construction, power poles, high pressure hazardous gas pipeline, corrosion effects, deep footings, tall poles amongst a high density residential neighborhood and an earthquake fault zone area. I want that in writing from PIPA or PHMSA. This isn't a project in an open rural area in the plains or the Alaska wilderness—it is within feet of homes in an upscale residential neighborhood. Remember Kim West's letter, an employee of Olympic Pipeline, sent to Dave Edmonds of the CAG after an Olympus Homeowner Association meeting with residents—she would not recommend the use of this gas line corridor for this project because of safety reasons! See her letter below)

Hi David,

I would like to offer my sincere thanks and appreciation for inviting us to your Olympus Homeowners Association meeting on Monday, February 24. It is a rarity when people have the opportunity to gather together and communicate their differences face to face. It was an opportunity for us to learn about our shared concerns over the future projects in Newcastle. As a follow-up to the meeting, I would like to recap some of the highlights that Mr. Ed Cimaroli, Vice President of Olympic Pipe Line Company discussed.

Olympic has two pipelines that run approximately the entire length of segments C, E, J, and M in a shared easement within Puget Sound Energy's electric transmission corridor. The location of the pipelines may be found anywhere within the easement from the center of the Right-Of-Way to either side and can run together or separate.

The route selection will be our prime concern for a variety of reasons including safety, impact to landowners, future maintenance, and customer impacts to name just a few. Therefore we feel that segments B, F, H, and L best address the concerns mentioned above.

Should the pipeline be required to relocate, the pipeline design and precise impacts cannot be determined until PSE selects a final route and develop a final design. The schedule and timeline are also dependent on the route selection and as a recent example, a pipeline reroute was required because of the city of Bellevue's culvert relocation project at Coal Creek. It took over four years from conception to construction completion and involved many hours of working with property owners, permitting through wetlands and parks before we could complete the project. It is important to note that anytime a permit is required there can be a reiteration of the design before the final design can be created which can push out the project schedule.

Unfortunately we were running out of time at the end of the meeting and I wanted to mention that a source for locating pipelines in the state of Washington can be found at the Washington Utilities and Transportation, Pipeline Safety map website at:<http://www.utc.wa.gov/regulatedIndustries/transportation/pipeline/Pages/pipelineMaps.aspx>

Hopefully this email will be the first step in a process to work toward a project of mutual concern. Again, I would like to thank you for extending an invitation for us to hear your Homeowner's concerns. Please feel free to forward these discussion points forward to whomever you feel would benefit from knowing more about the Olympic Pipeline. I look forward to working together on this project.

Kindest regards,

*Kim*

Kim L. West,  
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BP Pipelines and Logistics (North America) Inc.  
Operating Agent for Olympic Pipeline Co.  
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To comply with federal regulations, the Olympic Pipe Line Company has an integrity management program, including requirements to regularly inspect and monitor both natural gas and petroleum pipelines. Inspections are performed using a combination of tools to determine the suitability of the pipeline based on any anomalies detected, including corrosion, dents, or actual wall loss (loss of material on the inside or outside of the pipeline due to corrosion) (West, personal communication, 2015). (What are the issues with regards to Olympic Pipeline corrosion problems they have been put on notice to correct. Where are they, how severe? When and how will they correct the problems?)

#### **Significant Unavoidable Adverse Impacts:**

- **Significant impacts would be avoided through compliance with all applicable regulations and industry safety standards.**(Again DEIS gloss over of huge "Significant" impacts—which I have to ask—in this DEIS—did you find any "significant" areas —you couldn't play down? I didn't find any that remained "significant"—after you glossed over the importance of them. Did PSE have input in these responses also?)
- **Electric and Magnetic Fields: The City of Bellevue has adopted comprehensive plan policies that encourage City and utility involvement with regional or statewide agencies when and if they are developing policies regarding exposure to EMF. The policies also address intent to stay abreast of new accepted scientific research of potential health impacts, revise policies if the situation warrants, and require a reasonable balance between potential health effects and costs of mitigating for such impacts in the planning, siting, and construction of electrical infrastructure.** (There has to be EMF experts studying the effects and reviewing distances from pipelines for corrosion as well as proximity to homes and people.)
  - **Electric and Magnetic Fields and Corona Ionization: There has been substantial research into the possibility of health effects from EMF, as well as potential effects from corona ionization. There is substantial agreement among experts that there are no confirmed adverse health impacts from 60 hertz (Hz) 3 EMF exposure. Scientific evidence remains inconclusive on risk of childhood leukemia in homes with stronger magnetic fields, and research on this topic continues. However, while it does not appear that EMF and corona ionization are in fact a hazard, they are discussed in this document due to public concerns raised during EIS scoping. Magnetic fields, however, pass through most materials without change.** (Needs proper expert review)
- **Even though electrical equipment, appliances, and transmission lines produce both electric and magnetic fields, most recent research has focused on potential health effects of magnetic field exposure. This is because some epidemiological studies have reported an increased cancer risk associated with estimates of magnetic field exposure.** ( Perhaps that is why I know 7 people with or had cancer in Olympus—5 of them live right along the existing 115kV power lines running through our neighborhood! Coincidence or true—EMF's are not healthy. If they corrode pipes—they must do something to humans!)
- **For overhead lines, the magnetic field typically decreases in strength with the square of distance (1/d<sup>2</sup>) from the transmission line (Enertech, 2016).**( When PSE lowers pole heights for 230kV lines to 85' tall—we need to know if homes will be a safe distance away and what those readings will be.)

- **Ongoing Research and Unresolved Issues:**
  - **Work is still underway to find answers to questions about EMF and possible health effects. Some examples include the following:**
    - **• Research on childhood leukemia – Large studies continue, with one being conducted in California sponsored by the Electric Power Research Institute.**
    - **• Research on co-carcinogenesis – Questioning whether one or more agents, such as EMF plus a biochemical, environmental, chemical, or physical agent, act together to exacerbate the growth and expansion of tumor cells, while alone one such agent may not have an effect.**
      - **• Research on neurodegenerative diseases – There are suggestive findings of a connection between neurodegenerative diseases, particularly amyotrophic lateral sclerosis (ALS), and magnetic fields, though there is no known mechanism for such an effect. Worker studies are in process to examine the possibility that frequent electric shock may increase the risk of ALS, rather than EMF.**
      - **• Research on EMF interference with implanted medical devices – Longstanding research has concerned possible interference with the functioning of implanted devices such as cardiac pacemakers, which is of most concern within occupational environments. However, certain devices in use close to very high-voltage electric fields remain a potential concern for the general public. Exposure guidelines have been developed for workers, and manufacturer data sheets provide limitations on device performance during EMF exposure. Work is continuing to develop laboratory bench testing and a more precise understanding of EMF tolerances of these devices.**

(Any risk or unnecessary exposure to EMF should be limited as not proven if harmful—when in doubt—take the cautious side! Stay away from homes and schools.)

### **8.3.6 Corona Ions:**

The health concern with corona ions is related to how they may combine with airborne pollutants to create health impacts. As airborne pollutants enter the body by inhalation, they may be deposited in the respiratory system. The extent to which inhaled particles deposit in the various regions of the respiratory system depends upon physical factors such as their size, shape, and density, as well as charge. The extent of effects of corona ions on health will depend upon the increase in individuals' exposure to pollutants and the extent to which these pollutants are causes of disease. //However, Professor Henshaw's theoretical mechanisms involving corona ions and pollutant particles have not been proven by health studies on populations near transmission lines. (Why risk potential harm?)

### **8.5.1.2 Public Safety Risks – Activities Near Pipelines**

Construction of the project could theoretically damage the hazardous liquid pipelines operated by OPLC and other gas lines mentioned in Section 8.3.2, creating an explosion risk if safety policies and regulations were not implemented as required.

The UTC identifies five major reasons why gas pipelines leak or fail, potentially creating a public safety hazard: (1) third-party excavation damage; (2) corrosion; (3) construction defects; (4) material defects; and (5) outside forces resulting from earth movement, including earthquakes, washouts, landslides, frost, lightning, ice, snow, and damage done by authorized on-site personnel. The UTC also notes that other causes of failure can include cast-iron bell joint leaks and human error (UTC, 2015). Holes in pipelines can also be created by electrical arcing from downed transmission lines, leading to gas leaks and potential explosions (UTC, 2012). Construction equipment can create pipe gouges,

dents, scrapes, and cracks in the pipeline. This type of damage can grow and lead to a catastrophic failure (UTC, 2015).

Although a significant adverse impact to public safety could occur if a leak or an explosion of any of these types of gas lines resulted from the project, this type of event would not be likely to occur because PSE would comply with all applicable regulations and requirements in place for pipeline safety, including local land use requirements for siting facilities of this type. Site-specific investigations would be conducted during design to avoid existing gas lines by maintaining appropriate separation between existing and proposed facilities. Close coordination with potentially affected utilities would also be done, and the design and construction would be conducted consistent with all applicable requirements. Given these safeguards, the probability of a pipeline disruption resulting in an explosion is low, but the potential magnitude of the impact is potentially significant if this unlikely event were to occur. Because compliance with all applicable requirements would help to reduce the probability of an occurrence to a very low likelihood, potential adverse impacts associated with construction of the project are characterized as minor.

(Here again DEIS takes a "significant" impact—reduces it to minor impact—when Safety is our utmost concern—keep construction out of the gas pipeline corridor!)

#### **9 Noise:**

-Corona discharge from existing transmission lines may be audible, but it is a relatively low noise level. (I think residents living close would be the judge of that!) Existing transformers and ancillary equipment may be audible at adjacent sensitive land uses.

**Significant Unavoidable Adverse Impacts:** There would be no significant unavoidable noise impacts. (Again a gloss over by EIS—what if homeowners complain—what is our recourse after built—will there be mitigation after installation?)

#### **10 Land Use & Housing:**

Of the action alternatives, Alternative 1- Option A has the greatest potential to create significant adverse land use and housing impacts. The magnitude of probable impacts ranges from minor to significant, depending on final project location and adjacent uses.

(There is no compensation enough to take one's home, destroy neighborhood character and impact home values of those left. You can't put a price on one's home, upgrades made, style, location, privacy, views, friends, kids in schools, etc—you have no idea what all you are destroying!)

Comprehensive plans also include goals and policies that establish a 20-year vision and roadmap for each study area community's anticipated future.

Goals and policies that relate to electrical infrastructure can be grouped into the following broad topics:

- 1. Encouragement of energy efficiency and conservation - Goals and policies generally promote investment in, and proliferation of, renewable energy resources and reduce the demand for fossil fuels.** (Great idea—why doesn't PSE practice this)
- 2. Hazardous pipeline safety - Goals and policies generally require coordination between the pipeline operator, development project proponents, and local jurisdictions to examine the potential for construction and operational conflicts, and to avoid, minimize, or mitigate for such conflicts.** (There is no mitigation for destroying neighborhoods, uprooting families, risking safety along an aging gas pipeline—there is nothing that can guarantee our safety—the area should not be disturbed—period. Today—in news—Greenwood/Seattle natural gas explosion levels 3 buildings—PSE at the helm—no one can be careful enough!! There are enough accidents without risk to a catastrophe around the pipelines!)
- 3. Utility corridor development/management - Goals and policies generally promote co-location and shared use of utility corridors in order to minimize impacts, except when major adverse safety or land use consequences could result. Timely improvements to infrastructure are encouraged in order to meet anticipated energy demands.** (“except when major adverse safety or land use consequences could result.” You couldn't say it better)
- 4. Protection of community or neighborhood character and safety - Goals and policies generally support siting and designing utilities to minimize conflicts with community character and maintain safety.** (Removing homes to accomplish an over-scaled electrical project is unjust. See you in court. The judge will see if this warrants taking of homes.)
- 7. Undergrounding of utility lines - Goals and policies support undergrounding existing and new or expanding lines where safe, practical, and in accordance with rules, regulations, and other utility- and site-specific factors.** ( PSE covered their bottoms at WUTC long ago as to under-grounding—More bad acting by PSE)
- 8. Shoreline management – Goals and policies generally discourage locating non- water-related utilities in the shoreline jurisdiction, particularly in-water. Uses that negatively impact ecological functions are generally prohibited.** (That eliminates under-watering—so why was it listed? Just because it sounds like the easiest, cheapest, safest, and most reasonable to avoid high density and preserve the cities involved?)

(RE: Above—PSE is a bad actor. PSE wants the most destructive plan because they have a ROW existing—any responsible utility would not risk a catastrophe in a densely populated area for any profit. It is proven —co-location of power and pipes makes corrosion—-not a benefit to co-locate in this scenario, arcing to ground for fires and explosions. Just today—3/10/16 two homes catch on fire in Lynnwood due to tree blowing on line—touching ground and homes and starting a fire in a natural gas line between both homes. Accidents DO happen! This corridor is overburdened already—PSE should give it up to Olympic Pipeline and remove the existing poles so Olympic can redo their corroded pipes that PSE lines have contributed to over the years. PSE should co-locate with Seattle City Light to rework that corridor where it is safer—keeping power together —not over gas!!. Co-location n=means power and power together—not power, pipelines, homes and fault zones. Olympic purchasing the corridor rights from PSE will help pay for the PSE project.)

#### **Essential Public Facilities**

**(EPF) are defined by state law (RCW 36.70A.200 and WAC 365-196-550) as necessary facilities that are typically difficult to site. The GMA requires planning so that such facilities can be placed appropriately. (EE is NOT NECESSARY at scale proposed!)**

**A determination of whether the Energize Eastside Project qualifies as an EPF would be made by the permitting agency at the time of permit preparation or submittal.** (Hopefully all cities see through the destruction this would create and preserve our areas for years to come. I can guarantee my city of Newcastle will never allow homes taken for an unnecessary project, that will blight and scar our city for years—see you in court. The Attorneys are lined up—you can not prove this is needed for Eastside power!! We will not tolerate paying for this and destroying our neighborhoods for PSE to profit.)

**It is indicative of the land use planning strategy seen throughout the Eastside communities, which is to preserve existing single-family residential neighborhoods while fostering population growth in high-density housing in the urban areas.** (Then don't threaten eminent domain!!)

**Housing impacts would occur in the event that residences needed to be purchased and removed in order to build the project. PSE confirms that due to safety regulations, transmission lines would never be placed directly over homes (Strauch, personal communication, 2015).**(Really!! Who asked if they could run the wires over homes—PSE?)

**Setback distance, ROW landscaping, shielding of visual and aural effects, and integration of the ROW into the neighborhood can significantly reduce or eliminate the impact of transmission structures on sales prices;**( How do you hide metal poles that are 85'-100' tall—in a clear space of 150' wide with plants no taller than 15'—We want to see that mitigation—or PSE magic perhaps? Yes—devaluation of up to 20% on a \$700K home —impact is severe—\$140K!! Mitigate that cost to the many homes facing industrial scaled poles.)

#### **Examples of Goals and Policies for Reliable Energy Provision**

**Redmond Policy UT-59: Work with energy service providers to promote an affordable, reliable, and secure energy supply that increases development and use of renewable and less carbon- intensive sources, and that minimizes demand and consumption.**

**Kirkland Policy U-7.3: Work with and encourage PSE to provide clean and renewable energy that meets the needs of existing and future development, and provides sustainable, highly reliable, and energy-efficient service for Kirkland customers.** (Not only work with PSE—DEMAND OF PSE—or start a PUD for King County!)

#### **10.7.3.1 Option A: New Overhead Transmission Lines**

**Overall, the potential impacts to land use and housing with the transmission lines of Alternative 1- Option A could range from minor to significant depending on specific location and whether a new or existing corridor were used for the facility.**(Amen to that.)

##### **10.7.3.1.2. Existing Corridor**

**Placing the line through existing PSE corridors or other dedicated utility easements, or along roadways, would be more consistent with land use and utility policies supporting utility co- location, although it could still result in some conversions of adjacent properties or purchases of housing. These conversions could occur in the event that the corridors needed to be widened to accommodate the new utility and allow an adequate clear zone between the lines themselves and between lines and other structures. Up to 50 feet of additional clear zone could be needed throughout the corridor. This could require removal of some structures, including housing, and would reduce the availability**

**of vacant land for additional housing or other development. The use of an existing shared corridor would have a lower potential for impacts from property conversion than a new corridor. Impacts would range from minor to moderate, depending on location and actual design.** (HOW on earth would DEIS describe the above as minor to moderate impact? Just shows how slanted this is—if 26 homes need to go to widen 50' ROW in my neighborhood alone—you call that minor? Unbelievable conclusion. Maybe you should loose your homes since you have no mercy for others? Totally unacceptable on DEIS part!)

**Alternative 1- Option A would be generally consistent with local planning policies listed in Appendix F except in the event that PSE intended to co-locate the transmission line with the Olympic Pipeline Company (OPLC) high pressure pipeline described in further detail in Chapter 16. While some local planning policies encourage co-location with utilities where safe (see Chapter 8), three study area communities (King County, Redmond, and Kirkland) have policies or regulations that could specifically prohibit combining new or expanded transmission lines (which are considered high consequence land uses) with hazardous material pipelines. Development regulations would need to be consulted for all study area communities. The City of Bellevue, for instance, has one code section (LU 20.20.255) which would disfavor site selection in residential areas. (Smart cities—that is why Newcastle has placed a moratorium on PSE—to write codes to prevent the unthinkable! Construction along aging, corroding gas pipelines! Thank you Newcastle—you will do the right thing.) High Consequence Land Use is a use which, if located in the vicinity of a hazardous liquid pipeline, would present an unusually high risk in the event of pipeline failure due to its function, including utilities providing regional service.(Disaster —is too risky with other options available )**

**Table 10-2. Potential Land Use Restrictions for Alternative 1  
Study Area Community**

**Newcastle Utility yards not allowed in: Mixed Use, Urban Residential, Neighborhood Business zoning districts**(Thank you Newcastle)

(Sounds like other cities already have protection in place for co-locating work along the gas pipelines that would be hazardous—in residential areas.)

**10.8 WHAT MITIGATION MEASURES ARE AVAILABLE FOR POTENTIAL IMPACTS TO LAND USE OR HOUSING?**

**To limit impacts associated with conversion of properties to utility uses, PSE could apply the following measures:**

- **Use existing utility corridors or properties already in PSE-ownership to the extent feasible. ( Gas line Corridor is unsafe)**
  - **Underground all or part of the line, or place the line through Lake Washington. ( Makes great sense—but PSE will not do)**
  - **Provide relocation assistance for any residents displaced or businesses purchased.** ( WOW—that is so reassuring to those of us loosing our homes—just what I want is PSE help! You will pay dearly if you approach me for my home of 28 years)
- No significant unavoidable adverse impacts to land use or housing are expected with any of the action alternatives. Alternative 1- Option A, would likely have significant impacts if a new transmission corridor was developed, but mitigation is available as discussed above.** ( There is not enough mitigation available to move—see you in court! By that time the rolling blackout will have already hit the Eastside according to PSE. When actually I just read Canada has more than enough power right now and with their new dam built soon—they need to have a place to send that power—sounds like another unnecessary profit project by someone. So is this PSE line to send power south from Canada and the new dam? A joint effort for PSE ratepayers by Columbia Grid, PSE, BPA to get a project paid for by PSE's so called "clueless" ratepayers? Nothing short of fraud on all levels if that is the case.)

## **Chapter 11—Views and Visual Resources:**

### **Views and Visual Resources Key Findings**

**Alternatives 1 and 3 could cause significant impacts to views and visual resources due to vegetation removal and obstruction of scenic views. Overhead transmission lines have the greatest potential to affect residential views. Of all overhead options, 230 kV lines in a new corridor would have the greatest visual impact (Alternative 1, Option A), the taller poles used in Alternative 1 would have a greater contrast with the existing visual setting. Assessor's information also identifies properties with a view of a power line that, in the judgment of the Assessor, lowers the property valuations.** (There needs to be mitigation for all those affected by home devaluation—not just the ones that are stripped of their homes and property rights! No one should suffer for PSE to profit \$1-2 billion—they can pay for their destruction to families' biggest asset—home ownership and equity.)

#### **11.2.9 Newcastle**

**The Draft 2015 City of Newcastle Comprehensive Plan states that the city is “a small town situated in a lush green setting” (City of Newcastle, 2015a). The draft plan also states that utilities, including electricity, should be provided to serve the projected population growth within the planning area in a manner that is aesthetically acceptable to the community (City of Newcastle, 2015a). (Aesthetically acceptable—Newcastle said it all!)**

**Specifically, the plan states that utility lines should be placed in shared utility corridors, and that utility providers should minimize visual impacts of overhead transmission lines on adjacent land uses (City of Newcastle, 2015a). ( Shared corridors with SCL line—not shared with aging gas pipelines!)**

### **11.3 WHAT ARE THE VISUAL RESOURCES, VIEWPOINTS, AND VIEWS IN THE COMBINED STUDY AREA?**

#### **11.3.1 Visual Character on the Eastside**

**Mount Rainier, the tallest peak in the Cascade Mountain Range, provides a visual landmark for the greater Seattle area (Figures 11-4, 11-6). At 14,410 feet tall, Mount Rainier “visually dominates the skyline” from numerous locations throughout the combined study area, and up to 100 miles away (The National Geographic Society, 2015).** ( I have a beautiful Mt. Rainier view from my deck as do other homes in Olympus —definitely worth increase in home valuation.)

**11.3.3 Public Viewpoints—**(Ugly views of tall poles from prestigious Newcastle Golf Course—dining and events from there. That is the best view from a public space on the Eastside!! Tragic to view a wider corridor littered with tall power poles—not the definition of a “lush green city” Newcastle portrays—a designated TREE CITY—yet you want to cut and strip one of our most beautiful resources—just for poles and wires and power not needed to this scale! )

**Figure 11-12. Percent of Private Viewpoints Identified by King County Assessor in Study Area Communities**

**Source: King County, 2012—**(This show Newcastle with NO MT. Rainer views—however, my home and many in Olympus neighborhood have stellar MT. Rainier views!! Needs further review to impact of home values as these polls will degrade our homes as well as great territorial views obstructed by many more homes here.)

(Your property view scoring map Figure 11-13—is definitely incorrect! Come see our views from Olympus neighborhood!—Or was it too cloudy that day you were writing the DEIS?)

**Chapter 11-21 states—The 230 kV lines are typically suspended on steel poles that are 100 to 135 feet tall and 200 to 1,000 feet apart (Corbin, 2007).**( So why is PSE saying they will suspend the 230kV lines on 85' Tall poles—Unacceptable for safety to EMF in dense residential area as well as EMF causing pipeline corrosion. PSE needs to use industry standard practices instead of bending safe practices to earn them less resistance in the community from visual blight!)

**Figure 11-17 shows PSE Eastside electrical infrastructure.** (A second 230kV line should be placed along the existing one showing to the far east of the drawing —away from homes and views and gas pipelines. Why was that routing not studied?)

**Table 11-2. Impact Assessment Criteria**

**In most cases, viewers who are closer to new electrical infrastructure would be subject to greater visual impacts than those located farther away from the project.**( You couldn't say it better—huge impact to those closest!)

**Significant - If the duration of impact would be permanent, the degree of contrast would be high, and there would be a medium to high number of viewers with medium to high sensitivity to the change in the visual environment.**(Wow—you used the word 'significant' finally and realize there is no mitigation that can help with a industrial towers in a residential area. Your DEIS words—1st found in Chapter 11 to acknowledge this is a severe impact to residents on a permanent basis. However taking my home is not rated “significant” by DEIS! Amazing piece of work this DEIS is.)

**Clearing and grading can result in a visual impact because areas that were once vegetated would be cleared, and natural undulations in the topography would be graded. Clearing and grading has the potential to permanently change the character of the area,**

**particularly if a substantial amount of taller vegetation (such as trees) is removed or if grading noticeably alters any existing landforms.**

**Alternatives 1 and 3 present the greatest potential for visual impacts during construction,** (You said it again—visual impact will be definitely noticed)

**Vegetation clearing during construction can be either temporary or permanent.**

**Temporary vegetation removal that can be restored after construction is discussed in Section 11.5.** (Removing tall trees and replacing with low bushes will not do anything for hiding 100' tall towers. More PSE magic needed here!)

**Changes to visual character can occur through introduction of new infrastructure that creates contrast against the natural or built environment due to its height or geometric form. Changes to visual character can also occur as a result of introducing a clearing or opening in an area that was previously forested.** (150' wide cleared ROW will be seen from many places.)

**Several studies have found that areas adjacent to major transmission lines have lower property values than comparable properties where there is no view of a transmission line. The studies indicate a range of 1 to 20 percent reduction in property value.** (Ask realtors in the area—some will not show homes next to power lines—perception of safety and EMFs—20% decline or more is more appropriate to home de-valuation)

**Despite the varying conclusions on whether or not views of transmission lines translate into reduced property values, the King County Assessor's Office noted that factors such as construction of a view-obstructing transmission line could result in a negative influence on property values (FCS Group, 2016). The Assessor's Office noted that when a property value appears to be affected by the presence of a power line, the Assessor of the property adjusts the assessed value downward (Prins, personal communication, 2015).** (King County Assessor knows for sure)

**The EIS Consultant Team could not determine the degree to which these various factors negatively impacted the property assessment.** (Try harder!! Talk about stacking the deck to PSE favor!!—Unbelievable statement in DEIS! Let a judge decide how our home values will be changed!)

**It is reasonable to assume that some existing properties would have lower property values following construction of an overhead transmission line.** (Very reasonable to assume—you should have erased the statement above—your words! DEIS is flawed—as you can see)

**PSE may be able to reduce the required clear zone, in which case impacts would be less than assumed for this phase of the EIS.** (NO PSE MAY NOT change safety standards—at their own whim!! Safety standards are made for our protection—not to be altered by a greedy for profit company!)

**Easements allow PSE to remove anything located within the right-of-way (such as lawn furniture and other landscaping.** (Removing trees and plantings with potential/ or taller than 15' is inexcusable—and replanting with small shrubs—how do you mitigate the look of a 100' tall power pole?)

**In areas where trees would be removed, the transmission lines and poles would be visible to nearby viewers. Clear zones can result in impacts by changing the visual character of the area (removal of trees, landscaping, and structures) and by opening up views of transmission lines and/or other features of the landscape that were previously obscured by vegetation. (DEFINITE ugly impact—won't regrow for years—or in my lifetime!)**

**The clear zone for an overhead transmission line in a new corridor in a wooded area would produce a higher degree of contrast. (YES!!) Visible from homes and vistas from afar!! Unreasonable contrast to existing. Because the Eastside is predominantly single-family residential, there is a high likelihood that any overhead transmission corridor would affect sensitive viewers.**

**Poles and wires for overhead lines have the potential to impact views by introducing structures that may be of a different scale than existing structures in the area. They may also impact the enjoyment of visual resources by partially obstructing views.(View hindrances need to be mitigated by all involved—part of the project cost)**

**Long-term visual impacts associated with Alternative 1- Option A include changes to visual character through introduction of new electrical infrastructure, partially obstructing views of visual resources, and maintenance of clear zones. Some viewers would likely perceive a significant impact.(AMEN—you finally said something that makes sense!! )**

**It is anticipated that Option A would require a clear zone between 120 and 150 feet wide, requiring clearance of up to 327 acres of vegetation. Existing transmission corridors in the combined study area vary in width. If an overhead transmission line were placed in an existing transmission right-of-way, the existing right-of-way would need to be extended to meet clear zone requirements.(Exactly why Alt.1-Option A is the most undesirable of all options! Destroy the environment—isn't that what this DEIS is all about? Saving environment and our natural resources or is it just an exercise to satisfy the government? Do you heed what it actually does to the environment or to people or is this all about the exercise?)**

**The presence of transmission lines often results in a sharp contrast with the surrounding landscapes. The size of transmission line poles and the material they are made of can influence the amount of impact they create. It is anticipated that 85- to 100-foot-tall steel or wood poles would be used for the 230 kV lines. Depending on topography the pole height may vary, with the tallest height being approximately 135 feet if a highway is crossed (Corbin, 2007).(Or view contrast from Newcastle Golf Course)**

**Placement of poles can also determine the degree of impact. When placed in relatively unobstructed skylines, transmission lines can become the dominant structure on the horizon, create contrast against the sky, and result in a more noticeable visual impact. ( Yes taller poles dividing my Olympus Neighborhood would be a disaster!! Oh sorry "disaster" would be when the gas line explodes from a construction accident!!)**

**Topography can also play a role in the visibility of the poles(Especially in Olympus on a hill —many more homes to west will see these taller poles in their views of Mt. Rainier and territorial views.) Overhead transmission lines can impact views of visual resources from surrounding properties. (Your words— the approximately 18-mile length of the corridor and**

the predominance of residential land uses, a high number of viewers with high sensitivity would likely be impacted. Again DEIS states high sensitivity—yet Alt. 1-option A will be chosen since it is PSE favorite—biased outcome before process is even submitted.)

**Views from the east looking west toward downtown Bellevue would be less likely to be impacted because the infrastructure would share the horizon with the tall buildings located behind it.** (How Absurd!—Figure 11-19—just what you want is horizontal lines through your picture!! Come on!! Somerset views are their legacy—PSE would love to destroy—then say—we don't compensate for view hindrance—go back to Australia and wreck your own land!! They would not allow this there in that beautiful land!! )

**Replacing an existing 115 kV transmission line with a taller set of poles could affect a similar number of parcels as a new corridor, but the change in contrast between the transmission lines and the surrounding environment would be less noticeable than from a new line because the existing lines already affect some views. Typically, properties within approximately 500 feet of and either uphill from or at the same elevation as existing transmission lines have views that are already affected. Replacement with new taller transmission lines could increase the effect on those properties as well expand the area impact by approximately 250 feet because of the increased height. However, the greater the distance, the greater the likelihood of intervening features such as vegetation, other structures, and changes in topography that would obstruct views of the power lines. For immediately adjacent properties with small structures such as single-family homes, taller poles would appear out of scale.**

(Oh how true is that—a 25' tall home adjacent to a 100' poles—with a 4 foot wide base structure—try covering up that view!! )

**Your mitigation:Using aesthetically pleasing materials and landscaping to shield electrical equipment from public view. For steel poles, using paint colors that reduce the contrast of the poles with the surrounding environment;**(and what color would that be to hide a 130' tall pole? I don't think there is one—can you identify that color please as part of your DEIS things you need to answer.)

**Best Mitigation I have read:**

**Placing portions of the transmission line underground (as in Alternative 1, Option C) or underwater (as in Alternative 1, Option D) in areas where significant impacts would occur from overhead lines;**(—Excellent ideas to preserve neighborhoods, and views and most of all safety along a gas pipeline!)

**Under Alternative 1, potentially significant impacts to visual resources are likely with any overhead line alignment because of the high number of sensitive viewers and the high degree of contrast that would be created. Significant impacts would be unavoidable with development of a new overhead transmission line corridor. If existing corridors are used, significant impacts**

**may occur, but could be reduced through installation of underground lines.** (Now you are making some sense! Do not destroy neighborhoods and risk safety along the pipelines. Take the project outside of this corridor.)

#### **Chapter 12-Recreation:**

##### **12.6.3.1.1 Permanent Infrastructure within a Recreation Site**

**If transmission lines are located in recreation sites they could impact recreation users. There would be permanent loss of vegetation, including trees, because a 230 kV transmission line would require a cleared corridor of 120 to 150 feet wide (or up to 50 feet of clearing where the existing PSE easement is used). Impacts from vegetation loss would be considered significant if there is a permanent conversion of vegetation type (e.g., from forested to low-growing vegetation) that would substantively change or negatively impact the scenic nature of a recreation site.** (Many residents walk the pipeline corridor daily with their dogs—that is our space for recreation—you will be taking that away for many months.)

**Noise from transmission lines may be audible in recreation sites,** (As well as homes nearby! Glad you recognized noise—as PSE always played this down with new wires—there is no noise audible they say.)

**Transmission line noise could have a minor impact on recreation.** (and a big impact on residences nearby)

**The most likely future action that could alter or affect recreation sites within the Energize Eastside project area is Sound Transit's East Link project, which could be constructed during the same general time frame. The East Link project will impact some parks in Bellevue, Redmond, and King County (Sound Transit, 2011). In combination with the East Link project and other projects planned in the project area, the Energize Eastside project could potentially cause cumulative impacts on recreation if the same recreation sites are affected or if construction periods overlap. Energize Eastside may avoid direct impacts on recreation sites by siting facilities outside of designated park or recreation areas. Construction of the East Link project is anticipated to occur between 2015 and 2021. Construction for the Energize Eastside Project may occur during this same period; however, construction could be planned to avoid working in the same areas concurrently. Construction activity throughout the region could result in potential impacts to parks and other recreation sites. Coordination with potentially affected cities will help to reduce potential impacts through facility siting, and would comply with all applicable permitting requirements to mitigate impacts. (I thought Route L along Lk. Washington Boulevard and the "Rail Trail" were taken off EE project—why are you now mentioning this?)****Significant impacts could occur.**

#### **Chapter 13-Historic and Cultural Resources:**

( Newcastle Historic Cemetery is right adjacent to the existing 115kV lines and the pipelines—Rest in peace—do not disturb this area)

**Chapter 14-Transportation:**

**14.5.3.2.9 Olympic Pipeline**

**The possibility that the Olympic Pipeline would be damaged during construction is considered low, because of regulatory requirements and safety practices that govern construction near the pipeline. However, if significant damage to the pipeline were to occur, or if there is a planned temporary disruption during project construction, petroleum products normally transported in the pipeline would be transported by other means, primarily by trucks using interstate highways. This would be expected to generate up to a few hundred truck trips per day**

(Should pipeline damage result during construction or after construction and pipelines would have to be shut down —resulting in trucking of fuels from Anacortes to Portland along busy freeways—would cause significant highway safety risk to the public with this many trucks daily transporting hazardous liquids. **Significant—in my words**—adverse affect and dangerous situation)

(Transporting heavy equipment over pipelines is not safe and liquid soils between SE 84th Street and 129th Ave SE in Olympus—will result in trucks getting stuck—water in this area all year from springs)

**After utility poles are installed, transmission wire would be strung between the poles. During the period in which wire is pulled, no vehicular traffic could be allowed on roadways or sidewalks located beneath the areas of pulling activity.**(Very inconvenient in Olympus—only one exit to Coal Creek Parkway)

**CHAPTER 15- PUBLIC SERVICES:**

**15.3.1.2 Electrical Incidents**

**The capacity for harm and damage can be minimized if operating under large overhead wires can be avoided.** (YES—the gas lines would be right under for 16 of the 18 miles—NOT SAFE!)

**15.3.1.3 Pipeline Fire or Explosion**

**The Olympic Pipe Line Company (OPLC) Facility Response Plan (FRP) provides guidelines to respond to a spill from the Olympic Pipeline, and supplements responders' training and experience during an actual response. Study area communities located along the pipeline corridor have adopted emergency response plans outlining procedures for responding to pipeline incidents (Anderson, personal communication, 2015)** (Unfortunately these shut off areas are few and far between and gas personnel only can shut them off—meanwhile thousands of gallons are spilling into neighborhoods)

**Stronger laws are in place that require monitoring for digging that occurs near the pipeline (Anderson, personal communication, 2015).** (What are those new laws—outline those please for us. Olympic Pipeline told me they want to know any vehicles driving over their corridor—even cars—because pipelines are buried at different depths. These areas should be blocked off so no unauthorized motor vehicles can drive over them—but they are not! You see heavy trucks there many times during the year.)

**During the period in which wire is pulled, no vehicular traffic would be allowed on roadways located beneath the areas of pulling activity. These delays and closures could delay response by requiring emergency service and other public service providers to use**

**a less direct route.** (Shutting off streets during construction can hinder emergency responders to our homes for fire, police and ambulance—if they come upon road closures and have to detour for miles as in the case of my Olympus neighborhood. Lives could easily be at stake.)

**A potential significant adverse impact on public services could occur if a rupture and explosion of a pipeline occurred requiring response from both local and regional emergency service providers. Depending on the magnitude of the incident, the response could be large and involve multiple regional agencies and responders. However, as described in Chapters 8 and 16, conformance with industry standards and regulatory requirements would ensure that potential hazards are identified and design plans developed to minimize adverse effects from these hazards to minor levels.** (Here again DEIS takes a significant risk of pipeline accidents and minimizes them to minor just by using words! Any risk is too great for lives at stake!)

**For new projects, such as the Energize Eastside Project, electrical engineers will usually design overhead transmission lines to comply with recommended maximum conductor surface gradient values set forth in the Institute of Electrical and Electronics Engineers.** (Love how PSE will “usually” design to these standards—will they or won't they? Unsatisfactory response.)

**Gap discharges (where electricity crosses tiny gaps between mechanically connected parts) can also generate noise.** (What is mitigation if this noise does occur to residents?)

**Communication interference is dependent upon the frequency of the system in use, the relative locations of the transmitters and receivers with respect to one another, and other parameters (EnerTech, 2015). Overhead transmission lines do not, as a general rule, interfere with radio or TV reception.** (This is huge for enjoyment of life in your home—what can you do if interference is there?)

**Corona-generated radio frequency noise decreases with distance from a transmission line and also decreases with higher frequencies.** (Many homes will be close to the 230kV lines)

#### **Chapter 16-Utilities:**

**Although a significant adverse impact on utilities could occur if an explosion of any of these types of lines resulted from the project, the risk is minimized by conformance with industry standards, regulatory requirements, and construction and operational procedures that address pipeline safety.** (Again —most significant consequence is minimized by words—RISK along pipelines is dismissed again!)

**These goals and policies are generally focused on the following:**

- **Ensuring that adequate public utilities and facilities are planned for, located, extended, and sized consistent with planned growth;** (How about utilities sized as need is proven! Smart Alternative solutions apply here which CENSE will provide soon.)
- **Ensuring utility systems are constructed in a manner that minimizes negative impacts to existing development and utilities;** ( Think pipeline safety and taking of homes and disruption communities)

- **Minimizing and preventing unnecessary risk due to hazardous liquid pipelines.**(You can accomplish this by using any other alternative but Alt.1-Option A—stay away from the gas pipelines!)

**In addition, some study area communities include policies encouraging the use of new or innovative technologies to increase the quality and efficiency of utility service.** (Great idea—hope Newcastle adopts this!)

**Depending on their services, utilities not managed by Cities are state regulated, federally licensed, and/or municipally franchised providers.**(Except PSE—there is no over-sight—a huge flaw in Washington State that needs to be corrected. How can we get to this stage when we can prove this is not necessary to the scale PSE proposes—yet because they are a private company they don't have to be transparent? Where has all this slipped through the cracks? Doesn't even sound possible—when I have to obtain a permit to put in a water heater. PSE has no oversight before a project is built. I think the WUTC has had enough of PSE —sounds like WUTC ripped them apart recently in Olympia with their IRP. And should this project happen—the WUTC will not grant them ability to pass these bogus, unnecessary charges on to us ratepayers! Soon the demise of PSE—here comes KING PUD!)

**The UTC identifies five major reasons why pipelines leak or fail: (1) third-party excavation damage; (2) corrosion; (3) construction defects; (4) material defects; and (5) outside forces resulting from earth movement, including earthquakes.**(If UTC has oversight of pipelines and NOT PSE—then WUTC should stop this project being built over these hazardous gas pipelines. Especially since we have recently learned Olympic Pipeline in 2014 has been put on notice to make corrosion repairs —which to date have not been done.)

**Information currently available from UTC indicates that the leading cause of gas distribution pipeline failures in 1998 was excavation damage, causing 58 percent of leaks that occurred in Washington State. Construction equipment can create pipe gouges, dents, scrapes, and cracks in pipelines. This type of damage can grow and lead to a catastrophic failure (UTC, 2015).**(Glad UTC recognizes the danger—why can't PSE see it)

**The pipelines are considered hazardous liquid pipelines, as designated by RCW 81.88.040 and WAC 480-93-005. Hazardous liquid pipelines, if ruptured or damaged, can cause large explosions and/or fires due to high operating pressure and the highly flammable and explosive properties of the transported products.**(AMEN)

#### **16.3.6 Submerged Utilities and “Lake Lines”**

**Several existing pipes and cables are located along the bottom of Lake Washington and Lake Sammamish. Many of them provide electricity, gas, communications, wastewater, and water service to Mercer Island from the Eastside (Power Engineers, 2015).** ( If PSE can submerge lines to Mercer Island—then they can travel through Lake Washington and safely provide power they need north to south.)

#### **16.3.7 What is pipeline corrosion and why is it a concern?**

**As described in Chapter 8, high-voltage transmission lines produce electric and magnetic fields. Electric fields are produced by the voltage in use and magnetic fields are produced by current. The strength of the electromagnetic field (both electric and magnetic fields, also known as EMF) decreases rapidly with distance from the source. A consequence of high-voltage power lines and buried petroleum pipelines sharing a corridor is that electromagnetic interference can be introduced on the pipelines, which**

can cause corrosion on the pipeline over time. Corrosion accounts for about 23 percent of the significant failures in both hazardous liquid and gas pipelines (Baker, 2008). Electromagnetic interference, or induction, on pipelines occurs when there is extended and close parallel routing with three-phase overhead transmission lines (Figure 16-4). The voltage is due to any phase imbalance in the lines. Electromagnetic fields from high-voltage power lines are especially a concern where the pipeline route is in parallel with, or crosses, high-voltage power lines. The corrosion concern depends on the currents flowing in the pipeline, which result in a voltage difference between the pipeline and the surrounding soil. The corrosion potential is influenced by various parameters such as soil properties, pipeline to transmission line distance and configuration, and the overhead line's operating current (Baker, 2008). (Great reason for PSE to abandon their 115kV corridor all together and let Olympic Pipeline have it and they can rebuild their corroding pipelines here and can we all live happily ever after—safely!)

As described by Baker (2008), from a scientific point of view, corrosion is well understood, both in terms of cause and method of control. However, despite the level of industry knowledge, pipelines continue to experience failures due to corrosions. Factors cited include the following:

- The chemical properties of the environment surrounding a buried pipeline are not adequately understood.
- Variations in the oxygen content, moisture content, and chemical composition of the soil along the pipe length and from top to bottom of the pipe can act as concentration cells that promote corrosion.
- Moisture content and oxygen content of the soil vary with time.
- Coating quality varies along the length of a pipeline.
- Coatings sometimes become disbonded from the pipe surface, allowing groundwater to contact the steel but shielding the steel from cathodic-protection currents.
- Disbonded coating will prevent aboveground survey detection of underlying corrosive conditions.
- Physical variations in soil characteristics and placement (gaps, etc.) affect the distribution of cathodic-protection current.
- Visual inspection of the outside of the pipe and the coating require excavation.
- Stray currents from nearby buried structures can interfere with a pipeline's cathodic-protection system (Baker, 2008). (PSE can abandon the pipelines all together—you are causing big safety problems—put a 500kV line in Lake Washington!)

Although a pipeline-related explosion as a result of project construction appears unlikely given the regulatory framework now in place (see Chapter 8), such an event would equate to a moderate to significant impact depending on the size of such an event, the number of customers affected, and the time needed to restore service. (WOW—again DEIS—size of the event—customers still living will be affected for sure—those dead won't give a damn!)

Construction would involve the use of heavy equipment and excavation activity. If this work occurs within existing utility corridors, it would have the potential to cause utility conflicts and service disruption. (Thank you for acknowledging a problem would exist—finally in the last few pages.)

**If located along the existing PSE 115 kV easement, construction of a 230 kV line has the potential to disrupt existing natural gas lines or the Olympic Pipeline.**( You said it)

**Construction risks associated with the Olympic Pipeline include potential for compression damage from heavy vehicles or machinery driving or placed above the buried lines, potential for pipe disturbance during excavations for new poles, and potential for pipe disturbance from removal of current poles. Certain machinery, such as auger equipment, can be a particular concern because of how heavy the equipment is.**  
(Not safe!)

**A potential significant adverse impact on utilities could occur if a rupture and explosion of a pipeline occurred during construction resulting in widespread service disruption and difficulties in reestablishing service.** (Yes—great reason to avoid being around the pipelines)

**If a pipeline rupture and explosion also damaged the 230 kV transmission lines, there could be substantial and long-term power outages to PSE customers.** ( Now you have more than rolling blackouts—a real problem! That is why Smart Alternatives described soon by CENSE will eliminate any risk of this.)

**The Eastside is located in a seismically active region, and existing infrastructure is at risk of damage in the event of an earthquake. Due to the close proximity of other utilities to existing electrical infrastructure (substations, transmission and distribution lines), damage to electrical infrastructure from an earthquake poses risks that could potentially damage nearby utilities. Similarly, electrical infrastructure could be damaged by lightning strikes that could generate fires. Both earthquakes and lightning strikes could also cause damage to nearby buried utilities.**(Again—why complicate a potential problem that will occur in this project lifetime—why does PSE need to build here when all risks are present—when other alternatives would work much better)

#### **16.7.3.1.1 Consistency with Applicable Plans and Policies**

**A new 230 kV line within PSE's existing 115 kV line easement may not be consistent with goals and policies of some study area communities that specifically discourage co-location of critical utilities with hazardous fluid pipelines like the Olympic Pipeline.**  
(Newcastle will soon enact these policies in line with other cities to protect their citizens.)

**Compared to a 115 kV line, EMF is stronger with the higher voltage of a 230 kV line, but higher voltage requires more ground clearance which can mitigate this stronger field to some extent. The closer to the ground the lines are, the stronger the electric field at the surface (Marrinan, personal communication, 2015).**( So why is PSE now proposing poles 85' and 100' tall when they originally said they would be 95'-130' tall all through the CAG process. If pipes corrode from EMF's—then they have to affect humans—this is not right!)

**Given the higher voltage of the 230 kV line, there is potential for the new line to increase cathodic-induced corrosion of steel or other metallic pipelines, if present, which could lead to long-term accidental system disruption of such pipelines.**(Not Good!)

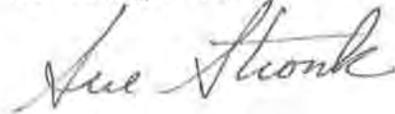
#### **Appendix K-Interview questions for Fire Departments:**

(No question to gas pipeline explosion—or how they will handle a catastrophe!)

I hope you had as much fun reading this as I did your 715 page DEIS document. Thank you for taking my concerns to heart to preserve safety in my community—Olympus neighborhood in Newcastle—and to preserve my home and many others subject to the wrecking ball for an unnecessary project.

Alternative 1-Option A —has by far the most adverse affects—even the DEIS agrees in many places. The best Alternative 2 is yet to come. CENSE believes Alternative 2 solutions are not the best as outlined in this DEIS and probably PSE wrote these in so they can be refuted as viable solutions. CENSE will propose the most effective and proven, workable solutions cities are now using—smart 21st century solutions that can be incrementally installed as power needs change. These will be accomplished safely away from gas pipelines, more cost efficient, and less destructive to our environment than widening ROW's, cutting trees, driving and drilling over corroding gas pipelines. I'm sure you will agree—or this process is rigged for PSE to benefit in a fraudulent scheme to have ratepayers paying for PSE shareholders to profit.

Sue Stronk  
12917 SE 86th Place  
Newcastle, WA 98056



# A CENSE board member!

*See attached Wall Street Journal Article:  
Utilities' Profit Recipe: Spend More*

Attach this to 30 pages of DEIS comments from:  
SUE STRONK / 12917 SE 86<sup>TH</sup> PLACE / NEWCASTLE, WA  
98056



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<http://www.wsj.com/articles/utilities-profit-recipe-spend-more-1429567463>

BUSINESS ([HTTP://WWW.WSJ.COM/NEWS/BUSINESS](http://www.wsj.com/news/business))

# Utilities' Profit Recipe: Spend More

To expand regulator-imposed earnings caps, electricity producers splurge on new equipment, boosting customers' bills



Every time Southern California Edison replaces a 50-year-old pole with a new one, it has a fresh investment on which it is eligible to earn an annual profit. *PHOTO: FRED PROUSER/REUTERS*

By **REBECCA SMITH**

April 20, 2015 6:04 p.m. ET

Families in New York are paying 40% more for electricity than they were a decade ago. Meanwhile, the cost of the main fuel used to generate electricity in the state—natural gas—has plunged 39%.

Why haven't consumers felt the benefit of falling natural-gas prices, especially since fuel accounts for at least a quarter of a typical electric bill?

One big reason: utilities' heavy capital spending. New York power companies poured \$17 billion into new equipment—from power plants to pollution-control devices—in the past decade, a spending surge that customers have paid for.

New York utilities' spending plans could push electricity prices up an additional 63% in the next decade, said Richard Kauffman, the former chairman of Levi Strauss & Co. who became New York's energy czar in 2013. It's "not a sustainable path for New York," he said.

New York is no outlier. Capital spending has climbed at utilities nationwide—and so have their customers' bills.

The average price of a kilowatt-hour of electricity rose 3.1% last year to 12.5 cents a kilowatt-hour, far above the rate of inflation. Since 2004, U.S. residential electricity prices have jumped 39%, according to federal statistics.

Over that same period, annual capital expenditures by investor-owned utility companies more than doubled—jumping to \$103 billion in 2014 from \$41 billion in 2004, according to the Edison Electric Institute, a trade association. The group expects total capital spending from 2003 through 2016 to top \$1 trillion.

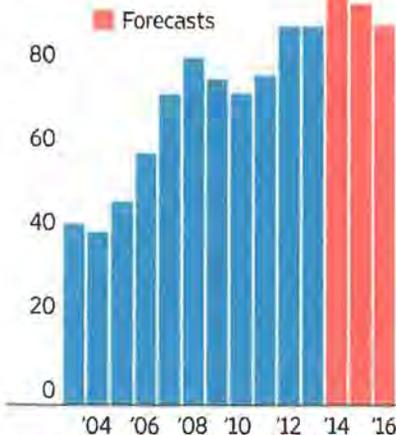
"This is the biggest splurge in capital spending we've seen in at least 30 years—it's the reason rates have been going up," said Bob Burns, an independent consultant and former energy researcher at Ohio State University.

## Power Gauge

Regulators are trying to rein in utilities' capital spending, which has ramped up over the past 10 years, driving up electricity prices.

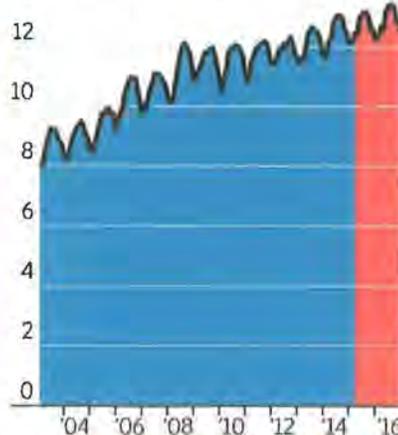
**Utility industry capital spending**

\$100 billion



**Residential electricity price**

14 cents per kilowatt hour



Sources: Edison Electric Institute (spending); Energy Dept. (prices) THE WALL STREET JOURNAL.

The biggest chunk of that spending—38% in 2013—went into new power lines and other delivery systems, the Edison Electric Institute said. Almost as much went to generation, often for new gas-fired plants to replace coal-fired ones that don't meet new environmental rules.

Experts say there are several reasons for soaring spending, including environmental mandates, and the need to harden the grid to protect it

from storms, physical attacks and cyber hacking.

But utilities have another incentive for heavy spending: It actually boosts their bottom lines—the result of a regulatory system that turns corporate accounting on its head.

In most industries, companies generate revenue, deduct their costs, and are left with profits, which can be expressed as a percentage of revenues—the profit margin. Regulated utilities work differently. State regulators usually set an acceptable profit margin for utilities, and then set electric rates at levels that generate enough revenue to cover their expenses and allow them to make a profit.

At the moment, it is common for utilities' allowable profit to be capped at 10% or so of the shareholders' equity that they have tied up in transmission lines, power plants and other assets. So the more they spend, the more profits they earn.

Critics say this can prompt utilities to spend on projects that may not be necessary, like electric-car charging stations, or to choose high-cost alternatives over lower-cost ones.

“Until we change things so utilities don't get rewarded based on how much they spend, it's hard to break that mentality,” says Jerry R. Bloom, an energy lawyer at Winston & Strawn in Los Angeles who often represents independent power companies.

Southern California Edison, a unit of Edison International in Rosemead, Calif., plans to spend about \$1 billion in debt and equity replacing or repairing thousands of power poles, which cost \$13,000 each. Every time the company replaces a 50-year-old pole with a new one, it has a fresh investment on which it is eligible to earn an annual profit, currently 10.45%, for 45 years.

The sudden interest in poles “suggests they've been negligent in the past or they're just looking for ways to spend money,” said Bob Finkelstein, a lawyer at the Utility Reform Network, a San Francisco-based watchdog group.

Mike Marelli, SoCal Edison's rates director, said his company analyzed 5,000 poles before deciding a massive program was needed to deal with deferred maintenance.

Overall, SoCal Edison intends to spend \$15 billion to \$17 billion on dozens of initiatives from 2014 through 2017. Similarly, Charlotte, N.C.-based Duke Energy Corp. expects to make \$17 billion worth of capital expenditures from 2014 and 2016. A rule of thumb it recently shared with investors: for every billion dollars in assets it adds to its inventory, it boosts earnings by about 8 cents a share.

Utilities can't bill customers for new capital expenditures without first getting the

---

*‘Until we change things so utilities don’t get rewarded based on how much they spend, it’s hard to break that mentality.’*

—Jerry R. Bloom, an energy lawyer at Winston & Strawn

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consent of state or federal regulators, notes Richard McMahon, a vice president at the Edison Electric Institute.

But Ken Rose, an energy consultant in Chicago, says that regulators don’t always do enough to make sure projects are the best deal for the customers footing the bills. He says companies have a propensity to choose expensive solutions to problems—building a new power plant instead of promoting energy efficiency, for example—because it puts big chunks of capital to work that lift profits.

Some analysts say utilities’ capital spending has been necessary and smart at a time of low interest rates.

“I don’t subscribe to the belief that utility companies are gold-plating their systems just to increase profits,” says Jim Hempstead, associate managing director of the global infrastructure finance at Moody’s Investors Service.

Utilities earned \$36 billion in 2013, excluding nonrecurring items, up 36% from 2004, according to the Edison Electric trade group.

So long as electricity consumption is growing, utilities can spread hefty costs across their customers without increasing rates. But since 2008, power sales haven’t been growing fast enough to absorb the impact of all the added spending.

Kansas City Power & Light has raised rates about 60% since it kicked off its current investment cycle in 2007. It is seeking rate increases of 12.5% in Kansas and 15.5% in Missouri.

Some states are pushing back.

In New York, regulators balked at Consolidated Edison Inc.’s plan to build a \$1 billion electrical substation in Brooklyn and Queens by 2017. Instead, the company has decided to help customers cut energy use by improving the efficiency of their electrical equipment through a \$500 million program that defers a decision about a new substation for at least a decade.

“What we’re doing is an alternative that’s less costly,” said Stuart Nachmias, vice president of regulatory affairs for ConEd.

From now on, utilities must prove that their spending will make an electric system cleaner, more efficient or stronger, says Audrey Zibelman, chair of the New York Public Service Commission. “Business as usual has become unaffordable.”

**Write to** Rebecca Smith at [rebecca.smith@wsj.com](mailto:rebecca.smith@wsj.com)

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To: Heidi Bedwell, Energize Eastside EIS Program Manager:  
From: Tom and Kristi Weir  
4639 133<sup>rd</sup> Ave SE  
Bellevue, WA 98006

We have lived Somerset for 45 years and are a half a block from the pipeline and over head power lines.

There are many reasons that the PSE Energize Eastside (Alternative 1A) should not go forward.

**First and foremost, the is the project is not needed.** PSE claims we will have the possibility of blackouts by 2018 under extreme weather conditions. This conclusion is based on unrealistic assumptions. PSE has assumed demand grows at 2.4% per year. Yet, the Northwest Power and Conservation Council says for the next twenty years most electricity needs can be met through conservation. The Council also states that since 1995 annual energy load grew at an average rate of only 0.40%! PSE has also underestimated transformer capacity in many ways. According to the independent study by Lauckhart-Schiffman, "the current system has three of four decades of capacity left in it."

The project is **highly risky** and could cause damage to homes and people as the proposed high voltage transmission lines will be placed above the Olympic gas pipeline.

Harm to the environment. This project will entail cutting down 8000 trees. We need these trees for carbon capture as well as preserving the aesthetics of Bellevue's noted "city in a park".

This project would cost ratepayers over \$1 Billion dollars over the lifetime of the transmission lines. This does not include the loss in property values and loss in property tax revenues to city governments.

Energize Eastside would leave us with an obsolete technology. We recommend reading the enclosed article by the Environmental Defense Fund (EDF) entitled "Welcome to the New Energy World." Here is a small excerpt:

*Over 3,000 electric utilities make up the U.S. power grid, which is sometimes called the largest machine in the world. But it's an antiquated system—largely unchanged from horse and buggy days. Because of this, electricity generation is today the single largest contributor to U.S. global warming. Now, change is coming. Big energy states are boldly reimagining how electricity is produced and distributed, making the system cheaper and cleaner.*

**Alternative 2**, the Integrated Resources Approach, would be safer and better for the environment. However, the solution described in the EIS is highly inadequate with costs and capabilities at times based on inaccurate and obsolete studies. See the enclosed article for many new ideas of how to rely on new energy sources which are far friendlier to the environment.



# Welcome to the new world of energy

**EDF**   
ENVIRONMENTAL  
DEFENSE FUND®  
Finding the ways that work

# Solutions

Vol. 47, No. 1 / Winter 2016

*SENT IN BY:*

Mr. and Mrs. Tom & Kristi Weir  
4639 133rd Ave SE  
Bellevue, WA 98006

By Leslie Valentine

Over 3,000 electric utilities make up the U.S. power grid, which is sometimes called the largest machine in the world. But it's an antiquated system—largely unchanged from horse-and-buggy days. Because of this, electricity generation is today the single largest contributor to U.S. global warming pollution. Now, change is coming. Big energy states are boldly reimagining how electricity is produced and distributed, making the system cheaper and cleaner. With EDF's help, they're providing a model for the rest of the country—and the world.

**W**ALLY BAZEMORE NEVER WANTS a repeat of what he and his neighbors went through three years ago, when Superstorm Sandy battered his Brooklyn community of Red Hook, leaving its 11,000 residents without power for weeks. At the time, he was caring for his 93-year-old bedridden mother. "It was rough," he says. "She was wrapped in Red Cross blankets to keep warm—she looked like a refugee."

These days, Bazemore is meeting with officials to get an energy system in place that will keep the electricity on the next time the central power grid fails.

Superstorm Sandy was a wakeup call not only for Red Hook residents. New York Gov. Andrew Cuomo openly criticized his own state's energy system and vowed to reform it.

There's a lot to reform. Today, the power grid uses the same one-way model that Thomas Edison designed more than a century ago. Typically, a power plant burns fossil fuel to produce electricity, losing power by the time it reaches customers, who have a single energy choice: on or off. Moreover, most utilities are monopolies that profit by selling more electricity and by building more

infrastructure—substations, polluting power plants, poles and wires—and passing the cost on to customers. That is a road to climate disaster—and a recipe for more blackouts. Add a tangle of public utility rules and you have formidable barriers to a clean, reliable power system.

What if utilities were rewarded for managing and saving energy, not just generating it? Today, EDF's clean energy team

### 8,079 pounds



the amount of coal it takes to produce the electricity for the average household in the U.S. each year.

is working with the Cuomo administration to bring that vision to life with a new energy policy for New York. A key goal is to find ways for utilities to profit from fully integrating renewable energy into their operations and helping customers use energy more efficiently. The challenge is to cut pollution and lower customers' energy bills while creating a more reliable electrical system. To ensure the changes take effect nationally, EDF is working in eight other states that make up about half the nation's electricity market.



A modernized grid will promote homegrown power, as in this Austin, TX, neighborhood.

New York's goals are ambitious: The state aims to get half of its power from renewable sources by 2030 (up from roughly 25% in 2014) and increase the overall energy efficiency of buildings by 23%.

"This is a huge opportunity to remake the system so it is fair and affordable—and cuts climate pollution," says Rory Christian, who directs EDF's clean energy work in New York.

If successful, the policy solutions New York develops could be a model for other states looking for ways to meet the goals of EPA's Clean Power Plan (see page 16). Success in New York could also guide other countries aiming to meet their climate goals quickly and at low cost.

With the historic Paris climate agreement now signed, reform of the electricity system will be a critical component in many nations' plans to meet their obligations. It's no surprise then, that policy makers around the world are keeping a close watch on the New York experiment. Such sweeping reform to integrate clean energy into the entire system, from power plants to the power outlet on your wall, has never been attempted.

EDF is also leading the way in designing financing methods to pay for the

## THE LONG ROAD TO CLEAN ENERGY

Ever since Thomas Edison flipped the switch on America's first central power plant in New York City in 1882, the business model has remained essentially unchanged. The goal: Add customers. Build coal-fired power plants. This archaic system is now being transformed.



### 1882: ELECTRIFYING THE NATION

The first power plant begins producing electricity, sparking a 130-year building spree of power plants and transmission lines across the country.

### 1954: SOLAR TECHNOLOGY IS BORN

Scientists at Bell Labs invent the first solar cell that uses the sun's energy to run everyday electrical equipment.



### 1987: SCIENTISTS WARN OF CLIMATE CHANGE

Atmospheric physicist Dr. Michael Oppenheimer, then at EDF, helped call international policy makers' attention to the problem of climate change.



About 75% of energy generated from traditional power plants is lost...



But renewable energy produced locally, like rooftop solar, is less wasteful.

How do you ensure that during blackouts people aren't forced to rely on diesel generators that are highly polluting? And how do you protect low-income families, for whom even a small, temporary rise in their utility bill can impact the food budget?

"It is crucial that low-income people and communities of color benefit from the coming changes and are not unduly burdened by pollution and higher costs, as they have so often been in the past," says Peggy Shepard, EDF trustee and director of Harlem-based WE ACT for Environmental Justice.

Changing an entrenched system requires delicate footwork. In 2014, New



EDF's Rory Christian (right) teamed up with community leader Eddie Bautista.

MICHAEL FRIEDMAN

York City's utility, Consolidated Edison (Con Ed), proposed a new \$1 billion substation to meet increasing demand for 700,000 residents of Brooklyn and Queens, who would have had to contend with higher utility bills as a result. EDF and our allies showed the state public service commission that there was a better way. By implementing energy-saving strategies, such as paying people to use less electricity during peak demand hours, we could cut pollution and costs. State regulators agreed and directed Con Ed to pursue alternatives to the \$1 billion project, saving customers hundreds of millions of dollars and laying the foundation for the broader energy reform now under way.

EDF's Rory Christian enlisted community support for the cheaper alternative. "EDF's guidance in helping community activists frame their campaign around energy reform has been invaluable," says Eddie Bautista, executive director of New York City Environmental Justice Alliance. With EDF's support, a powerful coalition of community leaders is now working with Con Ed to develop projects that benefit residents.

One such initiative—and winner of state funding—is a community microgrid that could produce income for residents. "In projects like this, there is great potential not only for green job creation but also for an ownership stake for residents," adds Bautista.

Meanwhile, in Red Hook, Bazenore is happy that a microgrid is coming to his venerable waterfront community. "There's still a lot to do, and we must be vigilant," the father of three says. "We have to think of the world we're passing to the next generation."

York City's utility, Consolidated Edison (Con Ed), proposed a new \$1 billion substation to meet increasing demand for 700,000 residents of Brooklyn and Queens, who would have had to contend with higher utility bills as a result. EDF and our allies showed the state public service commission that there was a better way. By implementing energy-saving

## Stuck in the past



THE ARNOLD BEACON JOURNAL

Across the country, a battle is playing out between vested interests in old, polluting energy and states and utilities adapting to a new energy landscape. While many utilities are retooling to join the clean tech revolution, Ohio-based FirstEnergy is fighting tooth-and-nail to keep the antiquated system in place:

Over the last decade, FirstEnergy, which operates in five states in the Midwest, has made a series of bad bets in the coal industry—for example, investing \$1.8 billion to retrofit a 50-year-old coal-fired power plant. These poor business decisions have led to a financial fiasco for FirstEnergy. Now, it is asking for a \$3 billion bailout, leaving customers to foot the bill. Not content with that, the company is trying to force Ohio to scrap its energy efficiency standards and other energy-saving programs.

"That's a losing strategy if ever there was one," says Dick Munson, director of EDF's Midwest clean energy program. EDF is fighting to stop FirstEnergy's desperate gambit to derail reform. We've rolled out ads in Ohio and mobilized supporters to urge Ohio's Public Utility Commission to reject the utility's request. A decision is imminent as we go to press.

### 2013: LAUNCHING A PLAN FOR CLEAN ENERGY REFORM

EDF launches a project in nine states to knock down barriers to a clean power system. New York announces plans for a total overhaul of its energy system.

### 2014: THE REVOLUTION IS UNDER WAY

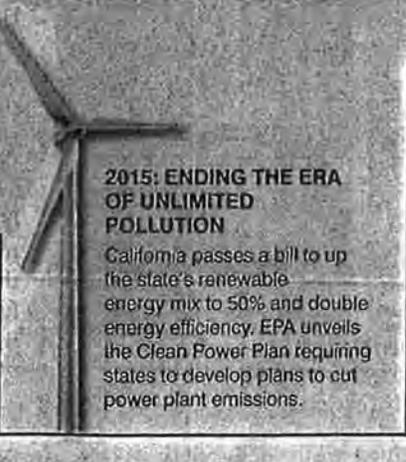
Solar and wind provide more than half of added U.S. generating capacity in 2014.

### 2015: ENDING THE ERA OF UNLIMITED POLLUTION

California passes a bill to up the state's renewable energy mix to 50% and double energy efficiency. EPA unveils the Clean Power Plan requiring states to develop plans to cut power plant emissions.

### 2018: ENERGY USE IS DEMOCRATIZED

Nearly 20 million New Yorkers can now manage their energy use, opt for renewable energy and gain access to microgrids. EDF's target states are on track to transform their energy systems.





Winds of change: On Lake Erie in Lackawanna, NY, wind turbines are humming where a steel plant once stood.

renovations and innovations that New York's energy plan will entail.

"What we're doing here," says Richard Kauffman, New York's chairman of energy and finance, "is building a new market platform to unleash clean energy technology and the financing needed so that we can reach our greenhouse gas reduction goals and grow our economy."

The state has rolled out a number of initiatives to spur private investment and innovation, including the creation of a state Green Bank to help provide the billions of dollars needed to retool the system. Gov. Cuomo has committed \$1 billion to grow New York's solar industry. With EDF's help, the state also launched a \$40 million competition to help communities develop microgrids—highly efficient local power networks—and 83 winners have been announced around the state.

From Buffalo to Brooklyn, change is already evident. There are giant wind turbines along Lake Erie where a Bethlehem Steel plant once stood. In economically struggling Buffalo, one of the nation's

largest solar panel factories is being built. Red Hook and a number of other New York City communities are seeking to install microgrids that would keep the electricity on in hospitals, relief centers and other essential buildings if the larger grid shuts down.

Besides providing reliable energy more efficiently, microgrids open up the distribution system to local energy produced onsite, through rooftop solar or wind, for example. Ultimately this puts affordable clean energy into many more people's hands. What's more, New York City is becoming a thriving hub for the clean tech industry. Solar installations have tripled in the past two years, and Cornell University recently broke ground for a new high-tech campus on Roosevelt Island.

### A seismic shift

Across the country, the clean energy market is booming, and not just in New York. Nationwide, in 2014, the industry expanded by 14%, to almost \$200 billion. The cost of solar panels has dropped 82% since 2009, and in some states energy

from the sun is cost competitive with conventional power. This signifies a fundamental shift toward clean energy produced locally, giving people true control over how they use, produce and interact with energy.

What does this mean for you? EDF sought to answer that in 2009, when we co-founded Pecan Street, Inc., centered on the Mueller neighborhood, a typical middle-class community in Austin, TX, with one big difference: It's a living laboratory for the technological future.

Pecan Street residents, many of whom live in homes with solar panels on their roofs and electric cars in their garages, can alter their energy usage in real time on their smart phones. They get a credit on their utility bill when they produce more energy than they use. Thanks in part to the work going on at Pecan Street, solar-powered dryers that shut off when the sun goes behind a cloud will be available in the not-too-distant future, and solar-powered homes will automatically switch to an alternate source of energy at night.

Not everyone is thrilled with the changes under way. Several states, including Florida (the Sunshine State), are charging fees to make up for lost revenue from rooftop solar customers, but poorly designed rate changes can impede adoption of solar and other renewables.

Other hurdles need to be cleared as well. Financing to upgrade buildings is lagging. That's why EDF developed a way to standardize how energy efficiency projects are developed and brought to market, similar to what was developed for solar, car loans and mortgages. California, New Jersey, New York and Texas are among the states starting to use the protocol, and we're adapting it for EU countries, including the UK and Germany.

And then there's the issue of justice.

### 2003: THE GREAT NORTHEASTERN BLACKOUT

A transmission line brushed against a tree in Ohio, shutting down the grid and leaving 50 million people in the Northeast and Midwest without power.



### 2006: CALIFORNIA OFFERS AN ALTERNATE FUTURE

California passes AB32, an EDF-cosponsored law that promotes renewable energy and efficiency, and requires reductions in climate pollution.

### 2008: EDF PIONEERS A SMART GRID

EDF helps launch Pecan Street Inc., an initiative with the high-tech industry and the city of Austin, TX, to develop a clean, smart grid.



### 2012: DISASTER IN NEW YORK CITY

Superstorm Sandy devastates the metropolitan area. The power grid fails, plunging much of New York into darkness and showing the system's vulnerability to climate change.

## Comments Regarding Energize Eastside EIS

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Dr. Anthony(Tony) Sutey – Retired Engineer

8117 128<sup>th</sup> AV SE  
Newcastle, WA 98056

### RECOMMENDATIONS:

REJECT Alternative 1  
ACCEPT Alternative 2

### BASIS FOR REJECTION of Alternative 1

Recently two Deal Breakers associated with Eastside Power Demands have “Come to Light” which justify rejection of Alternative 1.

- 1) The Northwest Power and Conservation Council 20 Year Plan(Seattle Times-Feb 10, 2016)
  - “By investing in energy efficiency.. we’ll be able to grow without an aggressive program to build new power generation resources and keep Northwest electricity rates low”.
  - Since 1995 annual energy loads grew at a rate of only 0.4 %.

Therefore, why does PSE need to construct major new 230kV power lines 80-100-130 feet high through our residential areas impacting our homes and environment?

- 2) The Lauckhart-Schiffman Load Flow Study (Sponsored by CENSE.org)
  - Existing distributed grids using critical transformers operating at only 85% of winter emergency ratings provide enough capacity for Eastside growth for the next 20 to 40 years.
  - Analysis used a power growth rate of 0.5% per year which is the number provide by PSE to WECC and is consistent with the 0.4% projection of the Northwest Power and Conservation Council
  - Contrast with the 2.4% growth per year used by PSE to justify Alternative 1.

### Further Analysis

PSE assumes all new power demands are electrical only and refuses to consider natural gas to supply more efficiently a major portion of energy for home and commercial heating in the winter (and air conditioning in the summer) without the need for additional high voltage electrical power lines

### PSE Demand Study Conclusions

- **Overstates** demand by **5 times**.
- **Inconsistent** with NW Power and Planning Council and Lauckhart- Schiffman studies.
- **Undervalues** existing power grid components and sub-elements.
- **Triples** power transmission to Canada from 500MW to 1500MW to justify needs
- **Inconsistent** with NW Power and Planning Council and Lauckhart- Schiffman studies.
- **Fails** to include the role of natural gas to meet power demand.
- Lifetime Cost **\$1.4-2.0 Billion**

This is not rocket science- this can be understood by all of us!! The Power Demand and Needs analysis by PSE is irresponsible!! Power Demands do not justify Alternative 1. PSE has provided bogus and inflated analysis to justify a \$1.4 -2.0 Billion capitalization project which will result in a 9.8% Windfall Profit( allowed by the WUTC) for their offshore owners—paid by PSE rate payers!!

3)ALTERNATIVE 1 Will Cause Major Environmental and Loss of Home Value Impacts

Option A (PSE Preferred Option)

- Increases existing power lines from 115kV to 230kV over an existing dual petroleum pipeline
- Increases power line height from 70 to 85-100-135 feet
- Widens the power line right-of-way by 20 to 50 feet.
- **Devalues and removes homes** and businesses along the 18 mile route from Renton to Newcastle to Bellevue to Redmond
- **Directly devalues our home** at 8117 128<sup>th</sup> AV SE, Newcastle which overlooks the power lines by at least 20% and possibly more if the homes along the east side of 128<sup>th</sup> AV SE are removed.
- **Substantially increases the risk** for loss of property and life due to potential earthquakes associated with the Seattle Fault Line which crosses major portions of the combined power line/petroleum line
- If we survive the earthquake—not sure if we will survive the explosions and fireball?? -Ha

Further Discussion:

- The EIS does not address the effect of doubling the voltage over the pipeline
- Safety of the pipe line and the powerlines are evaluated separately
- Analysis is required to evaluate scenarios considering the combined hazards associated with the simultaneous rupture of the dual pipeline and the power lines/towers under the event of an earthquake along the Seattle Fault Line

Conclusions regarding Environmental/Home Value Impacts:

-Why should we as citizens and rate payers be asked to pay for the environmental impact and devaluation or loss of our homes and communities for the Alternative 1-Option A project that is not needed and has not been justified!! Alternative 1 Options B, C, and D are also rejected since they are not needed.

**CONCLUSION REGARDING ALTERNATIVE 1 - REJECT**

BASIS FOR ACCEPTANCE OF Alternative 2

- Includes Energy Efficiency, Demand Response, Distributed Generation, Energy Storage and Peak Generation
- Cost effectively meets future power needs of the Eastside with low environmental impacts and minimum loss of home and community values.

SUMMARY

**REJECT Alternative 1**  
**ACCEPT Alternative 2**



February 18, 2016

YOUR FIRST CALL RESOURCE

Dear Ms. Bedwell,

The Renton Chamber's mission is to improve business and economic conditions, and the general welfare of the community. For more than 76 years the Chamber has been a leader in networking opportunities, advocacy, leadership development and promoting business prosperity. Our member businesses along with our non-profit and government partners play a significant role in building prosperity, excellence in education, wellness and healthcare along with a genuine good quality of life for the residents of Renton.

We must weigh in on issues that contribute to a consistent quality of life and prosperity for present and future generations. These issues include transportation, wages, education, business stability/vitality which involve improved infrastructure for a growing city.

Much of the new growth comes through manufacturing, hospitality, healthcare and service businesses that support our already established companies. According to the Puget Sound Regional Council, between 2010 and 2040, Renton's population is expected to grow 31 percent, and employment is expected to grow more than 50 percent. While this growth ensures the continued prosperity of Eastside cities and communities, it must be supported by suitable infrastructure.

We are also concerned with the public safety risks related to the "No Action" alternative outlined in the Draft EIS. Our community's firefighters, police and hospitals depend on reliable power to respond to and care for those in need. Additionally, a heat wave, severe cold spell, car accident, act of God, etc., can tax an electric system, causing outages particularly when customers use their air conditioning or heating around the clock. For our manufacturing businesses a power outage can ruin a "just in time" production schedule and end up costing the company millions of dollars.

Without adequate investments in our electric infrastructure, businesses and residents in Renton and across the Eastside will be at risk of power outages. Existing businesses cannot afford the loss of productivity and revenue resulting from power outages and new businesses will not locate here without a robust electric system. Our jobs, families and communities need dependable power in order to thrive.

Many solutions have been considered as part of the EIS process, but we need a solution that is proven, dependable and technically feasible. Betting on untested technologies is too big of a risk. The Eastside needs a solution that is viable and stands the test of time. **The Renton Chamber supports moving forward with the Energize Eastside project (as proposed by PSE, Alternative 1(a) in the Draft EIS) to ensure that we have continuous, reliable power to support current and future business growth in our community.**

Sincerely,

A handwritten signature in cursive script that reads 'Vicky Baxter'.

Vicky Baxter  
CEO

Renton Chamber of Commerce

Cc: Executive Board: Joe Kiley, Chairman; Brent Camann, Past Chair

Cc Renton City Council

Cc Bellevue City Council

To: Heidi Bedwell

ENERGIZE EASTSIDE: COMMENTS ON ENERGIZE EASTSIDE STATEMENT (EIS) February, 2016

I am very concerned about PSE's intention to build a large transmission line from Redmond, WA to Renton, WA. for several reasons:

1. The **need** for expanded capacity outlined in Chapter 1.3 of the DEIS has been questioned by the Lauckhart-Schiffman load-flow study dated February 18, 2016. This study indicates there are many flaws in PSE's assumptions. If winter emergency conditions are used instead of summer normal conditions and if .5%/year growth for Eastside energy demand is used, demand does not exceed flow until 2058. PSE's inflated rate of growth of 2.4%/year indicates the capacity is not exceeded until 2027. This should provide plenty of time to implement rapidly developing new technologies which would be much less expensive and intrusive.  
It appears the real motive for PSE's desire to expand capacity has more to do with the transfer of power to British Columbia, thereby enhancing the profitability of PSE and increasing the return on investment for the hedge fund owners of PSE who made a 10-year investment which anticipated high returns. These profits would be on the backs of the customers who would pay for the huge capital investment with increased rates.
2. **Public safety** is of primary concern. Given that we live in a seismic zone and the existing power line is built along a gas line, the possibility of a human catastrophe is exacerbated by construction and long term operations activities. Chapter 8.5.1.3 only mentions earthquakes during construction. What about seismic events in the future? I am reminded of the 1999 Bellingham disaster. In addition while effects on humans is hard to prove and controversial, why risk any adverse health effects, such as bone marrow cancer in infants and brain cancer in adults?
3. The detrimental impact to the **environment** cannot be overemphasized. We are looking at the destruction of several thousand trees and clear cutting many acres of vegetation. Bellevue and other eastside cities pride themselves on the largely attractive and desirable living conditions that have been developed over the years. Does it make sense to downgrade these admirable results and diminish the quality of life and the investments in homes and public places, especially when the demand need that has been proposed by PSE is highly suspect?

For these main reasons I urge those officials responsible for the evaluation of the Energize Eastside Project to reject the building of the proposed energy infrastructure and turn to the more sensible Alternative 2 – Integrated Resource Approach-outlined in the DEIS, pp2-32 to 2-49.

Furthermore, I urge the current EIS Step 1 Review to reach a conclusion and remand the final findings to the Bellevue City Council for review and a decision about proceeding to step 2.

W. Robert Moore   
4707 135<sup>th</sup> Place Bellevue, WA 98006  
Tel: 425-747-1388  
Email: [bmooreii@comcast.net](mailto:bmooreii@comcast.net)

Speaker # 13 Newcastle Public  
Hearing Comment 2.27.16

GOOD AFTERNOON MY NAME IS WARREN HALVERSON AND I RESIDE  
AT 13701 NE 32<sup>nd</sup> PLACE. I AM A MEMBER OF THE COALITION OF  
EASTSIDE NEIGHBORHOODS FOR SENSIBLE ENERGY.

MY PURPOSE IS TO SHARE WITH YOU THREE MAJOR CONCERNS THAT I  
HAVE WITH THE EIS PROCESS (I KNOW YOU WILL THINK ONLY THREE  
BUT I HAVE ONLY 3 MINUTES).

FIRST, THE CURRENT DEIS DOES NOT MEANINGFULLY CONSIDER  
THOSE CITIZEN COMMENTS WHICH WERE PROVIDED IN THE *DRAFT 1  
EIS SCOPING SUMMARY AND FINAL ALTERNATIVES CITY OF BELLEVUE,  
2015.* (SEE ITEM 2 P1-15 DEIS INTRODUCTION AND SUMMARY).

FOR EXAMPLE, IN THE SCOPING DOCUMENT, CITIZENS IDENTIFIED 10  
KEY COMMUNITY ISSUES TO HELP GUIDE THIS DEIS (PGS 67-92 & FIG 4).  
FOUR ARE NOT CONSIDERED AND THE OTHER SIX ARE LIGHTLY  
COVERED AND BURIED IN THIS 715 PAGE DOCUMENT.

FURTHERMORE, IF YOU READ THE INTRODUCTION TO THE SCOPING  
DOCUMENT, IT CONCLUDES (AND I QUOTE): 'IN GENERAL MOST  
COMMENTS EXPRESSED CONCERN OR OPPOSITION TO PSE'S PROPOSAL.'  
THEN ON PAGES 73-77 .... "THE MAJORITY OF COMMENTS INDICATED A  
LACK OF SUPPORT FOR ALTERNATIVE 1 .... MANY SUPPORTED  
ALTERNATIVE 2 OR SOME ASPECT OF IT".

PAGE – 2 DEIS COMMENTS BY W. HALVERSON

AS I READ THE 715 PAGES, THESE ISSUES AND CONCLUSIONS ARE NOT AT ALL EVIDENT. THIS IS CONTRADICTORY TO YOUR DEIS INTRODUCTORY STATEMENTS. REFERENCE 1.6 AND 1.7.

FRANKLY, IF YOU ARE NOT GOING TO FULLY CONSIDER THE COMMUNITY TESTIMONY OR EVEN YOUR OWN CONCLUSIONS ABOUT ALTERNATIVES, THE DEIS METHODOLOGY APPEARS BIASED AND FLAWED.

SECONDLY, WHILE THE COMMUNITY DID RECOMMEND SEVERAL ALTERNATIVES, -- PARTICULARLY ALTERNATIVE 2 -- THE DEFINITIONS ARE LACKING IN THE DEIS. IN ADDITION, THE INTEGRATED RESOURCE ALTERNATIVE IS SCALABLE AND PROVIDES UNIQUE OPPORTUNITIES TO COMBINE SOLUTIONS. THE DEIS PROVIDES NO INSIGHT INTO A COMBINATIONS OF THESE SOLUTIONS. FINALLY, IN EVALUATING ALTERNATIVES AGAINST THE ELEMENTS, THE DEIS USES CATEGORIES OF MINOR, MODERATE AND SIGNIFICANT. THIS PROVIDES A VERY BROAD BASIS OF EVALUATION. THE ASSESSMENT THEN INCORPORATES LAWS, REGULATORY ENVIRONMENT, ALL SORTS OF MITIGATION, (PARTICULARLY RELATED TO ALTERNATIVE 1) AND EVEN POSITIVE COORDINATION OF WORK GROUPS. IN MY OPINION RATHER THAN CLARIFYING ALTERNATIVES THIS SKEWS ALL RATINGS TOWARD MINOR

PAGE 3 - DEIS COMMENTS BY W. HALVERSON

THUS SKEWS THE EVALUATION TOWARD ALTERNATIVE 1. IT CERTAINLY APPEARS THEN THAT ALTERNATIVES ARE NOT BEING ANALYZED AT A PROPER LEVEL OF DETIAL OR IN A COMPARABLE MANNER.

FINALLY, MINDFUL OF THESE CONSIDERATIONS AND THE IMPORTANCE OF THIS DEIS, MY THIRD COMMENT IS ACTUALLY A SUGGESTION. THE EIS TEAM SHOULD INITIATE A REVIEW PROCESS BY THE PUBLIC OR AN UNBIASED HEARING EXMINER ONCE THE EIS TEAM HAS INCORPORATED PUBLIC INPUT.

THANK YOU.

  
WARREN HALVERSON  
13701 NE 32<sup>nd</sup> PLACE  
BELLEVUE, WASHINGTON 98005

2/29/2016

MY NAME IS WARREN HALVERSON AND I RESIDE AT 13701 NE 32<sup>ND</sup> PLACE.  
TONIGHT, I AM REPRESENTING THE CANTERGREENS HOMEOWNERS  
ASSOCIATION.

LET ME BEGIN BY ASKING A QUESTION: "WOULD YOU PURCHASE A  
PRODUCT IF YOU DIDN'T KNOW WHY YOU NEEDED IT OR WHAT IT  
WOULD COST?" WELL, WELCOME TO THE WORLD OF PUGET SOUND  
ENERGY AND THEIR PRODUCT "ENERGIZE EASTSIDE".

MY PURPOSE TONIGHT IS TO TALK ABOUT ECONOMICS AND THE COST OF  
THIS PROJECT. AS NOTED IN THE SCOPING PROCESS, THIS IS A MAJOR  
CONCERN OF THE COMMUNITY. IT IS AN ENVIRONMENTAL FACTOR UNTO  
ITSELF AND IMPACTFUL TO OTHER ELEMENTS OF THE ENVIRONMENT  
CONSIDERED IN THE DEIS.

WHILE THE DEIS DOES NOT COMPARE ALTERNATIVES BASED UPON COST,  
THE COSTS OF THESE ALTERNATIVES ARE DRAMATICALLY DIFFERENT.  
FOR EXAMPLE, ALTERNATIVE 1a IS ESTIMATED TO COST \$250 MILLION  
DOLLARS WITH A LIFE TIME COST OF NEARLY \$1.4 BILLION. NO OTHER  
ALTERNATIVE COMES CLOSE TO THIS COST YET WE ARE GOING TO HAVE  
TO PAY FOR THIS. THIS IS SHOCKING ENOUGH BUT A TRULY THOROUGH  
ANALYSIS WOULD NOT STOP HERE. IN EXAMINING THE ALTERNATIVES,  
ALTERNATIVE 1a IS THE MOST MITIGATED AND WHILE MITIGATION  
SUPPOSEDLY REDUCES THE ENVIRONMENTAL IMPACTS THERE IS NO

PAGE 2 – W. HALVERSON DEIS COMMENTS- BELLEVUE

MENTION OF THOSE COSTS. THROUGHOUT THE DEIS THERE ARE MITIGATION ACTIVITIES BUT THERE COSTS ARE NOT MENTIONED AMONG THESE WOULD BE REPLACEMENT OF VEGETATION AND TREES; MORE POLES THAN ANTICIPATED DUE TO NARROW CORRIDORS; WIDENING CORRIDORS TO 150'; CLEARING AND GRADING FOR 'CLEAR ZONES' AND ACCESS ROADS; AND EVEN THE USE OF EMINANT DOMAINE TO BUY HOUSES. THEN THERE ARE THE COSTS ASSOCIATED WITH GAS EMISSIONS, AIR QUALITY, STORM WATER CONTROL AND SUCH.

DON'T BE SURPRISED YOU WILL HAVE TO PAY A LOT MORE THAN WHAT YOU ARE BEING TOLD. ALTERNATIVE 1a HAS EXCESSIVE MEDIATION AND WILL COST MORE. ALTERNATIVE 2 HAS LITTLE MEDIATION. NEVERTHELESS ALL THIS SHOULD BE PRICED OUT. LET'S CALL THIS A GREAT OMISSION BECAUSE YOU REALLY CANNOT COMPARE ALTERNATIVES UNLESS YOU HAVE EQUAL DETAIL.

LET ME TURN NOW TO TWO COSTS IDENTIFIED IN THE DEIS: FIRST, PROPERTY VALUES—TUCKED AWAY UNDER "VIEWS AND VISUAL RESOURCES" AND "LAND USE AND HOUSING CHAPTERS" AND SECONDLY TAX BASE (SEE THE PUBLIC SERVICES CHAPTER 11.6.1.4 9 PG 29-30.). QUOTING NATIONAL STUDIES, THERE ARE BASICALLY TWO MAJOR CONCLUSIONS ABOUT THE IMPACTS OF POLE LINES ON PROPERTY

VALUES: FIRST, WITHIN THE CHAPTER ON “VIEWS AND VISUAL RESOURCES (AND I QUOTE): “IT IS REASONABLE TO ASSUME THAT SOME EXISTING PROPERTIES WOULD HAVE LOWER PROPERTY VALUES”. THE SECOND CONCLUSION IS: “THE EFFECTS OF A TRANSMISSION LINE ON SALES PRICES OF PROPERTIES DIMINSH OVER TIME AND ALL BUT DISAPPEAR IN FIVE YEARS” (SEE LAND USE AND HOUSING CHAPTER 10.7.1.4 (pg 10-22). SO ON A MILLION DOLLAR HOUSE THAT LOSES VALUE OF \$60,000 - \$200,000 +/- APPRECIATION WILL CATCH YOU UP IN 5 YEARS. REALLY! WHAT ABOUT THE \$200,000 THAT I LOST INITIALLY. OTHER STATEMENTS ARE: “...IMPACTS COULD BE 1-20% BUT AVERAGE 6.2% BASED UPON ASSESSED VALUD, NOT MARKET VALUE”; IN 11.1.2 (Pg 11-2); “ ... THE IMPACT ON PROPERTY VALUES IS 3-6% .... WHICH “DISSIPATES 200-300 FEET AWAY”; AND, “...DATA WERE INONCLUSIVE AS TO WHETHER THE REASON PARCELS WERE VALUED DIFFERENTLY WAS BECAUSE OF USE RESTRICTIONS WITHIN A POWER LINE EASEMENT, BECAUSE OF VISUAL IMPACTS OR FOR SOME OTHER REASON” . REALLY, TRY THAT ONE ON OUR FRIENDS FROM SOMERSET.

P. 3 – W. HALVERSON DEIS COMMENTS – BELLEVUE

REGARDING PROPERTY TAX REVENUES 15.6.4.5. , IT WOULD APPEAR THAT THE MAJOR CONCLUSION IS: “ .... THE IMPACT OF ALTERNATIVE 1a ON BELLEVUE’S \$35 MILLION DOLLAR BUDGET IS SMALL AND WOULD NOT AFFECT THE CITIES ABILITY TO ADEQUATELY FUND PUBLIC SERVICES.” THIS IS BASED UPON A REDUCTION OF PROPERTY TAXES OF \$10,000,000 WHICH EQUATES TO A REDUCTION OF \$9800 IN TAX REVENUES. THIS APPEARS TO BE FUZZY MATH. THE IMPACT OF ALTERNATIVE 1a IS MORE LIKE \$100,000 TO \$200,000 PER YEAR, EVERY YEAR. CONVERSELY, ALTERNATIVE 2 HAS LITTLE IMPACT ON PROPERTY VALUES OR TAX REVENUES

IN SUMMARY, THE DEIS PROPERTY VALUE ASSESSMENT INFORMATION IS ALL BASED UPON CAREFULLY SELECTED NATIONAL STUDIES, ONE OF WHICH IS SPONSORED BY THE PUBLIC UTILITIES INDUSTRY. SINCE THE IMPACTS ON PROPERTY VALUES AND TAXES ONLY RELATES PRIMARILY TO 1A – NOT AT ALL TO 2 – IT IS TROUBLESOME THAT THESE IMPACTS ARE MINIMIZED TO SUCH A DEGREE AND SEEMS TO SLANT AND BIAS COMPARISON OF ALTERNATIVES.

P.4 – W. HALVERSON DEIS COMMENTS – BELLEVUE

MY FINAL COMMENT IS ABOUT OPPORTUNITY COSTS. WHAT DO WE FORGO BY SPENDING \$1.4 BILLION DOLLARS. PSE'S 18 MILES OF TRANSMISSION LINES AND A SUBSTATION WILL COST AT A MINIMUM \$250 MILLION DOLLARS AND OVER THE LIFE OF THE PROJECT \$1.4 BILLION. THINK ABOUT IT. WITH A BILLION DOLLAR COMMITMENT (INCIDENTLY EARNING 9.8 – 10.2% FOR FOREIGN INVESTORS) HOW LIKELY ARE YOU TO CHANGE, INNOVATE, PROVIDE NEW OFFERINGS: LIKE ENERGY EFFICIENCY COMPONENTS; DEMAND RESPONSE; DISTRIBUTED GENERATION; ENERGY STORAGE; PEAK POWER GENERATION AND WHO KNOWS WHAT ELSE IN THE NEXT FEW YEARS. THE COST OF OLD TECHNOLOGY AND SUBSTATIONS WILL CERTAINLY REDUCE THOSE OPPORTUNITIES FOR THE FUTURE.

IN CONCLUSION, THE CURRENT DEIS NEEDS TO ACCOUNT FOR ALL COSTS AND RISKS OF THIS PROJECT SO THAT ALTERNATIVES CAN BE FULLY COMPARED. THIS SHOULD BE DONE BY UNBIASED LOCAL RESOURCES FOCUSED UPON BELLEVUE.

WARREN E. HALVERSON  
13701 NE 32<sup>ND</sup> PL  
BELLEVUE, WASHINGTON

March 9, 2016

Ms. Heidi Bedwell, Senior Planner  
Land Use Division – Development Services, City of Bellevue  
450 110<sup>th</sup> Avenue NE  
Bellevue Washington 98004



Re: Comments concerning DEIS process for Energize Eastside

On behalf of myself and CENSE, I am writing you to share three major concerns that we have with the EIS process.

First, the current DEIS does not meaningfully consider those citizen comments which were provided in the Draft 1 “EIS Scoping Summary and Final Alternatives City of Bellevue, November 2015” (See Scoping Item 2 & pgs 1-15; Also, “DEIS Introduction and Summary 1.7 1-16 & 18).

For example, in the scoping document, citizens identified 10 key community issues to help guide this DEIS (pgs 67-92 & Fig 4). Four are not considered and other six are lightly covered and buried in this 715 page document.

Furthermore, if you read the introduction to the scoping document, it concludes: “In general, most comments express concern or opposition to PSE’s proposal i.e. Alternative 1a”. Then on pages 73-77: “The majority of comments indicated a lack of support for Alternative 1 .... Many supported Alternative 2 or some aspect of it”.

Within the 715 pages, these issues and conclusions are not at all evident. This totally contradicts the DEIS introductory statements in Sections 1.6 and 1.7. And, frankly, if you are not going to fully consider community testimony and/or even your own conclusions about alternatives, one must conclude that the DEIS is very biased and flawed.

Secondly, while the community did recommend several alternatives – particularly Alternative 2 – the definitions in the DEIS lack specificity. The DEIS team should seek out expertise to fully define and explain these non- transmission alternatives. It is apparent that these alternatives are the least costly and most scalable providing a unique opportunity for PSE to meet its objectives while adapting to a rapidly changing electrical industry environment.

Finally, in evaluating alternatives against the elements, the DEIS uses categories of “Minor”, “Moderate” and “Significant”. The definitions of these categories are very broad, so broad that one cannot use them to meaningfully evaluate the alternatives. This assessment is further diluted by including all sorts of mitigative actions. The mitigation includes almost everything imaginable, for example, laws, codes, regulations and even

Page 2 Comments concerning DEIS process for Energize Eastside

coordination amongst work groups. This is especially true as to the evaluation of Alternative 1a. The cost of mitigation in this DEIS is no-where to be found. Rather than clarifying alternatives in Section 1 Tables 1, 2, &3 pgs 1-51 thru 55 , the evaluation of alternatives then is creatively skewed toward Minor. Therefore, one concludes alternatives are not being analyzed at a proper level of detail or in a comparable manner.

I hope you will take my constructive criticism as being useful in developing a more objective DEIS. Thank you!

Sincerely,

A handwritten signature in blue ink, appearing to read "Warren E. Halverson". The signature is fluid and cursive, with a large loop at the end.

Warren E. Halverson  
13701 NE 32<sup>nd</sup> Place  
Bellevue Washington 98005

ENERGIZE EASTSIDE  
PHASE 1 DRAFT ENVIRONMENTAL IMPACT STATEMENT  
PUBLIC HEARING/PUBLIC TESTIMONY

6:00 p.m.  
March 1, 2016  
450 110th Avenue NE  
Bellevue, Washington

LISA R. MICHAUD, CCR  
NORTHWEST COURT REPORTERS  
1415 Second Avenue, Suite 1107  
Seattle, Washington 98101  
(206)623-6136  
[www.northwestcourtreporters.com](http://www.northwestcourtreporters.com)

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PANEL MEMBERS

CLAIRE HOFFMAN - ESA  
CAROL HELLAND - CITY OF BELLEVUE  
HEIDI BEDWELL - CITY OF BELLEVUE

ALSO PRESENT:

MARCIA WAGONER - FACILITATOR - 3SB  
CASEY BRADFIELD - TIME KEEPER - 3SB

PUBLIC SPEAKERS

WARREN HALVERSON	LISA MERRILL
NORM HANSEN	JD YU
PATRICIA HANSEN	JAMES BLOOMFIELD
TODD ANDERSEN	SANGEETHA RAJENDVA
DON MARSH	RICHARD KANER
LINDY BRUCE	JANIS MEDLEY
BRIAN ELWORTH	BRIAN GRUNKEMEYER
DON MILLER	HU DONG
JOHN MERRILL	JAN KELLER
KATHLEEN SHERMAN	MARIA VLACHOPOULOU
CELINA CALADO	BARRY ZIMMERMAN
SUZANNE MESTIN	MARLENE MEYER
JAMES ADCOCK	STEVE WAGONER
ALICE WANG	LORI ELWORTH
SUE STRONK	JAMIE BROWN
LYNNE PREVETTE	STEVE O'DONNELL
DAVE HERBIG	KELLY BACH
KATHERINE MA	PAMELA JOHNSON

1                   MR. HALVERSON: My name is Warren  
2 Halverson. I reside at 13701 Northeast 32nd  
3 Place. Tonight I am representing the Canter  
4 Greens Homeowner's Association. Let me begin by  
5 asking a question. Would you purchase a product  
6 if you don't know why you need it or what it  
7 would cost?

8                   Would you purchase a product if you didn't  
9 know why you needed it or what it would cost?  
10 Welcome to the world of Puget Sound Energy and  
11 the product Energize Eastside. My purpose  
12 tonight is to talk about the economics and the  
13 cost of this project. As noted in the scoping  
14 process, this is a major concern of the community  
15 as an environmental factor unto itself and  
16 impactful to other elements of the environment  
17 considered in the DEIS.

18                   While DEIS does not compare alternatives  
19 based upon costs, the cost of these alternatives  
20 are dramatically different. For example,  
21 Alternative 1A is estimated to cost \$250 million  
22 with a lifetime cost of nearly \$1.4 billion.

23                   No other alternative comes close to this  
24 cost. Yet, we are going to have to pay for this.  
25 This is shocking enough, but a truly thorough

1 analysis would not stop there. In examining  
2 alternatives, Alternative 1A is the most  
3 mitigated, and while mitigation supposedly  
4 reduces the environmental impacts, there is no  
5 mention of those costs. Throughout the DEIS  
6 there are mitigation activities, but these costs  
7 are not mentioned. Among those are replacement  
8 of vegetation and trees, more poles anticipated  
9 due to narrow corridors, widening corridors to  
10 150 feet, clearing and grading for clearing zones  
11 and access roads, and even the use of eminent  
12 domain to buy houses.

13 Then there are the costs associated with gas  
14 emissions, air quality, storm water control, and  
15 such. Don't be surprised then if you have to pay  
16 a lot more than what you are being told.

17 Alternative 1A has excessive mediation and will  
18 cost more. Alternative II has little mediation.  
19 Nevertheless, all this should be priced out.

20 Let's call this a great omission because we  
21 really cannot compare alternatives unless you  
22 have equal detail. Let me turn now to two costs  
23 identified in the DEIS. First, property values  
24 tucked away under views and visual resources and  
25 land use and housing chapters. And secondly, tax

1 base.

2 Quoting national studies in the DEIS there's  
3 basically two major conclusions about the impacts  
4 of pole lines and property values. First, within  
5 the chapter on views and visual resources, and I  
6 quote, it is reasonable to assume that some  
7 existing properties would have lower property  
8 values.

9 The second conclusion is, quote, the effects  
10 of transmission lines on sales prices of  
11 properties diminish over time and all but  
12 disappear in five years. So on a million dollar  
13 house that loses \$60,000 to \$100,000,  
14 appreciation will catch up in five years. What  
15 about the \$200,000 that you lost initially?  
16 These statements seemed to be really an  
17 underestimation of the values of the impacts on  
18 properties.

19 There are several other quotes in there  
20 having to do with one to 20 percent reduction,  
21 average 6.2 percent. There's one that quotes the  
22 value that's reduced is three to six percent  
23 which dissipates after 200 and 350 feet away from  
24 the property line. For those that have views,  
25 the interesting quote is this:

1           "Data were inclusive as to whether the  
2           reason parcels were valued differently because of  
3           use restrictions within a power line easement  
4           because of use visual impacts or for some other  
5           reason. I think visuals were really discounted  
6           here. That has to do with property values.

7           Regarding property tax revenues, the second  
8           big aspect that's brought up in the EIS, the  
9           impact of Alternative 1A on Bellevue's 35 -- the  
10          major conclusion is the impact of Alternative 1A  
11          on Bellevue's \$35 million budget is small and  
12          would not affect the city's ability to adequately  
13          fund public services. Basically this is fuzzy  
14          math. I won't go through with it, but the actual  
15          amount is not 9800 bucks, it's more like \$100,000  
16          to \$200,000. And that certainly is an impact for  
17          Alternative 2A, not in -- or 1A not in 2A.

18          In summary the DEIS property value  
19          assessment is all based on carefully selected  
20          national studies, one of which is by the public  
21          utilities industry. Since the impact of property  
22          values and taxes only relates primarily to 1A and  
23          not to 2A it is troublesome that these impacts  
24          are minimized to such a degree and seems to set  
25          in bias the complete evaluation.

1           My final comment then is about opportunity  
2 costs. What do we forgo to spending \$1.4  
3 billion? We forgo a lot. We forgo that by  
4 putting into a major transmission like this which  
5 incidentally the investors earn .2 percent,  
6 you're going to forgo a lot of innovation.

7           You're going to forgo a lot of different  
8 offerings like energy efficiency components,  
9 demand response, distributed generation, energy  
10 storage, peak power generation, and who knows  
11 what else in the next few years. The cost of old  
12 technology in substations will certainly reduce  
13 those opportunities for the future.

14           In conclusion, the current DEIS needs to  
15 account for all costs and risks of this project  
16 so that all alternatives can be fully compared.  
17 This should be done in an unbiased local  
18 resources focused on Bellevue. Thank you.

19           MR. HANSEN: My name is Norm Hansen. I  
20 live at 3851 136th Avenue Northeast, Bellevue.  
21 And I'm speaking on behalf of the Bridle Trails  
22 Community Club. I'd like to speak on two  
23 sections of the EIS. One is the EIS reference  
24 page 1-5 introduction and summary. In one of the  
25 paragraphs it states that, "The EIS will not be

1 used to reject or validate the need for this  
2 project." I was surprised at that. Since the  
3 EIS draft was issued, CENSE, The Coalition of  
4 Eastside Neighborhoods for Sensible Energy has  
5 received a load flow modeling study by nationally  
6 recognized experts on transmission load analysis.  
7 This report uses PSE methods and software and  
8 conclude that the need is not imminent over many  
9 years.

10 Probably more then a decade. It points out  
11 PSE has apparent erroneous assumptions in this  
12 criteria to supply 1500 megawatts of power to  
13 Canada during peak power usage in Bellevue. The  
14 results of this study show that PSE's system can  
15 avoid overloads even when two critical  
16 transformers have failed during winter peak  
17 usage.

18 The result of the study states that there is  
19 sufficient capacity to deliver power for  
20 anticipated growth for at least two decades.  
21 This report needs full vetting in the EIS to  
22 determine the need issue for Energize Eastside.  
23 This is new information and is contrary to PSE's  
24 earlier studies which might be biased. If no  
25 need over the next few years, the new

1 transmission line -- for a new transmission line,  
2 then there is no need for Phase II EIS, and we as  
3 rate payers don't feel -- we end up kind of with  
4 the same.

5 The other item is on land use and housing  
6 impact Chapter 10. Alternative 1C undergrounding  
7 of the transmission line if and when additional  
8 power capacity is needed, then the EIS states  
9 that undergrounding has a minor impact on land  
10 use and housing and it uses much less land than  
11 an overhead line.

12 An overhead line requires a 100-foot wide  
13 easement, but the undergrounding line for a 230  
14 line only requires a six-foot wide trench  
15 four-feet deep. The EIS should further analyze a  
16 preferred underground route which they didn't do,  
17 also to determine what regulations need to be  
18 changed to have a reasonable economic plan for  
19 accomplishment.

20 Overhead in Bellevue continues to encumber  
21 nine million square feet of land that could be  
22 utilized for other purposes. Overhead is no  
23 longer efficient use of land when building a  
24 modern city. Thank you.

25 MS. HANSEN: Patricia Hansen 3851 136th

1 Avenue Northwest in Bellevue. For the record I'm  
2 a member of CENSE and also Bridle Trails  
3 Community Club. I kind of speak for myself. My  
4 comments apply to the EIS Chapter 8,  
5 environmental health; Chapter 10, land use and  
6 housing; and Chapter 11, views and visual  
7 resources. We have had testimony regarding the  
8 technical aspects of project Energize Eastside.  
9 I would like to share with you a more emotional  
10 or relationship side of this project.

11 During the CAG process, it was easy to  
12 figure out where PSE planned to put these new  
13 lines. The pictures they showed were very  
14 telling. They pictured neighborhoods encumbered  
15 by wires in front of homes, the before and after.  
16 Then they showed how it would look in Bridle  
17 Trails area where there's more land and open  
18 space, looked less encumbered.

19 Telling it like it really is for the  
20 property owner with PSE line encumbrance plus BP  
21 high pressure gasoline lines too. It certainly  
22 is a burden because we cannot use our property in  
23 a way others nearby can. They have maintenance  
24 crews for both easements at will. PSE seems at  
25 any time to be able to add things to this

1 easement such as communication lines. They give  
2 permission for certain cell tower use and needed  
3 equipment. Also potentially petroleum lines.

4 These electrical lines at times give way and  
5 fall to the ground. I know of two such  
6 incidents, one involving our property. Both in  
7 Bridle Trails. Imagine if you were someone else  
8 who was under that line and fell or an animal or  
9 pet. Could this ignite the high pressure  
10 gasoline line? Will this take legal action for  
11 property rights and resolve if we survive?

12 I might mention there are others directly  
13 affected by these easements. Those who live  
14 adjacent to those of us with these easements.  
15 When speaking about necessity, it is being proved  
16 that the need now is not present and won't be for  
17 a number of years, if then. There are so many  
18 advancements in technology that might not require  
19 these imposingly tall structures. Should those  
20 of us who have been carrying this burden of use  
21 and safety, property devaluation and so forth be  
22 the ones to continue carrying this burden for all  
23 for the next 90 years or more?

24 The easement was granted in 1929 when it was  
25 county and undeveloped land. Just so you know,

1 PSE and BP do not compensate the property owner's  
2 burden. And yet they are allowed to control so  
3 much and enjoy financial gain to their Australia  
4 Canadian hedge fund. Adding lines is one major  
5 way they increase their profit. When we  
6 mentioned the possibility of undergrounding in  
7 this work is needed in the future, they remind us  
8 that we would then be responsible for the  
9 exorbitant charges for the work. Do they show  
10 appreciation to those of us who have been  
11 providing the land they need?

12 Personally I believe the city of Bellevue  
13 and their the staff should be looking out for the  
14 safety and welfare of all Bellevue communities,  
15 not just the growing downtown business and condo  
16 community where electrical services are  
17 underground substations are --

18 MS. WAGONER: If you can wrap up your  
19 comments.

20 MS. HANSEN: -- and then there is the  
21 spring district. When Bellevue brings in new  
22 areas requiring new and updated service, Bellevue  
23 should require those new area developments to  
24 provide the additional needed service rather than  
25 look to existing communities. Thank you for your

1 time this evening. I would ask that you think  
2 about and consider the testimony you hear  
3 throughout the EIS process. That you think out  
4 of the box on ways to solve this problem. In my  
5 opinion a 100-foot plus poles in residential  
6 areas is not beautiful, not park like and does  
7 not fit a city in a park theme like Bellevue  
8 stringing up --

9 MS. WAGONER: If you can wrap up your  
10 comments.

11 MS. HANSEN: -- bellevue should be  
12 against the law.

13 MR. ANDERSON: Todd Anderson 4419 138th  
14 Avenue, Bellevue. The comments that I'm going to  
15 make are going to be abbreviated but I want to  
16 cover two topics. LED lights and windows. And  
17 first with the LED lights, you look above just in  
18 Bellevue City Hall there's 20 kilowatts of  
19 incandescent lights, which if that was converted  
20 to LED lights which have the exact same color as  
21 you're seeing here 2700 degrees Kelvin, you would  
22 save 87 percent of that energy.

23 PSE has a program, so everybody in the  
24 audience get your pens and papers out, PSE has a  
25 program where they'll give you 20 free LED

1 lights. It's called PSE Home Print, Google it.  
2 They don't want you to know about it. They only  
3 advertised it once two years ago in one of the  
4 mailing inserts at the bottom in the fine print.  
5 I who was fighting PSE even threw it away, woke  
6 up at 4:00 in the morning, pulled it out of the  
7 trash and said holy cow.

8 So that will save you \$300 a year in energy  
9 savings. If you add that all up just in PSE's  
10 territory alone, that's 600 megawatts. And if  
11 you assume only one-third of those bulbs are on  
12 during the peak load, that's 200 megawatts.

13 My next is windows, and this is also for the  
14 audience so get your pens out. The only windows  
15 that are sold in the entire northern region of  
16 the United States are hot climate windows. That  
17 is an artifact of a mistake that the EPA has  
18 made. The Department of Energy in testimony to  
19 the EPA, which is on their website, has fully  
20 documented this.

21 And even the EPA admitted they are going to  
22 explain to the northern states the difference  
23 between hot climate windows and cold climate  
24 windows. And so if you just look at the  
25 residential area, the residential windows alone

1 if the State of Washington, we have added 400  
2 megawatts annual megawatts. What an annual  
3 megawatt is if I left 400 megawatts on 7/24 24  
4 hours a day for the entire year, that's 400  
5 megawatts. And you don't have to take my word  
6 for it. This is Lawrence Livermore National  
7 Labs. I'll be giving you guys details on this.

8 And the reason for this is the EPA had  
9 fumbled how they were going to do the southern  
10 climate windows, and so they just punted when it  
11 came to the northern regions. The Department of  
12 Energy has documented the current waste per year  
13 which is additive, because after you install  
14 these windows, they're there for 30 years, 1.5  
15 trillion BTUs per year.

16 And so when you want to go buy a window, you  
17 have to know a lot to go get a cold climate  
18 window. The cold climate windows are cheaper.  
19 The difference between a cold climate window and  
20 a hot climate window is simply a hot climate  
21 window puts a couple layers of sliver on it,  
22 makes the window about \$5 more expensive, and  
23 it's a great window for San Diego. It's a  
24 disaster here.

25 England which has the exact same heating and

1 cooling requirements as the Puget Sound area, so  
2 they're cooling degree days is exactly the same  
3 as ours as their heating degree days. And they  
4 have a requirement that your window has to let in  
5 63 percent of the sun's energy. And the  
6 Department of Energy in managing the whole window  
7 stuff has bungled the ball multiple times. And  
8 the National Penetration Rating Council which has  
9 the responsibility for rating windows, they  
10 ranked the responsibility away from them as of  
11 last year, just started a thing that should have  
12 been done ten years ago.

13 It's called the attachment rating group.  
14 And that is a fancy way of saying they're going  
15 to start --

16 MS. WAGONER: You have one minute.

17 MR. ANDERSON: -- energy rating shades.  
18 And if you were to just do that appropriately,  
19 you would save another 200 megawatts. That's  
20 going to be probably outside of the scope of the  
21 EIS, but the other ones are fully documented, and  
22 if you have hired the technical talent with the  
23 necessary skills, it should be quite trivial for  
24 them to document this. And this would be  
25 independent of what PSE has put together. Thank

1           you.

2                       MR. MARSH: My name is Don Marsh, I am  
3           the president of CENSE, The Coalition of Eastside  
4           Neighborhoods for Sensible Energy. I live at  
5           4411 137th Avenue Southeast in Bellevue. On  
6           behalf of CENSE I am submitting documents  
7           supporting our concerns about the Energize  
8           Eastside project. Tonight we focus on four  
9           topics; the need and purpose that motivate the  
10          purpose, pipeline safety concerns, feasibility of  
11          Alternative II, and a petition signed by members  
12          of the community.

13                      To address the need and purpose of the  
14          project, we submit the Lauckhart Schiffman load  
15          flow study by Richard Lauckhart the former VP of  
16          transmission planning for PSE, and Roger  
17          Schiffman a transmission analyst with a long  
18          career in this field.

19                      Their conclusion is that the conditions PSE  
20          stipulates to overload transformers in Redmond  
21          and Renton would in fact risk wide spread  
22          blackouts throughout the Puget Sound region.  
23          Grid operators would never allow the system to  
24          run in this irresponsible manner. Using  
25          reasonable assumptions the study shows that we

1 have plenty of capacity to serve eastside growth  
2 for more than a decade.

3 PSE does not contest any fact in this study,  
4 but says the Lauckhart Schiffman report does not  
5 comply with federal reliability standards.

6 However, this Columbia grid 2013 system  
7 assessment describes a theoretical study which  
8 exports 1500 megawatts to Canada and turns off  
9 local generation plants.

10 These are the same assumptions PSE uses to  
11 establish the need for Energize Eastside.  
12 Columbia grid states this case is being studied  
13 for information purposes. It goes beyond what is  
14 required in the NERC reliability standards.  
15 These two documents unequivocally contradict  
16 PSE's rationale for building Energize Eastside.

17 That is why CENSE is requesting that the EIS  
18 process stop at Phase I and be judged by a  
19 hearing examiner to resolve these fundamental  
20 questions about need and reliability. Answers  
21 are needed now to avoid costly legal challenges  
22 in the future.

23 Next we submit two documents that address  
24 the safety of collocating the pipeline and  
25 transmission lines. The first document lists

1 five criteria that determine the risk of  
2 accelerated corrosion when pipelines and  
3 transmission lines are located in close  
4 proximity. When the Olympic Pipeline is paired  
5 with PSE's proposed transmission line, at least  
6 four of the five risk criteria are raised to the  
7 highest level of risk.

8 The second document includes analysis by  
9 Dr. Frank Chang, an internationally recognized  
10 pipeline safety expert. He questions Olympic  
11 Pipeline's cathodic protection program, and his  
12 concerns are reinforced by the Office of Pipeline  
13 Safety which only six weeks ago determined that  
14 the Olympic Pipeline is violating federal safety  
15 standards and failing to adequately protect the  
16 public from electrically induced corrosion of  
17 their pipelines. When one considers the fact  
18 that these pipelines passed close by the Tyee and  
19 Rose Hill middle schools, the coverage of safety  
20 issues in the draft EIS is woefully inadequate.

21 The next document entitled The Best  
22 Alternative examines draft EIS Alternative II.  
23 Industry consultant EQL Energy identifies many  
24 errors and obsolete data that make Alternative II  
25 appear unattractive in terms of risk, reliability

1 and cost.

2 However, Alternative II was not developed or  
3 reviewed by experts who are experienced with  
4 distributed energy resources. EQL presents  
5 feasible and cost efficient alternatives that  
6 would have minimal impact on our communities and  
7 environment. For the EIS these proposals should  
8 be carefully analyzed by consultants like EQL who  
9 have a proven track record in smart grid  
10 solutions.

11 Finally, we submit a simple form letter with  
12 names and addresses of 372 residents who wish to  
13 comment on the draft EIS, but felt they did not  
14 have the time or expertise to scrutinize the  
15 715-page document. Some of these residents  
16 submitted brief comments along with their  
17 signatures, but all of them wanted to help save  
18 their communities from a dangerous, expensive,  
19 unnecessary project. We ask that each be entered  
20 as an individual participant in the comment  
21 process entitled to a response. Thank you.

22 MS. BRUCE: Thank you, Carol, for this  
23 opportunity to speak this evening. I am Lindy  
24 Bruce, 13624 Southeast 18th Street, Bellevue  
25 98005 speaking tonight on behalf of the Sunset

1 Community Association which has six neighborhoods  
2 that border PSE's right of way in central  
3 Bellevue.

4 I was an alternate to PSE's CAG and  
5 currently serve on the board of CENSE. I  
6 wholeheartedly endorse the comments and  
7 recommendations of CENSE president Don Marsh.  
8 While PSE consistently disallowed the CAG and the  
9 DEIS to consider need, we now have studies and  
10 comments suggesting fundamental questions of  
11 need, reliability, and appropriate solutions that  
12 have not been adequately addressed.

13 More specifically, I would like you to  
14 address some of the construction issues that will  
15 affect our neighborhoods if PSE's preferred  
16 Alternative 1A were to proceed. Here are a few  
17 facts for segment E which runs through our  
18 neighborhoods.

19 The City of Bellevue critical hazards map  
20 show the right of way from Southeast 24th Street  
21 north to Southeast 2nd Street has a very severe  
22 soil erosion hazard. We already know that the  
23 neighborhoods lowest downhill deal with under  
24 ground streams that percolate down College Hill  
25 towards Richard's Creek.

1           These streams produced huge quantities of  
2           mud when Parkland Estates was built a few years  
3           ago. The right of way is already occupied by  
4           Olympic Pipelines 20- and 16-inch pipes that  
5           carry millions of gallons of jet and gasoline  
6           fuels per day to Seattle and Portland airports.  
7           There's also a natural gas line there.

8           Olympic Pipeline is currently under a final  
9           order to rectify deficiencies in their corrosion  
10          control program. And I point out that PSE's 230  
11          kilovolt lines produce EMFs that accelerate  
12          corrosion. When PSE rolled out Energize  
13          Eastside, they first told us that two sets of H  
14          poles in our neighborhood would be replaced by a  
15          single monopole.

16          Much later they admitted one set of H poles  
17          might be retained. Later yet at a neighborhood  
18          meeting PSE's expert from Power Rangers, utility  
19          consultants, told us that wherever the pipeline  
20          is in the middle of the right of way, they would  
21          need a tandem set of the tall monopoles. The  
22          pipeline is in the middle of much of the right of  
23          way, BPA recommends poles should be at least  
24          50 feet from pipelines.

25          During construction PSE must retain both

1 sets of H poles to continue distributing  
2 electricity in Bellevue. So we will have four  
3 65-foot wooden poles, two 85- to 135-foot steel  
4 poles and excavating equipment building cement  
5 support bases for those poles, all this in an  
6 area with an aging corroding pipeline and sodden  
7 soils as well as homes and our neighborhood park.

8 We don't yet know where they will stage all  
9 the materials and vehicles, but there's limited  
10 street access to the right of way. For safety  
11 reasons some parts of the entire right of way  
12 will have to be expanded by as much as 50 feet.  
13 Some homeowners have already been advised that  
14 their houses may be condemned or parts of their  
15 property will have to be added to the right of  
16 way. Uses on property near the 230 kilovolt  
17 lines can be restricted again for safety reasons.

18 The cause of the 1999 Olympic Pipeline  
19 explosion in Bellingham was traced to a one  
20 millimeter chip out of the pipe that occurred  
21 when a maintenance truck hit the pipe five years  
22 before the explosion. Our corridor will be  
23 crowded with poles, excavating machinery,  
24 construction equipment and pipelines. How long  
25 will we have to wait before we feel safe?

1 MS. WAGONER: One minute.

2 MS. BRUCE: Energize Eastside is a  
3 massive infrastructure project with enormous  
4 impacts through its 18-mile length. Even good  
5 intensions, careful engineering, and adherence to  
6 code haven't prevented Breakwater, Bertha, or  
7 even Sound Transit's tunnel digger, Pamela from  
8 causing soil subsidence, gapping sink holes and  
9 huge delays.

10 Are we really ready for those possibilities  
11 when our new information suggests that  
12 Alternative II can provide electrical reliability  
13 for less cost, has almost no adverse impacts on  
14 land use, housing, tree canopy, parks and  
15 schools, and has no new safety risks. I would  
16 like to see a specific study of all construction  
17 related issues and any precedent for  
18 overburdening the right of way in a dense urban  
19 corridor as Alternative 1A would most certainly  
20 do. Thank you.

21 MR. ELWORTH: Hello, my name is Brian  
22 Elworth. I live at 8605 129th Court Southeast in  
23 New Castle. And there's an article called High  
24 Voltage Taller Power Lines Spark Debate. An  
25 interesting quote, you'll recognize it, "As the

1 area has grown the load and demand for  
2 electricity has grown. Our dual concerns are  
3 that we have power necessary where the power is  
4 needed and the impact of the projects are  
5 appropriately mitigated."

6 Carol Helland, thank you for that statement.  
7 So Seattle Times December 23 had an Op-Ed article  
8 titled Now is the Time to Plan for Future Energy  
9 Needs. Their's wasn't so much on extension cords  
10 running through neighborhoods. They were  
11 wondering where does the power come from?

12 So they said, you know, based on current  
13 projections, loads and power generation, and  
14 depending on climate, we might need a few nuclear  
15 generation plants, but maybe it will work. But  
16 we need to get off coal and we may need to step  
17 up to maybe some nuclear power.

18 Well, at PSE's projected demand growth rate  
19 for Bellevue, that will outstrip that available  
20 generation capacity. So what does Bellevue think  
21 PSE is going to plug their big new extension cord  
22 into? That's Alternative I, by the way. And  
23 that's the one that runs through my backyard.

24 So Bellevue needs to start a serious power  
25 diet. Alternative II is a good start in that

1 direction, but it isn't actually enough.

2 Alternative I is a major fail for an energy  
3 future. \$200 million dollars wasted instead of  
4 being applied to this problem is \$200 million  
5 away from where you need to be.

6 You are not ever going to get where you need  
7 to be with PSE. So if this is all about consumer  
8 needs, then I have an option which I offered last  
9 time and it didn't even get noticed. The one  
10 true forward looking alternative is a PUD.

11 PSE is responsible to its owners. A PUD is  
12 only responsible to its customers. The  
13 consequential difference, PSE's objective is to  
14 squeeze the maximum allowable profit from its  
15 customers. A PUD's objective is to provide the  
16 best service and value to its customers. That's  
17 the difference between Seattle City Light being  
18 the greenest electrical utility and the  
19 neighboring PSE being the dirtiest.

20 PSE's objective is profit. PUD's objective,  
21 better forecasting, better management, better  
22 service, better efficiency, better environmental  
23 stewardship, better value, better security. The  
24 Energize Eastside project would never come into  
25 existence under PUD control.

1           The DEIS states that Phase I draft EIS  
2           broadly evaluates the general impacts and  
3           implications associated with feasible and  
4           reasonable options available as Page 1-4, a PUD  
5           is a feasible and reasonable option. Thank you.

6           MR. MILLER: Hello, my name is Don  
7           Miller. And I am a resident of Bellevue for  
8           25-plus years at 5205 Laker's Lane. Thank you  
9           for this opportunity to speak before the panel.  
10          I wear this orange hat in solidarity with the  
11          people from CENSE, a volunteer organization that  
12          is not for profit. A volunteer organization that  
13          has put their blood, sweat, and tears into  
14          bringing forward alternatives and alternative  
15          studies to consider in this process.

16          I'm bothered. I'm bothered that PSE has  
17          gone to great lengths to discredit every  
18          alternative or piece of information that's been  
19          brought forward as a part of the Energize  
20          Eastside project. I'm bothered by this quote  
21          from the Bellevue Reporter from Gretchen  
22          Aliabadi, the communications initiative manager  
23          for Energize Eastside that said, quote, We see  
24          concerns about more generation. That's not the  
25          issue. There are more than enough electrons to

1 power our customers. The problem we are facing  
2 is delivery.

3 In your opening comments, Ms. Helland, you  
4 stated alternatives that involve generating more  
5 power. So there's a disconnect between the  
6 statements PSE is making and our own  
7 understanding of what this project is for. I'm  
8 bothered by the fact that the Lauckhart Schiffman  
9 study brought forward differences in the data  
10 that PSE used to justify the Energize Eastside  
11 project and the data that PSE has supplied to the  
12 Western Electricity Coordinating Council.

13 I can't understand why those differences are  
14 there and PSE has never answered why there's a  
15 difference in the forecast they provide to the  
16 regional grid operators and the justification for  
17 the Energize Eastside project.

18 Now, I want to direct some comments to the  
19 actual draft EIS. I'm bothered by section  
20 10.7.1.14, property values. The DEIS chose to  
21 use a study prepared for the Electric Power  
22 Research Institute.

23 The Electric Power Research Institute stands  
24 for electricity generation, electricity  
25 transmission, and electricity use. What they

1 don't do is evaluate real estate values. They  
2 don't evaluate real estate prices. They don't  
3 evaluate the selling times of real estate. I  
4 don't understand -- excuse me. I'm bothered that  
5 the DEIS doesn't look at what the professional  
6 realtors or professional appraisers have prepared  
7 in regard to the impacts of transmission lines on  
8 property values.

9 Further, this particular study is a  
10 consolidation of 50 independent studies and  
11 without statistical validation, it's merely an  
12 opinion. It's not a statistical valuable source  
13 of research. But you guys pulled some points in  
14 DEIS out. You claim that land use analysis in  
15 this Phase I draft EIS considered effects on  
16 property values but found them to be  
17 inconclusive.

18 And then you go on to cite 12 different  
19 conclusions from the EPRI study, and over half  
20 these conclusions point to decreased property  
21 values, increased selling times, negative opinion  
22 and other facts negatively impacting property  
23 values.

24 The evidence from your select -- excuse me.  
25 The evidence from your selected and flawed study

1 doesn't even support the claim you made in the  
2 DEIS. I think in this regard the City of  
3 Bellevue has failed to obtain an independent  
4 analysis --

5 MS. WAGONER: One minute.

6 MR. MILLER: -- as the lead agency for  
7 the DEIS. I'll close with this: And I submitted  
8 these comments to the DEIS comment website.

9 Section 6.1 refers to unavoidable environmental  
10 impacts. The DEIS states, "Pursuing the Energize  
11 Eastside project with overhead lines will create,  
12 quote, significant unavoidable adverse impacts to  
13 plants and animals."

14 This is probably the most important  
15 statement in the DEIS. While the City of  
16 Bellevue has gone to great lengths to ensure that  
17 we are a park within a city, the simple  
18 environmental analysis conducted by PSE while the  
19 CAG evaluated routes showed that over 8000 mature  
20 trees would be cut down if PSE builds overhead  
21 lines.

22 The final project EIS will show permanent  
23 damage to dozens of streams, hundreds of  
24 wetlands, untold wildlife, foliage, and trees.

25 MS. WAGONER: Your time is up if you

1 can wrap up, please.

2 MR. MILLER: Thank you for the  
3 opportunity.

4 MR. MERRILL: I am John Merrill, 4800  
5 134th Place in Bellevue where I've lived for  
6 about 25 years. I want to speak tonight a little  
7 bit about the basic premise by which the DEIS  
8 seems to justify need. Section 1.3 is all about  
9 the DEIS team reviewing PSE's load flow studies  
10 and saying that they studied the process and have  
11 established that PSE's assessment was conducted  
12 in accordance with industry standards for utility  
13 planning.

14 And I take great exception to that  
15 statement. The process seems to focus on whether  
16 or not they use the right computer models. And I  
17 don't think anybody suggests they're not using  
18 the right computer models. In fact, Lauckhart  
19 Schiffman used the same computer model. Nobody  
20 is disputing that.

21 What is not industry standard about what PSE  
22 did is they did not use industry standard inputs.  
23 Lauckhart and Schiffman believe that the industry  
24 standard is established by NERC, the North  
25 American Reliability Corporation. And it sets up

1 a very rigorous test for whether or not a future  
2 grid will be reliable.

3 And everybody, virtually every utility in  
4 the industry uses that standard. However, PSE  
5 did not. It went well beyond that standard  
6 deciding apparently arbitrarily that we needed a  
7 grid that is many, many, many times more reliable  
8 than NERC requires. Therefore, it is not  
9 industry standard.

10 MS. WAGONER: One minute.

11 MR. MERRILL: So let me give you an  
12 example, an analogy. What if PSE decided that  
13 four plug prongs were more reliable than our  
14 industry standard prongs and required us to buy  
15 those as rate payers. It wouldn't make any sense  
16 whatsoever. That's the same sort of arbitrary  
17 decision that PSE has made in using nonstandard  
18 input into its computer models.

19 In conclusion, it's not to say that we  
20 should not be using best practices to plan far in  
21 advance for growth in smart ways. The Lauckhart  
22 Schiffman study which was performed using NERC  
23 minimum industry standards shows we do not have  
24 to rush headlong into an unwise decision, but  
25 have time to thoughtfully and collaboratively

1 plan smart ways to power growth on the eastside.

2 Thank you.

3 MS. SHERMAN: Hello, my name is  
4 Kathleen Sherman and my address is 4741 132nd  
5 Avenue Southeast, Bellevue and I have several  
6 comments. One is there's not enough information  
7 for the residents of Bellevue to evaluate this  
8 project because they do not have a detailed map.  
9 They either need to put out a -- get a building  
10 permit or detailed maps of the different power,  
11 different choices.

12 And then in the lobby before this meeting,  
13 before this part of the meeting, just before we  
14 started, a representative of PSE said the cost of  
15 this project comes out of the regular capital  
16 budget which is used for things like repairing  
17 leaky gas lines. They stated the total capital  
18 budget was \$4 million and this project would \$3  
19 million.

20 The single project will be 75 percent of the  
21 total capital budget. And if 75 percent of that  
22 budget is to be used on this Energize Eastside  
23 project, what projects and repair will not get  
24 done or where will the money come from if the  
25 capital budget is exceeded?

1           And also I think the City of Bellevue  
2           respectfully needs to look at the most rigorous  
3           evaluation of this project. And it may not be  
4           evaluated by the City of Bellevue. It might be a  
5           state or federal entity that evaluates it.

6           And then why should customers of PSE pay for  
7           a transmission line that sends energy to Canada  
8           to fulfill an international treaty between the  
9           U.S. and Canada. And why is the City of Bellevue  
10          evaluating that? And why does PSE take that upon  
11          itself when it's a national treaty? That's all.  
12          Thank you.

13                 MS. CALADO: Hello, my name is Celina  
14          Calado, and I reside at 13508 Northeast 29th  
15          place. And I'd like to be on the record as to  
16          how this project impacts my family and myself  
17          personally. We have been involved in coming to  
18          these meetings and going to our neighborhood  
19          groups. And my family lives directly under the  
20          power lines. And my small amount of conclusion  
21          here is that they're expensive, they are  
22          irreversible, there is unproven return of  
23          investment to our rate holders including us.

24                 There has not at all been proven a need for  
25          this project. It will damage our property

1 values. I'm personally concerned about the  
2 health impact of having these high voltage lines  
3 not just directly over our house, we're talking  
4 about houses that are 300 and 400 yards away  
5 three and four houses in.

6 And Puget Sound Energy has a terrible track  
7 record for helping out people who have had their  
8 property damaged from falling transmission lines.  
9 You combine that with a natural gas pipeline  
10 going through our property, and what are they  
11 going to say, it blows up our property and hurts  
12 people likely. And they'll not accept  
13 responsibility. I have no faith in that.

14 So I just want to be on the record, my  
15 concerns on the record. And I do plan to submit  
16 these in writing as well. Thank you.

17 MS. MESTIN: My name is Suzanne Mestin  
18 and I live at 13800 Northeast 40th Street. I've  
19 lived in Bellevue, the Bridle Trails area in  
20 particular all my life and I love this area of  
21 Bellevue. It's rural and kind of horsey with  
22 walking trails and parks throughout. But yet  
23 it's minutes from major shopping areas and office  
24 complexes.

25 As I watch what's happening with the

1 Energize Eastside debate, I felt compelled today  
2 to come down and share my thoughts on the draft  
3 EIS plans particularly as it relates to Chapter  
4 2, Project Alternatives.

5 So, and I've said this before,  
6 professionally I lead a team of 100 engineers  
7 whose sole purpose is new architect and design  
8 and implementation of new technology into our  
9 network. Relevant to the Energize Eastside  
10 debate is that as you can imagine, we found that  
11 it is not economically viable to build whole new  
12 infrastructure as a network to meet forecasted  
13 demand or reliability.

14 It's simply not affordable. And I liken  
15 that to adding new transmission lines.  
16 Technology is changing so fast. Companies need  
17 scalable approaches like PSE's approach to using  
18 peaker plants for peak loads. And that's a  
19 solution. But there are even more modern proven  
20 technologies that contemporary companies are  
21 using today.

22 In terms of integrating technologies and  
23 development and developing network reliable  
24 solutions, PSE statements of concern about  
25 reliability is in Chapter 16, utilities pages 634

1 through 36 are extremely exaggerated.

2 I know this because I work directly with  
3 researchers and vendors and our network people  
4 and we do this every day. Capacity forecasting,  
5 looking at triggers and exhausts, opportunities  
6 to be creative and what we need to do to stay  
7 competitive and do what's best for our company  
8 and its customers.

9 It's an exciting time. Technology  
10 advancements are occurring at such a rapid pace.  
11 I've heard it said that trialing or adopting new  
12 technology is too risky, and it can be if not  
13 evaluated or assessed appropriately.

14 MS. WAGONER: One minute.

15 MS. MESTIN: Obviously product testing,  
16 system testimony, beta testing, it is critical as  
17 you launch new projects and features into a  
18 network. But we shouldn't be misled by any  
19 excuses that new technologies may be risky or  
20 unreliable.

21 Ultimately my last and final point is that  
22 PSE and this EIS team need to further evaluate  
23 and study the combination of these solutions.  
24 This needs to be done by experts, truly qualified  
25 professionals who are educated and experts in

1 these technologies to fully compare the  
2 alternatives.

3 The current definitions and assessment of  
4 alternatives is simply inadequate. In closing,  
5 there's no question that it's important to all of  
6 us that we have reliable power in the future.  
7 But to provide that with old technology that's  
8 going to devastate and cause irreparable  
9 destruction to the community at an outrageous  
10 cost to customers and us as taxpayers is not the  
11 best approach, especially when the primary need  
12 is to meet peak demand for a 911 scenario. And  
13 I'm told this is like an N6 which has less than  
14 two-tenths of a probability of happening.  
15 Alternative 1A is simply overkill. Thank you.

16 MR. ADCOCK: This is James Adcock and  
17 I'm an electrical engineer, graduate of MIT.  
18 Address, 5005 155th Place Southwest, Bellevue,  
19 Washington. I have examined PSE's claims for the  
20 needs of additional generation and transmission  
21 for many years as part of the public process of  
22 integrated resource planning.

23 I have asked PSE at their stated CEII  
24 address in writing and receiving back a return  
25 receipt proof of delivery for access to the same

1 documents that the City of Bellevue, hereafter  
2 city's, so called independent consultants.

3 PSE has been totally not responsive. Again,  
4 I believe it is inappropriate for city and PSE  
5 not to allow me the same access to supposed  
6 evidence that the city references by their  
7 consultants. EIS is supposed to be a fair and  
8 open public process. What we have here instead  
9 is a sham process where city consultants pretend  
10 to be independent while merely regurgitating  
11 wholesale data and costs which PSE has provided  
12 with them while not giving public access to the  
13 same data, not even by appropriate CEII process.

14 I have read in comparison to PSE and city's  
15 claim the Laukhart Schiffman analysis which I  
16 found credible. I do not find PSE and city's  
17 claims to be credible. I also find the fossil  
18 fuel pipeline corrosion effects to be a credible  
19 concern. What I see in agreement with Laukhart  
20 Schiffman is a consistent pattern of PSE over  
21 claiming needs to build additional transmission  
22 and generation.

23 Currently PSE simultaneously in front of UTC  
24 is claiming that they need additional natural gas  
25 peaker plants, that they cannot meet winter needs

1 without additional generation with all generation  
2 plants running simultaneously and then some.

3 While at the same time in front of city to  
4 meet the same winter peak needs, PSE is claiming  
5 they need additional transmission capacity so  
6 they can run at the same moment of time with only  
7 less than half of their total generation running.  
8 These two claims cannot be true simultaneously.  
9 Either you need more peak generation or more  
10 transmission, but not both, or in reality you  
11 need neither.

12 You are simply trying to overbuild in order  
13 to overcharge the rate paying customers in order  
14 to apply, quote, unquote, apply lipstick to a pig  
15 to apply, quote, window dressing to the company  
16 before your owners, a frivolous dirty company,  
17 McCrory flips the company to new buyers.

18 MS. WAGONER: One minute.

19 MR. ADCOCK: Ala Bing Capital. Now, in  
20 the DEIS the other shoe begins to drop. PSE  
21 admits that the two KV line doesn't fit into the  
22 proposed routes. Houses will have to be torn  
23 down in New Castle. I believe more homes will  
24 have to be torn down in Somerset. Homeowners  
25 will be restricted from using their own

1 properties, their own backyard. You will not be  
2 allowed to sit in your own backyard drinking cold  
3 drinks sitting in a lawn chair.

4 Some homeowners will not be allowed to park  
5 cars on their own property. Getting into their  
6 cars others will experience nuisance shock.  
7 There is no such thing as a nuisance shock. Any  
8 shock can kill. The higher the transmission  
9 imposed voltage, the more likely the shock can  
10 kill.

11 MS. WAGONER: If you can wrap up your  
12 comments, please.

13 MR. ADCOCK: Anyway, I'll skip forward.  
14 Puget Sound Energy does not have to rebuild the  
15 current lines at 230 KV. They have the option of  
16 rebuilding an existing corridor at 115 KV  
17 doubling the existing capacity. I've asked them  
18 to consider that.

19 MS. WAGONER: If you can hold your  
20 clapping.

21 MR. ADCOCK: They've made excuses why  
22 they cannot do that. There's no logical and  
23 electrical engineering reason why they cannot  
24 rebuild higher capacity at 115 KV.

25 MS. WANG: Good evening officers, my

1 name is Alice Wang. I live at 14521 Southeast  
2 60th Street in Bellevue. I have two -- three  
3 children and we are -- I have come here to  
4 represent the Chinese community who are new  
5 immigrants. I've been living here for -- in  
6 Bellevue for six years. Not as some of our  
7 neighbors who've been here for 20, 25 years.

8 My house has no views, not expensive, not  
9 too -- not close to full power line at all. But  
10 we -- I feel I'm compelled to speak here because  
11 I feel for my neighbors and for my children too.  
12 My two children are in Somerset. They will go to  
13 Tyee and Newport High. So either one of the  
14 routes that PSE is proposing will be on one  
15 either of the schools.

16 So there's way for us to hide. We put all  
17 our life savings and half million of debt into  
18 this house hopefully because they are in a good  
19 school district. But with so much risk at stake  
20 we're losing our property values. I cannot stop  
21 but ask why? Why do we have to do this? I  
22 understand that you guys are not here to vet the  
23 need. I just learned this today.

24 Basically meaning to understand, justify the  
25 cause. But I call your attention to see this

1 whole picture. I'm a business analyst for work.  
2 And I have -- for every project I do, I have to  
3 look at the what first and why first before  
4 understanding the how. Now we're analyzing the  
5 how without thinking of the why and what.

6 So I'm going to give a little Chinese twist  
7 to this. We have an idiom that says for a shop  
8 the sell something they don't really sell, we say  
9 hanging a sheep's head but selling dog, meat.  
10 So, but understanding more and more, we feel that  
11 what's truly driving this? Like PSE they are  
12 experts. They should understand what it means  
13 to -- for every alternative they're choosing.

14 So they're not going with Alternative II or  
15 their push for Alternative I is because they're  
16 not truly energizing eastside. They're truly  
17 energizing their revenue and profits. So ask  
18 yourself, is it fair? I just feel that as  
19 residents here, always bigger corporates have  
20 bigger voice than our regular residents and this  
21 is not fair. That's why I'm speaking up for  
22 social injustice. Thank you.

23 MS. STRONK: Hello, my name is Sue  
24 Stronk and I live at 12917 Southeast 86th Place  
25 in New Castle. My neighbors are here tonight,

1 the Elworths. We live 100 feet apart adjacent to  
2 the Olympic Pipeline corridor and have been  
3 neighbors for the past 28 years. If PSE has  
4 their way, one of us will stay and one will go.

5 I have watched Lori and her husband Brian  
6 raise their two kids, Daniel and Mary, from  
7 infants through high school and college  
8 graduation. That is a generation. We have been  
9 there for each other over the years and worked  
10 together on the Olympus homeowners board.

11 We reestablished block watch and put on the  
12 annual neighborhood garage sale. We share  
13 outdoor movies and evenings around the camp fire  
14 in the backyard or camping on Hood Canal. We  
15 host neighbors for the national night out event  
16 on our front lawns as well as drink wine together  
17 at the annual wine women and white elephant party  
18 at Christmas.

19 We are friends. This is neighborhood  
20 character that PSE will shatter. PSE's favored  
21 route along the corridor will take one our homes  
22 and probably another 25 to accomplish an unneeded  
23 project. It is the duty of the DEIS and  
24 Bellevue's obligation to halt this process and  
25 have Rich Lauckhart meet with PSE experts before

1 the Washington State EFSEC to settle the need of  
2 this project once and for all.

3 You cannot accept blindly that PSE speaks  
4 the truth when this is evidence to the contrary.  
5 Be accountable now or face this in court.  
6 Neighborhood destruction rates significant in  
7 your impact rating. Unacceptable is our  
8 response. PSEs favored route is the most  
9 dangerous and most destructive of all the plans  
10 by placing the project along the pipelines,  
11 mixing tall towers and deep footings underground  
12 in an earthquake fault zone. Insane is the word.

13 If rate payers are charged for an over  
14 scaled, over priced unnecessary project, it is  
15 nothing short of consumer fraud.

16 MS. WAGONER: One minute.

17 MS. STRONK: Lori and I sign birthday  
18 and holiday cards as your neighbor for life and  
19 we intend to remain that way.

20 MS. PREVETTE: My name is Lynne  
21 Prevette and I live at 8114 120th Avenue  
22 Southeast in New Castle and I have for 23 years.  
23 I have been a former resident of Bellevue  
24 starting in 1963. Energize Eastside is a  
25 marketing label and it's used to increase the

1 capacity of electricity on the eastside as you  
2 know.

3 PSE presented to the EIS two documents to  
4 prove the eastside need assessment.

5 Unfortunately there were no arguments to prove it  
6 otherwise. This same thinking we have run into  
7 in the CAG meetings, which are of a couple of  
8 years ago I think, 2014. They invited the public  
9 in to comment on their proposal, however, their  
10 capacity to hear us was very small and our  
11 questions were not answered.

12 We have felt no sanity since this marketing  
13 ploy has been foisted upon us. We have felt  
14 belittled by those who thought they knew more  
15 than us. Pushed aside by engineers and planners  
16 all with something to gain from PSE's  
17 installation.

18 We have felt no sanity until now. There's  
19 something flawed in Puget Sound Energy's load  
20 flow study that isn't being assessed or  
21 documented, otherwise looked at. No one has the  
22 tools or the credibility for the computer  
23 simulation. And PSE is not giving us that  
24 information, and we've asked.

25 The clearance was granted to former Puget

1 Sound Power VP Richard Lauckhart along with  
2 electrical engineer Richard Schiffman to produce  
3 the now famous Lauckhart Schiffman load flow  
4 study. Their conclusion, and I quote, there is  
5 enough reserve capacity to deliver reliable power  
6 to the eastside for at least a couple of decades.

7 As one of those homes that will be literally  
8 torn down by Energize Eastside, I find this  
9 oversight unforgivable. Our homes are our  
10 biggest investment. Our health our most prized  
11 commodity, and safety priority number one. I  
12 encourage the EIS to look more thoroughly for  
13 things that are going to affect us personally.  
14 Thank you.

15 MR. HERBIG: Hello, I'm Dave Herbig, I  
16 live at 4911 Somerset Drive Southeast in  
17 Bellevue. I've lived in Bellevue for over 35  
18 years. Thanks for the opportunity to speak with  
19 you tonight. I wouldn't ordinarily be speaking,  
20 but this so important I felt I had to. I have a  
21 list of 15 different things here I wanted to  
22 discuss, but they've already been revealed by the  
23 CENSE study and the other comments that have gone  
24 on.

25 I just want to add I've known Rich Lauckhart

1 since I was in high school with him. His father  
2 worked for the Grays Harbor County PUD and his  
3 grandfather was in the same capacity. He knows  
4 what he's doing. He worked here when PSE was  
5 owned by local people who cared about us.

6 Now it's owned by a company whose stated  
7 intent was to use a leverage buyout, increase the  
8 revenue, and sell it off in ten years.

9 What they're proposing is immediate and  
10 permanent and it does not serve the residents of  
11 Bellevue. I bought a house because I wanted a  
12 view. I took some pictures of what a 130-foot  
13 tower would look like in front of my house and my  
14 neighbors, and I'd like to submit those.

15 Again, every one who's spoken tonight has  
16 very good points. The safety of our community is  
17 at risk. The economics are at risk. Every one  
18 in King County will pay if that value of my house  
19 drops by \$100,000. It's going to happen with the  
20 plan 1A. Thank you.

21 MS. MA: Good evening everyone, my name  
22 is Katherine Ma, and I live at 13912 Southeast  
23 44th Street, Bellevue, with my family. We have  
24 two kids. One is 11 years old in middle school  
25 and the other one will turn five this month. We

1 moved here from Chicago in the summer of 2014.  
2 We decided to settle down in Bellevue because of  
3 its excellent education system, diverse  
4 communities, lots of trees, flowers, and  
5 beautiful views. Tonight I am here to oppose  
6 PSE's Energize Eastside plan from my own  
7 experience and from the safety of our children.

8 The first time I learned about the high  
9 voltage power lines was last summer when I took  
10 my son to King County Aquatic Center in Federal  
11 Way. While waiting for his swimming practice, I  
12 took a jog on the trail next to the Aquatic  
13 Center.

14 There were high voltage power lines above  
15 the trail. I felt scared because I heard lots of  
16 buzzing and saw sparks from the power lines above  
17 the trail.

18 It seems like the dry grass underneath the  
19 power lines could catch fire at any moment.  
20 There were no trees, no houses under the power  
21 lines. It is such an absurd idea to build high  
22 voltage power lines through residential areas.  
23 No one, even the National Cancer Institute can  
24 say high voltage power lines are safe to humans  
25 especially to one of your kids.

1 Professionals from electron magnetic field  
2 suggest that safety distance from high voltage  
3 power line is 1000 feet and above. Somerset  
4 Elementary School, Tyee Middle and New Port High  
5 have more than 3000 students, yet these three  
6 schools are either on or next to PSE's proposed  
7 routes. As a mom I plead, please do not  
8 sacrifice our children's safety and health for  
9 money when we have other choices.

10 Tonight now my son's school has a concert  
11 and he's second chair in violin. It should be a  
12 night for mom to be proud of and to enjoy the  
13 music. I hate to miss it. I said to my son  
14 mommy is really, really sorry to miss your  
15 concert, but mommy have to stand up to protect  
16 our communities, to protect you and your friends.

17 My son totally supports me. Please help a  
18 mom do something for our next generations. Stand  
19 up with me to oppose PSE's Energize Eastside  
20 plan. Thank you.

21 MS. MERRILL: Thank you. My name is  
22 Lisa Merrill. I live at 4800 134th Place  
23 Southeast in Bellevue. And I have been a proud  
24 resident of this city for 25 years, small  
25 business owner, community volunteer as well as a

1 mother of two teenagers. And your son who just  
2 spoke, he made a big sacrifice, but he should be  
3 proud to have a mom speak so eloquently. I am  
4 not the most detailed reviewer of the EIS and I  
5 thank the other volunteers here tonight who did  
6 go into it. I will just kind of add my  
7 perspective to what's been said in terms of why I  
8 really beseech you to delay moving into Stage II,  
9 to slow down and really at this point engage in  
10 thoughtful, collaborative problem solving.

11 This is a high stakes issue. Very  
12 emotionally charged issue as we've heard. It  
13 seems to me it is unnecessary as scoped by PSE.  
14 I thank Don Marsh. I sat through Richard  
15 Lauckhart's detailed presentation a few weeks  
16 ago. I've talked with my husband John about this  
17 for more hours than anyone could imagine, and I  
18 feel finally compelled to share my own  
19 perspective.

20 I believe enough significant doubts have  
21 been raised on the fundamental assumptions of  
22 need that it needs to be looked at closely. I  
23 also believe, and I don't think anyone would  
24 disagree with me, that is it terribly unsightly  
25 as predicted, especially Alternative I.

1           It is ludicrous to me that we're standing  
2           here thinking and frightening about putting 18  
3           miles of industrial blight, 100-foot towers  
4           through schools, through parks in the midst of a  
5           city that prides itself on city in a park, that  
6           is planning a huge new bike/pedestrian corridor  
7           less than a half a mile away from these towers.

8           That really stresses values and priorities  
9           that I applaud with all of my being of how civic  
10          amenities and living and collaboration in the  
11          process. I just completed a course called  
12          Bellevue Essentials that encouraged people like  
13          me to share my voice and get involved in the  
14          city.

15          I believe in my heart, I don't have proof  
16          that it's unsafe as projected. The stuff I've  
17          read about electrically induced corrosion, the  
18          existence of high voltage power lines above, it  
19          just seems unnecessary, last resort,  
20          unnecessarily expensive. I now understand how  
21          PSE makes their money, the incentives we've set  
22          up as a country for utilities to invest in  
23          infrastructure are opposed to what were at hand  
24          here.

25          I finally think it's uninnovative. I

1       applaud you to think about what this region can  
2       do for conservation, for alternative suggestions  
3       to produce a smart plan for energy to power us.  
4       We can do this like no other city. But I don't  
5       hear that positiveness amongst some elements and  
6       I think we have a chance to get it right by  
7       slowing down. Thank you.

8               MR. YU: Good evening, madams, and  
9       everyone. My name is JD Yu. I live in 5401  
10       138th Avenue Southeast of Bellevue. I want to  
11       talk about the social and economic impact by the  
12       Energize Eastside project. But first I would  
13       like to share with you a story. Just right  
14       before the school meet winter break, my wife  
15       write me to arrange something for two kids in the  
16       break. So I determine a need that they should go  
17       to the Disney World in Orlando to have a good  
18       time. And booked flights which cost almost \$800  
19       per person plus hotel and rental car.

20               And that evening I want to surprise my  
21       ten-years-old boy and seven-years-old girl. Hey  
22       guys, I will energize you next week by taking you  
23       the Disney world. Disney World. And they look  
24       at me, I don't want to go. And the other said, I  
25       don't like the long flight. What? I spent the

1 whole day to set this up and you don't like it?

2 Tell me what would you want to do in the  
3 break I asked them. And they said maybe we could  
4 just go to the Great Wolf Lodge, that would be  
5 fun. And then we end up having a wonderful time  
6 at the Great Wolf Lodge. I determine the wrong  
7 need for my kids, but I correct it, and we end up  
8 having happy ending.

9 Now, for this Energize Eastside project, PSE  
10 has determined there is a need to construct a new  
11 high voltage transmission line on the Eastside,  
12 which will cost \$300 million on residents. But  
13 according to the industrial experts, Lauckhart  
14 Schiffman load flow study, this is enough  
15 capacity margin to serve growth on the eastside  
16 for 20 to 40 years.

17 So it's so obvious to me what makes sense  
18 and what doesn't make sense. If I force my kids  
19 to go to Orlando they will not be happy. And  
20 it's not worth the money spent. So tonight I'm  
21 here to support the Alternative II proposed by  
22 CENSE and the EQL with the proven technologies.  
23 No new transmission line, no hidden agenda.  
24 Thank you.

25 MR. BLOOMFIELD: My name is James

1 Bloomfield. I live at 14000 Southeast 14th  
2 Court, Bellevue. Been there for 36 years. When  
3 you boil all the arguments down here, it comes to  
4 a technical issue as to do we need it; do we not  
5 need it. The consultants being used by the  
6 writer of the EIS who is depended on by the City  
7 of Bellevue is dependent on a further  
8 subcontractor, I think the name is Stantec, is  
9 that the correct?

10 Stantec has not had an opportunity to come  
11 forward and tell us is there value in the  
12 Lauckhart Schiffman, or is there value in the PSE  
13 analysis. I urge the EIS group that's writing  
14 and overseeing this activity to bring Stantec  
15 forward and present their analysis fairly on each  
16 side, and let's get beyond the point where  
17 Lauckhart Schiffman stands tall. PSE stands low.

18 I'm an electrical engineer and I believe in  
19 putting all the arguments forward. I think this  
20 issue is fundamental to the whole process. If  
21 you don't need it, why spend the money? If you  
22 need it, then let's do it in the most efficient  
23 way. So let's see Stantec in front of this group  
24 and let it be open, transparent, and understood.  
25 Thank you.

1 MS. RAJENDVA: My name is Sangeetha  
2 Rajendva. I live in 86131 29th Court Southeast  
3 New Castle, Washington. I'm here to focus on two  
4 things. The first is safety and the second one  
5 disrupting of the neighborhood. Recently we  
6 heard about the explosion in a house in Port  
7 Orchard that caused the house to become  
8 completely reduced to rubble. We all saw it in  
9 the news.

10 The explosion was so severe that it exerted  
11 a seismic wave across Puget Sound. A propane  
12 tank was suspected. Just a little propane tank.  
13 Why I'm bringing this event here today is to  
14 bring the attention to danger of bringing gas in  
15 proximity to electricity which is what we're  
16 doing here by increasing the electrical power  
17 being transmitted.

18 It's a deadly combination. There is no  
19 telling what kind of dangerous explosions are a  
20 possibility. What is certain is that what causes  
21 such an explosion if we were unfortunate enough  
22 to experience it, it would be disastrous.

23 The second thing is disruption of  
24 neighborhoods. They so easily say they will tear  
25 down the houses, but for them it's a house. For

1 us it's a home where we have memories. We have  
2 put in our sweat and blood to our house. And for  
3 us to move on, we planned this house so that we  
4 could move on to the next stage in our house, me  
5 and my husband, and paying towards my daughter's  
6 college tuition. Now we fear to lose the house.  
7 We have to go back to the stage where we were  
8 before. Find a new house, find a neighborhood.  
9 And I'm sure we'll never find a neighborhood like  
10 where we're living.

11 Before making any decision, this has to be  
12 thought properly, how much of an impact it will  
13 do with such a big community. So please think  
14 about it.

15 MR. KANER: Hi, Dr. Richard Kaner, I'm  
16 a member of CENSE. I've lived on the eastside  
17 for 52 years. I live currently at 6025 Hazelwood  
18 Lane Southeast. In Chapter 1.3 of the DEIS, PSE  
19 determines that quote, there is need to construct  
20 a new 230 KV volt electrical transmission line,  
21 unquote.

22 Despite their assertions, it is not a  
23 foregone conclusion that this project is needed.  
24 PSE states they ran thousands of scenarios. They  
25 have had independent analysis that shows they

1 used the correct variable, and they did.

2 However, the data they used in those  
3 variable slots was not reviewed and is in fact  
4 incorrect. The Lauckhart Schiffman load flow  
5 study that you have provided to you tonight  
6 highlights multiple flaws. One, PSE submitted to  
7 the Western Electrical Coordinating Council,  
8 that's the WECC, a rate of growth and electrical  
9 demand of .5 percent per year.

10 Yet in their justification for the project  
11 they used 2.4 percent per year. This is almost  
12 five times greater than what they submitted to  
13 federal agencies. Second, transformer capacity  
14 is limited by overheating. The amount of  
15 electricity a transformer can handle is  
16 significantly less in the summer than it is in  
17 the colder winter months.

18 PSE for this winter emergency used summer  
19 normal load numbers which limit the electrical  
20 load to 700 megawatts. By contrast if the winter  
21 emergency loads are used, the peak load increases  
22 30 percent to 930 megawatts.

23 Third, it should be noted that during this  
24 winter emergency PSE has none of its six local  
25 generation plants in service. The 1400 megawatts

1 of energy that generates is more than enough to  
2 cover any shortage.

3 Lastly, PSE had included sending 1500  
4 megawatts north to Canada --

5 MS. WAGONER: One minute.

6 MR. KANER: -- during this emergency  
7 scenario. This is an untenable assumption on  
8 many fronts. Most models use 500 megawatts and  
9 there's no federal mandate that requires this  
10 exaggerated amount during an N11 emergency.

11 But most absurd is the scenario sending this  
12 much energy north during an emergent situation  
13 would cause blackouts in the entire Puget Sound  
14 region. Not just the eastside. The WECC would  
15 never allow this to happen.

16 As Lauckhart Schiffman illustrates, when the  
17 proper data is plugged into the variable slots,  
18 there is no shortage until 2058. Energize  
19 Eastside is the wrong project and is aimed at the  
20 wrong issue. The only way it makes sense is if  
21 the primary goals are profit and the transmission  
22 of energy south to north, perhaps that gives  
23 better understanding to these documents.

24 The first is the memo dated 2/21/13 from the  
25 Columbia Grid to WECC.

1 MS. WAGONER: If you can wrap up,  
2 please.

3 MR. KANER: -- okay. Stating the  
4 project purpose is, quote, to improve south to  
5 north transfer capability between Northwest and  
6 British Columbia. The second is PSE's 2013  
7 annual report to WECC where they reference the  
8 2011 report on transmission expansion to support  
9 winter south to north transfer. Suddenly the no  
10 build option seems to be the most sensible.

11 MR. MEDLEY: My name is Janis Medley.  
12 I live at 4609 Somerset Drive in Bellevue. My  
13 comments relate to the chapter on environmental  
14 health, section 8.9. It reads, quote, there is a  
15 risk of damage and subsequent explosion whenever  
16 construction or operations of maintenance occur  
17 near buried natural gas lines or the Olympic  
18 Pipeline.

19 And I think we all agree with that. It  
20 concludes by saying, quote, however, that risk is  
21 not considered an unavoidable significant impact  
22 because the probability of damage occurring is  
23 minimized by conformance with industry standards,  
24 regulatory requirements, and construction and  
25 operational procedures that address pipeline

1 safety, unquote.

2 I think that's saying the likelihood of  
3 anything really bad happening will be minimized  
4 by conformance to all the rules and regulations  
5 that are listed in Appendix M. So let's look at  
6 how well OPL is conforming to regulations. OPL's  
7 conformance to pipeline safety is monitored by  
8 the Washington Utilities and Transportation and  
9 Committee and the Federal Pipeline and Hazardous  
10 material Safety Administration.

11 On numerous occasions OPL has been cited  
12 for, and I quote again, failing to correct  
13 identified deficiencies in its corrosion control  
14 system within a reasonable period of time and to  
15 take prompt action to address all anomalous  
16 conditions, unquote.

17 I have several letters between the pipeline  
18 and Hazardous Materials Safety Administration and  
19 OPL, which I will submit. And just for the  
20 record in 2008, PSE the self-described pipeline  
21 expert was fined \$1.25 million for fraudulent gas  
22 pipeline inspection records. OPL's conformance  
23 to responding to spills is regulated by  
24 Washington Department of Ecology.

25 MS. WAGONER: You have one minute.

1 MR. MEDLEY: Okay. The best spill  
2 response takes a minimum of 15 minutes. That's a  
3 long time when flaming jet fuel is approaching  
4 your home and family. OPL knows a little about  
5 this. In 2004 an employee at OPL pumping and  
6 control station in Renton heard an explosion,  
7 looked out his office window and saw flames that  
8 were 20-feet high shooting into the air.

9 This explosion was caused by a leak in a  
10 test line connected to the pipeline. How safe  
11 should we feel if OPL can't prevent an explosion  
12 at its own headquarters?

13 The construction and operations impact on  
14 environmental health were rated as negligible or  
15 minor. Of course that might be true in a perfect  
16 world where OPL and PSE conformed to all the  
17 regulatory requirements.

18 But in the real world, ignoring their  
19 history of non-compliance is irresponsible and  
20 dangerously simplistic. Section 8.9 as written  
21 is unacceptable.

22 MR. GRUNKEMEYER: Hello, my name is  
23 Brian Grunkemeyer. I live at 16527 Northeast  
24 46th Street in Redmond. I've also been involved  
25 with Puget Sound Energy's integrated resource

1 plan for the last seven years. There's something  
2 very, very simple that's confusing me about the  
3 need for this project.

4 The integrated resource plan shows that the  
5 winter peak load is not going to grow for the  
6 next ten years. It's flat. And yet PSE's  
7 assumption about building this transmission line  
8 simply shows it has 2.5 percent growth in load  
9 every year. That is completely inconsistent.  
10 That right there gives you some, just a small dip  
11 of your toes into the mess here.

12 The existing study on the transmission load  
13 flow study by Lauckhart and company was very,  
14 very compelling. This project should not be  
15 built. I understand that for you this is all  
16 about reviewing the EIS. So what you need to do  
17 is you need to go slower on approving this.

18 Additionally, make absolutely sure that any  
19 require -- that all the right requirements are in  
20 place to ensure that if we do build this, then  
21 there is at least a 50-foot separation between  
22 the transmission lines and the pipeline.

23 We have -- we understand the risks of  
24 potential explosions, but certainly corrosion and  
25 possibly in emergencies arcing that could damage

1 the pipeline. We shouldn't build this project,  
2 but in terms how you guys should act tonight is  
3 by putting in extremely high requirements in the  
4 EIS on these issues. Thank you very much.

5 MR. DONG: Good evening. My name is Hu  
6 Dong. I live in 13106 Southeast 47th Street in  
7 Bellevue. Thank you very much for this  
8 opportunity to allow me to comment on this  
9 Energize Eastside project. The proposal  
10 Alternative I is based on a very flawed  
11 assumptions.

12 PSE assumes two transformers fail, six local  
13 power plants off the grid, a significant high  
14 amount of power, 1500 megawatts delivered to  
15 Canada, and record high amount of power  
16 consumption, that all happen -- that would all  
17 happen simultaneously. The analogy, this  
18 assumption is as if two major freeways was shut  
19 down, traffic signals on the local street were  
20 blacked out, and every one wants to get on the  
21 road at the same time.

22 This is the worst of the worst scenario that  
23 has never happened before and will likely will  
24 not happen in our lifetime. Even with PSE  
25 acknowledge its chance is extremely rare. In

1 addition, PSE also used annual gross rate  
2 2.4 percent as the rate of future demand.

3 The comparison WECC baseline shows only 0.5  
4 percent annual growth rate for the whole  
5 eastside. According to an independent study by  
6 Rich Lauckhart, Energize Eastside is actually not  
7 needed to provide reliable power for many years  
8 to come. Energize Eastside is a project that is  
9 not necessarily reliable, definitely more harmful  
10 to eastside and the environment.

11 Very expensive with little benefits to the  
12 local --

13 MS. WAGONER: One minute.

14 MR. DONG: -- without justification for  
15 all the assumptions, without the subtle analysis  
16 on the cost benefits to the local rate payers.  
17 Without a complete exploration on the latest  
18 technology that make the amount of response and  
19 the electrical efficiency, my wife, my father, my  
20 mother, my son, my whole family can only support  
21 no action for the short term and the modified  
22 Alternative II, the integrated resource approach  
23 for the long term. Thank you very much for your  
24 attention.

25 MS. KELLER: Hello, my name is Jan

1 Keller. I live at 115 146th Avenue Southeast in  
2 Lake Hills. And thank you very much for the  
3 opportunity to testify. First, I want to fully  
4 endorse the comments of CENSE president Don  
5 Marsh. Next, it's abundantly clear that in these  
6 times whenever we're considering building energy  
7 infrastructure, we must consider climate impacts.  
8 We owe it to ourselves, to the young people of  
9 today, and to future generations. Climate  
10 impacts are real.

11 We're already experiencing like last -- the  
12 serious summer drought last summer here in  
13 western Washington. Very different from what we  
14 used to see in past years. Climate impacts also  
15 extend to the sound and the ocean, oyster beds,  
16 the food webs that support our salmon and Orcas.  
17 With too much carbon dioxide, all of this and  
18 much is at risk.

19 When considering building energy  
20 infrastructure, we must take climate impacts  
21 seriously. So what does this mean for the DEIS?  
22 The DEIS should look very closely at whether this  
23 projection is aimed at the things we need most  
24 now.

25 We really need energy efficiency, a smart

1 grid, roof top solar, small scale wind turbines,  
2 and the fantastic batteries that even now are  
3 becoming more useful and affordable. Alternative  
4 1A is clearly backwards in this respect. It's  
5 time to stop investing in the old kinds of  
6 infrastructure such as extended high voltage  
7 lines and instead turn to the new. Alternative  
8 II is far better in this respect.

9 Right now we need a huge number of living  
10 trees. James Hansen, the climate scientist, has  
11 emphasized that what's necessary now is not just  
12 a transformation of our energy infrastructure, we  
13 also need to take care of the forests we have and  
14 wetlands and farm land which can also absorb CO2.  
15 Expand them quickly planting trees by the  
16 billions. Alternative 1A as described in  
17 6.6.3.1.1 would likely result in serious loss of  
18 canopy cover, that is trees.

19 The draft EIS describes a loss of a minimum  
20 of 43 acres of trees possibly up to a loss of 131  
21 acres of trees, which is massive inside of a  
22 place like where we live. And that's a huge  
23 number of established trees and important  
24 wildlife corridors and near our parks.

25 Cutting these trees means going the wrong

1 direction completely. We might think cut a tree,  
2 plant a tree, it doesn't matter. But a large  
3 healthy tree makes a layer of wood all over that  
4 big trunk and big branches every year and  
5 captures much more CO2. Smaller trees do not  
6 compare. Cutting these trees is backwards idea.

7 So I urge that we take seriously the reality  
8 of the situation we're in today in relation to  
9 greenhouse gasses and climate. That means  
10 emphasizing Alternative II or similar approaches  
11 and proceeding in a way that focuses the majority  
12 of attention on that kind of alternative.

13 That approach is very different from  
14 spending large amounts of money studying  
15 Alternative I. Our goal should be to secure a  
16 better energy future for our community and for  
17 our children. Thank you.

18 MR. VLACHOPOULOU: Hi, my name is Maria  
19 Vlachopoulou, and I live in Bellevue, 14708  
20 Southeast 15th Place. Thank you for giving us  
21 the opportunity to express our concerns about the  
22 Energize Eastside project. A quick summary about  
23 my background. I'm an electrical and computer  
24 engineer who worked at the Pacific Northwest  
25 National Lab here in Washington State.

1           While at the lab I worked as an energy  
2           researcher on various projects including energy  
3           forecasting. My team worked with various  
4           utilities like BPA in Washington State, Pacific  
5           Gas and Electric in northern California and  
6           central California, et cetera. I moved to  
7           Bellevue two years ago and PSE's Energize  
8           Eastside project immediately caught my attention.

9           I have followed PSE's, Quanta's, U.S.C's,  
10          Stantec's and CENSE'S postings and comments on  
11          the project. I have real concerns about the  
12          methodology PSE has followed to justify the  
13          necessity of this project, an at least  
14          \$250 million project that we the citizens will  
15          have to pay for.

16          To start I would like to point out that  
17          PSE's simulation is for extreme weather condition  
18          scenario over a very cold winter day, 23  
19          Fahrenheit, and peak electricity load conditions.  
20          The scenario projects for years 2017 and 2018  
21          where it is expected for utilities to simulate  
22          extreme weather scenarios, PSE simultaneously  
23          simulates pushing 1500 megawatts of energy to  
24          Canada.

25          Usually under such conditions, utility

1 operators significantly reduce additional energy  
2 outflows to secondary areas. PSE has not done  
3 that on their simulation. Why do we even  
4 simulate 1500 megawatts flow to Canada in the  
5 first place?

6 Additional, PSE simulated six global  
7 generation plants from out of service. I don't  
8 see and how and why those generators would not be  
9 functional. Even more concerning, it has been  
10 pointed out that PSE runs simulation using summer  
11 normal conditions for the transformers, but would  
12 drastically change the results of the simulation  
13 and it would just be flat out wrong.

14 I ask PSE to give us access to the input  
15 data they used to run their simulation. The  
16 Federal Energy Regulatory Commission has already  
17 determined we have a legitimate need to access  
18 the data PSE used to set up the simulation since  
19 we pose no security threat to them or to the  
20 community.

21 Finally, why is PSE using 2.4 percent energy  
22 demand growth for the eastside? They could use  
23 their own estimate of 02.5 percent energy demand  
24 growth for their entire eight county area. The  
25 power is interconnected so large energy demands

1 with one side of the grid usually do get  
2 compensated by other parts of the grid. We do  
3 not need this project.

4 MR. ZIMMERMAN: Hi, I'm Barry  
5 Zimmerman. I live at 5007 Somerset Drive  
6 Southeast in Bellevue. I've been a resident and  
7 homeowner in Bellevue since 1977 where I raised  
8 my family and developed my business. And I  
9 greatly appreciated the qualitative of life  
10 brought to our citizens by a caring, capable, and  
11 effective City Council and Land Use Commission.

12 It's, therefore, disturbing to see that such  
13 a destructive regional international transmission  
14 proposal to build 14-story towers through nine  
15 miles of our city in a park has even made it this  
16 far.

17 But give than it has, I got to jump on the  
18 theme that's been very prevalent in tonight's  
19 speakers in making one key point. PSE has not  
20 credibly or adequately defined this expensive and  
21 destructive Alternative 1A that we're being asked  
22 to review as a team, city and citizens alike to  
23 review alternatives.

24 There's a distinct lack of data and you  
25 heard about this throughout the evening for both

1 cost between the alternatives and growth  
2 projections. There are four different values  
3 presented in four different written documentation  
4 submitted by PSE to different agencies over the  
5 last 18 months.

6 And I'm here to say that we are -- one  
7 solution that's on the table that's never really  
8 been addressed properly is we're not looking at  
9 any empirical data. The city has gone through in  
10 the last 25 years a major growth phase. And yet,  
11 PSE refuses to provide the load data growth curve  
12 that we could use to say, so how did it grow the  
13 last 25 years? And then we can see, is this a  
14 hockey stick, an artificial hockey stick, this  
15 2.4 percent number, or is it not?

16 Carol Helland was quoted in today's Seattle  
17 Times saying, "As the area has grown, load demand  
18 for electricity has also grown." Carol, I  
19 respectively ask, how do you know? Where is the  
20 data? Let me do my best Tom Cruise. "Show me  
21 the data".

22 MS. WAGONER: One minute.

23 MR. ZIMMERMAN: PSE continues to cower  
24 behind the CEII requirements. And we've had  
25 several people apply for them. And we're asking

1           that you do something here to get this off the  
2           dime so that we can get the data we need to work  
3           together as a team to properly evaluate the need  
4           for the project, to define the project as either  
5           a local need for Energize Eastside or what it  
6           clearly is, a regional international need to send  
7           power to Canada.

8                        Nobody can value the alternatives  
9           effectively without the historical load growth  
10          data and load flow modeling data that PSE  
11          actually used. They're just trying to dismiss  
12          the Lauckhart study now, but they're hiding  
13          something.

14                      MS. WAGONER: If you could wrap up your  
15          comments, please. You're out of time.

16                      MR. ZIMMERMAN: Okay. So until this  
17          data is available, the lead agency cannot  
18          accomplish the SEPA process. You can't do your  
19          job. You can't finish this job. So we're asking  
20          like everybody else has been asking, you delay  
21          this movement to Phase II and take New Castle's  
22          lead in applying a moratorium until we can answer  
23          these questions.

24                      MS. MEYER: Thank you. Good evening,  
25          your patience in staying here all night to listen

1 to all of our concerned citizens. Citizens that  
2 have had outstanding remarks that I think are  
3 very, very important for you to take into  
4 consideration. I come to you to talk about two  
5 areas that I have somewhat heard about and yet  
6 not.

7 And one has to do with something mentioned  
8 in the DEIS regarding energy alternatives. The  
9 other has to do with the environmental  
10 considerations and the detriment to our wildlife.

11 For the energy alternative considerations,  
12 it was mentioned that the alternatives were going  
13 to be considered by PSE, but it seems that in the  
14 DEIS, they almost dismiss other alternatives in a  
15 way such as the wind power was mentioned in these  
16 pages in Section 2 that it couldn't supply  
17 enough. Okay.

18 We know wind power won't supply everything,  
19 but it has been shown by several states including  
20 in the United States and in other countries.  
21 Iowa is running at 20 percent wind power right  
22 now. Other countries like Denmark are running,  
23 getting up to almost 50 percent. They have made  
24 a statement that they will absolutely be at  
25 50 percent wind penetration in 2025.

1           We, in 2007 George W. Bush, U.S. Department  
2           of Energy came out with a plan called 20 percent  
3           wind energy by 2030. He set that into place  
4           because he knew that we could establish that in  
5           the next 20 years.

6           We have a company right here in this area  
7           called Siemens. They're located in the Puget  
8           Sound area. They're a German company.

9           MS. WAGONER: One minute.

10          MS. MEYER: And they have established  
11          really good systems for wind power. Let's look  
12          at some of these alternatives before saying we  
13          must only have these high power to supply all of  
14          are our energy.

15          The second point that I want to make real  
16          quick is that we haven't even studied, there is  
17          nothing in the report about the effects up high  
18          of our other wild life. As an Audubon board  
19          member, I don't represent, but I speak for the  
20          birds and the flying wildlife up there that can  
21          be affected by high voltage, running into poles,  
22          situations that can actually come back to us as  
23          human beings in affecting our property.

24          MS. WAGONER: If you can wrap up.

25          MS. MEYER: So I thank you and please

1 consider. My neighbors have said to me there's  
2 nothing we can do. PSE will get what they want.  
3 Please listen to us tonight and prove them  
4 differently.

5 MR. WAGONER: My name is Steve Wagoner.  
6 I live at 13440 Northeast 45th Street in  
7 Bellevue. I think I've heard that the city wants  
8 this process to be transparent. Unfortunately  
9 there is nothing transparent about this EIS  
10 document. Document is 716 pages long. Barely  
11 manageable as a PDF in Acrobat and ridiculous as  
12 a paper copy.

13 I am primarily interested in or was  
14 primarily interested in the summary and  
15 conclusions of the document. To get to them I  
16 flipped through four pages of cover page, eight  
17 pages of fact sheet and came to the table of  
18 contents.

19 The table of contents is 22 pages long, but  
20 since the document is not globally page numbered,  
21 it can't be used to find anything. I'd expect a  
22 PDF like this would have built in links, but it  
23 does not and there's no index.

24 I had to flip through 22 more pages of  
25 acronyms and glossary before I came upon Chapter

1 one Introduction and Summary. Chapter one is  
2 57-pages long. So that at the point I decided to  
3 search for a conclusion first. The only match  
4 pertinent to an overall conclusion was this from  
5 Page 116, Item 6, quote, PSE was provided and  
6 reviewed sections of Chapter one and Chapter two  
7 that did not contain analysis or conclusions of  
8 the analysis, unquote.

9 So this EIS has no conclusions. Next I  
10 wanted a summary. The summary of impact starts  
11 at the bottom of Page 18 of Chapter one and  
12 continues for 39 pages. The EIS is divided into  
13 14 findings chapters, each of these is treated  
14 separately in the 39 summary pages.

15 In the summary pages each findings area is  
16 given two pretty pictures, a listing of  
17 environments affected and verbiage about the  
18 impact of each project alternative on these  
19 environments.

20 Then tables are presented comparing  
21 alternatives impact during construction and  
22 thereafter. You saw these tables in the workshop  
23 prior. I don't want to dwell on these summary  
24 pages because I'm not fond of them.

25 For instance, they each have a section

1 entitled Summary of Impacts to all Alternatives,  
2 even though by definition a no action alternative  
3 does not have impacts. In fact, strangely the no  
4 action alternative impact is sometimes graded as  
5 minor or moderate to significant when compared to  
6 other alternatives in various categories.

7 Worse, the impact grading is often  
8 illogical, counterintuitive, contradictory, or  
9 ambiguous when compared to the discussions in the  
10 main text. For instance, why would Alternative  
11 II's energy efficiency component impact be graded  
12 as moderate to significant? Why would  
13 Alternative 1A's construction impact on land use  
14 and housing be negligible? You have looked at  
15 these summary grading tables yourself and can  
16 perhaps make more sense of them than I can.

17 I judge them not useful for decision making.  
18 Chapter one concludes with a two-page section.  
19 What are the areas of significant controversy?

20 MS. WAGONER: If you can wrap up,  
21 please.

22 MR. WAGONER: This is most instructive.  
23 We learned that the EIS has not been written to  
24 justify need. We also learned that concerns  
25 about visual impacts and potential for conflicts

1           between electrical and flammable liquid  
2           pipelines, fear of these and other impacts led to  
3           concerns in the community. Unfortunately these  
4           areas of controversy are extremely difficult to  
5           find in the summary information or in the  
6           document's body.

7           So the draft document does not address need.  
8           It never mentions cost. And it misses the  
9           opportunity to directly address the primary  
10          project controversies despite a clear awareness  
11          of them. The draft EIS is a monumental waste of  
12          time and money. The logical conclusion is to  
13          favor the no action alternative.

14          The most insightful paragraph in the EIS is  
15          at the last page of Chapter two, and I won't read  
16          it because I'm over time, but delaying this  
17          project is the best thing we can do.

18                 MS. ELWORTH: My name is Lori Elworth,  
19                 I live at 8605 129th Court Southeast, New Castle,  
20                 Washington. I want to thank you for this  
21                 opportunity to speak. And I want to thank Steve  
22                 Wagoner for his explanation of the DEIS. I know  
23                 he's read quite a few. This is the first one  
24                 I've ever read, 716 pages, I'm not sure. But  
25                 I'll go into my comments.

1 I am bothered by the DEIS claims that the  
2 need for the project has already been determined.  
3 How have the City Councils established that this  
4 project is necessary? Have they done an  
5 independent load flow study to confirm the  
6 voracity of PSE's claims?

7 CENSE performed their own load flow study  
8 despite PSE's refusal to share their data  
9 regarding the project. They found that the  
10 assumptions put forth by PSE are at best faulty  
11 and possibly even fraudulent. If PSE fails to  
12 provide new information to explain themselves or  
13 if an independent study done by the cities does  
14 not corroborate with PSE's claims that this  
15 project must be paused immediately.

16 PSE's preferred route, Alternative I has  
17 significant impact for my neighborhood, Olympus  
18 in New Castle. I'm grateful to the city of New  
19 Castle, issuing a moratorium two weeks ago on  
20 permit applications for new transmission lines in  
21 our city, and to give New Castle Planning  
22 Commission time to review its utility posed.

23 This demonstrates that the New Castle City  
24 Council is listening to the people. I live in  
25 one of the 51 homes long the 100-foot corridor in

1 Olympus next to the existing high pressure jet  
2 fuel pipeline. PSE's preferred plan would be to  
3 install the 230 kilovolt lines on 85- to 100-foot  
4 metal poles essentially lightening rods along the  
5 aging pipeline. I'm bothered by the DEIS Chapter  
6 10.7.1.

7 MS. WAGONER: One minute.

8 MS. ELWORTH: Alternative I, Option A  
9 will have significant adverse land use effects  
10 and housing impacts. Chapter 10.73.1 Alternative  
11 I, it will have minor to significant depending  
12 the location. Chapter 10.7.3.1.2 Alternative I,  
13 Option A using an existing corridor may require  
14 widening to accommodate the new utility. Up to  
15 50 feet of additional clear zone would be needed  
16 through the corridor.

17 This would require removal of some  
18 structures. Those are houses. High consequent  
19 land use if located in the vicinity of a high  
20 hazardous liquid pipeline would be present --

21 MS. WAGONER: If you could wrap up your  
22 comments.

23 MS. ELWORTH: How will this process be  
24 mitigated? When I lose my home, when my  
25 neighbors lose their home, we will be leaving

1 behind our neighborhood. We have been active  
2 engaged neighbors in a community much like that  
3 of a family. We have invested time with our  
4 neighbors, community, our family. How is this  
5 addressed in the DEIS? This is what some of us  
6 will face.

7 We will be displaced and no longer have our  
8 homes. Depression; impacts related to  
9 relocation, trying to find a home where housing  
10 is already limited. How do we find a place where  
11 we can have the community and support that has  
12 taken us 28 years create? How will we be  
13 compensated for this loss? Shouldn't this be  
14 addressed in the DEIS? Thank you for your time.

15 MS. BROWN: My name is Jamie Brown. I  
16 live at 5007 Westlake Sammamish Parkway Northeast  
17 in Redmond, Washington. I appreciate the  
18 opportunity to speak on behalf of this plan.  
19 I've lived on the eastside my whole life. It's a  
20 beautiful area, one that I might not be able to  
21 afford in the future.

22 Somerset while it's not my neighborhood, I  
23 have been at homes of friends there. It's an  
24 absolutely breathtaking view like many of our  
25 Puget Sound views. I don't see how anyone could

1 replicated it. But I can certainly say I would  
2 feel that this would help destroy it.

3 I don't feel like I typically have a say if  
4 the state, city, or even my neighbor wants to cut  
5 down a tree, be it for new construction, to aid  
6 in keeping their roof clean, or opening up a  
7 view.

8 To me the trees are a large part of the  
9 beautiful view. I don't know about you  
10 personally, but I like to breathe. Those mature  
11 trees PSE wants to cut down hold on to a lot  
12 carbon we've created. Furthermore, I'm deeply  
13 saddened that such large companies continue to  
14 have such a firm grip controlling consumers.

15 Large companies similar to oil companies  
16 continue to steer the ship while we all sit back  
17 and take it. Often feeling like we don't have a  
18 choice because they provide something we need.

19 While I appreciate that PSE provides  
20 something I do need and have come to rely on in  
21 my life, they've also made money. More money  
22 every day than I could ever dream of even seeing,  
23 money from me and everyone else consuming their  
24 goods.

25 That being said, we live in a time of

1 enormous excess and we're often very wasteful.  
2 Now, while I may not be as educated on this  
3 subject as some of our other speakers tonight, my  
4 hope would be that rather than building enormous  
5 and dangerous eyesores that endanger the  
6 beautiful landscape that we've been blessed to  
7 have here on top of the health and well-being and  
8 the homes of our neighbors, that PSE would  
9 encourage some kind of solar power package with  
10 discounts to install and then could benefit from  
11 our excess in solar power and sell it to whoever  
12 they want.

13 If it's really about generating more power  
14 for somewhere else, then please go ruin their  
15 landscape instead. I rather enjoy mine.

16 MS. WAGONER: One minute.

17 MS. BROWN: And no matter how many  
18 studies are done, I don't feel like one can  
19 really even begin to imagine the environmental  
20 impact, which would begin with cutting down the  
21 trees that are home to countless birds and other  
22 critters while helping to combat our CO2 issues.  
23 It doesn't stop there.

24 Personally I don't feel that living under or  
25 close to a power line is very safe, and certainly

1 not in addition to a pipeline. You cannot deny  
2 the loss of a home's value in such areas.

3 I urge you to reconsider this idea and focus  
4 on a bigger picture. We need to preserve what we  
5 can, not exploit it. Putting in these giant  
6 power lines isn't solving any problems. It's  
7 putting a Band-aide on it. And encouraging greed  
8 and waste.

9 MR. O'DONNELL: Jamie, you did a great  
10 job. First thing I think I checked the wrong box  
11 so I'm representing Somerset. My name is Steve  
12 O'Donnell. I'm past president of the Somerset  
13 Community Association and current board member.  
14 I've lived in Somerset for 40 years. And I'm  
15 also the past president and cofounder along with  
16 Don Marsh of CENSE, and on the executive board.

17 First thing I want to do is thank everybody  
18 in orange and all of you that support CENSE that  
19 didn't necessarily wear orange, but I want to  
20 thank Don Miller and Lori Elworth for the caps.

21 Thank you very much. And an extra shout out  
22 to our four new neighbors, friends, board  
23 members, our new Chinese members and especially  
24 to Katherine Ma and JD Yu. So thank you very  
25 much. Appreciate having them on the board.

1 I want to extend and expand my remarks on  
2 just two points. One on Lindy Bruce's comments  
3 about the dual structure of the poles and the  
4 lines. PSE has really dodged making a definitive  
5 statement regarding whether or not it will remove  
6 the existing lines that are on the 40- to 60-foot  
7 wooden poles.

8 Richard Lauckhart formally of Puget Power  
9 for well over 20 years is our consultant, and he  
10 tells us that the existing lines must stay while  
11 the new lines are built, and PSE has incentive in  
12 fact to leave them afterward. This is  
13 unacceptable. And this is a deficiency that I  
14 find in PSE's analysis in the DEIS.

15 You have not studied the impacts of these  
16 dual lines and a definitive statement needs to  
17 come from PSE that the other lines would be  
18 removed regardless if the J route through  
19 Somerset was selected.

20 Secondly, I want to turn to the pipeline  
21 issue and pipeline safety. There have been many  
22 pipeline accidents. There was one in June of  
23 2010 in Dallas, Texas. A huge fuel pipeline  
24 explosion, and this was in Johnson County in  
25 Dallas, Texas. I would urge the EIS consultants

1 to look at those pipeline accidents and give them  
2 great weight or consideration.

3 This fortunately was in a rural area, but  
4 still destroyed property. And it killed three  
5 workers. The heat from the inferno was so  
6 intense that no one could get close to the  
7 explosion a half a mile. Now, a half a mile in  
8 Bridle Trails or Somerset or Olympus, or any one  
9 of the other 40 neighborhoods along the 18 miles  
10 would incinerated these neighborhoods. Would  
11 incinerate the neighborhoods.

12 The loss of property, and more importantly  
13 the loss of life would be devastating. There are  
14 approximately 1500 homes in Bridle Trails and  
15 over 1500 in Somerset and hundreds in Olympus.  
16 The idea that a small leak could be caused by an  
17 arcing power line coming down in a storm or from  
18 construction and cause an explosion that could  
19 destroy hundreds and hundreds of homes and kill  
20 hundreds of people is absurd. Just ridiculous on  
21 its face.

22 I'm not going to have time to read this  
23 letter, but it will be submitted into the record  
24 from Kim West, who's an engineer of Britain  
25 Petroleum Olympic Pipeline.

1 MS. WAGONER: One minute.

2 MR. O'DONNELL: That is the company  
3 that supplies the logistics for the Northwest,  
4 they're in Renton. Their motto is no accidents,  
5 no harm to people, no damage to the environment.  
6 Right here in her letter. But her letter  
7 addressed the concerns of the pipelines being  
8 collocated with these power lines.

9 PSE ignores this. PSE says we're experts in  
10 pipelines. These PSE people don't have a clue.  
11 They bought a pipeline company, gas company. So  
12 if -- depending on the route selection and  
13 collocation of these lines with the pipeline  
14 couldn't be a bigger mistake. And I know I'm  
15 going to run out of time.

16 So I endorse the City of New Castle and  
17 their moratorium. Thank you so much for  
18 everybody in New Castle and thank you for the  
19 opportunity.

20 MS. BACH: Good evening, my name is  
21 Kelly Bach. I live at 12519 Northeast 29th  
22 Street. I'm a second generation Bellevue Bridle  
23 Trails resident who loves this city and cherishes  
24 the character of the neighborhood that I live in.

25 My husband and I, although we both work in

1 Seattle, intentionally chose to live on the  
2 eastside and raise our three children here.  
3 Energize Eastside's Alternative 1A's clearcutting  
4 of approximately 400 acres of vegetation is  
5 devastating. These trees are not replaceable.  
6 Visibly it will change the landscape of our city  
7 not to mention the 85 to 100-foot poles that will  
8 be replacing them.

9 Our already fragile ecosystem will also be  
10 impacted. Animals will lose their homes, storm  
11 water will no longer be absorbed by the earth,  
12 and the air quality we decrease without the  
13 natural purifier that trees offer. Bellevue  
14 prides itself on the image of a city in a park.  
15 By agreeing to this proposed plan by PSE, we are  
16 compromising value and character of our city for  
17 the financial gain of this company.

18 I believe each and every one of you are very  
19 intelligent people. So I'm not going to spend a  
20 lot of time on the fact that their proposed lines  
21 will be on top of two major petroleum gas lines.  
22 That's just a no brainer that this is really a  
23 terrible idea.

24 It is obvious to me you cannot mitigate all  
25 of the neighborhood concerns that are related to

1 the Alternative 1A. On previous occasions I have  
2 shared with you my background as a pediatric  
3 nurse. I have also shared with my concerns of  
4 the impact on the health of our citizens due to  
5 the increased EMF by the proposed 230 KV lines.

6 On multiple occasions I have read and heard  
7 the DEIS downplay this impact on citizen health.  
8 However, much as this disappoints me to read  
9 these unsubstantiated findings, it doesn't  
10 surprise me. These people have a vested  
11 financial interest in this project. I do not.  
12 For me a professional success is not determined  
13 by paycheck or closing of a deal. It's for  
14 caring for and curing those who seek medical  
15 care.

16 Here's the hard thing about cancer, cardiac  
17 conditions, seizures, and other health problems,  
18 although our scientists work hard, we don't have  
19 all the answers. The answers come after decades  
20 of work in identifying a common thread in the  
21 patients and sometimes this doesn't identify  
22 itself. It impacts subsequent generations.

23 What I ask of you is to not downplay the  
24 health impact of these lines. It is real. Take  
25 a quiet moment and look at yourself in the

1 mirror. Ask yourself this question: Is the  
2 financial gain of this deal worth the health and  
3 wellbeing of the citizens who make up this city?

4 If your parent, you spouse, your child is  
5 looking back at you in that mirror, is their  
6 health and wellbeing worth that risk? A few  
7 nights ago I was at work. I hugged a mom as she  
8 cried after learning her cancer diagnosis of her  
9 only child.

10 For a multitude of reasons I am so mad at  
11 the thought of PSE coming at Bellevue with such  
12 force on this issue. What is the value of a  
13 life? Paying off a hedge fund? These people  
14 aren't part of your community and show no regard  
15 to those who are in it.

16 What is the value of health? What is the  
17 value of you not being that mom or dad, that  
18 grandma or grandpa, that sibling or patient who I  
19 will take in my arms as you learn of that life  
20 altering medical diagnosis? Just ask you to  
21 think about it.

22 MS. WAGONER: We have completed all  
23 speakers who have signed up, so I believe that  
24 concludes our evening unless there is someone  
25 else. All right, you get the last three minutes.

1 And if you could please state your name very  
2 clearly because we won't have it written.

3 MS. JOHNSTON: Pamela Johnston,  
4 J-O-H-N-S-T-O-N, 3741 122nd Avenue Northeast  
5 Bellevue, Washington. There's a few things that  
6 I think that for the community did not come up in  
7 this meeting so far. First, PSE waged a campaign  
8 that focused on public outreach on the location  
9 of lines rather than the need for the project.  
10 This confused people into thinking that once the  
11 route was chosen, that the project had no other  
12 options than the transmission lines.

13 Second, splitting the EIS process into Phase  
14 I draft final and Phase II has further caused  
15 confusion. This is not in the spirit of  
16 transparency for the public to truly participate.

17 Third, PSE has waged a marketing campaign to  
18 say that this is needed to address reliability  
19 concerns on the eastside. That makes no sense  
20 given the reliability feedback to the city in the  
21 2015 reliability workshop final -- there's a PDF  
22 on it I have on here, 150805 PN.PDF. It's called  
23 the 2014 Bellevue Reliability Overview.

24 It said that 95 distribution circuits  
25 serving Bellevue, 70 circuits -- 74 percent had

1 performance better than the system wide average.  
2 24 percent circuits experienced no planned  
3 outages. And 25 percent circuits had --  
4 exceeding the system wide figures distribution  
5 system serving Bellevue in 2014.

6 Basically why in this document are they  
7 saying they're doing a fine job right now, and  
8 yet they need this other project if Bellevue's  
9 performance continues to be very good they said.  
10 It doesn't make sense.

11 Fourth, PSE proposed reliability project  
12 should be implemented before a system is as  
13 extensive as Energize Eastside. In the  
14 reliability studies, there's a whole list of  
15 number of reliability features that need to be  
16 filled. Why don't they do this before something  
17 as big and huge as Energize Eastside. Thank you.

18 MS. WAGONER: And with that I will turn  
19 the meeting back to Carol.

20 MS. HELLAND: Thank you everyone. Your  
21 comments are very much appreciated. We  
22 appreciate you hanging in there and staying  
23 tonight. Thank you so much and have a good  
24 evening.

25 (Meeting adjourned 8:57 p.m.)

ENERGIZE EASTSIDE  
PHASE 1 DRAFT ENVIRONMENTAL IMPACT STATEMENT  
PUBLIC HEARING/PUBLIC TESTIMONY

6:00 p.m.  
February 23, 2016  
11750 NE 118th Street  
Kirkland, Washington

LISA R. MICHAUD, CCR  
NORTHWEST COURT REPORTERS  
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PANEL MEMBERS

- MARK JOHNSON - ESA
- JEREMY McMAHAN - CITY OF KIRKLAND
- ERIC SHIELDS - CITY OF KIRKLAND
- CAROL HELLEND - CITY OF BELLEVUE
- HEIDI BEDWELL - CITY OF BELLEVUE

ALSO PRESENT:

- MARCIA WAGONER - FACILITATOR - 3SB
- CASEY BRADFIELD - TIME KEEPER - 3SB

PUBLIC SPEAKERS

- DON MARSH
- LORETTA LOPEZ
- JOY PHELPS

ALSO PRESENT:

- MARCIA WAGONER - FACILITATOR - 3SB
- CASEY BRADFIELD - TIME KEEPER - 3SB

PUBLIC SPEAKERS

- DON MARSH
- LORETTA LOPEZ
- JOY PHELPS

1 MR. MARSH: Thank you, and thank you  
2 for giving us this opportunity to submit comments  
3 into the EIS and shed some light on this project.  
4 We appreciate it. My name is Don Marsh. I live  
5 at 4411 137th Avenue Southeast in Bellevue. And  
6 I'm also the president of CENSE the Coalition of  
7 Eastside Neighborhoods for Sensible Energy.

8 And I recognize some of you from the last  
9 scoping thing, and I'm very pleased to meet you,  
10 Heidi. My manager from UW, Brendan McClean, says  
11 hi. You come with high recommendations, so very  
12 happy to have you engaged in this.

13 If there's just one thing that I would love  
14 for the EIS to make clear to me is, what is the  
15 role of expanded energy delivery to Canada?

16 We know that in the Eastside needs  
17 assessment PSE says this is one of the top five  
18 criteria that are assumptions that they had for  
19 that project. And we know from the independent  
20 technical analyst that Bellevue hired that if you  
21 don't have that level of flow to Canada, then  
22 most of the overloads, four out of the five  
23 overloads in the PSE system go away.

24 And we found later on that the fifth  
25 overload is very small. It could easily be

1 addressed by something -- by a project that's  
2 smaller than \$250,000,000. So if we could find  
3 out where that requirement is coming from. I  
4 just asked Jens Nedrud that question, and he's  
5 the project manager for Energize Eastside, and he  
6 says that's a Columbia grid requirement that they  
7 have to expand energy delivery to Canada.

8 And, you know, maybe that's true. But when  
9 FERC ruled on a CENSE complaint, that we weren't  
10 quite sure whether this was the right project for  
11 our region, they said, well, this is a local  
12 project and so FERC really doesn't have  
13 jurisdiction to rule on that. So as a local  
14 project, I don't understand how the flow into  
15 Canada comes into the thing.

16 Flow to Canada is regional. It's actually  
17 an international issue. So if we're expanding  
18 that flow into Canada, I would expect maybe some  
19 help from federal tax dollars or something. And  
20 also I just question whether it's reasonable to  
21 expand the electricity flow to this extent  
22 through 18 miles of heavily residential  
23 neighborhoods.

24 We've been looking at the pipeline safety  
25 issue for a while. And just looking around on

1 the web, I found this great article, it's a great  
2 paper from the respected risk analyst DNVGL, just  
3 came out in October 2015. And it was titled  
4 Criteria for Pipelines Coexisting with Electric  
5 Power Lines. And in the executive summary of  
6 this report it names five different criteria by  
7 which you can judge how dangerous it is to  
8 co-locate transmission lines and petroleum  
9 pipelines.

10 And the first criteria was separation  
11 distance and they had a table that showed what's  
12 the risk for different separation distances. And  
13 it turns out for us we rate high risk because of  
14 the narrowness of the corridor and especially if  
15 the poles come down to 85 feet or something, it  
16 puts the electric influence of those transmission  
17 lines in closer conjunction with the pipeline.

18 The next criteria was the amount of current  
19 that's running on the line. And we know  
20 approximately what this is from, the low flow  
21 study that Rich Lockhart did on this. We ranked  
22 either high or very high risk on that category.

23 The next category was soil resistivity. And  
24 I don't know what soil resistivity is. I looked  
25 on the website and it said that the soil that's

1 going through New Castle is highly corrosive to  
2 steel, but it didn't say what resistivity was.

3 The last two are co-location length and  
4 co-location angle. That's basically how long  
5 these things run together and whether they're  
6 parallel or perpendicular. And we rate as high  
7 risk or basically off the chart for the length  
8 because their chart ended at 5000 feet.

9 And we've got the better part of 16 miles of  
10 running together here. So this just raised real  
11 big questions for us about the risk to our  
12 communities and the offsetting risk of possibly  
13 having a power outage for a few hours in the  
14 year, but that's what the Eastside needs  
15 assessment says.

16 This is aimed at a few hours per year. And  
17 so trading the pipeline and transmission lines  
18 next to my kid's school and the possibility of  
19 danger there. I'm out of time, so thank you very  
20 much.

21 MS. LOPEZ: My name is Loretta Lopez  
22 and I'm vice-president of the Bridle Trails  
23 Community Club. I'm representing the club  
24 tonight. My comments are regarding the process.  
25 My first comment is with respect to the issue of

1 need. And our position is this:

2 That the citizens have a right, obligation,  
3 duty to ask whether this project is even needed.  
4 The city has repeatedly refused to address that  
5 issue. The EIS I know states that this is not  
6 about need. Our position is that it is about  
7 need. That's the whole point of this.

8 And in order to even evaluate the  
9 alternatives, in order to even think about this  
10 and what is possible, one has to understand what  
11 the need is. Part of understanding the need is  
12 assessing and analyzing the data that PSE has  
13 used to come to the conclusion that there is a  
14 deficiency in the system.

15 Don Marsh who just spoke before me has  
16 repeatedly asked Jens Nedrud for this  
17 information. I have a series of email messages  
18 between Don and Jens, nine pages. I've asked  
19 Carol Helland in a message to address this issue.

20 And I'd like to include this and present it  
21 for the record tonight. And I'll hand it to this  
22 person right here to the right. Thank you. It's  
23 nine pages, and I numbered the pages.

24 In addition then I also will address the  
25 aspect of process with respect to the way in

1           which this EIS has been organized. Now we know  
2           why it is that the city has phased this process  
3           in phase one and phase two with no intervening  
4           final decision. When we were at the scoping  
5           meeting, it wasn't obvious. But it's obvious  
6           now. It was obvious some time ago.

7           The result is that without final decision,  
8           no one can appeal this decision until the very  
9           end of this process, but that makes no sense.  
10          Why doesn't it? Because we don't have to reach  
11          the issue of the specific issue if we conclude  
12          that there's simply no need for this.

13          So why do we have to go on to the second  
14          phase? We've asked the City of Bellevue to stop  
15          this process and pause. The city has refused.  
16          The city has stated there's no -- they cannot  
17          control this process and that simply is not the  
18          case. PSE has filed. There is no application.

19          The city has and the cities have complete  
20          discretion about how to organize this process and  
21          have decided to do it in a way that causes in  
22          effect many citizens to be excluded from this  
23          process. Most people along this power line have  
24          no idea of what is going to go on when those  
25          bulldozers go through.

1           No one can possibly imagine this because  
2           this programatic [sic] EIS is a big picture.  
3           There is no way that people have adequate notice  
4           on this. And the Bridle Trails Community Club  
5           objects to this. Thank you.

6                   MS. WAGONER: So do we have others that  
7           would like to speak?

8                   MS. PHELPS: My name is Joy Phelps and  
9           I live at 4548 144th Avenue Southeast in  
10          Bellevue. My question, which I understand you  
11          can't answer it now, but I would like it to be  
12          explained in the documentation, is at some point  
13          in the past there was a substation called  
14          Shuffleton at the south end of Lake Washington,  
15          which was decommissioned.

16                  That would have been an opportunity to  
17          generate more power in the event of an emergency.  
18          Since that power station is gone, my question is,  
19          could it be preplaced? Could there be another  
20          facility put into the system that would provide  
21          the power that is no longer available at that  
22          subject station? Thank you.

23                  MS. WAGONER: Are there any others who  
24          would like to speak?

25                                (No response.)

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MS. WAGONER: Then that concludes the  
public comment portion of our hearing.

(Meeting adjourned 7:04 p.m.)

ENERGIZE EASTSIDE  
PHASE 1 DRAFT ENVIRONMENTAL IMPACT STATEMENT  
PUBLIC HEARING/PUBLIC TESTIMONY

2:00 p.m.  
Saturday, February 27, 2016

Newcastle Elementary School  
8400 136th Avenue Southeast  
Newcastle, Washington

KIMBERLY MIFFLIN, CCR, CSR

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PANEL MEMBERS

CAROL HELLAND - SEPA Responsible Official, City of Bellevue  
HEIDI BEDWELL - EIS Program Manager  
TIM MCHARG - Director of Community Development, City of  
Newcastle  
CLAIRE HOFFMAN - ESA

MEETING FACILITATORS

MARCIA WAGONER - Facilitator, Three Square Blocks  
CASEY BRADFIELD - Timekeeper

PUBLIC SPEAKERS

ANTHONY SUTEY  
BRIAN ELWORTH  
RICK KANER  
TODD ANDERSEN  
KATHIE OSSENKOP  
JOHN MERRILL  
BOB MULFORD  
MEL ZOERB  
DON MARSH  
MIKE YOUNG  
JEANNE DEMUND  
SUE STRONK  
WARREN HALVERSON  
GARY CLIFF  
LARRY JOHNSON  
RAJ KURAMKOTE  
STEVE KASNER  
JYOTSNA KURAMKOTE  
LINDA YOUNG  
MICHAEL BOYCE  
A.J. SUTEY  
JEFF PREVETTE  
LORETTA LOPEZ

1 DR. SUTEY: Thank you. I'm Dr. Anthony Sutey.  
2 I'm a retired engineer. I live in Olympus in Newcastle.  
3 My recommendations are reject Alternative 1, accept  
4 Alternative 2.

5 The basis for rejection of Alternative 1. Recently  
6 two deal breakers associated with Eastside power demands  
7 have come to light which justify rejection of Alternative  
8 1. One, the Northwest Power and Conservation Council  
9 20-year plan. By investing in energy efficiency we'll be  
10 able to go without an aggressive program to build new  
11 power generation resources and keep Northwest electricity  
12 rates low. Since 1995, annual energy loans grew at a  
13 rate of only 0.4 percent. Therefore, why does PSE need  
14 to construct major new 230 kV power lines which are used  
15 for bulk transmission and affect our residential areas  
16 and impact our homes and environment.

17 Secondly, the Lauckhart-Schiffman load flow study  
18 sponsored by CENSE. Existing distribution using critical  
19 transformers operating at only 85 percent of winter  
20 emergency rating provide enough capacity for Eastside  
21 growth for the next 20 to 40 years. Analysis used the  
22 power growth rate of 0.5 percent per year, which is the  
23 number provided by PSE to WECC and is consistent with the  
24 0.4 projection of the Northwest Power and Conservation  
25 Council. Contrast this with the 2.4 percent growth per

1 year used by PSE to justify Alternative 1.

2 Further analysis. PSE assumes all new power demands  
3 are electrical only and refuses to consider natural gas  
4 to supply more efficiently a major portion of energy for  
5 home and commercial heating, especially in the winter,  
6 and air conditioning in the summer without the need for  
7 additional high voltage electric power lines.

8 PSE demands study conclusions overstates demand by  
9 five times inconsistent with Northwest Power and Planning  
10 Council and Lauckhart-Schiffman studies, under values  
11 existing power grid components, triples power  
12 transmission to Canada from 500 megawatts to 1500  
13 megawatts to justify needs, inconsistent with the  
14 Northwest Power Planning Council and Lauckhart-Schiffman  
15 studies, fails to improve the role of natural gas to meet  
16 power demand at a lifetime cost of \$1.4 to \$2 billion.

17 This is not rocket science. This can be understood  
18 by all. The power demands needs analysis by PSE is  
19 irresponsible. Power demands do not justify Alternative  
20 1. PSE has provided bogus and inflated analysis to  
21 justify a \$1.4 to \$2 billion capitalization project which  
22 will result in a 9.8 percent windfall profit allowed by  
23 the WUTC for offshore owners paid by the PSE rate payer.

24 No. 3, Alternative 1 will cost major environmental  
25 loss of home value impacts. I won't go through the size

1 of the power lines and increased size of the transmission  
2 areas and the widening of the power lines and so on and  
3 so forth. We all know that it's going to de-value our  
4 homes and businesses along the 18-mile route from Renton  
5 to Bellevue, and it's going to directly affect our home  
6 and probably we're going to see at least 20 percent, at  
7 least, and possibly more, if the homes along the eastside  
8 of 128th Avenue are removed.

9 MS. WAGONER: If you could wrap up your  
10 comments, I would appreciate it.

11 DR. SUTHEY: Pardon me?

12 MS. WAGONER: If you could wrap up your  
13 comments. Your time is up.

14 DR. SUTHEY: The EIS does not address the effect  
15 of doubling the voltage over the pipeline. Safety of the  
16 pipeline and power lines are evaluated separately.  
17 Analysis is required to evaluate scenarios concerned.  
18 The combined hazards associated with the simultaneous  
19 structure of the dual pipeline and the power lines in the  
20 event of an earthquake along the Seattle fault.

21 Conclusions. Why should we as citizens and rate  
22 payers be asked to pay for the environmental impact and  
23 the de-valuation loss of our homes and communities for  
24 Alternative Option 1 that is not needed and has not been  
25 justified. Alternative Options B, C, and D are also

1 rejected since they are not needed.

2 So reject Alternative 1.

3 Basis for the acceptance of Alternative 2.

4 MS. WAGONER: Could you wrap up. I can take  
5 your comments and see that they're included.

6 DR. SUTEY: This approach cost effectively  
7 meets future power needs of Eastside with low  
8 environmental impact and minimum loss of home and  
9 community values.

10 Reject Alternative 1 and accept Alternative 2.  
11 Thank you.

12 MS. WAGONER: Thank you. Would you like me to  
13 keep your comments?

14 DR. SUTEY: It's all yours.

15 MS. WAGONER: All right. Thank you.

16 We ask that you hold your clapping, please. You can  
17 use your hand wave, but we appreciate you not clapping.  
18 Thank you.

19 AUDIENCE MEMBER: Why not? Why can't we clap?

20 MS. WAGONER: Because it's good to hear  
21 everyone and the clapping disrupts that.

22 AUDIENCE MEMBER: When they are not speaking,  
23 can we clap?

24 MS. WAGONER: I would appreciate if you would  
25 stick to -- your hand wave is great. Thank you.

1 MR. ELWORTH: Hello, my name is Brian Elworth.  
2 I live at 8605 129th Court Southeast in Newcastle. I  
3 represent the Olympus Homeowners Association.

4 I've lived in the area since 1963. I've lived at my  
5 current address since 1988. Newcastle is my city,  
6 Olympus is my neighborhood. This is my home. Regardless  
7 of any outcome of this process, it must be safe. It must  
8 be safe. So I'm going to talk about safety and  
9 community.

10 Safety has been an uphill battle for the residents  
11 ever since the start of the CAG process. It did not get  
12 fair recognition. Safety even in the DEIS is not really  
13 being taken very seriously. The DEIS states, Risk to the  
14 public is not likely from constructing or operating the  
15 project near pipelines due to extensive safety policies  
16 and regulations, Page 1-32. That kind of rings hollow  
17 with me.

18 If you go to the U.S. Department of Transportation  
19 Pipeline Hazardous Materials Safety Administration,  
20 hazardous liquid pipeline incidents, if you look at their  
21 report, you'll see electrical arc from other equipment  
22 and facilities, \$68 million. Third party excavation  
23 damage, \$144 million. Unspecified corrosion, \$6 million.  
24 Miscellaneous, \$160 million. Bellingham was  
25 miscellaneous, by the way, that's why I mention that.

1 Injuries and fatalities, 23 injuries, 29 deaths.

2 All of those incidents were accomplished by  
3 employing best management practices and extensive safety  
4 policies and regulations. So, again, those words rang  
5 rather hollow with me.

6 PSE selected a corridor end, and it's much too  
7 narrow to safely co-locate 230 kV transmission metal  
8 towers and have to reset the pipeline. Other sections of  
9 the corridor are equally high risk. PSE has been told  
10 routinely of this safety issue. PSE asserts that  
11 co-location is a good thing. In fact, they went in front  
12 of the Newcastle City Council and Planning Commission and  
13 said that quite often these utilities are co-located for  
14 safety. I'll give you the transcript of that. It's  
15 unbelievable. It's ludicrous. But I'll give you the  
16 transcript. That is their position.

17 BPA, Chevron, ARCO, MACE, BNGF and many more experts  
18 realize significant safety hazards in co-location. A  
19 high energy ignition source next to a highly flammable  
20 material is not a good thing. Induced AC corrosion in a  
21 hazardous liquid pipeline is not a good thing. You need  
22 50 or better foot separation between the towers support  
23 grounding structures and underground pipelines and other  
24 pipe utilities along that corridor. The existing end  
25 corridor is not wide enough.

1           So why is PSE's position so radically different from  
2           the rest of the industry? I'll tell you why. It's  
3           because they're wrong. It is not safe. Why is this  
4           being ignored in the DEIS? I feel as if it is sort of  
5           getting whitewashed.

6           The DEIS says the process of -- the process includes  
7           an objective understanding in order to identify feasible  
8           and reasonable private alternatives for consideration in  
9           the DEIS. So you have a choice to make. Either reject  
10          Alternative 1 since it is not technically feasible nor  
11          reasonable due to extreme safety risks or address the  
12          impact of the mitigation to make it safe. Pick one or  
13          the other. Don't fail to step up to this critical  
14          choice. Right now the DEIS looks like a bit of a  
15          whitewash. Again, this project should not impose safety  
16          risks to residents.

17          Let's talk about community. So let's say you do  
18          step up and you say, okay, we are going to address  
19          mitigation risks. The corridor end would then turn into  
20          mega end to provide for the necessary risk for safety  
21          margins. Many homes would be condemned and destroyed in  
22          Olympus. Up to 51 homes will be gone if they center  
23          their corridor along the existing right-of-way in  
24          widening for the safety margin.

25          Now, these aren't -- these homes are not just

1 concrete two-by-four and drywall structures. These are  
2 homes with families, homes with places where children --

3 MS. WAGONER: You have one minute.

4 MR. ELWORTH: Homes where neighbors have been  
5 neighbors for over a quarter of a century, homes where  
6 families enjoy life, homes of hard community. In Olympus  
7 20 percent of a well-established community would be wiped  
8 out by this mitigation.

9 So how is this being addressed in the EIS? It  
10 appears to be ignored. What's the visual character of a  
11 former neighborhood with metal towers replacing destroyed  
12 homes? It's the face of a neighborhood with a bunch of  
13 teeth knocked out.

14 So to repeat, you have a choice to make. Either  
15 reject Alternative 1 since it is not technically feasible  
16 nor reasonable to the extreme safety risk or address the  
17 impact of mitigation required to make it safe. Choose  
18 one.

19 Thank you.

20 MR. KANER: My name is Rick Kaner. I have  
21 lived on the Eastside since 1963. I live at 6025  
22 Hazelwood Lane Southeast. I would like to address  
23 neighborhood character.

24 I can't overemphasize the impact on neighbors that  
25 Alternative 1A represents. In Chapter 10.7.3.1.2 you

1 discuss the widening of the corridor. Eight thousand  
2 trees will go. On average, that's about 440 trees per  
3 mile. There is going to be significant impact on the  
4 beauty of the neighborhoods, the territorial views in  
5 addition to the sound barrier. It's also going to  
6 increase our carbon footprint, which seems to be a topic  
7 of the governor lately.

8 In addition, it's going to invoke eminent domain.  
9 That's the destruction of existing homes, and I don't  
10 believe numbers were actually provided in the DEIS.  
11 Those are our neighbors.

12 New homes that currently are not on the corridor  
13 will become bordering homes on the corridor. That means  
14 those homes will depreciate in value. That's the  
15 depreciation that the argument has been made is already  
16 calculated into the values of homes on the corridor. It  
17 is not calculated into homes further away from the  
18 corridor that will now be bordering.

19 You're looking at at least six percent up to 15 to  
20 20 percent depreciation in value for residents whose  
21 homes are their single greatest investment. In addition,  
22 taking homes off the books and putting new homes on the  
23 corridor with depreciation is going to reduce your tax  
24 revenues. That's going to impact every city and  
25 indirectly it's going to come right back to us with

1 reduced city services due to lack of funding.

2 Chapter 11.6.3.5.1 addresses the clearing of 327  
3 acres. I think for a lot of the same reasons as  
4 discussed with the trees as well as the eminent domain,  
5 this is a huge impact.

6 Chapter 11.6.3.5.3 discusses increased pole size.  
7 Going from 65-foot poles to 85- to 135-foot poles is  
8 going to go above the tree canopy in many areas. This is  
9 going to create new view impacts including some of the  
10 new highrises going in in downtown Bellevue. It's going  
11 to create difficulties for homeowners to sell their homes  
12 because HFA financing significantly shies away from homes  
13 within the fall zone of a pole. That's going lead to  
14 further home depreciation.

15 MS. WAGONER: If you can wrap up your comments.

16 MR. KANER: Okay. I think that throughout the  
17 document the verbiage minimizes or neglects the impact of  
18 Energize Eastside, the Alternative 1A. The impacts in  
19 Alternative 2 on all of these points remains negligible.

20 MS. WAGONER: Thank you. Next speaker.

21 MR. ANDERSEN: Hi, I'm Todd Andersen from  
22 Bellevue. My address is a matter of public record.

23 First, I would like to request that there's more  
24 time to comment on this EIS. The current EIS is over 700  
25 pages and PSE has changed over 2,000 pages of underlying

1 documents which the EIS relies on.

2 I would like to thank my first speakers because they  
3 keyed it up beautifully.

4 Alternative 2 is the only choice, and that's  
5 assuming you continue with PSE's fraudulent assumption of  
6 having to ship 1.5 gigawatts of power up to Canada during  
7 the middle of winter and that they shut off all power  
8 generation north of Renton essentially.

9 When you get to Alternative 2, they have 42  
10 megawatts over there on their little poster over there,  
11 and they are in the document, EIS document, they're using  
12 land based area. Well, the energy density of Energize  
13 Eastside is an order of magnitude greater than all of  
14 PSE's area. So they said, Energize Eastside, 14 percent  
15 of the land area, so we'll just take the entire  
16 conservation for the entire PSE's territory and assume it  
17 is 14 percent, which is totally fraudulent. So the list  
18 goes on and on.

19 One example is LED's. PSE has a classified program  
20 that they put in the footnotes of one of your building  
21 inserts two years ago where they'll give you 20 free LED  
22 light bulbs. Just look up home print. But if you use  
23 NEEA -- NEEA is Northwest Energy Efficiency Association,  
24 it's made up of 140 utilities which PSE is a part of --  
25 PSE pays 19 percent of NEEA's budget.

1           If you use NEEA's numbers -- and NEEA is made up of  
2           Oregon, Montana, Idaho and Washington -- just using their  
3           numbers, there are 600 megawatts of existing incandescent  
4           light bulbs remaining. And if you convert those and just  
5           assume one-third of them are on, that's 200 megawatts.  
6           All of that is at the peak power load. And that's more  
7           than enough to run Bellevue 80 percent of the time of the  
8           year in terms of savings.

9           The bigger one is NEEA also documents how PSE's  
10          rates are 28 percent higher than all 137 publicly-run  
11          utilities. So there's only three for-profit utilities in  
12          the entire four-state area. PSE is 28 percent higher.  
13          It's about time you take PSE and turn it into a public  
14          utility because they are corrupt at the core.

15                 MS. WAGONER: Thank you. Next speaker.

16                 MS. OSSENKOP: I'm Kathie Ossenkop. I live in  
17          the Renton Highlands. My address is 3316 Northeast 12th  
18          Street, Renton, and I have lived there since 1966.

19                 I am excited to come to this gathering to learn that  
20          actually there is another alternative, Alternative 2,  
21          compared to the alternative that I saw at the other  
22          meetings I attended where the end line -- where I'm  
23          deeply affected by the end line along Monroe Avenue.  
24          Monroe Avenue transits Renton Vocational Technical  
25          School. Along Monroe Avenue there is a childcare

1 facility, and there are several churches all within one  
2 mile. And the power lines are right in people's  
3 driveways along that avenue.

4 I am here because I'm concerned about the pipeline  
5 fault during the construction process that could severely  
6 impact the salmon spawning in the Cedar River. The Cedar  
7 River goes through the city of Renton and exits to Lake  
8 Washington. I have stood on the bridge over the Cedar  
9 River at the library and counted 44 salmon spawning  
10 within a four-minute period in October.

11 I'm here because of the corona issues that I have  
12 been told about in association with these type of lines,  
13 the buzz, the hum. It changes with the weather. And I'm  
14 here because of the interference with home electronics,  
15 home appliances, a television that doesn't have a cable  
16 and a cell phone. What is the city of Renton going to do  
17 with all of those cell phone towers that are being  
18 attached to the water tower on 12th Avenue North? City  
19 of Renton plans a great deal of activity around that  
20 water tower. That's their big water reserve area.

21 There is an EIS involved with that big construction  
22 project that's going to last a couple of years.

23 So for these reasons I do support Alternative 2.  
24 Thank you to the EIS people who came up with it.

25 MS. WAGONER: Thank you.

1 MR. MERRILL: I'm John Merrill and I'm a board  
2 member of CENSE. But Don is going to take our five  
3 minutes and I'll try to limit my comments to three.

4 First of all, I want to thank the EIS for outing the  
5 fact that PSE, if Alternative 1A were to be implemented,  
6 would have to widen the right-of-way by at least 50 feet,  
7 and they never told us before. They've selectively  
8 released information when it's the most convenient for  
9 them. I'm just wondering based on this what they are  
10 going to drop on us next. What is it that we do not know  
11 yet about what they're proposing. They have not  
12 submitted a permit application. We do not know what they  
13 really have in store for us.

14 One of the things that I've been made aware of  
15 recently is that PSE will build the new and intend to  
16 build the new 230 kV line over the top of the existing  
17 115 kV line, and they will not remove the existing 115 kV  
18 line. So we will a veritable spider web of 12, 12 very,  
19 very large conductors going through our communities with  
20 all the associated downside and impact.

21 And I saw -- I haven't read all 700 pages of the EIS  
22 word for word yet -- but I saw nothing reflected in the  
23 DEIS of the increased impacts from leaving the existing  
24 lines in place. So to me that is a major hole in the  
25 analysis.

1           Let me start out with some common ground. CENSE  
2 agrees with PSE that our communities must have a reliable  
3 and ample supply of electricity. On this there is no  
4 argument. Our differences are about how to provide this  
5 service in the context of our communities' best  
6 interests. And CENSE has hired industry insiders who are  
7 definitive experts in the 21st century technologies and  
8 programs that are shown in the DEIS as Alternative 2.

9           However, the DEIS analysis of these low impact  
10 solutions is inadequate for several reasons. No. 1,  
11 Alternative 2 mischaracterizes unreliable,  
12 unimplementable and generally treated in a skeptical  
13 dismissive manner that smacks of bias and a clear lack of  
14 expertise and ability to provide an objective analysis  
15 based on current information about this fast moving  
16 branch of the electrical utility industry.

17           Second, Alternative 2 is arbitrarily burdened with  
18 unsubstantiated requirements. Section 2.3.3.1 states  
19 that distributed generation must provide up to 400  
20 megawatts of peak power, although elsewhere the need is  
21 to make that 200 megawatts.

22           MS. WAGONER: Sir, if you could wrap up your  
23 comments. Your time is up.

24           MR. MERRILL: No. 3, the DEIS Alternative 2  
25 conveniently ignores the fact that the existing Eastside

1 115 kV system could relatively easily and inexpensively  
2 be upgraded with additional transformers, conductors and  
3 other equipment, if needed, and that that's a burden on  
4 Alternative 2 that could very, very easily be made much  
5 less than the 200 megawatts that is characterized in the  
6 EIS. Thank you.

7 MS. WAGONER: Thank you.

8 MR. MULFORD: Thank you for the opportunity to  
9 speak. My name is Bob Mulford and I live in Newcastle in  
10 the Vineyards at 12733 Southeast 86th Place. This is  
11 just adjacent to the Olympus neighborhood.

12 And I want to echo the concerns that have been  
13 expressed by prior speakers on the effect that this  
14 project would have on the character of the neighborhood,  
15 the loss of trees, the widening of the corridor and the  
16 safety concerns, both with the construction of the  
17 pipeline, and these are not imagined concerns. We'll all  
18 familiar with an accident that happened in Bellingham  
19 involving a pipeline and construction.

20 And I'm concerned that the justification for this  
21 project depends on a load flow study done by PSE that has  
22 a number of dubious assumptions, again, mentioned by  
23 previous speakers. In particular, the assumption that we  
24 would be sending 1500 megawatts of electricity to Canada.  
25 We would not have a need to do that if there was truly an

1 emergency in the winter.

2 And so I urge you to consider these concerns, look  
3 at the need for the project and look at the very, very  
4 real possibility of satisfying our needs for power by  
5 simpler -- simpler methods that would have a less impact  
6 on our community and on our environment, approaches that  
7 have been recommended by other utility organizations  
8 including distributed generation of electricity,  
9 conservation. There are ways to meet our needs without  
10 doing this very, very destructive project. Thank you.

11 MS. WAGONER: Thank you.

12 MR. ZOERB: My name is Mel Zoerb. I live at  
13 8408 129th Avenue Southeast in Newcastle in the Olympus  
14 area, about a block from the right-of-way.

15 And the first thing I want to say is express my  
16 thanks to the EIS team. It's obvious from the document  
17 that that was a big effort. And we may not all agree  
18 with all the points in there, but nonetheless, it's  
19 pretty obvious that there was a lot of manhours put into  
20 that thing.

21 I think the thing that is bothering a lot of us is  
22 that we're in one of these situations where in a sense  
23 the horse is before the cart. We're forced into this  
24 situation, I guess, by regulatory demands and that sort  
25 of thing. And many of us feel like we're asked to

1 comment on the EIS without having adequate information.

2 So I think for today what I would like to do is just  
3 emphasize two things. One, if this line is going to be  
4 built, we have to make sure that the construction effort  
5 in particular is safe. There is too many houses  
6 involved, there is too much chance of an accident.  
7 Accidents happen all the time. You pick up the newspaper  
8 and you can see this crane falling over and whatever. I  
9 know a crane doesn't apply in this case, but I'm just  
10 using that as a simple example. So we have to make sure  
11 that everything possible, if it goes to the point where  
12 we see that this line is going to become reality, it has  
13 to be accompanied with a tremendous safety effort.

14 And from my perspective and I think a lot of the  
15 homeowners that are along this right-of-way line, we  
16 feel, I feel at least, that we should have a situation  
17 where we're assured that there isn't going to be any  
18 property condemned to put this type of system through our  
19 area. That's the No. 1 thing that I think should be a  
20 ground rule. And whether that is a literal part of an  
21 EIS effort or not, I can't say. But nonetheless, that's  
22 the most important thing that I see that many of us are  
23 very concerned about.

24 We want -- if there is going to be an effort, we  
25 want it to be super safe, and we want a chance to audit

1 the type of equipment that's going to be used, the  
2 procedures. We've got a number of engineers, I know some  
3 of them right in the back behind me here, that can do  
4 this sort of thing. I'm a retired engineer myself.

5 MS. WAGONER: If you could wrap it up.

6 MR. ZOERB: They would be glad to do that. And  
7 we just want to make sure that the effort is an  
8 appropriate one.

9 I want to make sure that we --

10 MS. WAGONER: You are out of time.

11 MR. ZOERB: I'm out of time. I'm sorry.

12 MS. WAGONER: I would be happy to take your  
13 comments if you would like.

14 MR. ZOERB: That's okay. I didn't hear your  
15 warning.

16 MS. WAGONER: Thank you.

17 MS. HELLAND: I just wanted to acknowledge for  
18 the record that I did receive a letter from Mel, and I  
19 have that in my possession.

20 MR. MARSH: My name is Don Marsh. I'm the  
21 president of CENSE, the Coalition of Eastside  
22 Neighborhoods for Sensible Energy, and I'll be speaking  
23 for that organization.

24 In past meetings I've questioned the need and  
25 purpose of the Energize Eastside project, and those are

1 important questions. But perhaps nowhere along the  
2 18-mile route is the issue of safety more relevant than  
3 here in Newcastle where the utility corridor is only 100  
4 feet wide as it passes through parts of the Olympus  
5 neighborhood.

6 PSE is proposing to squeeze a lot of infrastructure  
7 into that corridor. Two existing high-pressure pipelines  
8 that deliver over 13 million gallons per day of jet fuel  
9 and gasoline to the Seattle and Portland airports, two  
10 existing 115 kilovolt lines and new transmission line  
11 operating at 230 kilovolts. It is currently not clear if  
12 or when the 115 kilovolt lines will be removed.

13 There are three kinds of risks that relate to  
14 pipeline safety, construction risk, corrosion risk and  
15 arcing risk. I will elaborate on each of these.

16 The risk of an accident during construction is a  
17 real concern. Crews will be digging deep holes for the  
18 pole foundations within feet of these 40-, 50-year old  
19 pipelines. One slip could cause a disaster in the same  
20 way it happened in Bellingham in 1999. In that case,  
21 construction equipment nicked the pipeline and caused a  
22 leak that wasn't discovered until three boys accidentally  
23 ignited the escaping fluid and lost their lives as a  
24 result.

25 Electrical engineers in Newcastle and other

1 communities raised the issue of corrosion risk soon after  
2 the project was announced. I called the Olympic Pipeline  
3 Company and mentioned these concerns. The engineer I  
4 talked to admitted it was a known problem, but the  
5 company mitigates the risk by running a DC current  
6 through the pipeline to provide cathodic protection. I  
7 was satisfied that it wasn't as worrisome as I first  
8 thought.

9 But then I found a paper on the Internet called  
10 "Criteria for Pipelines Co-existing with Electric Power  
11 Lines" authored by the respected risk analyst DNG VL in  
12 October 2015. This paper contains a survey of up-to-date  
13 science on the risks and mitigations of co-locating this  
14 kind of infrastructure. We were dismayed to find that --  
15 let's see, oh, I'm sorry.

16 The executive summary contains five tables that  
17 contain the most important criteria for evaluating risk.  
18 We were dismayed to find that the corridor through  
19 Newcastle presents the highest risk level for four out of  
20 five of these criteria, and we would have to measure the  
21 soil resistivity to judge the final criterion.

22 We called the author of this paper to see if we  
23 could get a detailed analysis of our situation. He  
24 agreed that our description of the situation warranted a  
25 careful study, but his firm does a lot of work for PSE so

1 he couldn't get directly involved. His office is in  
2 Texas, just to give you an idea of PSE's sphere of  
3 influence.

4 Fortunately, we found and engaged Dr. Frank Cheng, a  
5 professor in Canada, research chair in pipeline  
6 engineering to give us an initial opinion. Dr. Cheng  
7 says, quote, It is generally acknowledged that buried  
8 pipelines can be corroded at an accelerated rate in the  
9 presence of AC interference. Recently there has been  
10 mounting evidences of AC-induced corrosion of pipelines  
11 and their failures, end quote.

12 He questions the effectiveness of Olympic Pipeline's  
13 cathodic protection policy and says, quote, A  
14 comprehensive study program should be developed prior to  
15 the construction of these power lines, end quote.

16 Dr. Cheng is not an expert on arcing danger but this  
17 is mentioned in safety guidelines published by the  
18 Bonneville Power Administration. On the topic of a  
19 downed power line, the paper from DNG VL says a direct  
20 arc of electric current, quote, can result in coating  
21 damage up to the point of burn through. Even if an arc  
22 is not sustained long enough to cause burn through, a  
23 short duration elevated current can cause molten pits on  
24 the pipe surface that may lead to crack development as  
25 the pipe cools, end quote.

1           The danger of a pipeline accident is summarized in  
2           this quote from the Bellevue Fire Department's report  
3           entitled "Standards of Response Coverage." Quote, Given  
4           that the pipeline incidents continue to occur in this  
5           country, and many for undetermined reasons, the community  
6           is still at risk. The combination of a highly flammable  
7           liquid in large quantities --

8           MS. WAGONER: One minute.

9           MR. MARSH: -- and in urban environment  
10          translates into a significant consequential risk that  
11          approaches the catastrophic level, end quote.

12          The fire department goes on to state that it does  
13          not have sufficient response and mitigation abilities to  
14          extinguish a pipeline fire. With houses located closer  
15          than 50 feet to the pipeline, the potential for death and  
16          destruction without warning is of great concern to our  
17          community.

18          MS. WAGONER: If you can wrap it up.

19          MR. MARSH: One more sentence.

20          That is especially true where the pipeline and power  
21          lines pass close to schools such as Tyee Middle School  
22          and Rose Hill Middle School. We aren't prepared to risk  
23          our children for this project.

24          Thank you very much.

25          MS. WAGONER: Thank you. Our next speaker.

1 MR. YOUNG: I'm Mike Young. Julie and I have  
2 lived on the Eastside since '82 and we currently live at  
3 5031 Lakehurst Lane Southeast. We're long-time customers  
4 of Puget Sound Energy and we're grateful that our kids  
5 and grandkids now live in the area and they are too.

6 Because of that, two things are really important to  
7 us. One is that Puget be able to maintain the power  
8 service that they're providing to all of us. And the  
9 second is that our local governments be wise and  
10 responsible in their decisions so they don't harm the  
11 environment or our community and so they don't waste our  
12 community's resources with projects and rate increases  
13 that aren't essential. We think those are compatible  
14 objectives frankly, and we think your EIS process, the  
15 unbelievable resource you put together, is part of the  
16 way to get there.

17 From my limited study of the Draft EIS, I want to  
18 share the conclusions it leads me to and just a few  
19 reasons for those conclusions and one objection to the  
20 process.

21 My conclusions: I could support the no action  
22 alternative, which may be shocking, or Alternative 2, the  
23 integrated resource approach. In saying I could support  
24 no action, I don't mean no action forever. I just mean  
25 no action right now. One of the many strengths, frankly,

1 I think of the no action alternative or of Alternative 2  
2 are the flexibilities that both of them provide for the  
3 community, and for PSE frankly, to benefit from  
4 developing technology and to benefit from more accurate  
5 assessments of needs, both the structural needs and the  
6 timing of the needs.

7 MS. WAGONER: You have one minute.

8 MR. YOUNG: Thank you.

9 Your charts at the other end of the room, which are  
10 in the EIS, I thought were fantastic in terms of looking  
11 at the various factors and showing what differences there  
12 are in impacts. Chapters 4, 5, 6, 10, 11 and 12 I think  
13 are pretty clear in differentiating and in showing that  
14 the impacts from Alternative 2 would be considerably less  
15 than 1 or 3.

16 So my objection is based on, let's say a car  
17 analogy. It's not hypothetical. Julie and I just went  
18 through this. Your car breaks down or you get a recall  
19 notice. You go to the shop. They give you a list of  
20 things that are wrong and say it will be \$3,500 to fix  
21 them. Well, in our case, our car is a dozen years old  
22 and so we've got to think and ask ourselves, do we want  
23 to buy a new car. But we go out shopping. We identify  
24 three cars that will fit the bill and we compare them.  
25 Then we think, well, there is a shop that did a great job

1 for us before, let's get a second opinion.

2 MS. WAGONER: If you can wrap up, please.

3 MR. YOUNG: We get the second opinion, and they  
4 say, oh, here's why you don't need to do A, B and C, you  
5 do need to do D, E and F and it will be \$1,200. We don't  
6 need to buy a new car.

7 And I just think that you are driving the process,  
8 whether you're in government or whether you are one of  
9 the consultants, you have a responsibility to do  
10 something the EIS, Draft EIS says you won't do, and that  
11 is revisit the need whenever you get credible information  
12 about meaningful mistakes in assumptions or facts that  
13 were used in supposedly proving the need. I don't know  
14 how you do it procedurally, but I ask you to try. Thank  
15 you.

16 MS. WAGONER: Thank you.

17 MS. DEMUND: Hi, my name is Jeanne Demund. I  
18 live at 2811 Mountain View Avenue North in Renton. I  
19 appreciate the opportunity to come in front of the EIS.

20 I live along one of the routes that was considered  
21 but not selected for the Energize Eastside project. And  
22 I've been trying to get my neighbors to come out and  
23 comment as well. One of them asked me if I could tell  
24 her which citizen groups were supporting this project so  
25 that she could do some research on the other side. I

1           couldn't come up with one for her. Her response was,  
2           well, that kind of says it all, doesn't it.

3           Anyway, this project is not needed for electric  
4           system capacity or reliability. The assumptions  
5           underlying PSE's load flow analysis are critically flawed  
6           as detailed in the Lauckhart-Schiffman report which is  
7           available on cense.org.

8           But the main focus of my comments today is safety.  
9           I was very surprised that there wasn't a heading for this  
10          topic on your online comment form. We've heard a lot  
11          about potential for damage to the Olympic pipeline and  
12          the risk through increased corrosion. The Olympic  
13          pipeline runs very close to the surface and it carries  
14          flammable and hazardous materials.

15          What everyone may not know is that the Olympic  
16          Pipeline Company is currently under a final order to  
17          comply with the standards of the Federal Office of  
18          Pipeline Safety, part of the Department of  
19          Transportation. The problems relate to corrosion  
20          control.

21          And the order states that the Olympic Pipeline, and  
22          I quote, Failed to correct identified deficiencies in its  
23          corrosion control system that could adversely affect the  
24          safe operation of the pipeline. This is under normal  
25          operations without the additional stresses of heavy

1 construction near the pipeline.

2 Now, in case you think the federal government will  
3 get the Olympic Pipeline Company to take care of this  
4 quickly, let me tell you that the inspection took place  
5 in August of 2014. The final order was issued in January  
6 of this year. The problems have gone uncorrected that  
7 entire time, and the pipeline has a further 18 months to  
8 complete corrective action. PSE wants a green light for  
9 construction right next to this pipeline before the  
10 pipeline is repaired, wants to increase the potential for  
11 corrosion going forward and wants us to believe that  
12 these risks are theoretical.

13 These two corporate citizens might deserve each  
14 other as neighbors, but we do not. I submit to you that  
15 risking lives, property and the environment in this way  
16 for a project that is not needed is irresponsible,  
17 unacceptable and should not be condoned.

18 An integrated resource planning approach in line  
19 with the recommendations of the Northwest Power and  
20 Conservation Planning Council different from the  
21 alternative authored by PSE should be developed.

22 Thank you for this opportunity.

23 MS. WAGONER: Thank you.

24 MS. STRONK: That's a hard act to follow.

25 Hello, my name is Sue Stronk and I live at 12917

1 Southeast 86th Place in Newcastle, and I live along --  
2 I've lived along the pipeline for 28 years.

3 The DEIS states the need for the project is already  
4 determined. The Lauckhart-Schiffman load flow study  
5 disagrees. This process should be halted now and  
6 reviewed by a hearing examiner to determine the need  
7 before proceeding. No need, no problem, no project.

8 When the story changes, so does the need. PSE said  
9 1500 megawatts of power was needed to Canada. Don Polk  
10 said this project is not about Canadian power. That  
11 would be sent outside this area. The USE study said  
12 without power to Canada there may be a shortage of 74  
13 megawatts. Alternatives can supply this minimal power  
14 safely without condemning homes, destroying neighborhoods  
15 and degrading home values.

16 Technical expertise in evaluating alternatives is  
17 lacking in this DEIS. Hiring PSE contractors to make  
18 this document is a conflict of interest. PSE footprints  
19 are all over the 715-page document. PSE's favorite route  
20 through Olympus is rated significant impact in many  
21 categories. However, with a few tiny words, all is  
22 dismissed, such as safety risk along the gas pipeline is  
23 minimized by saying safe practices will be employed. The  
24 Olympus corridor is most significantly affected by home  
25 acquisition, yet mitigation says PSE will assist in

1 relocation. Experts on electromagnetic pipe corrosion  
2 was discussed by Don, so I'm not going to go into that.

3 But if EMF corrodes pipes, there has to be EMF  
4 damage to humans. What are safe distances from wires to  
5 homes especially now that holes are lowered to 85 feet?

6 It is obvious already the document is biased, that  
7 Alternative 1 Option A will be the DEIS favorite to  
8 proceed for construction. Define the need first before  
9 you fast forward to a solution.

10 An overscaled, overpriced, unnecessary project paid  
11 for by rate payers is nothing short of consumer fraud.

12 MS. WAGONER: Thank you. Next speaker.

13 MR. HALVERSON: Good afternoon. My name is  
14 Warren Halverson. I reside at 13701 Northeast 32nd  
15 Place. I'm a member of the Colition of Eastside  
16 Neighborhoods for Sensible Energy. I'd like to address  
17 the EIS process in my comments.

18 My purpose is to share with you three major concerns  
19 that I have with the EIS process. I know you will think,  
20 well, maybe there's a lot more than three, but I only  
21 have three minutes. My intent is to be constructive.

22 First, the current DEIS does not meaningfully  
23 consider those substantive comments which were provided  
24 in the Draft 1 EIS scoping summary and final alternative  
25 to the City of Seattle 2015. See item 2, page 115, DEIS

1 introduction summary. For example, in the scoping  
2 documents, citizens identified 10 key community issues to  
3 help guide the DEIS. Four are not considered and the  
4 other six are lightly covered and buried in the 715-page  
5 document.

6 Furthermore, if you read the introduction to the  
7 scoping document, it concludes, and I quote, In general,  
8 most comments express concern or opposition to PSE's  
9 proposal. Then on pages 73 through 77, the majority of  
10 comments indicated a lack of support for Alternative 1.  
11 Many supported Alternative 2 or some aspect of it.

12 As I read the 715 pages, these issues and  
13 conclusions are not at all evident. This is  
14 contradictory to your DEIS introductory statements  
15 referenced in 1.6 and 1.7. Frankly, if you're not going  
16 to fully consider the community testimony or even your  
17 own conclusions about alternatives, the DEIS methodology  
18 appears biased and flawed.

19 Second, while the community did recommend several  
20 alternatives, particularly Alternative 2, the definitions  
21 are lacking in the DEIS. In addition, the integrated  
22 resources alternative is scalable and provides unique  
23 opportunities to combine solutions. The DEIS provides no  
24 insight into combinations of these solutions.

25 Finally, in evaluating alternatives against the

1 elements -- alternatives against the elements -- the DEIS  
2 uses categories of minor, moderate and significant.

3 MS. WAGONER: You have a minute.

4 MR. HALVERSON: This provides a very broad  
5 basis of evaluation. The assessment then incorporates  
6 laws, regulatory environment, all sorts of litigation,  
7 particularly related to Alternative 1, and even positive  
8 coordination of work groups.

9 In my opinion, rather than clarifying alternatives,  
10 this skews all readings towards minor, thus skews the  
11 evaluations towards Alternative 1. It certainly appears  
12 then that alternatives are not being analyzed at a proper  
13 level of detail or in a comparable manner.

14 Finally, mindful of these considerations and the  
15 importance of this DEIS, my third comment is actually a  
16 suggestion. The EIS team should initiate a review  
17 process by the public or an unbiased hearing examiner  
18 once the EIS team has incorporated public input. The  
19 fact that you now take our input and move to the next  
20 stage is not transparent, it's not fair.

21 MS. WAGONER: Thank you. Next speaker.

22 MR. CLIFF: Hello, my name is Gary Cliff. I've  
23 lived at 8435 128th Avenue Southeast in the Olympus  
24 subdivision of Newcastle for 18 years. I retired two  
25 years ago after working 38 years in the IT industry. I

1 want to thank you in advance for giving me the  
2 opportunity to express my concerns.

3 I have many concerns regarding the Energize Eastside  
4 project, but due to the time constraints, I will only  
5 focus on two.

6 My first concern is very fundamental and  
7 straightforward. Is Energize Eastside really needed?  
8 PSE conducted a load flow study which is a definitive  
9 study for justifying the need for this project. Such  
10 critical data must be scrutinized and challenged when  
11 necessary. They should not be taken at face value as  
12 factual since it's teamed with nationally recognized  
13 power and transmission experts with specific knowledge of  
14 the Northwest power grid to conduct a load flow study to  
15 validate the PSE's study findings. The results of this  
16 study contradicts many of PSE's assumptions and  
17 conclusions regarding need.

18 CENSE has submitted this document for your review,  
19 and I'm asking that Ms. Bedwell/Helland and team provide  
20 a written response to our citizens detailing your areas  
21 of agreement or disagreement regarding the CENSE study.

22 I'm also concerned with the safety of this project  
23 regarding the insulation and removal of poles and other  
24 construction activities so close to a pipeline. I know  
25 PSE states they have done this before and not to worry.

1 My guess is that the citizens of Bellingham were also  
2 told not to worry, and we know how that turned out. I  
3 have no idea of the probability of a catastrophic event  
4 similar to Bellingham's, but even if it is a fraction of  
5 one percent, it is too high a risk to take with our lives  
6 and our property.

7 My concluding remarks are directed towards the  
8 decision-makers in this process, city councils and  
9 various other administrators representing us.

10 MS. WAGONER: One minute.

11 MR. CLIFF: Very few people in their careers  
12 have the opportunity and responsibility to make a  
13 decision that is truly meaningful and impactful. Whether  
14 you want to or not, the choices you make this year will  
15 leave a lasting legacy. It will either be a positive  
16 legacy that we will be proud of in the years to come  
17 because you stood up against a large corporation that did  
18 not have the best interests of its customers at heart, or  
19 you will leave a negative legacy of 18 miles of huge  
20 poles and wires that were not needed.

21 How will you explain to your children and  
22 grandchildren that you did not make the tough decisions  
23 when so many people rely on you? And please remember  
24 that the citizens of the Eastside expect you to do your  
25 duty. Thank you.

1 MS. WAGONER: Thank you. Next speaker.

2 MR. JOHNSON: My name is Larry Johnson. I live  
3 at 8505 129th Avenue Southeast in Newcastle. I am a  
4 designated speaker and president of Citizens for Sane  
5 Eastside Energy. I understand that gives me five  
6 minutes.

7 I'm a lawyer also, and on behalf of CENSE and CSEE,  
8 Citizens for Sane Eastside Energy, I filed a complaint  
9 with the Federal Energy Regulatory Commission on behalf  
10 of CSEE and CENSE against this project that PSE is  
11 pushing. Let's remember. The only reason we're here is  
12 because they want this project; nobody else really does.

13 But FERC, F-E-R-C, dismissed that complaint saying  
14 this is a local project only in the PSE service area.  
15 They don't have jurisdiction. So what Bellevue does,  
16 what the City of Newcastle does is where the buck stops.  
17 And on that point, I wish to commend our mayor, Rich  
18 Crispo, who is sitting back there. He is our true hero.  
19 He was here on his own capacity the last time we were in  
20 this room, and he said I'm speaking on my behalf. This  
21 looks like we energize Bellevue. Where is the benefit to  
22 Newcastle? All we get is an atom bombing of our  
23 corridors, so that the rich fat cats in Bellevue can  
24 build their big projects and we get no benefit out of it.

25 I've gotten a lot of public records requests from

1 City of Bellevue, from Seattle City Light, from the  
2 Bonneville Administration in preparation for this  
3 complaint. I've been working on this essentially for two  
4 years. One of the things that I got is your calendar,  
5 Carol Helland, and it shows that you meet weekly  
6 Thursdays with PSE every week with three or four people.  
7 Why aren't the community people represented in those  
8 meetings? Why don't we get to talk to you for more than  
9 for three or five minutes once a year and you talk to  
10 them every week? You know, this whole process looks like  
11 it's all PSE-oriented. You're right across the street  
12 from PSE. It's all so cozy. And we don't -- and the  
13 rest of the communities, even though you are the lead  
14 agency, we're neglected. Fortunately, we have such a  
15 talented man as Tim McHarg watching for our interests.

16 So this whole project is a PSE used car. It's not  
17 even a new car that we're looking at, it's a used car.  
18 My research showed that eight years ago PSE questioned  
19 this project as the Sammamish Lakeside Talbot project,  
20 and it was to relieve the congestion that was perceived  
21 in power going to Canada. That's where this 1500 bogus  
22 megawatts of power to Canada comes from. And this  
23 assumed a local project.

24 And if you look at load flow studies, the only way  
25 they can jimmy up some kind of need for this fake project

1 is to say, well, we've got to provide 1500 megawatts in  
2 peak times to Canada. That's the only way you can look  
3 at their flow studies, and our flow studies showed it's  
4 totally bogus and unnecessary.

5 So we're here discussing the environmental impact of  
6 a project that shouldn't exist. And talk about safety,  
7 it wasn't even a criterion when we were here a year ago.  
8 And I had to remind you, Carol, the statute says the  
9 environmental impact statement has to look at safety.  
10 Oh, wow. And you should know this, you're a lawyer. And  
11 now with a project, you know, this DEIS just kind of  
12 whitewashes that.

13 PSE says, well, trust us, trust us. You know, we  
14 worked with Olympic Pipeline all along. What they will  
15 never tell you is that in 2008 the Washington Utilities  
16 Transportation division fined them the highest fine they  
17 ever got, \$1.2 million, for falsifying gas safety  
18 inspection records for four years. We're to trust this  
19 company that is so hungry for money it will bogus up  
20 fraudulent documents and pay a \$1.2 million fine. They  
21 should have been disenfranchised, they should have been  
22 sent to jail. And this is the same utility that the EJ  
23 went after last year for overcharging its customers.

24 MS. WAGONER: You have one minute.

25 MR. JOHNSON: You cannot trust these people.

1           Now, Rick Aramburu is one of the lawyers for CENSE.  
2           He sent you letters saying this whole EIS process is  
3           fake. You should have done this after permit application  
4           so we know what project it is. You're participating in  
5           PSE's bidding.

6           And also, there should be a public hearing after  
7           this first phase is done, and you're not doing that  
8           either. You have been told this will be a lawsuit. I  
9           can tell you right now I did this pro bono for our  
10          communities, and I will gladly sue on behalf of the 51  
11          families whose homes that you want to tear down just to  
12          accommodate PSE's greed. And that will not happen.

13          Now, you've got a choice between A, a project that  
14          will kill people, and B and C and D that won't. How hard  
15          is that? What kind of rocket science does it take to  
16          say, do I do this project if it kills people, or here's  
17          another one that's okay and it won't kill people. How  
18          hard is that? Do the right thing.

19                 MR. KURAMKOTE: Hello everyone. I'm Raj  
20          Kuramkote. I live at 8613 129th Court Southeast in  
21          Newcastle. And this is with reference to proposed PSE  
22          transmission line project Alternative 1A, pages 221  
23          through 225, 18 miles of new 230 kV transmission lines  
24          plus new transformer.

25          We have a fault line running by our house, so we are

1           likely impacted. And we are living in the house for the  
2           last 18 years. And I work for Intel Corporation and I'm  
3           stationed in my campus in Redmond, so I have a good  
4           visibility into how all these pillars of technology are  
5           handling the movement towards green energy.

6                     At Microsoft campus, they started experimenting with  
7           powering the streetlights with both solar panel and  
8           little green turbines, both on the same pole that houses  
9           the land, and so this is a great self-forward approach to  
10          making -- helping out with environment.

11                    I think, though, in the Oregon campus they installed  
12          microturbines on top of a building along with solar  
13          panels that generates 65 kilowatt hours of power, and  
14          that's being used to provide electricity to the  
15          conference center there.

16                    So there are a number of such attributes all over  
17          the world, and Intel is being recognized by the United  
18          States EPA agency for seven years in a row for other  
19          green energy attributes. And these are just two examples  
20          of many more that forward-looking corporations are  
21          making.

22                    And we are concerned about losing our home if we go  
23          with the type 1A project. And our home is in a perfect  
24          setting in terms of proximity to Seattle and Bellevue,  
25          and at the same time, it's in a green neighborhood, and

1 it would be hard to find other existing property. And  
2 we're concerned about safety impacts of the proposed plan  
3 for folks living in proximity to the power lines.

4 So we're concerned that if the plan goes through,  
5 there's no turning back, and our neighborhood would be  
6 forever changed. So I strongly urge PSE and cities of  
7 the King County to stop Eastside Energy from backward  
8 looking and start working with both corporations, city  
9 governments and residential customers to move towards  
10 green energy solutions in our fast growing cities and set  
11 an example for other areas operations across the U.S.

12 So I reject Alternative 1A, and what I'm talking  
13 about here kind of aligns with Alternative 2A. So thanks  
14 for allowing me to present my case. Thank you.

15 MS. WAGONER: Thank you.

16 MR. KASNER: Good afternoon. My name is Steve  
17 Kasner, and I reside at 1015 145th Place Southeast in  
18 Lake Hills, Bellevue, Washington, and I've lived in  
19 Bellevue for over 25 years. It's nice to be in Newcastle  
20 and see old friends Carol and Heidi and new friends, Tim  
21 and Claire.

22 I come here today because I'm very concerned about  
23 how this process has come together. The community has  
24 very much organized to ask for the information that would  
25 allow them to understand what is best for them in the

1 future. So my crystal ball is kind of fuzzy. I can't  
2 tell you what's going to happen five years, 10 years, 20  
3 years from now. What I can tell you after the  
4 Lauckhart-Schiffman study where Mr. Lauckhart was a power  
5 planner for PSE -- forget about future demand. They  
6 can't even agree on what winter capacity is. I mean, if  
7 you set the winter capacity at the Lauckhart-Schiffman  
8 level of 900 megawatts, the 2018 shortfall doesn't occur  
9 until 2058.

10 Now, I care about my kids and grandkids. In 2058  
11 it's not going to really matter to me because I'm not  
12 going to be here.

13 But I want to put on something that is really  
14 accurate, and that is my historical lens. I'm a teacher.  
15 History teaches us something. When I got out of law  
16 school in the 80's, my first job was as an attorney  
17 working on the WPPSS litigation, Washington Public Power  
18 Supply System case against the power companies that tried  
19 to build five nuclear power plants because they claimed  
20 by the year 2000 we'd need 20 of them. One actually got  
21 built.

22 In the PSE load information, I've heard 1.7, I've  
23 heard 2.4. The industry standard is less than half of a  
24 percent, .4 percent. So we have a capacity issue which  
25 can be positively adjudicated. What is the N minus one

1 minus one capacity of the system as it sits with no  
2 action today. When we see that number, then we can run  
3 all sorts of demand curves as to what we need.

4 But what's unfortunate about this -- and I have a  
5 little bit of experience with PSE on the project totally  
6 separate from this one -- is how can we reach a common  
7 understanding of what we have in the present to then make  
8 decisions in the future.

9 And as I've talked to the City of Bellevue at the  
10 city manager level, is Bellevue's role to facilitate  
11 permits that are submitted which we don't have yet or is  
12 it to be a guardian of the people to decide what is  
13 needed, how it's needed and how that works. I have not  
14 gotten that answer on any project during a permit.

15 I understand that after the permit is filed, there  
16 are restrictions legally what can be done and not done.  
17 We have the opportunity to do something really special  
18 for our community. I've lived in Bellevue for 25 years,  
19 I love Bellevue. The other cities around it are  
20 important. But if the capacity that is set up in the EIS  
21 is incorrect, then all of the assumptions are incorrect.

22 And the fact that the no action is listed as the  
23 baseline, not as an alternative, I believe that it is a  
24 very viable option based on how the science plays out.

25 I do not claim to be an engineer. But I've listened

1 to enough engineers that you can find anyone to support  
2 the position that a particular person or a corporation  
3 wants. The fact that thousands of people have mobilized  
4 to get answers to protect their community, houses being  
5 condemned, pipelines possibly exploding, you know, power  
6 lines falling or failing, we are talking about  
7 potentially catastrophic situations which we have not yet  
8 decided or proved to the satisfaction of almost anyone  
9 that we need this project.

10 I suspect I may reappear at some point in the  
11 future. But, please, this is the document that will  
12 control the process moving forward, and the Phase 1,  
13 Phase 2, I think we need to reach some decisions right  
14 now before we talk about how we continue, because we do  
15 not have agreement on what the current situation is.

16 I very much appreciate everybody took time out on  
17 their Saturday to work on this monumentally changing  
18 proposal for all of the Eastside cities. Thank you very  
19 much for your time.

20 MS. WAGONER: Thank you.

21 MS. KURAMKOTE: Hi, everyone, my name is  
22 Jyotsna Kuramkote, and I live with my parents at 8613  
23 129th Court Southeast in Newcastle. I'm a student at  
24 Liberty High School and I actually did my elementary  
25 schooling here in this very school we are currently

1 gathered at. I have lived my entire life in the state of  
2 Washington. More importantly, I have lived my entire  
3 life in the same house, a house that is located directly  
4 in front of the potential construction area of the  
5 Energize Eastside project.

6 Home has always symbolized security and constance in  
7 my life. It's been the one thing that I have counted on  
8 to remain the same forever. The Energize Eastside  
9 project threatens the stability of not only my home but  
10 my life with a project that could potentially be  
11 hazardous. Here are several reasons from the Draft EIS  
12 of why this project poses serious risk to my family and  
13 others.

14 No. 1, the tower footings are 25 feet to 50 feet  
15 underground in close proximity to the gas lines.

16 No. 2, holes can be created in the pipeline by  
17 electrical arcing from down lines leading to leaks and  
18 explosions.

19 No. 3, lightening strikes could send current to  
20 anything metal in the area and create holes in the  
21 pipeline as well.

22 And No. 4, we live along the Seattle fault zone, a  
23 seismically active area. An earthquake during the life  
24 of the project, according to the Draft EIS, can cause  
25 substantial damage and even death.

1 I'm tired of living in a society where big  
2 corporations snuff out individual voices. I want PSE to  
3 listen to me and understand the personal impact of its  
4 potential actions. This project can jeopardize the lives  
5 of the people who are wholeheartedly against its  
6 contentions. And if PSE chooses to ignore our concerns,  
7 it will be an injustice against everyone in this  
8 community.

9 Thank you for listening.

10 MS. YOUNG: Linda Young, 12813 Southeast 80th  
11 Way, Newcastle. I am an Olympus development Newcastle  
12 homeowner. Puget Sound Energy's plans to build 130-foot  
13 metal structures with 230 voltage through the  
14 neighborhood are total insanity. They plan to build  
15 these structures over the Olympic pipeline, the same  
16 ancient Olympic pipeline installed over 50 years ago. I  
17 repeat, over 50 years ago.

18 Olympic Pipeline does not like anyone to even drive  
19 a small truck over this land. Heaven help us when heavy  
20 equipment drills down and down to accommodate these tall  
21 structures.

22 Olympic Pipeline is well aware of their disastrous  
23 gas explosion in Bellingham in 1999, a gas explosion that  
24 took the lives of three young boys. Others may have put  
25 this explosion out of their equation, but rest assured,

1 the parents and families of the burnt to death young boys  
2 have never forgotten.

3 Newcastle has excellent fire, police and EMT  
4 personnel, but a gas explosion of like magnitude would be  
5 beyond their resources.

6 Now in the 700-page document homes would have to be  
7 bulldozed to create enough footage from the huge metal  
8 structures carrying 230 voltage. Homeowners have Puget  
9 Sound Energy's totally frightening plans hanging over  
10 their heads. For people close to the Olympic pipeline,  
11 how can they sell their homes? In the area where Puget  
12 Sound Energy wants to build we have families with babies,  
13 young children, children in school, retired couples, and  
14 then we have those with serious medical problems. We  
15 have a care home taking care of dementia and Alzheimer's  
16 patients, people who are unable to leave their homes due  
17 to serious medical conditions, non ambulatory people.  
18 The list goes on and on. How could you get those people  
19 out in time?

20 MS. WAGONER: You have one minute.

21 MS. YOUNG: We have people needing 24/7 care  
22 very soon, and how can they sell their homes to pay for  
23 this ongoing care. They are being held hostage. And  
24 when I have spoken to them, it is obvious they are living  
25 under enormous stress.

1           Puget Sound Energy, stop playing with people's lives  
2           and just support the high interest rate being paid to  
3           your foreign national owners in Australia. There are  
4           proven alternatives to Puget Sound Energy plans. Stop  
5           being the bully and think in the 21st century.

6           MS. WAGONER: Thank you.

7           MR. BOYCE: Hello, thank you for allowing me to  
8           speak. Thank you for all the work done on this EIS. It  
9           looks like a lot of work, but unfortunately, there are a  
10          lot of problems. My name is Michael Boyce. I live at  
11          4932 131st Place Southeast. And I've lived there about  
12          35 years.

13          And I want to say that I'm having a very difficult  
14          time understanding why this project is even being  
15          considered, this so-called Energize Eastside, because I  
16          think it is very, very dangerous. I want to say that  
17          again. It is very, very dangerous. Think about pipeline  
18          leaks, think about fires and explosions, landslides,  
19          earthquakes. The list goes on and on. You just don't  
20          put power lines next to an aging pipeline in the way  
21          that's proposed.

22          So the project in my opinion is not needed at all.  
23          And if you need evidence of that, just look at the  
24          Lauckhart-Schiffman study, which is very clear. It shows  
25          that the demand forecasts that have been done by PSE are

1 basically bogus. They have exaggerated the need for this  
2 power about by about five times. We have enough power  
3 with what we have right now probably for many, many  
4 years.

5 Now, Alternative 2 I could support because it takes  
6 less land, it doesn't have the housing impacts, it has  
7 lower costs, and it's much safer. But even there I don't  
8 think we need the power that's forecasted.

9 It's very, very important to realize that it's not a  
10 question of will this -- will this pipeline power  
11 transmission project --

12 MS. WAGONER: You have one minute.

13 MR. BOYCE: -- will it fail in the future. We  
14 know it will fail. It's just a question of when. And  
15 when it does, look out.

16 In fact, I can't understand why PSE wants this  
17 project, because if they're honest with their  
18 stockholders, they would tell them that when this thing  
19 fails it could bankrupt PSE. The lawsuits are  
20 unimaginable. Hundreds of millions of dollars, lost  
21 lives, and there will be an investigation to see how this  
22 thing was approved in the first place. Was it known that  
23 this thing was so dangerous that the community speak up?

24 And I'm saying now, we are speaking up, and there is  
25 an alternative that is a lot better, Alternative 2. I

1 ask that you consider Alternative 2 and slow down this  
2 process so we can get on with progress and safety.

3 Thank you.

4 MS. WAGONER: Thank you.

5 MS. SUTEY: My name is A.J. Sutey. I'm at 8117  
6 128th Avenue Southeast. My husband and I purchased our  
7 home in Newcastle's Olympus neighborhood over 20 years  
8 ago. We love our views of Cougar Mountain and Cascade  
9 foothills and sometimes Mount Rainier. Our neighborhood  
10 is a wonderful mix of cultures and people. It's  
11 peaceful, it's warm, it's a pretty place. We've worked  
12 very hard to make our home and our yard and our garden a  
13 retreat. It's a haven where we can grow very, very old.

14 Energize Eastside Alternative 1A will change a great  
15 deal of all that we love about our retreat and our  
16 neighborhood character. Our home is directly across the  
17 street from the houses whose backyards face the Olympic  
18 pipeline with current 115 kV transmission lines. In  
19 addition to the sadness of losing the entire row of  
20 neighbors on that side of our street due to the required  
21 Alternative 1A home buyouts, we will be forced to look on  
22 a bleak void, a long linear scar, a permanent clear zone  
23 occupied by very high pressure liquid fuel pipelines and  
24 towering 230 kilovolt transmission lines.

25 Safety will be an even higher concern and not one

1 fully addressed in the Phase 1 Draft EIS. And by safety,  
2 I mean the combination of the high pressure, the dual  
3 fuel pipeline, the Alternative 1 230 kilovolt  
4 transmission line and the very real threat of the Seattle  
5 fault earthquake potential along the route PSE has chosen  
6 for Alternative 1A.

7 Although there's been mention of the seismic hazards  
8 in the EIS, the work done about this in the document is  
9 either -- and I'm not sure -- poor or deliberately  
10 misleading. I am providing details about some of this in  
11 my written document, but I'm going to be brief here in my  
12 feedback.

13 MS. WAGONER: You've got one minute.

14 MS. SUTHEY: The most glaring fault is in the  
15 map, which is Figure 2-3. This map I'm holding up here,  
16 this is referring to seismic areas, seismic hazards. And  
17 it's labeled seismic hazards. It shows green shading,  
18 all of the green shading, and the keys label this as  
19 seismic hazard area. It's actually liquefaction area.  
20 Soil liquefaction area has nothing to do with the seismic  
21 hazard area.

22 Right here I have a corresponding map, and this  
23 comes from the American Society of Civil Engineers. It  
24 corresponds with this, coordinates perfectly, but to the  
25 mislabeled EIS liquefaction map.

1 MS. WAGONER: If you can wrap up.

2 MS. SUTEY: But it completely leaves out the  
3 seismic hazard area.

4 This is an important factor to be considered in the  
5 safety of the combination of dual high pressure fuel  
6 pipeline, the transmission lines and the earthquake of  
7 the Seattle fault. This is something we need to take  
8 seriously, the Seattle fault zone. Look at the scenario  
9 for the magnitude 6.7 earthquake of the Seattle fault on  
10 the Website of the Earthquake Engineering Institute  
11 Website.

12 MS. WAGONER: Wrap up your comments.

13 MS. SUTEY: Because of this and the lights that  
14 have come to recently about why is this project even  
15 needed, do we really have to take these safety risks, I'm  
16 recommending critical thinking here, recommending that we  
17 do not go with Alternative 1 and select Alternative 2.

18 MS. WAGONER: Wrap it up. Now, would you like  
19 to submit these as well, the maps?

20 MS. SUTEY: Yes. I have the maps, yes.

21 MS. WAGONER: Okay. Thank you very much.

22 MR. PREVETTE: My name is Jeff Prevette. I  
23 live at 8114 128th Avenue Southeast. I'm on the corridor  
24 that the proposed monstrous power lines are going in.  
25 I've lived there for 23 years. My wife and I have raised

1 two children there. We had concerns when we bought the  
2 house because there were power lines there, but because  
3 of the low voltage and everything, we decided it wasn't a  
4 real issue.

5 I think that PSE has done a fantastic job of  
6 attempting to pull the wool over the faces of people that  
7 don't have the education that the people that represent  
8 PSE have. I suppose if I was a shareholder in PSE I  
9 would be all about this process beings as how they have  
10 guaranteed a 9.8 percent return on the money investigated  
11 with them. That's quite a motivator for building a  
12 project like this. I feel sometimes like I'm trapped in  
13 an old Disney movie where large corporations can take  
14 over small towns.

15 I'm affected directly and in fear of the proposed  
16 power poles being put in next to the pipeline that runs  
17 basically right behind my back fence. I'm invested in my  
18 community. I've got really, really good neighbors. I  
19 really don't want to move. I really don't want my house  
20 bought up and destroyed by a company. A lot of thought  
21 went into making this purchase when we moved into this  
22 neighborhood.

23 I think that if there was a legitimate need, you  
24 know, maybe my opinions would be a little bit different.  
25 I'm all about supporting what is best for the masses.

1 This isn't better for anybody but PSE shareholders.

2 MS. WAGONER: Wrap it up.

3 MR. PREVETTE: PSE is owned by an investment  
4 bank in Australia. It's not connected with our community  
5 in any way, shape or form. What do you got to lose?  
6 Well, a lot of lives potentially.

7 So this is it. I can't elaborate. All of the  
8 intelligent people have made all of their -- used all  
9 their facts, and it's all great. I'm right behind that.  
10 I'm very thankful for intelligent people.

11 But you know what? This is a potential destroyer of  
12 families, of properties, of communities, and I think it  
13 sucks.

14 MS. BRADFIELD: So our final speaker is Sam  
15 Esaylan.

16 MR. ESAYLAN: I'll pass.

17 MS. LOPEZ: I would like to speak.

18 MS. WAGONER: All right. You can come up.

19 MS. LOPEZ: My name is Loretta Lopez. I  
20 represent the Bridle Trails Community Club. You all have  
21 heard me speak before. We continue to object to the  
22 entire basis of this project and we object that there is  
23 no need for this project.

24 In the DEIS Section 1.3, the statement is PSE has  
25 determined there is a need to construct a new

1 transmission line. The DEIS goes on to state, To better  
2 understand PSE's private proposal, the EIS consultant  
3 team has obtained clearance and reviewed the information.  
4 It further goes on to state that this information is  
5 confidential, and therefore, cannot be reviewed, blah,  
6 blah, blah.

7 It is unacceptable, as I've stated before, for the  
8 public to be unable to review the information. And  
9 here's my suggestion. There are clearly ways to have  
10 confidential information disclosed and allow parties --  
11 this happens in litigation often -- to review the  
12 information. And I request that the City of Bellevue  
13 provide a mechanism for the citizens to review that  
14 information.

15 Further, on 1.5 the statement is, The EIS will not  
16 be used to reject or validate a need for proposal. The  
17 DEIS further goes on to state on page 1.56, The purpose  
18 of this EIS is not to determine whether the project is  
19 needed but to confirm that the methods used to define a  
20 need are consistent with industry standards and  
21 generally-accepted methods.

22 My request is that each city representative  
23 personally sign a statement that they have reviewed the  
24 information and they state, they certify in their opinion  
25 and take responsibility that the methods used to define

1 the need are consistent with the industry standards and  
2 generally-accepted methods. I think that is essential  
3 before we go on. Someone has to take responsibility for  
4 this project instead of constantly telling the community  
5 that we way not ask the questions, we may not review the  
6 information, we may not question PSE.

7 On Monday night at the Bellevue City Council meeting  
8 in response to the question, can we review the project, I  
9 believe it was Nicholas Matts who stated, no, this is a  
10 private project. And therefore what? Therefore we can't  
11 review it? It is our community. It is our safety. It  
12 is unacceptable and we will not accept this. We will  
13 continue to object to this. Thank you.

14 MS. HELLAND: That represents our last speaker  
15 this afternoon. We do appreciate you all coming out, and  
16 thank you so much for your comments. Have a nice  
17 weekend.

18 (Meeting adjourned at 4:17 p.m.)

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ENERGIZE EASTSIDE  
PHASE 1 DRAFT ENVIRONMENTAL IMPACT STATEMENT  
PUBLIC HEARING/PUBLIC TESTIMONY

6:00 p.m.  
February 25, 2016  
1055 South Grady Way  
Renton, Washington

LISA R. MICHAUD, CCR  
NORTHWEST COURT REPORTERS  
1415 Second Avenue, Suite 1107  
Seattle, Washington 98101  
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PANEL MEMBERS

- JENNIFER HENNING - CITY OF RENTON
- CLAIRE HOFFMAN - ESA
- CAROL HELLEND - CITY OF BELLEVUE
- HEIDI BEDWELL - CITY OF BELLEVUE

ALSO PRESENT:

- MARCIA WAGONER - FACILITATOR - 3SB
- CASEY BRADFIELD - TIME KEEPER - 3SB

PUBLIC SPEAKERS

- LORI ELWORTH
- LAURIE BAKER
- BRIAN ELWORTH
- BARBARA BRAUN
- CURTIS ALLRED
- RICARDO GARMENDIA
- DARIUS RICHARDS
- VICTORIA KAPITAN
- DON MARSH

1 MS. ELWORTH: My name is Lori Elworth.  
2 I live at 8605 129th Court Southeast, New Castle.  
3 Thank you for allowing me the time to speak. One  
4 aspect of the project that has not been addressed  
5 in the DEIS is the need. It states on Page 156  
6 that the purpose of the DEIS is not to determine  
7 the project is needed as if that is a given.

8 However, I question that claim and I believe  
9 that PSE has done a poor job establishing the  
10 necessity of the Energize EastSide Project.  
11 CENSE, a citizen's, group asked nationally  
12 recognized power and transmission planners  
13 Richard Lauckhart and Roger Schiffman who have  
14 specific knowledge of the northwest power grid to  
15 study this project.

16 On November 18, 2015 they concluded their  
17 study of the project titled Lode Flow Modeling  
18 for Energize Eastside. The study found that the  
19 current system was sufficient capacity and will  
20 continue to meet customer demands until the year  
21 2058 without any improvements.

22 Unless PSE can offer a legitimate  
23 explanation for where they got their assumptions  
24 and why they claim that customer demand will  
25 exceed the system capacity in 2018, then the need

1 remains in question.

2 The project should be paused until need is  
3 demonstrated. Continuing on a project without a  
4 need established is a pointless exercise that  
5 serves no purpose other than to waste the time of  
6 the city's and taxpayer money.

7 My question for the City Councils is why was  
8 the need not addressed in the DEIS? And in light  
9 of recent conflicting studies, will an  
10 independent load flow study be performed? Thank  
11 you.

12 MS. BAKER: My name is Laurie Baker and  
13 I currently live in Renton. For over 40 years I  
14 lived on a power line. And from an environmental  
15 perspective, I would have to say it's a scar on  
16 the earth. It's well maintained scar on the  
17 earth meaning they come regularly and re-scar it  
18 because it has to be kept clear.

19 So in general I would say I certainly am  
20 against creating more scars. Cities who wave the  
21 flag of trees and arbors and things like that  
22 would seem to recognize the value of trees and  
23 vegetation for all the well publicized reasons.  
24 And, therefore, I think that the simple fact of  
25 putting another scar on the earth in our

1 neighborhoods is not a good idea.

2 I also will confess I have not read the  
3 715-page document nor am I likely to read it all.  
4 First of all, I don't read very well and I don't  
5 read very often and I don't like to read. But I  
6 take it from many of my neighbors who are very  
7 concerned about this that there are many  
8 questions about whether or not this is really  
9 needed.

10 When I arrived tonight my question was, is  
11 there a citizen organization that is supporting  
12 this project? That is waving the flag and saying  
13 yay, yay, we think PSE is exactly right. And as  
14 far as I know, there isn't. There is one that's  
15 saying perhaps it's not needed.

16 And I think that says it all in terms of how  
17 citizens feel about its impact on the community.  
18 Thank you very much.

19 MR. ELWORTH: Hello, my name is Brian  
20 Elworth. I live at 8605 129th Court Southeast in  
21 New Castle. I've lived in my current location  
22 since 1988 adjacent to the power line. I want to  
23 talk about research integrity.

24 In the field of science and engineering  
25 research, there are standards of integrity.

1 Researchers are accountable for what they report.  
2 This EIS is essentially a research document. In  
3 my view its purpose is to serve as an organized  
4 consolidation of factual information related to  
5 the environmental impact of this proposal.

6 Now, although the standards of integrity are  
7 much lower for the EIS than you find in the  
8 science community, it's still important that the  
9 EIS be reasonably factual because this EIS  
10 doesn't just affect Bellevue. It affects all the  
11 cities in the region. A very broad 18-mile  
12 region.

13 So what I'd like to request is that all  
14 unsupported opinions and unsupported summary  
15 conclusions be removed from the document. There  
16 are many in the document that there's no basis  
17 for the statements to be made.

18 I ask that those either be qualified as  
19 someone's opinions or removed from the document.  
20 Washington Administrative Code 197.11.400 states,  
21 "An EIS shall provide impartial discussion of  
22 significant environmental impacts and shall  
23 inform decision makers and the public of  
24 reasonable alternatives including mitigation  
25 measures that would avoid or minimize adverse

1 impacts or enhance environmental quality."

2 Those aren't just words in a document. You  
3 need to really internalize that message there.  
4 The process should comply with the spirit,  
5 intent, and the letter of the WAC.

6 Cities and residents of Redmond, Kirkland,  
7 New Castle, and Renton depend on Bellevue as a  
8 lead agency to make sure that that document has  
9 the integrity, the transparency, the objectivity,  
10 and the thoroughnesses that is just basic respect  
11 for these cities.

12 SEPA handbook section 3.3 states the lead  
13 agency is responsible for the content of the EIS,  
14 and goes on. The message is you are responsible  
15 for the content of the EIS regardless of its  
16 source. Every word, every sentence, every  
17 paragraph, every diagram, every figure, every  
18 table in the EIS is owned by Bellevue.

19 If you put it in the EIS, you own it.  
20 Ownership implies a trust that the declarations  
21 of fact are accurate and complete. So, again, I  
22 say please eliminate all the unsupported opinions  
23 and unsupported summary conclusions.

24 If you want to identify a source and their  
25 opinion, that's fine, but when you state it as a

1 fact, that's where that line of integrity is  
2 crossed.

3 MS. WAGONER: If you can wrap up your  
4 comments or come back.

5 MR. ELWORTH: I'll come back.

6 MS. BRADFIELD: I'm going to read the  
7 next three names. We have Barb Braun. And  
8 again, I apologize if I mispronounce anyone's  
9 name. Curtis Allred, and Ricardo Garmendia.

10 MS. BRAUN: Hi, I'm Barbara Braun, I  
11 live at 13609 Southeast 43rd place in Bellevue,  
12 and do not live adjacent to power lines, but I am  
13 an extremely concerned citizen. I concur with  
14 many of the comments tonight that the need for  
15 this project is really not established.

16 The EIS ignores this as we discussed and it  
17 really is an oversight in the process that needs  
18 to be revisited. Earlier in the year the, quote,  
19 unquote, independent determination of need by  
20 Stantec did not include load flow studies and  
21 merely basically said that PSE conducted their  
22 study in accordance with industry standards. I  
23 don't think the City Council of Bellevue had any  
24 idea whether or not Stantec had an independent  
25 and legitimate conclusion.

1           So as also was stated before the load flow  
2           analysis by Lauckhart and Schiffman calls into  
3           question in a very big way the need for this  
4           project. And so I think that basically the  
5           cities need to come together and revisit the need  
6           via an independent and auditable assessment.

7           And that any conclusions that are drawn need  
8           to be audited by people, experts that actually  
9           know what we're talking about.

10          Further, the assumption that basically we  
11          need to be shipping 1500 megawatts of power to  
12          Canada during a temporary power shortage seems  
13          like an assumption that is downright dishonest.  
14          If we actually experience a scenario like that,  
15          it seems like we would temporarily decrease the  
16          flow of power to Canada through the power  
17          shortage, and that that would obviate the need  
18          for the project.

19          So again, the EIS does not clearly establish  
20          the need for the project. I think the EIS should  
21          assume that the do nothing alternative is the  
22          right and preferred alternative and prove beyond  
23          a shadow of a doubt with facts and data available  
24          to all interested parties that this is not the  
25          case.

1           Assuming there is a need for the project,  
2           and if we pursue Alternative I as PSE wishes, I  
3           think the cost to the communities and our  
4           environment outweighs any benefit that we would  
5           get out of a project like this. So we need  
6           really a cost/benefit analysis so we don't spend  
7           millions and millions and billions of dollars for  
8           some very minute and incremental benefit.

9           Some of the costs that we would experience  
10          are astronomical increase in the risk of power  
11          line explosions, accidents, and even deaths.  
12          We're going to have to condemn a lot of homes and  
13          basically put more industrial blight in our area.  
14          You can look out here and see thousands of power  
15          lines. It's very ugly and very blightful.

16          We have a huge climatic impact by cutting  
17          down thousands of trees, and will proliferate a  
18          carbon based electricity solution for another 50  
19          to 65 years.

20                 MS. WAGONER: If you could wrap up your  
21                 comments.

22                 MS. BRAUN: Okay, and then I'll come  
23                 back. Then lastly, basically I don't think the  
24                 benefit is to anybody but PSE, and I do not think  
25                 the citizens really can afford this project. And

1 basically I don't think the state or the country  
2 can afford it either from an environmental point  
3 of view. I'll come back.

4 MR. ALLRED: My name is Curtis Allred.  
5 I'm at 13609 Southeast 43rd Place in Bellevue.  
6 And thank you for this opportunity to speak in  
7 public about this project. I'll just make three  
8 points. I think I can get through them in three  
9 minutes. First of all, I have a big problem  
10 charging ahead on EIS for a massive expensive  
11 project without being convinced of the need.

12 What we know is that PSE really wants to  
13 build this power line. And they claimed they've  
14 done an analysis that proves we need it, but it  
15 looks suspicious. They assumed a much higher  
16 growth rate than other regional planners are  
17 using. They're sending three times more power to  
18 Canada than the normal WECC base case. And we  
19 turned off six local power generation stations to  
20 create this need.

21 So an independent power expert which was  
22 referred to earlier, Rich Lauckhart, and his  
23 friend ran his own analysis using the same  
24 software and initial data and found that there is  
25 no need for extra capacity in at least the next

1 30 years. Of course PSE refutes this study, but  
2 they will not share their data so it can be  
3 independently verified. Essentially they're  
4 saying we're the experts. Trust us.

5 So that brings us to the EIS which is being  
6 conducted assuming the need is there, which much  
7 of the community does not believe. So a second  
8 point is, brings us into the EIS and the EIS  
9 itself is also misleading. It leads us to  
10 believe there are alternatives being considered.  
11 And the best alternative will be chosen based on  
12 the outcome of the EIS.

13 And I recently learned that's not true.  
14 It's actually PSE who makes the choice. And they  
15 have already made their choice clear. It's the  
16 230 volt above ground power lines running along  
17 the existing corridor. So I have to ask, what is  
18 the point of evaluating these alternatives when  
19 PSE has already dismissed them?

20 I believe at this point the no alternative  
21 option is the only logical choice, but that won't  
22 be the alternative chosen by PSE. If it turns  
23 out there is need for some solution, it will  
24 certainly be less drastic than PSE wants us to  
25 believe. Alternative II suggests modern grid

1 technologies, conservation, alternative energy  
2 sources to fill the gap. PSE dismissed this as  
3 unfeasible based on outdated information. This  
4 alternative needs to be reevaluated using updated  
5 information and by experts in modern grid  
6 techniques, not PSE. PSE is saying it's an  
7 economic issue, not environmental.

8 So how is this going to be addressed and  
9 mitigated? Some say this the NIMBY issue, but  
10 there's a big backyard that's going to be  
11 impacted by these power lines. They'll tower  
12 over the tree lines, be visible for many miles  
13 for many yards and neighborhood streets.

14 For people on or near the right of way,  
15 values will likely be impacted by 10 to  
16 20 percent. Could result in the loss of tens to  
17 hundreds of millions of dollars in home value and  
18 loss of property tax revenue as well. So how  
19 will this be mitigated? Thank you.

20 MR. GARMENDIA: My name is Ricardo  
21 Garmendia. My address is 10205 126 Avenue  
22 Southeast in Renton. I live in the, close to the  
23 Honey Creek area and I would like to, first of  
24 all, thank everyone who has been here, been very  
25 eloquent in their presentations and their

1 testimony and I concur with everyone at this  
2 point.

3 This is my first time at one of these  
4 meetings. I have not read the 700-page document.  
5 And in part because probably the main thing I  
6 would like to comment is on perhaps we need more  
7 information and for you guys to communicate with  
8 people that are impacted by this.

9 I live -- right behind me is the power line  
10 from you guys, PSE, and not very happy that  
11 information had not been very well communicated  
12 to us. I'm not sure how these small groups are  
13 representative of everyone in the community at  
14 this point. So more participation will be  
15 encouraged by better communication.

16 I have a question that has not been  
17 answered. When I approached some of the folks in  
18 here, the engineers or whoever they are, and it  
19 has to do with the service that was performed  
20 behind my house. And when I asked the person  
21 that was performing the survey they referred me  
22 to a gentleman I believe Heidi, you replaced. I  
23 don't remember.

24 And so I still don't have an answer to what  
25 type of survey that was being formed. They

1 cleared some blackberry bushes behind my house  
2 and they have some stakes and little things they  
3 did. I don't have an answer yet, so I'm not sure  
4 where I can get that answer. And will be reading  
5 the report and attending the New Castle meeting.  
6 Thank you.

7 MS. BRADFIELD: We have two more people  
8 who are signed up to speak. Darius Richards and  
9 I might mispronounce this one, Victoria Kapitan.

10 MR. RICHARDS: Good evening. My name  
11 is Darius Richards. I reside at 3605 Lake  
12 Washington Boulevard North in the Kennydale  
13 neighborhood in the north end of Renton. I've  
14 lived there since 1974. I want to also give my  
15 thanks to the folks that took the time to come  
16 out here tonight. And for the hard work you  
17 folks did as far as putting together the EIS.

18 I'm an ex-environmental safety and health  
19 engineer and electrical engineer and I understand  
20 the amount of work it takes to do something like  
21 that. Throughout 2014 I was on the PSE community  
22 advisory board, and as a result of what I saw  
23 happening at that, I felt uncomfortable with the  
24 quality and integrity of some of the information  
25 that was being presented to us by PSE and chose

1 to become a member of CENSE at that time, the  
2 Coalition of Eastside Neighbors for Sensible  
3 Energy so that there would be a credible  
4 alternate voice.

5 Due to that experience on CAG and my  
6 evaluation of the project alternatives offered in  
7 the draft EIS, I strongly believe that  
8 Alternative II, if anything -- if this project in  
9 deed moves forwards, I think that Alternative II  
10 is clearly the best choice.

11 I think it's the only alternative that  
12 provides a way of dragging PSE kicking and  
13 screaming into the 21st century and avoiding all  
14 the negatives that go along with Alternative 1A  
15 such as safety challenges increased charges to  
16 the eastside rate payers, decreased quality of  
17 life due to visual pollution, spoiling our  
18 environment, devalue of neighborhoods and more.

19 The study that was done by Richard Lauckhart  
20 and Richard Schiffman has been referred to  
21 previously, and I think I saw the presentation on  
22 that. It is a real eye opener in terms of  
23 providing what I see as a credible alternative to  
24 the PSE's eastside customer demand forecast which  
25 we recognized in 2014 just didn't make sense.

1           I am very hopeful that you folks will take  
2           the opportunity to read the report, read that  
3           report in its entirety. I do have a couple of  
4           copies of the executive summary of that report,  
5           and the full report is available on the CENSE  
6           website at CENSE.organization. If you would be  
7           interested, I can give you a couple of copies  
8           right now. Thank you very much for this  
9           opportunity to speak.

10                   MS. KAPITAN: Good evening, I'm  
11           Victoria Kapitan. I live at 1209 North 38th  
12           Street in Renton, the Cahill neighborhood. Thank  
13           you for the opportunity to speak to you. I am  
14           very concerned about Puget Sound Energy's  
15           Energize Eastside project which proposes to build  
16           18 miles of high voltage transmission lines  
17           through our neighborhoods.

18                   This is known as the Alternative I which I  
19           oppose. I want the flaws and unanswered  
20           questions in the DEIS addressed regarding safety,  
21           environment, economic, neighborhood character  
22           impacts. Most importantly I am not convinced  
23           this project is even needed.

24                   PSE tries to justify the need for the  
25           project using an impossible scenario that would

1 actually cause regional blackouts according to  
2 the Lauckhart/Schiffman load flow study. The  
3 solutions described in the DEIS were not  
4 developed or reviewed by independent experts that  
5 have suitable experience with modern electrical  
6 grid technology including demand side management  
7 and distributed energy resources. The cost and  
8 capabilities are based on inaccurate and obsolete  
9 studies.

10 I would ask that you support Alternative II,  
11 the integrated resource's approach which is a  
12 safer and less costly alternative. Rate payers  
13 are asked to spend more than a billion dollars  
14 over the lifetime of PSE's transmission line  
15 proposal. The draft EIS must answer these flaws  
16 and unanswered questions in order to convince  
17 residents that we are getting the best possible  
18 plan for our energy future. Thank you.

19 MS. WAGONER: We are through the  
20 speakers who signed up so far. So if you'd like  
21 to continue your presentation.

22 MR. ELWORTH: Again, I am Brian  
23 Elworth. I live at 8605 129th Court Southeast in  
24 New Castle. I was talking about research  
25 integrity. Like to continue on that. On Page

1 1-5 of the EIS, it states, "This EIS will not be  
2 used to reject or validate the need for the  
3 proposal." But stating assertions as facts  
4 implies validation. And in several sections --  
5 places in that section it talks about, This  
6 deficiency is expected to arise or the existing  
7 transmission system could -- found that the power  
8 grid was at risk of outages. They're statements  
9 that sound like statements of truth when they're  
10 merely opinions from, I presume, PSE.

11 Opinions don't belong in here. If you want  
12 to refer to something as an opinion, that's fine.  
13 But don't state it as a fact, please. There's  
14 another section that says in the same area, Page  
15 1-5 Stantec prepared a memorandum evaluating the  
16 stated need for the project and confirmed that  
17 PSE's Eastside Needs Assessment was conducted in  
18 accordance with industry standards for utility  
19 planning. You heard that referenced earlier. It  
20 points to Appendix A. Appendix A has nothing to  
21 do with industry standards, so that's a  
22 misreference.

23 But those forecasts are built to industry  
24 standards, so let's look at that. Let's look at  
25 what the CAG was presented by PSE back in the

1 early CAG period. They forecasted -- I'll leave  
2 this with you -- but they forecasted a need of  
3 660 megawatts in 2014. They missed it by 75  
4 megawatts. The problem we're talking about  
5 solving here is 74 megawatts. They didn't even  
6 get the measure right. If you look at these two  
7 curves all built to the same industry standards,  
8 you've got to see that there's something wrong.

9 If your stock broker gave you this upper  
10 picture and then said this is industry standards  
11 and I had people validate I did it right, and  
12 then they give you this curve, you'd run out of  
13 the office. You wouldn't give them a penny. You  
14 wouldn't trust them. Yet you state it as a fact  
15 that this is truth. This is not truth. It's  
16 just -- it's a ouija board is what it is.

17 So what I'm saying is there's reasonable  
18 doubt in those statements. And to post those as  
19 assertions is just plain old incorrect. So back  
20 to my original integrity question. My question  
21 is, what training and mentoring on the proper  
22 conduct of research is being provided to the  
23 individuals who are responsible for the content  
24 of the EIS?

25 If no formal training or mentoring is in

1 place, what is the plan to rectify this process  
2 deficiency and provide product for public review  
3 that is compliant with basic research standards?  
4 If the concepts are not well understood or you  
5 don't really understand the process, I went and  
6 did a little homework for you and I found a  
7 couple books. They're from the National  
8 Academies Press.

9 One is called On Being a Scientist, a Guide  
10 to Responsible Conduct in Research, third edition  
11 2009. Found another book, Responsible Science,  
12 Volume I, Ensuring the Integrity of the Research  
13 Process 1992, National Academies Press. You can  
14 go to the website. I didn't include the website,  
15 but you can find it on line. You can get the  
16 books for free. I ask that you read those books  
17 and evaluate your production against those  
18 standards. Thank you.

19 MS. BRAUN: This is Barbara Braun  
20 again, and I was talking about if there were any  
21 alternatives justified other than do nothing, I  
22 was saying that Alternative I has high, very high  
23 costs to the community and there's no  
24 justification for it. Alternative II, the  
25 integrated resources study, which would be a

1 preferred alternative if we have to have one is  
2 not scoped and assessed properly.

3 The appropriate need assumptions are not  
4 correct and they're not using the latest  
5 technology as others here have said. And we know  
6 there are some emerging technologies that could  
7 really drive down the cost of various aspects of  
8 this like battery storage, et cetera, that would  
9 bring Alternative II in at a lower cost than  
10 Alternative I. So we really need to assess that  
11 and do it independently with people that have  
12 expertise and not PSE.

13 And then I think in terms alternatives, the  
14 cities need to have an independent audit if we're  
15 taking data from PSE, an independent audit of the  
16 EIS makes sure that our facts are correct. And  
17 then in any alternative, even in the do nothing  
18 alternative, one of the things that I think we  
19 need to really look at is the safety issues of  
20 co-locating power lines with a hazardous  
21 materials pipeline.

22 And we face a very high risk today as  
23 demonstrated in the article, Criteria for  
24 pipelines coexisting with electrical power lines  
25 done by DNVGL October 2015. That basically says

1 that our current power lines located next the  
2 Olympic Pipeline is a very high risk solution,  
3 and that we have major safety concerns, issues  
4 right now.

5 So any PSE plan should include permanently  
6 removing all power lines from the pipeline  
7 corridor. And this should be a base requirement  
8 that all cities require and we should pass  
9 ordinances that improve the safety regulations  
10 around the pipeline since we just signed a  
11 ten-year lease or whatever it was for the pipe  
12 line, and make sure that we take the power out of  
13 there permanently all together. End of story.

14 So that's it. And I have written comments,  
15 not that you don't already have enough from me.

16 MS. WAGONER: Is there anyone else that  
17 would like to speak? I believe we're through our  
18 signed up speakers.

19 MR. MARSH: My name is Don Marsh. I  
20 live at 4411 137th Avenue Southeast in Bellevue.  
21 I'm the president of CENSE and I'll be speaking  
22 on behalf of CENSE tonight, the Coalition of  
23 Eastside Neighborhoods for Sensible Energy.

24 One of the things that -- during the last  
25 meeting I spoke of our confusion about the

1       increase of power to Canada. I'm not going to  
2       reprise that, but there's other things about the  
3       purpose of this project that confuse us. So as  
4       we know, this project isn't about overall  
5       capacity or -- we've got plenty of power, PSE  
6       tells us that. It's just about reliability in a  
7       certain circumstance, happens when we have peak  
8       loads here in the Northwest, which would be on a  
9       day that's below 23 degrees. That doesn't happen  
10      very often, but maybe a couple times a year.

11             Maybe in a real cold snap, you could have a  
12      week worth of that weather. It really doesn't  
13      happen that often. That's good. We think the  
14      electrical reliability should be studied in that  
15      circumstance because we don't want to be losing  
16      our power when the thermometer drops.

17             In addition to that, PSE says that they need  
18      to study a situation when during that peak load  
19      situation we lose two critical pieces of  
20      infrastructure. In this case it's one 230  
21      kilovolt to 115 kilovolt transformer in the north  
22      side of eastside and one in the south.

23             So if both of those go at the same time we  
24      are experiencing peak loads, that's what they  
25      want to study. And again, we have no problem

1 with that. That is a federal standard to make  
2 sure your system can handle peak loads with two  
3 failures. That's a good thing and we like that  
4 level of reliability.

5 But then PSE adds some additional criteria  
6 on things. And even before I get to there, what  
7 happens when we have that situation? PSE says  
8 that they might have some overloads in the  
9 system, but they have something called a  
10 corrective action plan which is allowed under  
11 NERC reliability standards that can do some  
12 things to reconfigure the network that stop the  
13 overloads, no outages. And we're going great.

14 That sounds like an appropriate response.  
15 But they say if they do that, there are some  
16 neighborhoods, some parts of other communities  
17 that would be served only by one transmission  
18 line. So they say what would happen if we lost  
19 that transmission line under all those  
20 circumstances, then we would have power outage.

21 But we say, hey, wait a minute, is that a  
22 NERC reliability standard that you've lost two  
23 critical pieces of infrastructure and then you  
24 lose a third one. What level of reliability are  
25 we trying to serve here? So that seems a little

1 suspicious to us, but then they've added these  
2 two other assumptions that we don't know where it  
3 comes from.

4 One is the Canadian -- the increase in  
5 Canadian power. And the other one is they've got  
6 nine local generation plants that help produce  
7 power especially in this particular circumstance.  
8 And they say six of those aren't going to be  
9 producing any power in this particular scenario  
10 they're studying. And we're wondering why not.  
11 Why -- those plants are there to serve power in  
12 this particular peak load situation. What  
13 justifies taking those off line?

14 And so there's a table in the Eastside Needs  
15 Assessment that shows the capability of all the  
16 generators in our area and then what PSE is  
17 studying them. And there's a whole bunch of  
18 zeros in that table and other places where the  
19 ratings have been reduced, or it's not producing  
20 up to its full capacity.

21 So they have taken off 1800 megawatts of  
22 power in that table. We've got 1800 megawatts  
23 less available in our area than we should have.  
24 And that requires a whole bunch more electricity  
25 to be pumped in over the Cascades to serve that

1 need. 1800 megawatts, that is two and a half  
2 times the amount of power that the eastside uses  
3 at its peak load according to PSE. They're  
4 saying it's somewhere around 700 megawatts. 1800  
5 megawatts is two and a half times -- it's kind of  
6 like two and a half eastsides just disappeared,  
7 or you could say depending on which side of the  
8 equation you look at, like two and a half times  
9 more electricity that's being required to be  
10 served.

11 PSE says that doesn't really have any impact  
12 on the study. But we know that's actually false  
13 because we ran -- Rich Lauckhart and Roger  
14 Schiffman ran a study that shows taking off that  
15 much capacity in our area causes a whole bunch of  
16 regional issues. So we'd like to get really  
17 clear on what the federal reliability standards  
18 are and whether PSE is really -- if Energize  
19 Eastside is the solution for this reliability  
20 criteria. Thank you very much.

21 MS. WAGONER: Any other speakers  
22 tonight?

23 (No response.)

24 MS. WAGONER: Thank you for your  
25 comments tonight, and, Carol, would you like the

1 floor?

2 MS. HELLAND: Sure. I'd like to say  
3 thank you. I'm sure Jennifer would like to say  
4 the same thing. We really appreciate you coming  
5 out. It was a nice evening. Your participation  
6 ensures that the process is robust. So thank  
7 you. Jennifer?

8 MS. HENNING: Thank you so much for  
9 coming tonight to the city of Renton for this  
10 meeting and we look forward for your continued  
11 involvement. And you'll see some of us from the  
12 cities that come to more of these meetings. So  
13 please do engage us, say hello and we welcome  
14 your comments in every step of the process.  
15 Thank you.

16 (Meeting Adjourned 7:34 p.m)

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ENERGIZE EASTSIDE  
PHASE 1 DRAFT ENVIRONMENTAL IMPACT STATEMENT  
PUBLIC HEARING/PUBLIC TESTIMONY

6:00 p.m.  
February 29, 2016  
15670 NE 85th Street  
Redmond, Washington

LISA R. MICHAUD, CCR  
NORTHWEST COURT REPORTERS  
1415 Second Avenue, Suite 1107  
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PANEL MEMBERS

- CLAIRE HOFFMAN - ESA
- CAROL HELLAND - CITY OF BELLEVUE
- HEIDI BEDWELL - CITY OF BELLEVUE
- CATHY BEAM - CITY OF REDMOND

ALSO PRESENT:

- MARCIA WAGONER - FACILITATOR - 3SB
- CASEY BRADFIELD - TIME KEEPER - 3SB

PUBLIC SPEAKERS

- NORM HANSEN
- BRIAN ELWORTH
- DON MARSH
- LORI ELWORTH
- CHRISTINA ARON-SYEZ
- RON BROMWELL

1           MR. HANSEN: My name is Norm Hansen. I  
2 live at 3851 136th Avenue Northeast in Bellevue,  
3 and we've lived there for 43 years. I've been  
4 involved in this project. I was a member of the  
5 CAG which was the earlier group that PSE put  
6 together. And I have a copy of the EIS. And I  
7 still have some thoughts that I don't completely  
8 understand the need.

9           And I know that when you look at the EIS  
10 document 1-5, it says make sure you understand  
11 the need and requirements before you comment on  
12 this. Well, recently a load flow study was done  
13 by another national expert which really conflicts  
14 with the ones that had been done previously based  
15 primarily on some, what we feel, are erroneous  
16 assumptions.

17           And so I feel before you continue to Phase  
18 II that you would issue a final Phase I EIS to  
19 settle this controversy to define what the need  
20 really is, because if we have no need, there's no  
21 need to charge 1.1 million rate payors to  
22 continue on with this activity.

23           Now, that need may be stretched out 10, 20  
24 years or more, and so that's my -- it would be  
25 common sense, I believe, to figure out how we're

1 going to do an objective review because what  
2 happens is that some of the consultants, they  
3 work in the industry and they're looking -- they  
4 need to work and think about their next job.

5 And so we're not sure that that influences  
6 some of the criteria that they use. And so --  
7 and I know that the city doesn't have any  
8 particular technical competence in this  
9 particular area. We've encouraged them in the  
10 past to obtain that so they would have something  
11 on their staff.

12 The electrical reliability study that was  
13 done several years ago also recommends that that  
14 be done. And I know the City Council now finally  
15 has put in their new budget \$150,000 to maybe  
16 pursue some type of activity.

17 And so I think it would benefit the whole  
18 community, the whole eastside to take a real  
19 common sense approach. So thank you.

20 MR. ELWORTH: My name is Brian Elworth.  
21 I live at 8605 129th Court Southeast in New  
22 Castle. I'm going to go over a few topics that  
23 I've already touched on previously. So I want to  
24 revisit a few topics that I've talked about  
25 mostly in the form of questions.

1           One of the basic ones, is this EIS about a  
2           PSE need or customer needs? Because that's kind  
3           of confusing. It's kind of muddled together and  
4           I'd really like you to make that decision. The  
5           SEPA handbook section 3.3.1 it says, "Agencies  
6           are encouraged to describe a proposal as an  
7           objective", not just as a solution, which is what  
8           PSE says, here's a solution. Love it.

9           It's supposed to be stated as an objective.  
10          What are we trying to achieve here. So if it's  
11          about cities and residents, the whole EIS  
12          objective must be recast in the context of  
13          something like identify and address energy needs  
14          for the region in the next decade.

15          This opens up a wide spectrum of opportunity  
16          for a viable energy future. If it's about PSE,  
17          please delete all the irrelevant and erroneous  
18          statements regarding need. Just state PSE wants  
19          230 kilovolt power lines.

20          I want to talk about what looks like  
21          apparent bias, maybe unintentional, obviously  
22          unintentional, but the DEIS seems to carry some  
23          biases and I want to maybe clarify why that is  
24          and there's probably good explanations.

25          WAC 197-11-960, the environmental checklist,

1 air, Section A, "What type of emissions to the  
2 air would result from the proposal during  
3 construction, operation, and maintenance when the  
4 project is completed? If any, generally describe  
5 and give approximate quantifies if known."

6 B is, "Are there any offsite sources or  
7 omissions or odors that may affect your proposal,  
8 if so, generally describe." And then in WAC  
9 197-11-444 elements of the environment, air  
10 quality is mentioned there. So air quality seems  
11 to be a subject we're supposed to talk about.

12 So what exempts the DEIS from including  
13 mercury and toxic standards, the MATS standards,  
14 controlled air pollutants from consideration?  
15 Just one-seventieth of a teaspoon of mercury  
16 deposited on a 25-acre lake makes the fish unsafe  
17 to eat. So that's from the Union of Concerned  
18 Scientists if you want to look up that quote.

19 The EPA ranks coal strip power among the  
20 worst in the nation for mercury. That's a 2011  
21 statement. And also ground water, they're also a  
22 major pollutant of ground water due to coal ash.  
23 Should that not be considered?

24 Alternative I is about using power from coal  
25 strip. And Alternate I increases both the

1 greenhouse gas, which you do identify, but it  
2 also increases all these toxic pollutants. So  
3 why is this distinction ignored? I'd kind of  
4 like -- I think that ought to be documented in  
5 the DEIS.

6 Alternative II is a huge environmental  
7 benefit 24/7 365 days a year. Not just during  
8 the conditions that PSE states is the problem  
9 area. It's working for you all the time. Off  
10 peak wind and solar generation along with battery  
11 storage help mitigate peak load generation, coal  
12 strip demand every day, not just the couple days  
13 a year where PSE says we have a problem.

14 So it's like your Prius battery. It's  
15 always working for you, not just when you're  
16 climbing the big hills, all the time it's  
17 moderating the flow to reduce the demand on the  
18 engine. It's working for you full time on that.

19 Alternative II is exactly that same way.  
20 It's working for you. It's a good thing to do  
21 even if this whole thing goes away. So it's  
22 not -- I don't think it's given proper credit for  
23 the environmental benefits that Alternative II  
24 provides.

25 So I'm asking why do those get ignored? To

1 me they're important. It's an important part of  
2 what that alternative is about. It's an  
3 important discriminator between Alternative II  
4 and Alternative I. So it kind of looks like it's  
5 being sandbagged. I don't know what the SEPA  
6 process is, but if it's in somebody else's  
7 backyard, you get to ignore it.

8 This is all happening in Montana and you  
9 might say, well, that's not a Washington State  
10 thing, I don't care about it. If that's a  
11 reason, maybe it would be helpful to state that.

12 Another subject, GMA and destruction of  
13 housing. The environmental checklist talks  
14 about -- I'll come back.

15 MR. MARSH: My name is Don Marsh, I'm  
16 the president of CENSE, the Coalition of Eastside  
17 Neighborhoods for Sensible Energy. And I live at  
18 4411 137th Avenue Southeast in Bellevue. And I'd  
19 actually like to continue the discussion of  
20 Alternative II. As you probably can tell  
21 residents really like the idea of making some  
22 progress on our environmental goals and lots of  
23 other advantages that Alternative II seems to  
24 provide.

25 And so I was really ready to read about

1 Alternative II in the DEIS, and so I started at  
2 section 2.3.1 which talks about energy efficiency  
3 and that's says, "The potential for additional  
4 energy efficiency on the eastside is not  
5 currently known and would require additional  
6 evaluation."

7 That was a little disappointing. I was  
8 hoping I would find out something about energy  
9 efficiency. But then it says, "The additional  
10 energy efficiency assumed for Alternative II  
11 would be triple the amount that PSE estimated as  
12 achievable after 2024, and that additional energy  
13 efficiency would have to be accomplished before  
14 2024." Is this even possible? It sounds crazy.

15 Maybe energy efficiency isn't really going  
16 to work for us. So I have, well, maybe demand  
17 response. Demand response is a big topic in the  
18 northwest, the seventh northwest power plan from  
19 the Northwest Power and Conservation Council. So  
20 demand response is recognized as going to make a  
21 big difference in the northwest.

22 And the DEIS says, "For the Phase I draft  
23 EIS, it is assumed that an additional 32  
24 megawatts of demand reduction would need to be  
25 accomplished in the eastside by 2024." This

1 would triple the expected rate of adoption of  
2 demand response in PSE's integrated resource  
3 plan.

4 Wow, do we have to do something three times  
5 again what PSE is saying we can do? That sounds  
6 pretty hard. Well, maybe batteries, so 2.3.3.4  
7 deals with energy storage. And it says, "An  
8 energy storage system with power and energy  
9 storage ratings large enough to reduce normal  
10 overloads has not yet been installed anywhere in  
11 the world."

12 We will be building the biggest battery  
13 ever. Is that practical? Citizens are really  
14 worried. This sounds like a fantasy. Okay,  
15 let's go on to peak generation plants 2.3.3.1.  
16 "Most of the substations on the eastside are in  
17 residential areas and these types of generators  
18 produce a high noise level that would be  
19 incompatible with those surroundings. For this  
20 reason PSE has eliminated this option from  
21 consideration."

22 Man, Alternative II just sounds terrible to  
23 me. I don't think we can build something that's  
24 this crazy. Well, actually we thought we better  
25 get a second opinion on that to make sure. So we

1 hired an industry analyst named EQL Energy. You  
2 might have heard of them before. They helped us  
3 with alternatives during the prior scoping round  
4 for the EIS.

5 And EQL Energy looked at this proposal and  
6 he said, boy, there is a lot of inaccuracy in  
7 this, obsolete data, downright errors in this.  
8 Looks like PSE has -- seems PSE is driving this  
9 whole description of Alternative II from what he  
10 could see.

11 So, for example, so we said what would be a  
12 reasonable plan? And he described energy  
13 efficiency at 30 megawatts, which is about a  
14 third less than the DEIS. And that's achievable  
15 because the DEIS is using obsolete and incorrect  
16 data regarding energy efficiency. And makes it  
17 look a lot less feasible than it actually is.

18 In demand response he actually identified  
19 one-third higher capability than DEIS estimate,  
20 but that's based on conservative estimates and he  
21 breaks it into two different parts. A day ahead  
22 strategy and a ten minutes strategy of demand  
23 response that gives you a potential that's higher  
24 than what's in the DEIS.

25 What really interested me was his analysis

1 of energy storage. He said we could get by with  
2 15 megawatts which is about one-eighth of the  
3 size that's prescribed in the DEIS. So that's  
4 much more economical and feasible and it's also  
5 much more economical because the DEIS analysis  
6 doesn't included the cost avoided transmission in  
7 its energy cost. So it's much more attractive  
8 than what the DEIS and the stratagem report might  
9 have you think.

10 In addition to these he identified 19  
11 megawatts of distribution efficiency that could  
12 be gathered. Combined heat and power, you could  
13 get 30 megawatts. And it's a great time to be  
14 thinking about that because with all the building  
15 in downtown Bellevue in the Spring district it's  
16 very, very feasible.

17 19 megawatts of dispatchable standby  
18 generation. Anyway, we will be putting in a  
19 detailed description of all these things into the  
20 DEIS. I will submit that report tomorrow night.  
21 Very excited to really grasp the future of our  
22 eastside energy. Thank you.

23 MS. ELWORTH: My name is Lori Elworth.  
24 I live at 8605 129th Court Southeast in New  
25 Castle. Thank you for the opportunity for my

1           comments. My comments tonight are directed  
2           mainly at Alternative I, Option A. I live with  
3           my husband and our two kids just a few miles from  
4           where we grew up in Newport Hills where our  
5           parents still live.

6           The PSE Olympic Pipeline corridor allows us  
7           to easily walk and bike over to their houses  
8           while avoiding the busy streets and traffic along  
9           Coal Creek Parkway. My 90-year-old mother takes  
10          advantage of the corridor to go on four-mile  
11          round trip walks to the New Castle Safeway.

12          She has been doing this daily for the last  
13          25 years and it has helped her remain in  
14          excellent health, but we are not the only people  
15          who enjoy the use of the corridor. Countless  
16          other families; bikers, dog walkers and even some  
17          horse riders all can be found out about getting  
18          their exercise along the pipeline at all times of  
19          the day.

20          The utility corridor is a significant part  
21          of the New Castle trial system. Every resident  
22          that enjoys making use of it will be negatively  
23          impacted by any restrictions of access that the  
24          Energize Eastside project will cause.

25          The DEIS fails to adequately or reasonably

1 address how much this project will adversely  
2 affect these people. We live in a hilly area  
3 that sees more and more traffic every day. The  
4 flat sheltered trail that is the corridor is a  
5 blessing for senior citizens, people with young  
6 children or strollers. I know this firsthand. I  
7 have lived there my entire life.

8           Nevermind all the beautiful trees that will  
9 be destroyed and many houses that will need to be  
10 condemned to ensure that power lines are  
11 installed at a safe distance from the gas  
12 pipeline.

13           This unnecessary project will destroy some  
14 of the neighborhood character that makes this  
15 area a great place to live. Thank you. I want  
16 to submit this for the public record.

17           MS. ARON-SYEZ: Good evening, my name  
18 is Christina Aron-Syez and I own my home at 13725  
19 Northeast 34th Place in Bellevue. I'm speaking  
20 this evening on behalf of the Shadow Wood Lane  
21 Homeowners Association of which I am the  
22 president. I am also a board member of CENSE.

23           I have been heavily involved in  
24 understanding PSE's proposed Energize Eastside  
25 project for over a year and a half since my

1 neighbor invited me to someone's house to learn  
2 more about it. Until that moment I had not heard  
3 of the project. I was stunned when I learned  
4 what PSE is attempting to build through the heart  
5 of the eastside. The proposed route does not go  
6 through my property, but it does affect two of  
7 the 13 homes in our association.

8           However, I want to be clear, I would still  
9 put in the dozens of hours a week that I do to  
10 oppose this project no matter where on the  
11 eastside it might be sited. I care too much  
12 about my wonderful community and the health and  
13 welfare of its residents, especially the  
14 children, to let this go.

15           This project has such fatal flaws in its  
16 foundation and its proposed execution that to  
17 construct it would be a failure of due diligence  
18 by the authorities including you, Ms. Helland,  
19 who are charged with the responsibilities of  
20 being the SEPA officer. For example, this DEIS  
21 does not identify all interdependent pieces of  
22 the project under Washington Administrative Code  
23 197-11-0603. Allow me to explain.

24           Section 2.2 of the DEIS described in detail  
25 what PSE's objectives are for building Energize

1 Eastside. It then lists 15 electrical and four  
2 non-electrical criteria that the project or any  
3 alternative must meet. These criteria were  
4 written by PSE themselves and there is no  
5 discussion whatsoever in the DEIS of whether  
6 these 19 collective criteria each have merit or  
7 are even reasonable.

8 The only basis for accepting them is that  
9 PSE must meet, quote, applicable transmission  
10 planning standards and guidance, end quote.  
11 These 19 points are the material backbone to the  
12 rest of a 711-page document. Every alternative  
13 is vetted against these 19 points. Yet there is  
14 zero analysis for their basis other than the NERC  
15 and WECC standards listed in the Criteria I.

16 For example, items 7, 9, and 11 have no  
17 basis in either the NERC or WECC documents listed  
18 in number one. What is happening? PSE has  
19 essentially created a list of things it wants as  
20 criteria. Yet these things are not actually in  
21 line with the NERC and WECC requirements listed  
22 here or in other regional requirements which you  
23 will hear more about tomorrow night from Don  
24 Marsh.

25 Why would PSE do this? To ensure that only

1           their project gets built. I will submit my  
2           detailed and technical analysis before March 15,  
3           however, in summary, PSE is not building Energize  
4           Eastside to satisfy any federal reliability  
5           requirement. How do I know this? I have  
6           technical experts on my side. Experts such as  
7           Rich Lauckhart. I am sure you've heard of him by  
8           now.

9                     This brings me to my next point. What  
10           technical experts such as someone like Rich  
11           Lauckhart does the lead agency for \$1.4 billion  
12           project have on their side to guide them through  
13           this intensely complex project? As far as I can  
14           see there are none comparable.

15                    Bellevue has failed to comply with the  
16           recommendation from their own consultant,  
17           Exponent in 2012 to hire an electrical expert to  
18           the city staff. This is a serious shortfall in  
19           the technical ability of the city staff and DEIS  
20           staff to adequately comprehend what is being  
21           proposed by PSE and to separate the wheat from  
22           the chaff when it comes to what PSE wants and  
23           what PSE is actually required to do. In closing,  
24           I leave you with this:

25                    What if a business came to you and said we

1 need to build a 100-story skyscraper in downtown  
2 Bellevue. Let's also assume that this particular  
3 business has a lot of money, clout, and power to  
4 make this project happen. From the specs they  
5 gave you, this building appears to be very  
6 unsafe, doesn't appear to truly need to be 100  
7 floors because only two of them will be occupied,  
8 and will cost area residents \$1.4 billion.

9 Do you think you would hire an architect, a  
10 financial analyst, a whole bevy of other experts?  
11 You surely would. So why in the case of Energize  
12 Eastside is the DEIS staff using a no questions  
13 asked approach when the safety of thousands of  
14 residents are in their hands?

15 We deserve better and we will not relent.  
16 Thank you.

17 MR. BROMWELL: My name is Ron Bromwell.  
18 I live in Bellevue, 13650 Northeast 34th Place in  
19 Bellevue. I have the joy of having seven large  
20 wires going through my backyard as well as two  
21 gasoline pipes. So that's why I'm here. It  
22 seems to me that we're hearing very, very little  
23 about the safety of the pipeline. Not the power  
24 line, the pipeline because these electrical lines  
25 are going to be within a very, very short

1 distance from two large pipes up to 20 inches in  
2 diameter which are filled with gasoline. And  
3 they're full all day because they feed the SeaTac  
4 airport.

5 I have been in communication with the  
6 president of Olympic Pipeline, and he has advised  
7 me that they do not have a say in this which  
8 amazes me because they are the subtenant of the  
9 easement. The easement is 100-foot wide and the  
10 power line has 85 feet and the pipeline has  
11 15 feet.

12 Now in 85 feet, these new poles are going to  
13 go in and presumably they're going to be in the  
14 middle of the 85 feet which means they will be  
15 within 50 feet meaning about 40 feet of these  
16 gasoline pipes, which is contrary to the  
17 Bonneville Power Association.

18 They say a minimum of 50 feet should be the  
19 safety zone for anything coming near to power  
20 line structure. So these are important issues.  
21 Because the pipeline cannot say anything about  
22 this, they are the subtenant of the easement and  
23 the only alternative is for them to move the  
24 pipeline, which you can imagine doesn't thrill  
25 them very much.

1           But at the same time, the thought of putting  
2           in concrete posts to a foundation for up to 72  
3           poles, which is what would happen over the  
4           18-mile stretch, this would obviously create a  
5           great deal of construction activity within just a  
6           few feet of these two gasolene pipelines.

7           Now, in the literature that the pipeline  
8           puts out, it tells you that pipelines are very  
9           sensitive to vibration. And even putting a fence  
10          post in, a fence post goes down two feet as  
11          opposed to a foundation for a 120-foot power line  
12          pole, there's going to be substantial activities  
13          and vibration.

14          So that's just in the structure, but even on  
15          into the future you've got significant problems  
16          because you've got lightening strikes -- if I can  
17          just quickly finish -- you have a grounding  
18          system where the wire comes from the high tension  
19          electricity down the pole, but then it has to go  
20          several hundred feet in the ground alongside the  
21          gasolene pipes in order to earth them.

22          And so it's just a terrifying prospect  
23          particularly because now we've been identified as  
24          an earthquake zone. As you may know, the Pacific  
25          Northwest is registered as the most significant

1 earthquake zone in North American.

2 I have that all documented from this  
3 testimony I gave to Bellevue a week or two ago,  
4 so I'd be happy to send you each a copy if I  
5 could get your names and mailing addresses.

6 MS. BEDWELL: You can send it to the  
7 general info line we have for you or I can give  
8 you my business card and you send it to me  
9 directly.

10 MR. BROMWELL: I'd like to do that,  
11 please.

12 MR. ELWORTH: Brian Elworth returning  
13 to complete my presentation here. Growth  
14 Management Act and destruction of housing, I want  
15 to touch on what you talked about in New Castle.  
16 This project destroys my neighborhood. I think  
17 the DEIS was a bit light on that subject.

18 WAC 197-11-960, "Environmental checklist  
19 land and shoreline use, what is the current use  
20 of the site and adjacent properties? Will the  
21 proposal affect current land uses on nearby or  
22 adjacent properties? If so, describe.

23 "Will any structure be demolished? If so,  
24 what? What is the current zoning classification  
25 of the site? What is the current comprehensive

1 plan designation of the site, proposed measures  
2 to ensure that the proposal is compatible with  
3 existing project and land uses and plans, if  
4 any"?

5 So it touches a little bit lightly on that.  
6 It does address some of these very lightly, but  
7 basically corridor M, the right of way is not  
8 wide enough. And I spoke to that on Saturday.  
9 It is not wide enough.

10 So why are none of these issues being  
11 addressed at least qualitatively in the DEIS.  
12 There's a light touch on them, but you can at  
13 least list the neighborhoods that are going to be  
14 destroyed by this proposed solution.

15 Just list out the neighborhoods, list out  
16 the impacts, maybe you don't have to say  
17 50 percent of the neighborhood or huge  
18 destruction, you can just say these ones are  
19 impacted. At least list those things and do a  
20 little bit more thorough job of the qualitative  
21 nature of the impact of Alternative I. Thank  
22 you.

23 MS. WAGONER: Was there anyone else  
24 that would like to speak?

25 (No response.)

1 MS. WAGONER: I'm going to turn the  
2 meeting back to Carol.

3 MS. HELLAND: I just want to say thank  
4 you so much for coming tonight. Many of you we  
5 have seen before, but there are some new faces  
6 and we appreciate every one of the continuing  
7 comments. Every one has been very thoughtful  
8 about bringing new issues to the microphone every  
9 time they come up to speak.

10 That's very appreciated and with essentially  
11 identifying questions and concerns that they have  
12 with the draft EIS. They will all be taken into  
13 account and it makes -- your feedback to us makes  
14 the process more robust and thorough.

15 So thank you for taking your time this  
16 evening. And tomorrow night the next meeting is  
17 at the City of Bellevue if any of you are  
18 attending that. And as Claire noted, any  
19 comments in writing can then be submitted until  
20 March 14. So thank you and have a nice evening.

21 (Meeting adjourned 7:20 p.m.)

22 ////

23 ////

24

25

Timestamp	First Name	Last Name	Comment
1/28/2016 20:19:11	Linda	Porter	<p>This document seems lengthy, in fact almost endless, to me. Would you please direct me to the sections and exact pages where i might find useful maps of exactly where each Option would have construction impact. In other words, what neighborhoods would be impacted by each Option.</p> <p>Thank you.</p>
1/29/2016 10:21:40	Suzi	Beerman	<p>It appears that the energy company has done very little to promote real alternatives to these extremely tall and dense power poles on primarily private property. If we conserve properly, the power company doesn't stand to profit unless they can send our unused energy to Canada, where its owners are headquartered.</p> <p>The power company should have to rise to a certain level of green energy success before it can ever be allowed to make such dramatic changes to the power system, people's private property, and the number of trees along the pathway.</p> <p>Safety has not been addressed sufficiently where those towers are being built directly on top of the fragile jet fuel pipeline under the current power lines.</p>
1/29/2016 11:14:02	Michael	Hafken	<p>Chestnut Hill Academy, a private elementary school, is located directly adjacent to the current Lakeside substation. While it is an industrial land use zone, it is still a school filled with hundreds of young children.</p> <p>Section 10.7.3 lists the Lakeside substation as a potential location for a new 230 kV to 115 kV transformer but the school is not mentioned as being nearby. Table 10-1. SHOULD list an elementary school as being around the Lakeside substation as it is literally 100-150 feet away from the school.</p> <p>Studies have shown an increase in risks of leukemia to children who are exposed to average levels of magnetic fields above 3 or 4 mG. What impact, if any, would an expansion of Lakeside have on levels of EMF at this school?</p> <p>Regardless of what zone a school is in, the health and safety of children should be taken into consideration in any expansion of the Lakeside substation.</p>
1/29/2016 12:17:11	Nathan	Hoff	<p>I am absolutely 100% opposed to the installation of replacement high transmission lines in populated areas for Energize Eastside. I won't be satisfied until an alternative that includes underground lines is fully explored and presented as a viable option by PSE. The current lack of this alternative is unacceptable and is anathema to the needs of the communities and the property values of Eastside residents.</p> <p>Nathan Hoff Somerset Neighborhood Bellevue, WA 98006</p>
1/30/2016 17:51:10	Richard	McNeill	<p>Of the alternative routes for the proposed power lines, I support underground and possibly underwater. The large towers have a wide negative influence on neighbors and business.</p> <p>Before any permit is given, please verify that the Eastside will need more energy than what is available now. The claim is in dispute. PSE, opponents say, needs the lines to expand its capacity for power to Canada.</p> <p>Please review the claims PSE is making in its ads. And do not allow PSE to put its profits over the appearance and livability of our community.</p> <p>Thank you very much.</p>

1/31/2016 8:53:51	Raymond	Silverstein	<p>Electricity users have not been asked to do enough to partner in solving the capacity issue. Alternatives 1 and 3 can always be deployed if Alternative 2 does not end up yielding the kind of demand and supply side expectations needed to meet the forecasted need. In addition, none of us can accurately predict the future. The 'dire' circumstances predicted may well not come to pass. Technological innovations may arise that end up addressing the capacity issues (like, for example, Tesla's home battery solution).</p> <p>Continuing to increase capacity also encourages the seemingly insatiable hunger for more and more electricity by the communities. The only way to really rein in GHGs and carbon impacts is to constrain the supply.</p> <p>Therefore, I advocate pursuing Alternative 2 as the first thing we try. We all need to pitch in here and simply adding more and more capacity is not the solution.</p> <p>One minor note: page 1-54 shows the Recreation impact as 'minor to significant' across the board for Alternative 2. This is misleading based on the findings. Also, I think it is misleading to color 'minor to significant' as red. It should be yellow.</p>
2/5/2016 10:10:12	Alice	Evans	<p>I have been following PSE's proposal for building new power lines on the Eastside. I support Alternative 2. Its flexibility, its respect for the residents of our city and for their property values, its lower cost, its lower vulnerability to damage from storms, fires, and terrorism, clearly make it the best choice. I have noticed and resent PSE's many misrepresentations and steamroller approach. I, for one, have learned not to trust them. Please support Alternative 2.</p>
2/5/2016 10:10:38	Margaret	Niendorff	<p>As a "local need", paid for through our local fees, this project need not include Canadian needs. Please "proper-size" this project, using appropriate data that serves our community needs. The objectives of EE can be met through Alternative 2 without compromising our "City in a Park".</p>
2/5/2016 10:31:15	Mike	Roser	<p>Alternative 2 or bury the lines</p>
2/6/2016 11:59:36	Jeff	Callison	<p>Do the right thing- new forward thinking technology, citizen friendly, in Alternative 2 vs older, uglier, less safe, and neighborhood value declines in overhead transmission lines.</p>
2/8/2016 15:08:22	Keith	Laepfle	<p>Hello, I'm a Bellevue resident of over two decades writing in support of Alternative 2.</p> <p>After having attended a PSE open house, where I spoke with multiple PSE engineers and representatives, read most/all information presented by CENSE, and spoken with neighbors also tracking Energize Eastside, it is not at all convincing that new overhead transmission lines are necessary for Bellevue and other Eastside cities to continue thriving and sustainably progress.</p> <p>In fact, it seems even more likely to me that further incentivizing PSE, developers, and residents to embrace alternative power infrastructure options would be an even healthier path for all of our communities, and our country overall. This is an opportunity for us to show leadership and innovation, propelling the energy solutions necessary to evolve to a more managed, thoughtful approach to growth and development, that America and the world so sorely needs.</p> <p>Building 18 miles of bigger, uglier, potentially risky transmission lines is mid-twentieth century thinking, serving only the narrow economic interests of the utility, its shareholders, and the non-local customers who'll also benefit from them. Forward thinking communities such as ours need to think beyond expediency, towards what will truly advantage our lifestyles and values.</p> <p>Please scrutinize and consider all alternatives before allowing major new transmission lines to be built.</p>

2/12/2016 16:03:13	Roger	Anderson	As a forty year resident and Bellevue construction business owner I strongly support Action Alternative 1 A. I have carefully read the Phase One Environmental review and believe that the technical information provided strongly supports this alternative as the most predictable and cost effective method of constructing the electrical transmission lines we must have to support population and business growth in the future. Alternative 1 B (SCL corridor) would also have my support for further study in the Phase Two and Final EIS process. If coordination with SCL is not immediately assured or creates schedule uncertainties time should not be wasted on further effort in this direction. Moving this process as quickly as possible is of paramount interest to citizens of the Eastside. Rolling Outages for any period of time or for any process purpose is not an acceptable alternative.
2/14/2016 10:24:46	Deandra	Bishop	I have been a resident of Bellevue for over 43 years and for the last 40 have lived along the power line easement. When I purchased the lot my home is built on, I knew about the power lines and I was able to make an informed decision about buying with the powerlines running right through my back yard. Now I am faced with having much higher voltage power lines running over my back yard and the possibility of a large tower built on my property. I am very concerned tht these lines are being contemplated along the Olympic Pipe Line route. I am very concerned about the decrease in the value of my home. I believe it will be significantly higher than Puget Power estimates. I believe the project is unnecessary to provide power to our east side communities and do not believe we should be blighting our neighborhoods and increasing our risk to our community unless there is no reasonable alternative.  Please do everything in your power to stop this project and please pass a city ordinance prohibiting additional high power lines coexisting above the Olympic Pipe Line.
2/20/2016 7:32:19	Barbara	Braun	New information coming to light from the independent load flow study completed by respected industry experts Rich Lauckhart and Roger Schiffman show the PSE needs analysis and conclusion for this project are not only flawed but likely fraudulent. This independent analysis was completed by these experts with CEII clearance and using PSE data provided by the WECC Base Cases from FERC. Their conclusion: PSE is using an impossible load scenario to try to scare residents into funding a billion-dollar project.
2/20/2016 7:33:50	Barbara	Braun	16.The EIS provides does not question the need to the project. The City of Bellevue and PSE say they have done all the needs analyses that are going to be done, case closed. In fact the Lauckhart/Schiffman analysis suggests that the No Acton alternative is the one to select at this time because we have no immediate need for additional power. In the future, Alternative #2 would be the alternative to pursue as new technologies become more viable and cost effective. Alternative #2 is more scalable, more reliable and more cost effective. The EIS analysis of Alternative #2 is based on outdated data and needs to be revisited by people with the right expertise, not by PSE who has every motivation to maintain status quo, antiquated solutions.
2/20/2016 7:34:53	Barbara	Braun	17.The Bellevue City Council, along with all the city organizations, should pause the EIS process and truly review the need for this project by either accepting the Lauckhart/Schiffman analysis or contracting for a truly independent study that includes an honest, transparent and verifiable load flow study. The Council needs to either use the services of CENSE or some other truly independent counsel to insure they get unbiased modeling and analysis. This has not happened to date. The independent studies have either not run their own load flow studies or have used the flawed (impossible scenario) assumptions provided by PSE. The Council should agree with the base case scenario and assumptions being used in any independent load flow analysis. It should also get an independent assessment of the demand forecast as the PSE demand forecast also looks to be flawed – overstated and with incorrect assumptions. PSE used forecast growth of 2.4% per year to justify the project. PSE sent WECC a forecast of only 0.5% per year. Can this discrepancy be explained? If you use PSE's own forecast to WECC, it clearly indicates the project is not needed. The Council has the authority to require a pause in the EIS and to get an independent assessment done. The Council should partner with the other cities to do this and to get them to participate. The Council should not shirk their duty on this.
2/20/2016 7:35:40	Barbara	Braun	Energize Eastside is a needless waste of ratepayer funds, to the Eastside and the environment, not the best solution for reliability or safety, is motivated to maximize investor returns.

2/20/2016 7:36:57	Barbara	Braun	PSE also states there are no issues with co-locating HVAC in a pipeline right of way. {Mark Williamson said, "You don't need to do any engineering studies. [25 feet of separation is] far enough that you can just be laissez-faire and let it go."}. CENSE investigated this and finds the logic highly suspect. In looking at "Criteria for Pipelines Co-Existing with Electric Power Lines," prepared by DNV-GL, October 2015, Energize Eastside looks to be extremely high risk. They contacted Dr. Frank Cheng, a recognized pipeline safety expert, who concluded "HVAC affects adversely the integrity and safety of buried pipelines that are collocated with electric power lines right-of-way and that "... a comprehensive study program would be developed prior to construction of the power lines."
2/20/2016 7:38:08	Barbara	Braun	In fact, it looks as if the current power lines in this right of way are very high risk and should be removed to improve the safety of the community, especially since the City of Bellevue just signed a 10-year agreement with Olympic Pipeline.
2/20/2016 7:39:09	Barbara	Braun	The City of Bellevue should complete an independent study to dismantle the current power poles that run in the right of way and remove them from the grid altogether. I suspect that an independent study would reveal that given the collective capacity already running through the eastside, from all providers, provides more than enough power to meet future demand. The antiquated poles should be removed and no transmission lines should ever be put through that corridor. This is a basic safety need of the community. The City of Bellevue should pass a resolution to put a moratorium on construction of anything in the pipeline right of way.
2/20/2016 7:40:13	Barbara	Braun	The final version of the Seventh Power Plan from the Northwest Power and Conservation Council will be released in late February. They are concluding Energy Eastside is not needed. Why would we put our head in the sand and ignore the evidence that is all around us? This project is not needed.
2/20/2016 7:41:13	Barbara	Braun	We need to take PSE out of private sector and make it a public utility district.
2/20/2016 7:42:12	Barbara	Braun	If the City of Bellevue allows this project to proceed without question and there are accidents or even cost overruns. What will this say about City officials? Will the City be negligent? PSE will certainly be found negligent. Just think of the countless pipeline accidents. Think of Bellingham. Why are we being dismissive and irresponsible about our own safety? Does Bellevue want to be known for blatantly exposing it's citizenry to off the charts safety risks? Like Flint Michigan? Think of the highway tunneling project in Seattle. Does Bellevue want to be known for costing rate payers billions of dollars? Think about it.

2/20/2016 15:46:10	Kelly	McGill	<p>Thank you for the opportunity to comment on this project. In the interest of full disclosure I was employed by PSE for over twelve years, and left voluntarily in 2014 to pursue another opportunity. I was directly involved in this project in its early planning stages as a Right of Way Agent.</p> <p>While I am not qualified to evaluate the load models that PSE or its detractors use, I am, for the sake of this comment assuming PSE's science to be accurate . My comments assume the need for the project is well justified and that the region's growth depends on a robust electrical system.</p> <p>I speak in support of the only two alternatives that I feel are a reasonable use of land resources, specifically options 1a and 1b. In both cases the routes substantially use existing rights of way that were purchased ages ago and where homeowners have made a choice to purchase homes adjoining. The resistance neighborhoods such as Somerset and Olympus have created is quite astounding. The residents made decisions to live in developments created adjacent to the rights of way, and seem to feel those land rights are somehow invalid. I would encourage anyone to read the easements themselves, they are quite broad and are certainly appropriate for high voltage lines. PSE ought to use an existing corridor, where practical, rather than create new ones.</p> <p>I urge the decision makers on this project to weigh heavily the need for an electrical system that can accomodate a robust economic growth against the often ill informed opinions of individuals who voluntarily purchased property right next to an already active energy corridor.</p> <p>Sincerely</p> <p>Kelly C. McGill SR/WA</p> <p>P.S. I spent the first three years of my life growing up in a house on College Hill. The entire backyard being in PSE's Right of Way.</p>
2/21/2016 15:22:07	Denise	Mickelson	<p>I am responding to the Draft EIS for the Energize Eastside Project.</p> <p>As a resident of Bellevue for 55 years, I am very disappointed in the Alternatives that are presented to our Somerset neighborhood for the Energize Eastside Project by Puget Sound Energy.</p> <p>The Olympic Pipeline runs in front of our home and the existing 115kV transmission lines currently run through our backyard. We are squeezed by these two utilities.</p> <p>My main concern besides disrupting the character of our neighborhood is that the proposed high voltage transmission lines are located too close to the Olympic Pipeline and would increase the risk of a catastrophic explosion. We have jokingly asked ourselves, would we run up the hill (towards the downed lines) or down the hill (towards the burning fuel) should a catastrophe indeed occur.</p> <p>Having attended the meetings both at the Bellevue City Hall to learn the details of the Energize Eastside Project as well as the meetings offered by CENSE, I am convinced that the project has been mismanaged and that the No Action Alternative 4 should be the choice as a short-term solution.</p> <p>Sincerely,</p> <p>Denise Mickelson Somerset Resident</p>

2/21/2016 15:46:25	Jeffrey	Byers	<p>Richard Lauckhart, the former Vice President of Power Planning at Puget Sound Power &amp; Light (the predecessor of PSE), is a man that deeply understands the technical details of PSE's Energize Eastside project and what Mr. Lauckhart recently revealed in his technical study of the project can only be described as shocking [Lauckhart R., Schiffman R. (2016) Lauckhart-Schiffman Load Flow Study, <a href="http://cense.org/Lauckhart-Schiffman%20Load%20Flow%20Study.pdf">http://cense.org/Lauckhart-Schiffman%20Load%20Flow%20Study.pdf</a>]. In a nutshell, PSE misled our region about the electric load growth on the Eastside, the capacity of our current transmission system, the cost of the project, the impact on the area, the safety of the project, and the efficacy of the proposed transmission line.</p> <p>To justify Energize Eastside to the people of the Eastside, PSE told us a very different number from what they told the region's electric planning entity – the Western Electric Coordinating Council. In fact, they told us that customer demand would grow at a rate almost FIVE TIMES higher (2.4% per year growth) than what they told the WECC (just 0.5% per year). [Lauckhart-Schiffman Load Flow Study, Appendix B – Choice of Base Case]</p> <p>PSE also came up with an irrational capacity scenario to justify Energize Eastside. Electric utilities are required to simulate what would happen if two critical elements of their system failed. PSE did that by simulating outages at the Talbot Hill substation in Renton and their Sammamish substation in Redmond. Interestingly, in that scenario the system kept working. So PSE added several more inexplicable conditions to the scenario, taking six local power plants offline while sending 1,500 megawatts of electricity to Canada. It's not clear why the power plants would be offline when they are meant to be run in precisely these types of emergency situations and Canada would in no way be expecting our electricity when we're in the midst of an emergency [Lauckhart-Schiffman Load Flow Study, Appendix D – Exports to Canada]. Besides that, PSE appears to have used the wrong transformer capacity in their much publicized demand growth chart (<a href="http://energizeeastside.com/need">http://energizeeastside.com/need</a>). Instead of using the appropriate "winter emergency" capacity for their transformers in their winter peak demand scenario, they incorrectly used "summer normal" transformer capacity, which is 24% lower! [Lauckhart-Schiffman Load Flow Study, Appendix F – Equipment ratings]</p> <p>But for just a moment, let's consider what would happen in the bizarre scenario that PSE has laid out in which two critical transformers go down, six local generators are brought offline, and 1,500 megawatts of electricity is sent to Canada. Mr. Lauckhart did precisely that by running computer simulations on the scenario and found that the 11 transmission lines that connect the Puget Sound to power sources in central Washington would be overloaded. The whole Puget Sound area would be blacked out! [Lauckhart-Schiffman Load Flow Study, Appendix E – Regional grid capacity limitations]</p> <p>Energize Eastside is also much riskier than what they are telling the public. When utilities put power lines in the same area as gas pipelines, they consider several criteria to establish risk level, e.g., separation distance, HVAC power line current, collocation length, collocation angle. For those four criteria, Energize Eastside would be considered "high risk" per industry standards. [Finneran S. (2015), Criteria for Pipelines Co-Existing with Electric Power Lines, DNV GL, <a href="http://www.ingaa.org/File.aspx?id=24732">http://www.ingaa.org/File.aspx?id=24732</a>] But this is what Mark Williamson, representing PSE had to say about the collocation of the transmission line and gas line: "You don't need to do any engineering studies. [25 feet of separation is] far enough that you can just be laissez-faire and let it go. "</p> <p>To sum up, we don't need Energize Eastside, it's dangerous, and even in the contrived outage scenario that PSE devised to justify it the whole Puget Sound area would be blacked out! And for the privilege of having this project built for us, we the PSE ratepayers get to pay, conservatively, a total of \$1.4 - \$2 billion over its lifetime. [King J. (2016) Lifetime cost analysis for Energize Eastside - What will Energize Eastside cost customers over its lifetime?, <a href="http://cense.org/Lifetime%20Cost.pdf">http://cense.org/Lifetime%20Cost.pdf</a>]</p> <p>The residents of the Eastside have had our trust betrayed by our public utility. Regulators and our elected leaders haven't protected us from this outrageous project. It's up to us, the residents of the Eastside, to protect ourselves from Energize Eastside by voicing our concerns and trust that the agency reviewing these comments on the Environmental Impact Statement act in the public's best interest.</p> <p>The best alternative is clearly "Alternative 4: No Action".</p>
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2/21/2016 20:22:28	James	Leininger	<p>To whom it may concern:</p> <p>I am very concerned about the Energize Eastside initiative.</p> <p>I do not feel that PSE has clearly demonstrated a need for large power lines. The studies you site are based on flawed assumptions.</p> <p>I endorse Alternative 2 as the preferred energy alternative because it is: Safe, Cost effective, Reliable and Better for the environment.</p> <p>Sincerely,</p> <p>Jim</p>
2/21/2016 21:48:14	Chris and Val	Fritz	<p>Proposed PSE Energize Eastside transmission line project (Alternate 1-A) will:</p> <p>Disrupt Neighbor Character</p> <ul style="list-style-type: none"> <li>•Huge poles and wires are NOT consistent with City of Bellevue Comprehensive Plan which contains detailed descriptions of neighborhoods and neighborhood character.</li> <li>•The utility corridor in cities like Newcastle may need to be widened for safety purposes. This will require homes to be condemned and families displaced.</li> </ul> <p>Threaten Community Safety</p> <ul style="list-style-type: none"> <li>•High voltage transmission lines located so close to the Olympic Pipeline increase the risk of a catastrophic explosion during construction and daily operation. (threatening Somerset area homes and schools, including Tyee Middle School)</li> <li>•Taller poles and higher voltage expose more homes and schools to risk if lines are brought down by earthquake, extreme weather, or terrorist attack.</li> </ul> <p>Cause unnecessary environmental degradation</p> <ul style="list-style-type: none"> <li>• Approximately 8,000 trees will be removed. • Strategies for reducing carbon emissions are not addressed, as they are in Alternative 2.</li> </ul> <p>Divert investments from 21st century energy technologies</p> <ul style="list-style-type: none"> <li>•PSE's preferred solution puts all our eggs in one basket. We will spend more than a billion dollars over the lifetime of the project for a solution that will cause reliability problems if it fails.</li> <li>• Newer technologies spread the risk and the investment. Our dollars will go further as technology improves and costs drop. We can also support local businesses developing the energy solutions of the future.</li> </ul>

2/22/2016 10:45:18	Yanfen	Song	<p>I am very concerned about Puget Sound Energy's "Energize Eastside" project, which proposes to build 18 miles of high-voltage transmission lines through four Eastside cities (Alternative 1A).</p> <p>PSE tries to justify the need for the project using an impossible scenario that would cause regional blackouts, according to the Lauckhart-Schiffman Load Flow Study, available at CENSE.org.</p> <p>Alternative 1A would place new lines and poles much too close to aging petroleum pipelines. Responsible safety standards require at least a 50 foot separation. A construction or operational accident could cause a catastrophic pipeline explosion like the one that killed three Bellingham residents in 1999. This risk is not adequately addressed in the EIS.</p> <p>Alternative 2, the Integrated Resources Approach, is a safer and less costly alternative. But the solution described in the EIS was not developed or reviewed by independent experts that have suitable experience with modern electrical grid technologies, including Demand Side Management and Distributed Energy Resources. The costs and capabilities are based on inaccurate and obsolete studies. As the Northwest Power Council's Seventh Power Plan makes clear, a carefully developed plan would easily beat alternative 1A in cost, safety, and support for the environment.</p> <p>The other transmission line options (1B, 1C, 1D and Alternative 3) are not practical for financial or political reasons.</p> <p>Ratepayers are asked to spend more than a billion dollars over the lifetime of PSE's transmission line. The Draft EIS must answer these basic questions in order to convince residents that we are getting the best possible plan for our energy future.</p>
2/22/2016 10:47:32	Tim	Liu	<p>Dear Ms. Bedwell,</p> <p>I am very concerned about Puget Sound Energy's "Energize Eastside" project, which proposes to build 18 miles of high-voltage transmission lines through four Eastside cities (Alternative 1A).</p> <p>PSE tries to justify the need for the project using an impossible scenario that would cause regional blackouts, according to the Lauckhart-Schiffman Load Flow Study, available at CENSE.org.</p> <p>Alternative 1A would place new lines and poles much too close to aging petroleum pipelines. Responsible safety standards require at least a 50 foot separation. A construction or operational accident could cause a catastrophic pipeline explosion like the one that killed three Bellingham residents in 1999. This risk is not adequately addressed in the EIS.</p> <p>Alternative 2, the Integrated Resources Approach, is a safer and less costly alternative. But the solution described in the EIS was not developed or reviewed by independent experts that have suitable experience with modern electrical grid technologies, including Demand Side Management and Distributed Energy Resources. The costs and capabilities are based on inaccurate and obsolete studies. As the Northwest Power Council's Seventh Power Plan makes clear, a carefully developed plan would easily beat alternative 1A in cost, safety, and support for the environment.</p> <p>The other transmission line options (1B, 1C, 1D and Alternative 3) are not practical for financial or political reasons.</p> <p>Ratepayers are asked to spend more than a billion dollars over the lifetime of PSE's transmission line. The Draft EIS must answer these basic questions in order to convince residents that we are getting the best possible plan for our energy future.</p>

2/22/2016 17:24:40	Yanfen	Song	<p>I am very concerned about Puget Sound Energy's "Energize Eastside" project, which proposes to build 18 miles of high-voltage transmission lines through four Eastside cities (Alternative 1A).</p> <p>PSE tries to justify the need for the project using an impossible scenario that would cause regional blackouts, according to the Lauckhart-Schiffman Load Flow Study, available at CENSE.org.</p> <p>Alternative 1A would place new lines and poles much too close to aging petroleum pipelines. Responsible safety standards require at least a 50 foot separation. A construction or operational accident could cause a catastrophic pipeline explosion like the one that killed three Bellingham residents in 1999. This risk is not adequately addressed in the EIS.</p> <p>Alternative 2, the Integrated Resources Approach, is a safer and less costly alternative. But the solution described in the EIS was not developed or reviewed by independent experts that have suitable experience with modern electrical grid technologies, including Demand Side Management and Distributed Energy Resources. The costs and capabilities are based on inaccurate and obsolete studies. As the Northwest Power Council's Seventh Power Plan makes clear, a carefully developed plan would easily beat alternative 1A in cost, safety, and support for the environment.</p> <p>The other transmission line options (1B, 1C, 1D and Alternative 3) are not practical for financial or political reasons.</p> <p>Ratepayers are asked to spend more than a billion dollars over the lifetime of PSE's transmission line. The Draft EIS must answer these basic questions in order to convince residents that we are getting the best possible plan for our energy future.</p>
2/23/2016 12:53:24	Susan	Wu	<p>To: Heidi Bedwell, Energize Eastside EIS Program Manager From: Susan Wu</p> <p>Dear Ms. Bedwell,</p> <p>I am very concerned about Puget Sound Energy's "Energize Eastside" project, which proposes to build 18 miles of high-voltage transmission lines through four Eastside cities (Alternative 1A).</p> <p>PSE tries to justify the need for the project using an impossible scenario that would cause regional blackouts, according to the Lauckhart-Schiffman Load Flow Study, available at CENSE.org.</p> <p>Alternative 1A would place new lines and poles much too close to aging petroleum pipelines. Responsible safety standards require at least a 50 foot separation. A construction or operational accident could cause a catastrophic pipeline explosion like the one that killed three Bellingham residents in 1999. This risk is not adequately addressed in the EIS.</p> <p>Alternative 2, the Integrated Resources Approach, is a safer and less costly alternative. But the solution described in the EIS was not developed or reviewed by independent experts that have suitable experience with modern electrical grid technologies, including Demand Side Management and Distributed Energy Resources. The costs and capabilities are based on inaccurate and obsolete studies. As the Northwest Power Council's Seventh Power Plan makes clear, a carefully developed plan would easily beat alternative 1A in cost, safety, and support for the environment.</p> <p>The other transmission line options (1B, 1C, 1D and Alternative 3) are not practical for financial or political reasons.</p> <p>Ratepayers are asked to spend more than a billion dollars over the lifetime of PSE's transmission line. The Draft EIS must answer these basic questions in order to convince residents that we are getting the best possible plan for our energy future.</p>

2/23/2016 13:05:29	Susan	Wu	<p>To: Heidi Bedwell, Energize Eastside EIS Program Manager From: Susan Wu</p> <p>Dear Ms. Bedwell,</p> <p>I am very concerned about Puget Sound Energy's "Energize Eastside" project, which proposes to build 18 miles of high-voltage transmission lines through four Eastside cities (Alternative 1A).</p> <p>PSE tries to justify the need for the project using an impossible scenario that would cause regional blackouts, according to the Lauckhart-Schiffman Load Flow Study, available at CENSE.org.</p> <p>Alternative 1A would place new lines and poles much too close to aging petroleum pipelines. Responsible safety standards require at least a 50 foot separation. A construction or operational accident could cause a catastrophic pipeline explosion like the one that killed three Bellingham residents in 1999. This risk is not adequately addressed in the EIS.</p> <p>Alternative 2, the Integrated Resources Approach, is a safer and less costly alternative. But the solution described in the EIS was not developed or reviewed by independent experts that have suitable experience with modern electrical grid technologies, including Demand Side Management and Distributed Energy Resources. The costs and capabilities are based on inaccurate and obsolete studies. As the Northwest Power Council's Seventh Power Plan makes clear, a carefully developed plan would easily beat alternative 1A in cost, safety, and support for the environment.</p> <p>The other transmission line options (1B, 1C, 1D and Alternative 3) are not practical for financial or political reasons.</p> <p>Ratepayers are asked to spend more than a billion dollars over the lifetime of PSE's transmission line. The Draft EIS must answer these basic questions in order to convince residents that we are getting the best possible plan for our energy future.</p>
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2/23/2016 13:11:29	Alice	Wang	<p>Dear Ms. Bedwell,</p> <p>I am very concerned about Puget Sound Energy's "Energize Eastside" project, which proposes to build 18 miles of high-voltage transmission lines through four Eastside cities (Alternative 1A).</p> <p>PSE tries to justify the need for the project using an impossible scenario that would cause regional blackouts, according to the Lauckhart-Schiffman Load Flow Study, available at CENSE.org.</p> <p>Alternative 1A would place new lines and poles much too close to aging petroleum pipelines. Responsible safety standards require at least a 50 foot separation. A construction or operational accident could cause a catastrophic pipeline explosion like the one that killed three Bellingham residents in 1999. This risk is not adequately addressed in the EIS.</p> <p>Alternative 2, the Integrated Resources Approach, is a safer and less costly alternative. But the solution described in the EIS was not developed or reviewed by independent experts that have suitable experience with modern electrical grid technologies, including Demand Side Management and Distributed Energy Resources. The costs and capabilities are based on inaccurate and obsolete studies. As the Northwest Power Council's Seventh Power Plan makes clear, a carefully developed plan would easily beat alternative 1A in cost, safety, and support for the environment.</p> <p>The other transmission line options (1B, 1C, 1D and Alternative 3) are not practical for financial or political reasons.</p> <p>Ratepayers are asked to spend more than a billion dollars over the lifetime of PSE's transmission line. The Draft EIS must answer these basic questions in order to convince residents that we are getting the best possible plan for our energy future.</p> <p>Thank you.</p> <p>Sincerely your,</p> <p>Alice Wang</p>
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2/23/2016 13:26:44	Huifen	Li	<p>Dear Ms. Bedwell,</p> <p>I am very concerned about Puget Sound Energy's "Energize Eastside" project, which proposes to build 18 miles of high-voltage transmission lines through four Eastside cities (Alternative 1A).</p> <p>PSE tries to justify the need for the project using an impossible scenario that would cause regional blackouts, according to the Lauckhart-Schiffman Load Flow Study, available at CENSE.org.</p> <p>Alternative 1A would place new lines and poles much too close to aging petroleum pipelines. Responsible safety standards require at least a 50 foot separation. A construction or operational accident could cause a catastrophic pipeline explosion like the one that killed three Bellingham residents in 1999. This risk is not adequately addressed in the EIS.</p> <p>Alternative 2, the Integrated Resources Approach, is a safer and less costly alternative. But the solution described in the EIS was not developed or reviewed by independent experts that have suitable experience with modern electrical grid technologies, including Demand Side Management and Distributed Energy Resources. The costs and capabilities are based on inaccurate and obsolete studies. As the Northwest Power Council's Seventh Power Plan makes clear, a carefully developed plan would easily beat alternative 1A in cost, safety, and support for the environment.</p> <p>The other transmission line options (1B, 1C, 1D and Alternative 3) are not practical for financial or political reasons.</p> <p>Ratepayers are asked to spend more than a billion dollars over the lifetime of PSE's transmission line. The Draft EIS must answer these basic questions in order to convince residents that we are getting the best possible plan for our energy future.</p> <p>Yours Sincerely,</p> <p>Huifen Li</p>
2/23/2016 13:38:34	Stella	Shepard	<p>Please do not place high power lines near the Olympic Pipeline near Tyee Middle School. This would cause a significant increase in life-threatening hazardous conditions for the region.</p>

2/23/2016 14:59:18	Xun	Sun	<p>Dear Ms. Bedwell,</p> <p>I am very concerned about Puget Sound Energy's "Energize Eastside" project, which proposes to build 18 miles of high-voltage transmission lines through four Eastside cities (Alternative 1A).</p> <p>PSE tries to justify the need for the project using an impossible scenario that would cause regional blackouts, according to the Lauckhart-Schiffman Load Flow Study, available at CENSE.org.</p> <p>Alternative 1A would place new lines and poles much too close to aging petroleum pipelines. Responsible safety standards require at least a 50 foot separation. A construction or operational accident could cause a catastrophic pipeline explosion like the one that killed three Bellingham residents in 1999. This risk is not adequately addressed in the EIS.</p> <p>Alternative 2, the Integrated Resources Approach, is a safer and less costly alternative. But the solution described in the EIS was not developed or reviewed by independent experts that have suitable experience with modern electrical grid technologies, including Demand Side Management and Distributed Energy Resources. The costs and capabilities are based on inaccurate and obsolete studies. As the Northwest Power Council's Seventh Power Plan makes clear, a carefully developed plan would easily beat alternative 1A in cost, safety, and support for the environment.</p> <p>The other transmission line options (1B, 1C, 1D and Alternative 3) are not practical for financial or political reasons.</p> <p>Ratepayers are asked to spend more than a billion dollars over the lifetime of PSE's transmission line. The Draft EIS must answer these basic questions in order to convince residents that we are getting the best possible plan for our energy future.</p>
2/23/2016 18:31:16	Jing	Long	<p>From Jing long:</p> <p>Dear Ms. Bedwell,</p> <p>I am very concerned about Puget Sound Energy's "Energize Eastside" project, which proposes to build 18 miles of high-voltage transmission lines through four Eastside cities (Alternative 1A).</p> <p>PSE tries to justify the need for the project using an impossible scenario that would cause regional blackouts, according to the Lauckhart-Schiffman Load Flow Study, available at CENSE.org.</p> <p>Alternative 1A would place new lines and poles much too close to aging petroleum pipelines. Responsible safety standards require at least a 50 foot separation. A construction or operational accident could cause a catastrophic pipeline explosion like the one that killed three Bellingham residents in 1999. This risk is not adequately addressed in the EIS.</p> <p>Alternative 2, the Integrated Resources Approach, is a safer and less costly alternative. But the solution described in the EIS was not developed or reviewed by independent experts that have suitable experience with modern electrical grid technologies, including Demand Side Management and Distributed Energy Resources. The costs and capabilities are based on inaccurate and obsolete studies. As the Northwest Power Council's Seventh Power Plan makes clear, a carefully developed plan would easily beat alternative 1A in cost, safety, and support for the environment.</p> <p>The other transmission line options (1B, 1C, 1D and Alternative 3) are not practical for financial or political reasons.</p> <p>Ratepayers are asked to spend more than a billion dollars over the lifetime of PSE's transmission line. The Draft EIS must answer these basic questions in order to convince residents that we are getting the best possible plan for our energy future.</p>

2/24/2016 12:02:36

Jeanne

DeMund

Dear Ms. Bedwell

I appreciate the opportunity to comment on the Draft Environmental Impact Statement for the Energize Eastside Project. As you may recognize from my address, I live along one of the routes that was not selected for this project. However, after considering the information provided by PSE, by the EIS, and by independent sources, I am compelled to comment.

□

1. The project is not needed: The assumptions underlying PSE's load flow are critically flawed, as explained by independent experts Richard Lauckhart and Roger Shiffman in their February 2016 report. Here are just 2 examples:

PSE has inflated electric demand growth estimates by as much as 500%. The Northwest Power and Conservation Council estimates overall demand growth at just 0.5 to 1.0%...right in line with the 0.5% that PSE told the Western Energy Coordinating Council they anticipate in their Base Case data So why is PSE using a 2.4% annual growth rate as a key element in their justification for Energize Eastside?

PSE did load flow analysis of winter peak demand rates using summer load limits on transformers. This effectively shrinks actual transformer capacity by 25-30%, creating an artificial shortfall.

If either or both of these anomalies is an error, it raises grave questions in my mind about PSE's competence, and the possibility for other errors in both their assumptions and their analysis. If either is a deliberate attempt to rig the outcome of the analysis, PSE's integrity as a member of our community is at issue.

You can read the entire report on line at: <http://cense.org/Lauckhart-Schiffman%20Load%20Flow%20Study.pdf>

2. Environmental impacts: This project will require cutting down thousands of trees, somewhere in the neighborhood of 8,000 trees over its 18 mile length. A mature tree can absorb up to 48 lbs of carbon dioxide per year. The Eastside will potentially suffer an increase of over 14,000 MT of carbon dioxide that is not being absorbed by these trees (EIS amount). Any mitigate might occur off site, require purchase of carbon credits, and leave the some or all of the impact in our area. This is an unacceptable environmental impact, even more so given that the entire project is not needed for either capacity or reliability of the electric system.

3. Safety: As cited in the EIS, there is potential for damage to the Olympic Pipeline during construction, in chapter 16, maintenance in chapter 18 and increased corrosion due to electromagnetic interference during ongoing operations, Chapter 16 again. The EIS attempts throughout these chapters to minimize perception of these risks, for example in chapter 18, using the word "theoretical" in describing the potential for damage to the Olympic pipeline during routine power pole and line maintenance.

The Olympic Pipeline is only 3-10 feet below the surface of the ground, and it carries gasoline, diesel and jet fuel. All of these are flammable and hazardous. We all know that gasoline is so flammable that we're not supposed to touch our car after we start fueling in the winter, to avoid static electricity that could start a fire. To give you an idea of the scale of potential damage, a 2014 pipeline spill of 7 gallons resulted in \$1.5 million in property damage in Skagit County according to the federal records.

Here's what really sent chills up my spine: the Olympic Pipeline is currently under a Final Order to comply with standards of the Office of Pipeline Safety, part of the federal Department of Transportation. The problems relate to corrosion control, and the Order states that Olympic Pipeline failed to correct identified deficiencies in its corrosion control system that could adversely affect the safe operation of the pipeline. You can see the details of both the Final Order, and the prior documents at:  
[http://primis.phmsa.dot.gov/comm/reports/enforce/CaseDetail\\_cpf\\_520155014.html#\\_TP\\_1\\_tab\\_1](http://primis.phmsa.dot.gov/comm/reports/enforce/CaseDetail_cpf_520155014.html#_TP_1_tab_1)

The inspection that ultimately led to this Final Order was conducted in August of 2014. This final order was only issued in January 2016. The condition has gone uncorrected for 18 months, and the pipeline has a further 18 months to complete corrective action, a time period that overlaps with PSE proposed construction. And PSE wants a green light for construction right next to this pipeline, wants to increase the potential for corrosion and wants us to believe that these risks are "theoretical". These two corporate citizens might deserve each other as neighbors, but we do not.

Ms. Bedwell, the citizens of King County rely on you and your colleagues in Bellevue and the other jurisdictions to do the right thing to protect us, both physically and fiscally. I submit to you that risking lives, property and the environment in this way for a project that is not needed is irresponsible, unacceptable and should not be condoned. There is time to develop an integrated resource approach in sync with the recommendations of the Northwest Power and Conservation Planning Council, and different in some respects from the alternative offered by PSE, and such an approach should be developed.

Thank you for the opportunity to comment.

Sincerely,

Jeanne DeMund

cc:

Carol Helland Development Services Land Use Director City of Bellevue 450 110th Avenue NE Bellevue, WA 98004  
City of Kirkland

Jeremy McMahan Development Services - Planning Manager (425) 587-3229 [jmcmahan@kirklandwa.gov](mailto:jmcmahan@kirklandwa.gov)  
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City of Renton

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2/24/2016 16:09:01	Barbara	Braun	<p>Subject: Energize Eastside Call to Action</p> <p>As a citizen who has watched the City Council in action regarding PSE projects for the last couple of years, I am stuck by the level of passivity the Council has and is exhibiting concerning one of the largest, most impactful projects facing our city. As CENSE and other community organizations have demonstrated, the citizens are gravely concerned about the need for and the trajectory this project is taking, and that no one but the citizens are investigating alternatives in any serious way. Many citizens are putting a lot of time and personal money into this. Why isn't the Council reciprocating?</p> <p>I would like to sound a CALL TO ACTION for the City Council to get proactively involved in questioning the need for this project and for insuring that our energy future is both responsible and forward looking by pursuing Alternative 2 – The Integrated Resource Approach, incrementally, over time, and as it is needed.</p> <p>The claim that the Council's hands are tied is bogus. Note the council played this card on the Lake Hills/Phantom Lake Transmission project and said there was nothing they could do. Thankfully the East Bellevue Community Council stepped up to do the right thing and they prevailed! With Energize Eastside being so blatantly flawed and unnecessary, it seems patently negligent for the Council to passive sit by and let this project steamroll through our community.</p> <p>What can and should the Council do? Here are some suggestions:</p> <ol style="list-style-type: none"> <li>1. Get a lawyer! Obtain a thorough independent legal opinion on your rights and jurisdiction as Council Members;</li> <li>2. Provide full comments on EIS 1 stating 1) the need for the project is not adequately established; 2) Alternative 2 is not fully developed or vetted by independent experts; 3) the criteria for selecting alternatives and decision making in this process is not clear and transparent; 4) require PSE to share ALL their data and analysis, including their load flow data with the public; and 5) require an independent study of pipeline safety and mitigation requirements be done.</li> <li>3. Do not allow the EIS process to move forward with PSE selecting the wrong alternative. Pause after EIS 1 and revisit the need for this project. Require that Alternative 2 be studied in depth and demonstrate how it CAN meet our energy future needs. Make sure independent industry experts assess Alternative 2, not PSE who doesn't have the expertise or motivation to properly vet this option;</li> <li>4. Build a coalition of independent advisors and get the expert advice you need to help you understand this project. Require Stantec, or another more independent third party, to run the load flow study using PSE data. Engage State and Federal agencies with expertise to review the need for this project and its alternatives;</li> <li>5. Pass ordinances strengthening safety regulations and setbacks around the Olympic Pipeline in accordance with the latest pipeline/electrical transmission collocation studies. Insure our earthquake risks are accommodated;</li> <li>6. Prepare to refuse permits to PSE. Investigate and develop a plan for this. Warn PSE that you will not be issuing permits; and</li> <li>7. Conduct a ballot measure to move PSE to a Public Utility District so citizens can insure this utility is managed in a way that best benefits the community, not a private, for-profit company. There are many in our state, and it may be time for us to join them.</li> </ol>
2/25/2016 17:56:42	Jamie	Kim	<p>I am opposed to the energize eastside project. Evidence provided by a nonindependent surveyor does not show a clear indication to proceed with this poorly designed plan. There are much better alternatives, ie: underground transmissions lines, that PSE states is too expensive. Until clear evidence is provided by an entity other than PSE, this project is nothing but a way to improve revenue for PSE.</p>
2/25/2016 22:12:48	Conrad	Bayer	<p>It is not clear that this project is required and that PSE has the best interests of the residents of Bellevue and neighboring areas. They have not been open with the data to support the studies and attempts to simulate their work and assumptions failed. A project like this requires complete transparency of all relevant data. PSE is a private corporation with interests the will not always align with the residents that their projects will affect. There are viable and more environmentally sound alternatives available.</p>
2/26/2016 0:04:50	Oleg	Ryabukha	<p>Alternatives 1 and 3 involve significant amount of construction, and removal of thousands of trees. I don't think that loss of so many trees is acceptable - it would significantly degrade environment on the Eastside.</p> <p>I urge PSE to look closer into Alternative 2 as it the best for preserving environment.</p>

2/26/2016 0:16:13	Oleg	Ryabukha	<p>Alternatives 1 option A involves construction of a high-voltage line right next to Olympic Pipeline or existing natural gas pipelines. This is unsafe (as mentioned in DEIS, Chapters 16.3.7, 16.6.1.3, 16.6.3.1.1) even in the normal course of events, but even more dangerous in case of earthquake.</p> <p>Moreover, building one single line without redundancy makes whole system more vulnerable to disruptions caused by construction accidents, natural causes (storms, floods and earthquakes), or malicious intent (terrorism).</p> <p>I urge PSE to consider and implement Alternative 2 (Integrated Resource Approach), since it does not require placing high-voltage lines near gas pipelines and makes it possible to distribute (much smaller) generation and storage unit closer to consumers, thus making whole infrastructure more resilient to any disruptions.</p>
2/26/2016 0:22:23	Oleg	Ryabukha	<p>Alternatives 1 and 3 involve paying significant cost for unclear benefit - independent Lauckhart-Schiffman Load Flow Study, available at <a href="http://cense.org">cense.org</a>, found that:</p> <p>"... PSE's system can avoid overloads and outages even when two critical transformers have failed during winter peak usage. There appears to be sufficient capacity to handle anticipated growth for at least a couple of decades. In our professional opinion, Energize Eastside is not needed to provide reliable power in this scenario for many years."</p> <p>I would strongly prefer to see Alternative 2 (Integrated Resource Approach) implemented, since it allows pay-as-you-go, with incremental improvements where they really needed, and when they can take advantage of newly developed technologies (solar, cheaper battery storage, etc.)</p>
2/27/2016 13:10:24	Judy	Boyce	<p>I'm very concerned about plans to construct and run high voltage lines so close to the Olympic petroleum pipeline. My house backs up to the pipeline right of way and I walk there almost every day with my dog. The 1999 Bellingham explosion, which killed three people, was a terrible tragedy that should make us extremely cautious about creating an even more dangerous situation.</p> <p>In Chapter 8.5.1.3.2 of the draft EIS states that "significant adverse impact to public safety could occur if a leak or an explosion of any of these types of gas lines resulted from the project" in we choose Alternate 1 - Option A.</p> <p>I believe we should choose Alternate 2. Chapter 8.5.4.2.2 mentions that "the risks during construction of distributed generation facilities would be lower than with Alternative 1 because there would be greater flexibility in locating the facilities away from pipelines."</p> <p>In my neighborhood, the pipeline right of way goes by many houses and right in back of a park popular with neighborhood children. I dread to think about a major explosion due to an earthquake, fault in the pipeline, or any other reason.</p> <p>Thank you,</p> <p>Judy Boyce</p>
2/27/2016 14:16:59	Thomas	Cezeaux	<p>The conditions PSE set up in the need for this project: Shut down multiple substations, ship additional energy to Canada (when they are not required to) seems to indicate that this project should not move forwards.</p> <p>Also, the proposed route along the Olympic Pipeline, regardless of promises of safety from PSE, flies in the face of common sense and endangers families and communities throughout King County.</p> <p>Environmental risks of high voltage lines through neighborhoods composed of many young families with small children also causes concerns around EMF emissions and cancer concerns.</p> <p>Please stop this project.</p>

2/27/2016 14:31:57	Thomas	Cezeaux	The level of impact of this project seem to be compared against Bellevue only. However, the impact of the project on smaller towns like Newcastle will likely be proportionally higher. For example, the impact on revenue from property taxes to Newcastle will be proportionally much higher than for Bellevue (because it is larger, and has a more diverse tax base).
2/27/2016 20:14:38	Thomas	Heinzle	After reading all accounts of the EnergizeEastside proposal and reading about the Lauckhart-Schiffman load study I am more convinced than ever that this project should not be approved. Personally I think PSE is acting like current day carpetbaggers. I am also appalled that a government agency has no power to stop this? Maybe we need to pass some new laws?
2/27/2016 21:06:07	Sally	McCray	<p>I support and endorse Alternative 2, an Integrated Resource approach. It is cost effective (a lifetime cost of 1.4 - 2 billion to rate payers is outrageous!), more reliable, better for the environment, smart and secure. The only objective it doesn't meet is making the PSE owners more money via the WUTC 10% investment boondoggle. When can we rate payers get in on that deal? Oh, right, it is the unfortunate rate payers who get to PAY PSE the 10% for 30 years. No wonder they found a need and then proposed the costliest "solution" possible.</p> <p>I believe that if a need for an additional transmission capacity is revealed, in the next 40 years, over and above what the Integrated Resource approach can provide, then and only then should a massive upgrade to a utility corridor running through a heavily populated area. Transmission to Canada and California can easily happen on the east side of the Cascades. Transmission to benefit the Eastside, only, should run on one of the two North South corridors already in existence, starting with the substantially unused 230kv corridor owned by Seattle City Light.</p>
2/27/2016 21:12:39	David	McCray	<p>I believe the flow studies that were used to justify the "Energize Eastside project" were flawed and consequently incorrect alternatives and conclusions are being presented. PSE has refused to provide information to clarify the assumptions used in their flow study. In addition, a load flow study was produced by Lauckhart-Schiffman that reaches significantly different results and they have offered the study to PSE who has refused to enter into discussions regarding the discrepancies.</p> <p>Essentially, PSE has based their flow study on several significant faulty assumptions. The winter season is the peak period of usage in our region. However, the PSE load flow study does not appear to use the winter seasonal ratings for critical transformers in the study. The winter ratings are significantly higher than summer ratings and consequently using the incorrect season causes a significant understated distortion in capacity.</p> <p>In addition PSE did not reflect utilization of local generator capacity in their load flow study. Again this significantly distorts and understates the projected capacity.</p> <p>Another aspect of the PSE study that makes no sense, is they actually show the flow to Canada increasing during local peak season needs. There is no requirement for PSE to transfer power to Canada and that faulty assumption falsely increases apparent usage in the local area.</p> <p>The Laukhart-Shiffman load flow study was prepared with corrected assumptions and they have offered to make that study available for review and discussion. This study needs to be followed up on.</p> <p>PSE is a foreign "for profit" company who has a clear profit motive for distorting the load flow results and getting the project approved for a guaranteed near 10% rate of return. The process and proposal is outrageous and the brakes need to be put on to get to the truth behind the numbers.</p> <p>As far as alternatives presented in the EIS, only Alternative 2 - Integrated approach is justifiable. This alternative is safe and cost effective. It is better for the environment as it preserves thousands of trees, reduces carbon emissions, and provides for improved appearance of our neighborhoods.</p>

2/27/2016 21:46:02	Sally	McCray	<p>I believe the need for this massive project does not exist. PSE cooked the books to come up with an analysis demonstrating the need. Bellevue, to their credit, hired an independent consultant. However, the City Council is made up of ordinary folks and politicians, who are easily misled in a billion dollar game with a corporation with millions to spend on marketing. Thus the independent consultant was hired to do the wrong job, review PSE's calculations. NOT to do the more important work of reviewing the assumptions. You've heard the term garbage in, garbage out? That is what Bellevue got for their money, they didn't ask the right question.</p> <p>Fortunately, others did ask the question. And when their assumptions were different than PSE's? PSE refused to explain their assumptions. For example, why did they assume so much more load going to Canada than required? PSE has said time and again that this is a local project, yet they tripled or even quadrupled the load to Canada in their peak demand calculation. Why would they assume this load going to Canada on during peak demand locally? There is no requirement to continue that flow during a peak demand time - a time that might not last any longer than a few hours to a few days at most. Garbage in, garbage out.</p> <p>As another example, why isn't there an assumption of a peaker station or two, supplying power in peak demand times, like the old Shuffleton station? It doesn't take a EE degree; it is just common sense that the management of power delivery would include a peak demand generator or two. It is the low cost, reliable, smart alternative. If we didn't know that PSE had its rate payer's interests at heart, it would almost seem PSE was planning, even then, to "need" to build a giant project to increase return on capital for the private corporation, at the expense of rate payers on the Eastside. I wonder how the sale of that asset was justified? Probably that there was no conceivable need for power generation to support the Eastside - quite the opposite of what they are saying now. Can we see those records and learn for ourselves? Regardless, a reasonable need analysis should assume at least two peak demand generation facilities.</p> <p>Independent analysts should be hired to review all the PSE "need" assumptions, and justifications for those assumptions. How is the 205MW shortfall in the EIS calculated? Why are there so few transformers in PSE's calculations? (They are a low cost, proven alternative).</p> <p>PSE should comment on the Lauckhart-Schiffman Load Flow Study. Respected industry experts Rich Lauckhart and Roger Schiffman ran computer simulations of the need for PSE's "Energize Eastside". They used the same industry software that PSE uses. Their conclusion: PSE is using an impossible situation to try to scare residents into funding a billion-dollar project. In other words: garbage in, garbage out.</p> <p>PSE should be required to reveal the rational for its assumptions. In the medical field, no one takes a study seriously unless it is peer reviewed. Even the best make mistakes. It is the best way to avoid: garbage in, garbage out.</p>
2/27/2016 21:56:25	Sally	McCray	<p>Alternative 1, Option A should be avoided due to the huge and significant adverse impacts to people who live near the project. Chapter 11.6.3.5.3 states that permanent clear zones would be required for Alternative 1, Option A. This is not consistent with Eastside esthetic values, anywhere but in downtown areas. (Where transmission lines are always underground). Alternative 2 would have much fewer land use impacts and is thus preferred.</p> <p>The only worse alternative to Alternative 1, Option A would be to put the transmission lines in an area that didn't already have transmission lines.</p>

2/27/2016 22:10:19	Sally	McCray	<p>This project is not needed and should be rejected. The Northwest Power Plan report, dated Feb 2016, states that even though the population is forecast to grow..."the region's electricity loads are expected to stay at the current level....continuing a 20 year trend of low load growth"</p> <p>PSE's own annual reports, found on the SEC website support this conclusion, power demand has been decreasing; peak demand for PSE was in the winter of 2009.</p> <p>The Wall Street Journal, New York Times and other respected periodicals have all reported that electrical demand is decreasing all around the country. At the same time, alternatives to ever more wires are being developed. It is outrageous that a project like this would be approved for a "potential" demand that may never materialize, with the most expensive and environmentally destructive solution possible. The only people this could make sense to sit in the PSE board room or stockholders meeting. It makes absolutely no sense for PSE rate payers.</p>
2/27/2016 22:18:34	David	McCray	<p>I understand PSE sold the Shuffleton power plant in recent years. This reduction of local production capacity has the effect of reducing the local energy supply and narrowing the margin between peak demand and available resources.</p> <p>PSE obviously has a plan to make significant profits for it's foreign shareholders. It doesn't seem right for PSE to pocket the proceeds from selling the local power plant and turn around and try to falsely justify the need for local ratepayers to pay for investing in increased capacity.</p> <p>PSE should be required to put the proceeds from the Shuffleton power plant back into additional power generation capabilities in the local market place. Local rate payers paid for the Shuffleton plant and PSE should not be allowed to sell off the asset and reduce important local power generation capability.</p>
2/28/2016 16:03:08	W. Robert	Moore	<p>ENERGIZE EASTSIDE: COMMENTS ON ENERGIZE EASTSIDE STATEMENT (EIS) February, 2016</p> <p>I am very concerned about PSE's intention to build a large transmission line from Redmond, WA to Renton, WA. The need for expanded capacity outlined in Chapter 1.3 of the DEIS has been questioned by the Lauckhart-Schiffman load-flow study dated February 18, 2016. This study indicates there are many flaws in PSE's assumptions. If winter emergency conditions are used instead of summer normal conditions and if .5%/year growth for Eastside energy demand is used, demand does not exceed flow until 2058. PSE's inflated rate of growth of 2.4%/year indicates the capacity is not exceeded until 2027. This should provide plenty of time to implement rapidly developing new technologies which would be much less expensive and intrusive.</p> <p>Furthermore, Public safety is of primary concern. Given that we live in a seismic zone and the existing power line is built along a gas line, the possibility of a human catastrophe is exacerbated by construction and long term operations activities. Chapter 8.5.1.3 only mentions earthquakes during construction. What about seismic events in the future? I am reminded of the 1999 Bellingham disaster. In addition while effects on humans is hard to prove and controversial, why risk any adverse health effects, such as bone marrow cancer in infants and brain cancer in adults?</p> <p>The detrimental impact to the environment cannot be overemphasized. We are looking at the destruction of several thousand trees and clear cutting many acres of vegetation. Bellevue and other eastside cities pride themselves on the largely attractive and desirable living conditions that have been developed over the years.</p> <p>I strongly urge PSE to stop the expansion project. Your public image is being severely damaged by a proposal which appears to be strictly a financial play on the part of the hedge fund investors who own PSE at the expense of the rate paying customers. Shame on PSE!</p> <p>W. Robert Moore  WA 98006  Email: bmooreii@comcast.net</p> <p style="text-align: right;">4707 135th Place Bellevue,  Tel: 425-747-1388</p>

2/28/2016 16:19:52	Katharine	Phelps	As a long-time resident of south Bellevue, I am very concerned about the current proposal for EIS. The forests and other wild places on the eastside are a unique and precious feature of our area, and once they are lost or damaged, they are not easily recovered. The number of trees that would be destroyed by the project is too high a loss to accept, in my opinion. I am aware that several alternatives are being considered. I beg that everyone involved choose the least destructive option in environmental terms.
2/28/2016 17:10:52	Don	Miller	<p>Energize Eastside Draft Environmental Impact Statement (DEIS) Comments  Submitted by Don Miller, 5205 Lakehurst Lane SE, Bellevue (email: donald_c_miller@hotmail.com)  I Support the NO BUILD OPTION 4 based on the deceptive representation (or flawed analysis) of need by PSE, the outrageous environmental impacts and the inadequate consideration of viable alternatives.  COMMENTS DIRECTED TO THE CITY OF BELLEVUE AS LEAD AGENCY:  I'd like to start by acknowledging the work of the City staff to include alternatives in this DEIS that were never considered by PSE from the introduction of Energize Eastside; namely underground, underwater and energy efficiency options. Not only did PSE fail to consider alternatives, the company worked aggressively to undermine consideration and feasibility of these options. Further, the members of the Community Advisory Group (CAG) that represented municipalities and business worked in concert with PSE to denounce and repress consideration of alternatives. Thank you to the City of Bellevue staff who worked to include the alternatives in this DEIS.  Interestingly, what has not been considered in the Energy Efficiency Alternative are specific code changes to the Building Code in the City of Bellevue that would ensure a sufficient power supply by modifying the way residential and commercial buildings are constructed.  PROJECT NEED Section 1.3:  The DEIS states "PSE has determined that there is a need" As a foreign owned for profit energy company we cannot merely accept their determination as justification to destroy our environment, property values, neighborhood character and to burden the entire Puget Sound rate-payer base with the enormous cost of this project. This section of the DEIS goes on to discuss the secrecy and complexity of determining the need. While there are certain security concerns, the process is not as exotic as the DEIS would lead one to believe. I have attended a presentation of the Lauckhart-Schiffman load-flow study dated February 18, 2016 and found that with the appropriate security clearance and qualified engineers to conduct an alternative analysis the engineering concepts used to determine need are straightforward and rational. The extent to which PSE attempted to thwart this alternative analysis must be added to the actions of this foreign owned company. Although the City of Bellevue accepted validation of PSE's analysis the firm the City of Bellevue hired to validate PSE's analysis of need is a close ally and in PSE's pocket. In this regard, the City of Bellevue has failed to obtain an independent review of the need for this project.  Further, the data used in the Lauckhart-Schiffman load-flow study uses the very database which PSE supplied to the Western Electricity Coordinating Council (WECC) prior to the conception of the Energize Eastside project. In that earlier version of PSE's own database, there was NO NEED for this project. NO NEED. Even in the extreme scenarios. Only after PSE altered the model to a state of substantial system failure combined with an excessive flow of power to Canada were they able to manipulate the database to create justification of the Energize Eastside project. The recent actions of PSE to justify this project continue to be based on discrediting valid information while simultaneously failing to provide any substantiation to their claims. The bottom line is what matters here and as a foreign owned power company PSE's only concern is profit. They are burdening generations of Puget Sound citizens with the expense of this unneeded project as all rate-payers will bear the cost, not just the Eastside.</p>

**SECTION 6.1 UNAVOIDABLE ENVIRONMENTAL IMPACTS:**

The DEIS states pursuing the Energize Eastside project with Overhead lines will create “significant unavoidable adverse impacts to plants and animals.” This is probably the most important statement in the DEIS. While the City of Bellevue has gone to great lengths to suggest they will no longer consider if the need for the project is for energy or for profit, the analysis in this section is complete. To allow this project to go forward would be a catastrophe to the City of Bellevue and our neighbors. We must do everything we can to preserve the limited habitats that remain and therefore must re-evaluate the need using the independent Lauckhart-Schiffman load-flow study.

The simple environmental analysis conducted by PSE while the CAG evaluated route alternatives showed that over 8000 mature trees would be cut down if PSE builds overhead lines. The final project EIS will show permanent damage to dozens of streams, hundreds of wetlands, untold wildlife, foliage and trees. This project will devastate the remaining natural areas in our Cities. While our cities enact countless restrictions to protect the environment they seem willing to allow this un-needed project to proceed on the backs of the hard working taxpayers and the defenseless environment. No Mitigation will ever replace the damage wrought by this profit motivated initiative.

**SECTION 10.7.2 NO ACTION ALTERNATIVE:**

This section was written based on this assumption “No Action Alternative would likely lead to declining reliability of the electrical power supply on the Eastside” which the Lauckhart-Schiffman Load Flow Study shows to be a distortion of fact. The projected growth in the Eastside will not stop developers from building or people from moving here. If, in fact, there is a power supply issue it will be managed by PSE and the developers will be long gone and the houses will be occupied. This is a red herring that PSE has created to scare municipalities into approved this un-needed project.

**SECTION 10.7.3.1.2 EXISTING CORRIDOR:**

I am dumbfounded as to the purpose of Table 10-2 where it lists restrictions in Beaux Arts, Hunts Point and Yarrow Point areas of Bellevue. These areas have never been under consideration as a part of the Energize Eastside project. Is this boilerplate, diversion or just a waste of City resources as it has no value in this report.

**SECTION 10.7.1.14 PROPERTY VALUES:**

The DEIS states “one study prepared for The Electric Power research Institute (EPRI) titled Transmission Lines and Property Values: State of Science (Mullins et al., 2003) was chosen for use as the source of information for this EIS because it synthesizes and summarizes the findings of over 50 surveys and studies.”

			<p>Let's look at the problems with this study:</p> <p>(1)It is something that was prepared for the power industry, not a study conducted by recognized experts in real estate value.</p> <p>(2)It is a consolidation of 50 independent studies and without statistical validation of the individual studies it is merely opinion. As the DEIS quotes "no quantitative generalizations about findings from the studies can be made with any degree of reliability" This EPRI study masks the geographical and socioeconomic demographics that impacted the results of these studies. It is common knowledge that the Property values of undeveloped land increases with the introduction of utilities whereas the value of affluent neighborhoods decline with such intrusions yet the DEIS used a study that could provide neither of these conclusions.</p> <p>(3)The DEIS claims "land use analysis in this Phase 1Draft EIS considered effects on property values but found them to be inconclusive" yet the Draft EIS cites 12 conclusions from the EPRI study and over half of these conclusions point to decreased property value, increased selling times, negative opinion and other factors negatively impacting property values. The evidence from your selected and flawed study doesn't even support the claim you made in the DEIS.</p> <p>(4)The DEIS makes no indication that real estate professionals were consulted to obtain valid information about the impact of power transmission lines on property values in affluent US communities which would have been a reasonable source to seek out.</p> <p>Again, in this regard, the City of Bellevue has failed to obtain an independent analysis as the lead agency.</p> <p>SECTION 11.6.3.5.3 NEIGHBORHOOD IMPACTS:  The DEIS states "It is anticipated that 85- to 100-foot-tall steel or wood poles would be used" which represents new and avoidable risks to citizens and their property due to the presence of the Cascadia Subduction Seismic Zone. Recent predictions are not "if" a big earthquake will hit in the Pacific Northwest but "when." An article in The New Yorker describes the likely scenario as defined by the Federal Emergency Management Agency (FEMA)</p> <p>A link to FEMA and the associated article can be found here: <a href="http://www.fema.gov/blog/2015-07-15/big-one-pacific-northwest-taking-conversation-action">http://www.fema.gov/blog/2015-07-15/big-one-pacific-northwest-taking-conversation-action</a></p> <p>Introducing new risk to our communities is entirely preventable. The obvious choice is the NO BUILD OPTION, Alternative 4.</p>
2/28/2016 19:35:13	Thomas	Campbell	<p>The current PSE plan is based on a return for their Australian investment group. This is not a beneficial plan to Bellevue residences. The PSE (profit generating company) load studies are flawed and should not include energy being provided to Canada. This is a local issue as determined by FARC. Any Bellevue Council Member voting positively for this PSE proposed changes should be financially accountable for their vote via litigation. This is not a near term issue for Bellevue. This is a near term issue for the Australian investors Group. The City of Bellevue should not lay the cost of this Australian investor groups profit on the heads of their Bellevue population. Technology is advancing in a direction that needs less power. This is supported by all the current power consumption data that I have seen. The Bellevue City Council should require PSE to release all their data to Energize Eastside and any other organization before they make their decision.</p>
2/29/2016 8:16:30	Shawn	Steele	<p>The current transmission line corridor provides a green space that is currently fenced, particularly between NE 24th ST and the 520 bicycle path. The corridor should include a path or trail so that people can use the space, particularly to provide access to the 520 bike path from NE 24th st.</p>

2/29/2016 10:47:07	Rajendra	Kuramkote	<p>Hello All,</p> <p>I am Raj Kuramkote. I live at 8613 129th Court South East Newcastle. This is with reference to Proposed PSE transmission line project (Alternate 1-A) Pages 2-21 to 2-25 18 miles of new overhead 230 kV transmission lines + new transformer. We have the power line running directly behind our house. We have lived in our house for the last 18 years. I work for Intel corporation and I am stationed in Microsoft campus in Redmond. I have good visibility into how these pillars of technology are handling the movement towards green energy. At Microsoft campus they have started experimenting with powering the street lights with both solar panel and little wind turbine both on the same pole that houses the lamp. This is a great self-powered approach to lighting for Northwest environment. At Intel in the Oregon campus, they have installed micro wind turbines on top of a building along with solar panels that generate 65 kilowatt-hours of power that will be used to provide electricity to the conference center. They have a number of such initiatives all over the world and are recognized by the United States EPA agency for seven years in a row. Please take a look at print-outs of these green energy initiatives. These are just two examples of many more that forward looking corporations are making.</p> <p>We are concerned about losing our home which has a perfect setting in terms of proximity to Seattle and Bellevue and at the same time is in a green neighborhood and it will be hard to find another similar property. We are concerned about safety impact of the proposed plan for folks living in proximity to the power line. We are concerned that if the plan goes through, there is no turning back and our neighborhood is forever changed.</p> <p>I strongly urge PSE and cities of King county to stop eastside energy efforts that are backward looking and start working with both corporations/city Governments and residential customers to move towards green energy installations in our fast growing cites and set an example for other energy corporations across U.S.</p> <p>I reject proposed PSE transmission line project (Alternate 1-A).</p> <p>Thanks for allowing me to present my case.</p> <p>Sincerely, Raj Kuramkote □</p>
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2/29/2016 14:11:20	Nailene	Wiest	<p>I have thought the story of evil corporation riding into town to make a fast buck with no respect to its safety, traditions or values belongs to Hollywood. Sadly, it is happening right in my neighborhood.</p> <p>I have attended several public hearings on the PSE's proposed power line project before making up my mind on the issue. Many of my neighbors make clear and forceful arguments that the proposed power line built over the aging deteriorating jet fuel pipeline is a serious safety risk. I believe, or used to believe, this fact alone should kill the project right on the drawing board. Not only did it take off, but shockingly the \$1.4 billion cost would be borne by PSE customers. The need assessment is simply not convincing. The Eastside is thriving, but the projected growth comes from increased residential and consumer-based commercial use, not the construction of some power-hungry industrial plants. The increased need can be met by efficient use of energy without reconfiguring the powerline.</p> <p>Citing woefully outdated technology as the "only" other options and alternatives to its proposed project, PSE is insulting the intelligence of our community. We know that better alternatives exist and with the rapid advance of technology, more solutions will become available in the coming years. Why should any sensible project planner commit huge resources now to build a white elephant? The only answer is the profit motive. The rate payers foot the bill and investors in a far-flung foreign country reap the gains.</p> <p>Residing in China for 15 years, I saw time and again the rich and powerful in cahoots with corrupt officials trampling on citizens' rights in a country where there's no representative democracy, no accountability of the officialdom, no access to justice, few outlets to voice grievances. With a heavy heart I left China to retire in Newcastle only to find the same corporate greed, mendacity and utter disregard for community welfare. Luckily, we are in the U.S.A. We have recourse as citizens to demand strict safety standard and respect for our right-to-know. I support Alternative 2. It is absolutely the right thing to do to stop PSE from imposing its will on us, treating us like docile fools and making us pay for future accidents waiting to happen.</p>
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2/29/2016 17:14:23	Terry	Block	<p>We have lived in Bellevue for 25 years and watched its fairly rapid, yet controlled, growth. We believe that the citizens of Bellevue, ourselves included, have a strong desire to preserve the quality of our environment for its present and future residents. We are concerned about the effect of the PSE Energize Eastside project on the environment in that it will cause the loss of over 5000 trees, create new landslide risks, potentially expose nearby residents to the deleterious effects of EMF, and ravage the beautiful landscapes through which above ground utility poles will pass under alternatives 1A or 3.</p> <p>We might be willing to accept these very negative environmental impacts if we believed the assertions of PSE that there is a potential near term energy shortfall on the Eastside. Despite the fact that energy demand has been relatively flat in recent years, suggesting that conservation measures are taking hold, and PSE's projection to WECC is an only 0.5%/year growth in demand, PSE modeled its request for the project on a greater than 2% growth rate. Now we have been presented with new information from the Lauckhart-Schiffman Load Flow study, an independent study without the inherent financial conflicts of interest implicit in the PSE study, that suggests that there is no short-term, or even intermediate term, need for increased energy capacity/transmission on the Eastside. For this reason, we believe that PSE is motivated not by it's obligation to provide a consistent and ample energy supply to the Eastside, but rather a desire to maximize it's cash flow. Since the costs of this project, which will be considerable over the next two decades, are guaranteed by rate payers, we believe that our elected officials should protect our interests and those of our fellow citizens by reviewing the PSE proposal with a healthy skepticism.</p> <p>In the twenty-first century, the technology of energy creation and conservation is changing rapidly. We are old enough to remember the WPPS fiasco, and we fear that Energize Eastside will be another repetition, albeit on a smaller scale, of these types of past mistakes. Alternative 2 appears to be a common sense approach to a twenty-first century issue rather than the anachronistic, costly, and environmentally unfriendly approach advocated by PSE.</p> <p>Respectfully</p> <p>Terry and Kari Block</p>
2/29/2016 21:08:23	Edward	Huang	We don't need new PSE transmission lines!

2/29/2016 21:12:55	Amy	Faith	<p>I am writing to support the NO ACTION ALTERNATIVE . Here is why:</p> <ol style="list-style-type: none"> <li>1. PSE manipulated the data when doing the load study to create the appearance of need for this project.</li> <li>2. When citizen advocacy group Cense asked you to redo your load study due to suspected inconsistencies, you refused, saying you were done doing studies.</li> <li>3. When Cense asked for permission to see the data you used for your load study, you refused, saying there was no need for anyone to review your work.</li> <li>4. Instead, Cense had to go through FERC in order to gain access to your data.</li> <li>5. When Cense had a load study done using the same data as you, they only got your results after entering incorrect weather conditions, not clicking the proper boxes, adding the sale of energy to Canada and adding unrealistic situations that would not happen at the same time in real life.</li> <li>6. The project would bring in a profit of 8.9% a year for PSE , while costing customers over a billion dollars over the life of the project.</li> <li>7. Factoring in the sale of energy to Canada when the energy produced should be used to provide power for the cities the lines are to be going through instead.</li> </ol> <p>This is not the way to work with the residents who would be adversely affected by your proposed project. All options, except that of the NO ACTION alternative would have significant negative effects on the environment, plants, animals, and people in those neighborhoods. The combination of over head power lines and pipeline adds even more danger. We need to work together to find an economically reasonable solution that meets our energy needs without jeopardizing our health or the environment.</p> <p>Thank you for listening. Amy Faith Bellevue</p>
2/29/2016 21:31:27	Lin	Gong	We do not need a new PSE new transmission line.
3/1/2016 1:59:35	Lily	Yin	We don't accept Energize Eastside EIS program.
3/1/2016 7:09:38	Lily	Yin	Energize Eastside EIS program will cause negative environmental issue at Eastside. Please seeking other green and clean resources. We love this beautiful land and enjoy it. Will prevent any project from damaging this city.
3/1/2016 7:21:31	Xue	Song	We do not support having the overhead option. Please consider other options. Thank you!
3/1/2016 7:48:20	Irene	Wilmore	It would be INSANE to put PSE towers along Ripley Lane. Not only would it be destroying one of the prettiest routes along Lake Washington but it would be putting our environment and neighbors health in danger. We pay so much in taxes, much more than the average resident, to protect our environment so why would we jeopardize that? I dont think its worth the risk. I vote for Alternative 1, Option D.
3/1/2016 15:49:54	Jamie	Moy	I would like to voice my opposition to the Energize Eastside project, in particular, any options that require bigger and/or more power lines to be constructed. We are living in an era where major technological advances in power are occurring, both on the generation side (i.e. solar, battery storage) and the consumption side (more power-efficient electronic devices, LED bulbs). The Eastside needs to be a beacon for these new and future energy technologies to be deployed, not a reminder of yesteryear via unsightly and unnecessary power lines.

3/1/2016 16:24:17	Margaret	Moore	<p>The Proposed PSE project which is now in Phase 1 of the DEIS process is of great concern to me and all citizens who live on the Eastside. In addition to having enormous environmental impact on the entire region, it is increasingly being disproven as a necessary project. Touted by PSE - an off-shore consortium - as critical to future needs, it is designed to enhance its investment and ensure emergency power to Canada at the expense of rate-payers throughout our region. Better methods to meet future needs are available and will continue to be developed before our Eastside requirements become crucial.</p> <p>1.Of primary significance to the current EIS process, the ENVIRONMENTAL IMPACT is enormous. Over the 18 mile length of the plan, thousands of trees and numerous homes must be destroyed to make way for the required easement for 240kV wires on up to 135 foot poles. This is to say nothing of the archaic, ugly towers required to complete the installation. Far better ways exist to meet future needs than to revert to this old-fashioned method of power transmission. New, proven ways are happening -- new technologies are coming on line, utility efficiencies are developing, to say nothing of people and businesses reducing their consumption voluntarily and/or through pricing schedules.</p> <p>2.It is unthinkable to ignore the public SAFETY issues around constructing these heavy-duty transmission wires over an existing, aging pipeline carrying high octane jet fuel under great pressure. In this active earthquake zone so much could happen to damage both the fuel line and the transmission towers/lines. It's hard enough to think about the existing situation, let alone consider having the new lines involved with the Olympic Pipeline in a seismic event. We have had ample evidence of the unthinkable happening in similar situations to not be extremely concerned about the possibility here and do everything we can to prevent it.</p> <p>3.Finally, the NEED is not there for the foreseeable future. PSE has created a scenario to enhance their investment within the window in which they must divest, thereby increasing profits for Australian and Canadian investors. Who pays for this \$215 million dollar project? We the rate-payers will, while they continue to receive their guaranteed 9.84% ROI. PSE selected and edited data to enhance their request. It refused to allow a citizen's panel offer solutions or comments that were outside PSE's preferred scenario. (A surprising number of citizens on that review panel refused to sign the final report because it was shaped by PSE and did not allow a truly open process.) PSE has refused to acknowledge the Lauckhart-Schiffman load-flow study created by experts in energy planning – indeed Lauckhart previously was PSE's expert!</p> <p>It is very important that the current DEIS review pay attention to all data and information available and come to a conclusion that truly reflects more than the self-serving rationale presented by PSE. When a recommendation is made now, it should closely reflect Alternative 2 – an option that truly considers more than 20th century thinking about how to continue power flowing to the Eastside far into the future.</p>
3/1/2016 23:27:45	Eugene	Choi	<p>Everything I am seeing is that proposed action is for the profit of the utilities rather than the well-being of the community. The analysis on which the case for the added capacity was built on is weak and not representative of real-world reality, which raises red flags on true motives. If there are other communities that need the electrical capacity, the least the utility can do is minimize the long-term impact to the Seattle Eastside community (use existing overhead lines, underground lines, underwater lines, or explore other integrated approaches).</p> <p>Alternate 1-A's impact on the character of the neighborhoods and especially the physical impact to New Castle homes is appalling. Additionally, why would anyone put high voltage lines close to the Olympic Pipeline?</p>
3/2/2016 19:41:25	Sirisha	Dontireddy	<p>I am extremely concerned about building high voltage power lines so close to the Olympic gas pipeline in an earthquake prone area. Please refer to the link to the independent study by Dr. Frank Cheng on "Safety of Collocation of Electric power lines and Pipelines" on CENSE.org. Living close to high voltage power lines is a health risk, especially for children, pregnant women, elderly and for people with compromised immune systems. High voltage power lines should not go through residential neighborhoods, schools and hospitals.</p> <p>I oppose Alternate 1 as proposed by PSE.</p> <p>Thank you for your consideration, Sirisha.</p>

3/2/2016 22:01:30	Sam	Fetchero	I prefer Alternative 4. PSE has not proved the need for any additional work/capacity.  Bellevue is supposed to be a city in a park. The three alternatives make that vision less of a reality. We don't want Alternative 1, 2, or 3. Listen to us. We don't want it!
3/4/2016 18:39:08	Michael	Diederich	We need to invest in energy but not the systems from the last century. This makes no sense at a time when global warming is an ever growing concern it makes no sense to invest in more capacity this way. There are sensible alternatives. I'm especially concerned when a foreign company wants me to pay fir something when they are deliberately vague in their studies and communications. Shame on Bellevue for letting them get this far
3/5/2016 13:43:26	Kitty & Larry	buchanan	first of all why do aussies own and even have a say in our utilities? Alternative 1-2 or no action is the vote my husband and I have. We own two homes in bellevue and have since 1958. thank you
3/5/2016 17:53:38	Mary	Truscotf	I am following this proposed project and would like to register my strenuous objection to yet another poorly conceived project based on studies with dubious data, and what sounds like insufficient funding. Any work done or near the Olympic Pipeline should be scrutinized very carefully, and any propey owners who could be impacted should receive information on the project, directly, and not in the form of direct mail and media coverage.
3/5/2016 19:48:27	Paul	Davenport	I support Alternative 4 (NO ACTION) as I do not believe new transmission lines are necessary and we should avoid costly upgrades that are not needed.
3/5/2016 20:24:11	Richard	Kaner	The DEIS discusses how the different identified pieces of Alternative 2 don't satisfy the shortage predicted by PSE. This is discussed in Chapter 2.3.3 and expanded further in 2.4.2, 2.4.3 and 2.4.5. In light of the Lauckhart-Schiffman report, it is clear that all of these options should, indeed, be back on the table.  It is further disappointing to see that PSE sold the Schuffleton Peaker Plant, pocketed the money and now predicts shortages. At a minimum, PSE should be obligated to contribute the proceeds of that sale to the upgrade of the grid.  The DEIS is deficient in that the discussion of the components of Alternative 2 was done without the input of experts in these respective fields.
3/6/2016 6:30:04	Lara	Prior	Please implement option #2 of integrated resource approach or #4 no action. We are voting and taxpaying home-owning citizens of Bellevue and urge you to be sensible, listen to the people and stop this project.
3/6/2016 11:52:08	Gerald	Watkins	Puget Sound Energy has not provided rationale or data for its outrageously unrealistic assumptions concerning our future power needs. They seem to have completely ignored technologically modern ways of meeting current and future power demands. Instead they want us to pay for an outdated system that is ugly, damaging to the environment and unsafe by crossing the dangerous Olympic Gas Line.
3/6/2016 12:11:04	Anne D.	Watkins	Puget Sound energy has not thoroughly informed the public regarding their intentions with any specifics regarding the use of their proposed dinosaur electrical system. There are more progressive alternatives to meet power demand for this area now and in the future. I say "NO" to alternative 1-A and support Alternative 4: NO ACTION.
3/6/2016 12:25:21	Gerald	Watkins	This is a revised version of my previous submission. Puget Sound Energy has not provided rationale or data for its outrageously unrealistic assumptions concerning our future power needs. They seem to have completely ignored technologically modern ways of meeting our current and future power demands. Instead they want us to pay for an outdated system that is ugly, damaging to the environment and unsafe by crossing the dangerous Olympic Gas line. I vote NO to Alternative 1-A (Energize Eastside) and recommend Alternative 4 No Action.

3/6/2016 15:09:24	Linda	Igoe	no no no to alternative 1-A  Scrap the whole idea that ruins our environment and I would be willing to do my share in using less energy
3/6/2016 16:05:25	Barbara	Dickson	Without driving my eyes crazy as I have serious dry eyes, I don't see anything to tell me what the projected growth might be to need all this. I would assume certain areas have hit their maximum growth already, thereby being fine the way they are. Also, I believe if there is so much growth additional facilities should happen then/later at builder's expense, not the general public and taken a piece at a time. We cherish Redmond and other parts of the Eastside for the green, not substations and power grids. Besides when this growth happens, perhaps there would be a more environmentally efficient way to achieve a better grid and then we will have just spun our wheels for nothing. Planning should be long term, but not construction for what might not even be needed. Thank you.
3/6/2016 19:36:11	Keith	Watts	"50,000 EV's by 2020"??? It is possible. We should consider the impact the Washington EV Action Plan 2014 will have on electricity demand on the Eastside. I have not heard this mentioned in the EIS. The WA EV Action Plan states... "This plan is intended to inform policy-makers, elected officials, and local leaders about the electric vehicle landscape in Washington, and identify actions that would drive further electric vehicle adoption. This plan sets forth actions that will ensure we continue our momentum, and achieve the state's goal of 50,000 EVs by 2020" It goes on to say.. "Creating a robust market for electric vehicles will help: <ul style="list-style-type: none"> <li>• Meet state goals to reduce greenhouse gas emissions.</li> <li>• Protect public health and air quality.</li> <li>• Promote economic growth.</li> <li>• Save drivers money."</li> </ul> The WA electric car adoption study does not mention the need to upgrade the grid infrastructure to handle it. Perhaps it should. I couldn't find anywhere in the EIS phase 1 that mentions the impact of additional electric car adoption. Would the additional demand caused by electric car adoption offset (cancel out) conservation efforts described in Alternative 2?
3/7/2016 6:26:50	Hanski	Elizabeth	The map (heat map) on the website that has the energy use projections doesn't pass the sniff test. Why is bridal trails state park and other parks red? The parks can't be using that much electricity. There are other mature neighborhoods around the park, so their energy draw shouldn't be changing significantly. Not having any green on the chart gives the appearance the energy needs are being overstated and a more scaled back solution would be more appropriate. Have any non advocates reviewed the projections? Have Monte Carlo simulations been run to improve the accuracy of the projections? I don't want to degrade the quality of Kirkland and Bellevue unless we can prove a problem.
3/7/2016 12:14:59	Laura	Rivendell	I would like to state my emphatic opposition to Puget Sound Energy's Energize Eastside proposal.  I am writing in support of Alternative 2 - Integrated Resource Approach . This is the most cost effective, reliable and safe of the options. According to the independent Lauckhart-Schiffman study, "PSE's system can avoid overloads and outages even when two critical transformers have failed...Energize Eastside is not needed to provide reliable power in this scenario for many years."  We urgently need to be investing in renewable energy options and infrastructure, which Energize Eastside Alternative #1 does not do.  Please do not approve Energize Eastside Alternative #1, which is clearly a project to make money for Puget Sound Energy and is very disadvantageous for PSE's customers.

3/7/2016 13:21:56	Liping	Ke	Having another old-out-of-date Transmission Lines setup in the sky is really scaring, especially when passing through the whole Bellevue and many other cities. It's a not a potential threat to safety, but it also impacts the whole environments and neighborhood. Current techniques make it natural that we should reuse current lines or make it hidden. If no actual requirements, we believe no action is the best choice. Otherwise, we need to think about the reuse of the existing one, which might be more economical.
3/7/2016 18:25:00	Orville	Gunnoe	After making an effort to educate myself about EIS, I am appalled by the poor communication of facts and data by PSE. The maps and scant information provided to let the public know what their specific plans are poor and lacking and one can only assume PSE wants to run some heavy electrical cables somewhere through Bellevue into Redmond. The specific routing is TBD, the specific need (as stated) is overstated according to reputable studies (something PSE has either failed to do or is unwilling to share how it got the outcome it did), and the company has done an exceptionally poor job of System Engineering (e.g., it has done a poor or nonexistent job of identifying and validating its requirements, designing the architecture that would satisfy the requirements, and linking requirements to planned actions). In short and however one wants to look at the job it has done, PSE has not put forth a convincing argument for the action it wants to pursue, but then that might be what a corporation gets when it turns to a 'weather man' to be its vice president associated with a complex engineering undertaking. I found better and more believable information to be available in an independent study done, in part, by its former vice president who has some engineering qualifications and found PSE's assertions to be overstated and/or fallacious. Additionally, it appears there are alternative approaches to meet the energy needs of tomorrow and one has to wonder whether PSE's approach is more to suit its desire to supply power to Canada than it is to meet the needs of the Eastside area. Therefore, I see no way that the City of Bellevue can or should approve/countenance PSE's flawed request. When one uses lacking and/or faulty data to arrive at a decision or plan, the decision and plan are equally worthy of rejection.
3/7/2016 20:46:07	Maxine	Voetberg	I would like to urge PSE to cancel the proposed new high power lines. There are health consequences when putting such high power lines near the Olympic Pipe Line. This is an accident being prepared to happen. How can our Clty let this happen to it's residence. PSE has not proven this is necessary. Selling power to Canada is not a necessity. The Clty has received enough information from CENSE to halt this from happening. PLEASE, DO NOT bury you head in the sand and let this happen.
3/8/2016 8:16:21	Donna	Peha	Please DO NOT build gigantic power lines over our neighborhoods. I haven't heard anything about the safety features of the proposed power lines. What happens when one falls during a storm? They are supposed to traverse our schools, possibly causing harm to children if damaged. There is plenty of time to bury power lines underground or come up with another solution. Don't make our neighborhoods ugly and devalued by installing these huge power poles.
3/8/2016 11:14:50	Pam	Paris	Please don't bring in the ultra huge utility poles, Redmond is already becoming a junk yard of new ugly condos, and the last thing we need is a terribly expensive "idea". We don't need it yet and as a tax payer I don't want to be paying for it.

3/8/2016 12:45:53	Jill	Sulzberg	<p>As a homeowner in the Bridle Trails area of Bellevue with two sets of power poles currently on my property, I appreciate the opportunity to comment on the DEIS, and will focus on three issues: need, neighborhood/environmental impact and safety.</p> <p><b>Need</b></p> <p>PSE's Energize Eastside project is unnecessary and overreaching given current and near-term community needs. There is no proven, credible need for a project of this scope to serve the Eastside, and it is reasonable to question claims that the project is solely for local benefit. Chapter 1.3 of the DEIS asserts "there is a need to construct a new 230 kV bulk electrical transmission line." An independent study (Lauckhart-Schiffman load-flow study) shows the contrary: demand will not exceed peak flow until 2058. Even using PSE's own (inflated) rate of growth in electrical demand (2.4%), current capacity will suffice until at least 2027—a full 10 years longer than PSE claims. Clearly, there is time to pursue alternatives, especially as energy technologies rapidly develop. PSE must address this independent study as it goes forward and provide persuasive evidence of a near-term need.</p> <p><b>Neighborhood/Environmental Impact</b></p> <p>The EIS "is intended to identify alternatives that could attain or approximate PSE's objectives at a lower environmental cost and disclose potential significant adverse environmental impacts associated with all alternatives identified." (DEIS Chapter 1.3, emphasis added). PSE must evaluate in good faith the consequences of all the proposed alternatives, not just those that allow PSE to attain its stated goals exactly as the corporation outlined.</p> <p>In the event that PSE moves forward with Energize Eastside, I urge it to consider more fully the DEIS Alternative 2 (as PSE appears to have dismissed outright the ability to place lines underground or underwater). If it consists of a realistic and cost-effective mix of proven and cutting edge technology, Alternative 2 will permit improvements to the existing grid as needed, but will have a lower impact than the current proposal. Bellevue is known as "the city in a park." We are surrounded by lush vegetation, and in some places, striking vistas. We are realists, and understand the existence of power poles and easements over public and private property, but request that PSE respect the current character of the city as a whole and PSE's existing rights-of-way and easements.</p>
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3/8/2016 16:01:19	Kellie	Utzinger	<p>Living in one of the most high tech and environmentally conscious cities in the U.S., I have to believe we can come up with a better alternative that meets our growing energy needs without industrial sized power lines running through our backyards. We need to avoid the easy option here and be innovative. Other industries are doing this i.e. Tesla with cars, why doesn't PSE seriously look for new solutions for Bellevue's energy demands?</p>

3/9/2016 16:25:32	Kathleen	Sherman	<p>I have questions about this for-profit utility's [PSE] evaluations of need and cost of this project because it is owned and associated with the Australian business MacQuarie. Three reasons are that:</p> <ol style="list-style-type: none"> <li>1. MacQuarie's other questionable projects</li> <li>2. A 2014 inquiry by the Australian Senate called for the Australian Securities and Investments Commission "to put Macquarie Group's financial planning unit under 'intensive surveillance,'" according to the Sydney Morning Herald. The inquiry was sparked by reports of "misconduct by financial planners at the Commonwealth Bank," but concerns about financial practices spread beyond Commonwealth. The Senate report stated, "The committee is concerned with the efficacy of the enforceable undertaking entered into as a result of serious compliance deficiencies within Macquarie Private Wealth." [11] About the inquiry, the Australian Financial Review reported that "Macquarie Group's private wealth unit [was] accused of not co-operating with the Senate committee that delved into unethical financial planning practices at the Commonwealth Bank of Australia." [12]</li> <li>3. Is this construction project part of a plan to pay off debts acquired with the purchase of PSE and not a benefit for consumers?</li> </ol> <p>"In 2008, Macquarie and a group of Canadian pension funds purchased Puget Sound Energy (PSE), the largest energy company in Washington, which provides electricity and natural gas to Seattle and the surrounding area. The Macquarie-led consortium purchased PSE from its shareholders for \$7.4 billion, which was financed in large part by borrowing \$4.2 billion. Commentators worried from the beginning of the transaction that Macquarie's heavy borrowing would "saddle Puget Energy with debt, sapping its financial standing and creating pressure in the future to raise rates." [56] The Washington Utilities and Transportation Commission staff and the Public Counsel Section of the Washington state Attorney General's Office also opposed the transaction during its initial stages due to the large amount of debt financing. Public Counsel Section Chief Simon Fitch warned "at the same time, customers have no assurance that capital for infrastructure will be any more available or affordable than without the merger. Consumers appear to get little or nothing in return for the increased financial risk." [57]</p> <p><a href="http://www.sourcewatch.org/index.php/Macquarie">http://www.sourcewatch.org/index.php/Macquarie</a> 3/9/2016 12:11 pm</p>
3/9/2016 20:29:40	Kathleen	Sherman	<p>All authors and contributors of the DEIS need to disclose any financial or other relationships with PSE and its related entities in the past, present or planned in the future</p> <p>I Am A Member of the committee and spoke at the Bellevue meeting and have submitted other comments</p>
3/9/2016 20:34:01	Kathleen	Sherman	<p>All authors and contributors of the DEIS need to disclose any financial or other relationships with PSE and its related entities in the past, present or planned in the future</p> <p>I Am A Member of the committee and spoke at the Bellevue meeting and have submitted other comments</p>
3/10/2016 9:24:40	Mike	Abel	<p>Wednesday March 9, another pipeline explosion rocks a Seattle neighborhood. This incident is eerily similar to the explosion that rocked San Bruno, California in 2010 resulting in 8 deaths and destruction of 38 residences. As noted in the Seattle Times, PSE has had numerous instances of failure to comply with applicable pipeline safety regulations. And now they plan to construct 150-foot power poles along an existing high-pressure gasoline pipeline that is owned by Olympic Pipeline, a company with its own history of failing to comply with safety rules. Time and time again, pipeline companies have been shown to be negligent in servicing, monitoring and maintaining the safety of their systems, with corrective action only being taken after disaster strikes. Olympic Pipeline has been suspiciously absent from all of the meetings and hearings related to Energize Eastside. They should be made to be a party to these hearings.</p>

3/10/2016 12:23:30	Paul	Gibbons	<p>Page 120 of the PEIS states that any Solar Panel or alternative electrical generating installation for reducing the overall capacity needed cannot be included in the overall capacity required. This forces all residents within the City of Bellevue to only purchase Electrical Power from PSE. That institutes a Monopoly on Power Sales. This discourages conservation and alternative sources of power for the Citizens of Bellevue. This project is unneeded, and is a way for this company to gouge the customers in the future.</p>
3/10/2016 14:52:04	Eugen	Pajor	<p>To: Heidi Bedwell, Energize Eastside EIS Program Manager  From: Eugen Pajor, 8441 129th Ave SE, Newcastle, WA, 98056</p> <p>Dear Ms. Bedwell,</p> <p>I am very concerned about Puget Sound Energy's "Energize Eastside" project, which proposes to build 18 miles of high-voltage transmission lines through four Eastside cities (Alternative 1A).</p> <p>PSE tries to justify the need for the project using an impossible scenario that would cause regional blackouts, according to the Lauckhart-Schiffman Load Flow Study, available at CENSE.org.</p> <p>Alternative 1A would place new lines and poles much too close to aging petroleum pipelines. Responsible safety standards require at least a 50 foot separation. A construction or operational accident could cause a catastrophic pipeline explosion like the one that killed three Bellingham residents in 1999. This risk is not adequately addressed in the EIS.</p> <p>With the very minimum safety distance of 50 foot between the pipe lines and the high voltage lines the existing PSE corridor must be widened. This will result in a certain number of houses to be destroyed and certain land to be converted into utility land. I could not see an analyze of the impact on Newcastle tax revenue and on housing and house value loss in the EIS draft. How this tax loss will be mitigated? How the families affected by this changes will be compensated for their property loss? In the Olympus neighborhood, according with a preliminary study, 51 houses will be gone just to widen the corridor, that is about 19% of the community. How that will be mitigated? This is a big concern and it is not properly addressed in the EIS draft.</p> <p>Regards,  Eugen Pajor</p>

3/10/2016 19:28:22	Kathleen	Sherman	<p>Comments on the DEIS Chapter 8 Environmental health is not defined.</p> <p>In this DEIS report There are many instances of stating that there are laws covering this issues but very few statements of how PSE will met these requirements.</p> <p>8.1 Item number 2 Lists safety risks of activities near pipelines as an item of environmental concern. Where is the list of safety risks near a high voltage transmission line which is being studied? Item number 3 does not include corrosion as a natural phenomenon There is no mention of above ground structures or other underground structures like natural gas mains, waterlines and sewers. . PSE was Fined \$1.25 Million for Falsifying Gas Pipeline Safety Inspection Reports For 4 Years Running. Who is going to supervise PSE in the management of construction near its own structures like natural gas pipelines?</p> <p>8.2.1 This section does not follow the concept of transparency. It is probably a partial listing of codes laws and regulation. It does not include how the regulations will be met or who will enforce. There is no transparency for public notice of failures, shortcomings, or fines. This is particularly important because of PSE past serious safety violations. PSE was Fined \$1.25 Million for Falsifying Gas Pipeline Safety Inspection Reports For 4 Years Running. Who is going to pay for the kind of supervision PSE NEEDS? Likely hazardous wasted are not listed including jet fuel spills. Again who is going to provide the kind of supervision for profit PSE needs to follow expensive safety regulations Storm water management will be necessary both during and after construction. There are no maps or plans provided for storm water management. There is no plan for managing mosquitos in standing water. Storm water has to go somewhere and its management is important in hilly areas. Underground lakes and reseviours amybe be formed leading to erosion and damage to buildings, pipelines and transmission lines. No MSDS information is included for building materials that will be used and no MSDS information is provided for substances that are possibly found or created at the building site or operation site There is no plan for storing materials for construction or materials found or created on or near the site before, after or during construction and operation. PSE has a history of being fined for flouting safety regulations The city of Bellevue does not have the technical expertise to regulate or evaluate pipeline and high voltage transmission lines. The study they commissioned to independently evaluate Energize Eastside did not evaluate the data input by PSE as did the Lauckhart study. cense memeber</p>
3/10/2016 19:31:00	Kathleen	Sherman	<p>8.2.2.1 This section does not address PSE responsibilities in constructing. Operating or maintaining anything in the pipeline corridor. It addresses the pipeline company's responsibilities only instead of PSE responsibilities and penalties .This section lists civil penalties for pipeline operators but not penalties for pipeline non- operators who are building or maintaining or using something in the pipeline corridor</p> <p>8.2.2.2 There is no list of high density on-site populations centers. There is no plan for increasing the availability of emergency services and traffic police during construction or afterward. There are no city personnel or financial plan for any increased risk incurred by the city for the increased services incurred during the construction and operation of the high voltage transmission lines. Will the city insurance for emergency personnel and other things increase with this high voltage transmission line construction and operation afterward? Will police and emergency personnel need to be reassigned because of increased risk caused by these transmission lines? Are city emergency personnel at an increased risk? How will their risk be analyzed and minimized? How much will the involved cities' insurance increase?</p>

3/10/2016 19:31:49	Kathleen	Sherman	<p>8.2.3</p> <p>The international agency for research on cancer (IARC) in 2002 classified the extremely low frequency magnetic field generated by electrical devices as possibly carcinogenic to humans [1]. In 2011, the radio frequencies of electromagnetic fields were qualified by IARC and WHO as possibly increasing the risk of malignant brain tumor development [2]. Please address this fact.</p> <p>The effect of power lines on defibrillators, EKG misinterpretation needs to be addressed particularly because the high voltage line will pass near schools and other places where people gather.</p> <p>Please address this study in terms of people living or working near power lines</p> <p>Onco Targets Ther. 2016 Feb 12;9:745-54. doi: 10.2147/OTT.S94374. eCollection 2016.</p> <p>Effects of electromagnetic radiation exposure on bone mineral density, thyroid, and oxidative stress index in electrical workers.</p> <p>Kunt H1, Şentürk İ2, Gönül Y3, Korkmaz M4, Ahsen A5, Hazman Ö6, Bal A7, Genç A8, Songur A3.</p> <p>Author information</p> <p>Abstract</p> <p>BACKGROUND:</p> <p>In the literature, some articles report that the incidence of numerous diseases increases among the individuals who live around high-voltage electric transmission lines (HVETL) or are exposed vocationally. However, it was not investigated whether HVETL affect bone metabolism, oxidative stress, and the prevalence of thyroid nodule.</p> <p>METHODS:</p> <p>Dual-energy X-ray absorptiometry (DEXA) bone density measurements, serum free triiodothyronine (FT3), free thyroxine (FT4), RANK, RANKL, osteoprotegerin (OPG), alkaline phosphatase (ALP), phosphor, total antioxidant status (TAS), total oxidant status (TOS), and oxidative stress index (OSI) levels were analyzed to investigate this effect.</p> <p>RESULTS:</p> <p>Bone mineral density levels of L1-L4 vertebrae and femur were observed significantly lower in the electrical workers. ALP, phosphor, RANK, RANKL, TOS, OSI, and anteroposterior diameter of the left thyroid lobe levels were significantly higher, and OPG, TAS, and FT4 levels were detected significantly lower in the study group when compared with the control group.</p> <p>CONCLUSION:</p>
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Consequently, it was observed that the balance between construction and destruction in the bone metabolism of the electrical workers who were employed in HVETL replaced toward destruction and led to a decrease in OPG levels and an increase in RANK and RANKL levels. In line with the previous studies, long-term exposure to an electromagnetic field causes disorders in many organs and systems. Thus, it is considered that long-term exposure to an electromagnetic field affects bone and thyroid metabolism and also increases OSI by increasing the TOS and decreasing the antioxidant status.

This recent peer review article shows a link between birth weight and proximity to high voltage lines Does 60hz exposure also affect birth weight? Please address this.

Environ Int t2014 Aug;69:51-7. doi: 10.1016/j.envint.2014.04.012. Epub 2014 May 7.

Residential proximity to electromagnetic field sources and birth weight: Minimizing residual confounding using multiple imputation and propensity score matching.

de Vocht F1, Lee B2.

Abstract

Studies have suggested that residential exposure to extremely low frequency (50 Hz) electromagnetic fields (ELF-EMF) from high voltage cables, overhead power lines, electricity substations or towers are associated with reduced birth weight and may be associated with adverse birth outcomes or even miscarriages. We previously conducted a study of 140,356 singleton live births between 2004 and 2008 in Northwest England, which suggested that close residential proximity ( $\leq 50$  m) to ELF-EMF sources was associated with reduced average birth weight of 212 g (95%CI: -395 to -29 g) but not with statistically significant increased risks for other adverse perinatal outcomes.

However, the cohort was limited by missing data for most potentially confounding variables including maternal smoking during pregnancy, which was only available for a small subgroup, while also residual confounding could not be excluded. This study, using the same cohort, was conducted to minimize the effects of these problems using multiple imputation to address missing data and propensity score matching to minimize residual confounding. Missing data were imputed using multiple imputation using chained equations to generate five datasets.

For each dataset 115 exposed women (residing  $\leq 50$  m from a residential ELF-EMF source) were propensity score matched to 1150 unexposed women. After doubly robust confounder adjustment, close proximity to a residential ELF-EMF source remained associated with a reduction in birth weight of -116 g (95% confidence interval: -224;-7 g). No effect was found for proximity  $\leq 100$  m compared to women living further away. These results indicate that although the effect size was about half of the effect previously reported, close maternal residential proximity to sources of ELF-EMF remained associated with suboptimal fetal growth.

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3/10/2016 19:33:26	Kathleen	Sherman	<p>Please address these recent peer reviewed articles in regards to childhood cancer. The abstracts are included</p> <p>Asian Pac J Cancer Prev. 2015;16(6):2347-50.  Increased risk of childhood acute lymphoblastic leukemia (ALL) by prenatal and postnatal exposure to high voltage power lines: a case control study in Isfahan, Iran.  Tabrizi MM1, Bidgoli SA.  Abstract</p> <p>Childhood acute lymphoblastic leukemia (ALL) is one of the most common hematologic malignancies, accounting for one fourth of all childhood cancer cases. Exposure to environmental factors around the time of conception or pregnancy can increase the risk of ALL in the offspring. This study aimed to evaluate the role of prenatal and postnatal exposure to high voltage power lines on the incidence of childhood ALL. This cross-sectional case control study was carried out on 22 cases and 100 controls who were born and lived in low socioeconomic families in Isfahan and hospitalized for therapeutic purposes in different hospitals from 2013-2014. With regard to the underlying risk factors, familial history and parental factors were noted but in this age, socioeconomic and zonal matched case control study, prenatal and childhood exposure to high voltage power lines was considered as the most important environmental risk factors of ALL (p=0.006, OR=3.651, CI 95%, 1.692-7.878). As the population was of low socioeconomic background, use of mobiles, computers and microwave was negligible. Moreover prenatal and postnatal exposure to indoor electrically charged objects was not determined to be a significant environmental factor. Thus, pre and post-natal exposure to high voltage power lines and living in pollutant regions as well as familial influence could be described as risk factors of ALL for the first time in a low socioeconomic status Iranian population.</p> <p>PMID:  25824762  [PubMed - indexed for MEDLINE]  Abstract</p> <p>Asian Pac J Cancer Prev. 2015;16(17):7613-8  Childhood acute lymphoblastic leukemia (ALL) is one of the most common hematologic malignancies which accounts for one fourth of all childhood cancer cases. Exposure to environmental factors around the time of conception or pregnancy can increase the risk of ALL in the offspring. This study aimed to evaluate the influence of prenatal and postnatal exposure to high voltage power lines on the incidence of childhood ALL. It also examines the role of various factors such as environmental factors and alpha-amylase as a marker in the development of leukemia. This cross-sectional case control study was carried out on 22 cases and 100 controls who born and lived in low socioeconomic families in Tehran and were hospitalized for therapeutic purposes in different hospitals from 2013-2014. With regard to the underlying risk factors; familial history and parental factors were detected as risk factors of ALL but in this age, socioeconomic and zonal matched case control study, prenatal and childhood exposure to high voltage power lines was considered as the most important environmental risk factor (p=0.006, OR=3.651, CI 95% 1.692-7.878). As the population study was from low socioeconomic state, use of mobiles, computers and microwaves was negligible. Moreover prenatal and postnatal exposure to all indoor electrically charged objects were not detected as significant environmental factors in the present study. This work defined the risk of environmental especially continuous pre and postnatal exposure to high voltage power lines and living in pollutant regions through the parents or children as well as the previously described risk factors of ALL for the first time in low socioeconomic status Iranian population.</p> <p>PMID:  26625771</p>
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3/10/2016 19:41:41	Kathleen	Sherman	<p>Please address the health effects of high voltage power lines in the following recent peer reviewed article The article discusses sleep disturbances and circadian rhythms Sleep disturbances are an issue in safety such as driving safety and health.</p> <p>Biomed Res Int. 2014; 2014: 169459.  Published online 2014 Jul 22. doi: 10.1155/2014/169459  PMCID: PMC4130204  Influence of Electric, Magnetic, and Electromagnetic Fields on the Circadian System: Current Stage of Knowledge  Bogdan Lewczuk, 1 ,* Grzegorz Redlarski, 2 , 3 Arkadiusz Żak, 2 Natalia Ziółkowska, 1 Barbara Przybylska-Gornowicz, 1 and Marek Krawczuk 2</p> <p>This article has been cited by other articles in PMC.</p> <p>Abstract  One of the side effects of each electrical device work is the electromagnetic field generated near its workplace. All organisms, including humans, are exposed daily to the influence of different types of this field, characterized by various physical parameters. Therefore, it is important to accurately determine the effects of an electromagnetic field on the physiological and pathological processes occurring in cells, tissues, and organs. Numerous epidemiological and experimental data suggest that the extremely low frequency magnetic field generated by electrical transmission lines and electrically powered devices and the high frequencies electromagnetic radiation emitted by electronic devices have a potentially negative impact on the circadian system. On the other hand, several studies have found no influence of these fields on Chrono biological parameters. According to the current state of knowledge, some previously proposed hypotheses, including one concerning the key role of melatonin secretion disruption in pathogenesis of electromagnetic field induced diseases, need to be revised. This paper reviews the data on the effect of electric, magnetic, and electromagnetic fields on melatonin and cortisol rhythms—two major markers of the circadian system as well as on sleep. It also provides the basic information about the nature, classification, parameters, and sources of these fields.</p>
3/10/2016 19:44:26	Kathleen	Sherman	<p>The amount exposure to power line effects should take into account cumulative exposures that occur at home, school and other places children spend time.</p> <p>Bio electromagnetics. 2008 Oct;29(7):564-70. doi: 10.1002/bem.20431  Analysis of individual- and school-level clustering of power frequency magnetic fields.  Lin IF1, Li CY, Wang JD.  1Institute of Occupational Medicine and Industrial Hygiene, College of Public Health, National Taiwan University, Taipei, Taiwan.</p> <p>Abstract  This study reports the continuous 8-h monitoring of data on extremely low-frequency magnetic fields (ELF-MF) relating to 14 children and 35 teachers in 11 elementary schools in Northern Taiwan. It was anticipated that the subjects in two of these campuses would have elevated exposure to ELF-MF as a result of their close proximity to high-voltage (161 kilo-Volt, kV) power lines. The results of our analysis reveal that in those schools with high-voltage power lines running through the campuses, the mean ELF-MF exposure level (0.38 +/- 0.51 micro-Tesla (microT), or 0.15, 0.25 and 0.44 microT at the respective 25th, 50th and 75th percentiles) was higher than the mean ELF-MF exposure level for campuses situated far away from such high-voltage power lines (0.14 +/- 0.27 microT, or 0.04, 0.06 and 0.10 microT at the respective 25th, 50th and 75th percentiles). The multi-level analytical technique, which takes individual measurements as the analytical unit, and which also takes into consideration the inter-correlation between measurements from the same individual and/or campus, was also applied to the analysis of the data. We conclude that individual-level and school-level clustering of the measurements, both of which were discernible in this study, should be taken into consideration in any future analysis of data obtained from the continuous monitoring of exposure to ELF-MF.</p> <p>this comment box will not let me put the entire article.</p>

3/10/2016 19:52:09	Kathleen	Sherman	<p>Mental health is part of environmental health These two articles show effects of power lines on mental health. Please address these concerns.</p> <p>Am J Epidemiol. 1997 Dec 15;146(12):1037-45  Magnetic fields of transmission lines and depression.  Verkasalo PK1, Kaprio J, Varjonen J, Romanov K, Heikkilä K, Koskenvuo M.  Abstract  Electromagnetic fields have been suggested to contribute to the risk of depression by causing pineal dysfunction. Some epidemiologic studies have supported this possibility but have generally reported crude methods of exposure assessment and nonsystematic evaluation of depression. Using two available nationwide data sets, the authors identified from the Finnish Twin Cohort Study 12,063 persons who had answered the 21-item Beck Depression Inventory of self-rated depressive symptoms in 1990. The personal 20-year histories of exposure (i.e., distance and calculated annual average magnetic fields) before 1990 to overhead 110- to 400-kv power lines were obtained from the Finnish Transmission Line Cohort Study. The adjusted mean Beck Depression Inventory scores did not differ by exposure, providing some assurance that proximity to high-voltage transmission lines is not associated with changes within the common range of depressive symptoms. However, the risk of severe depression was increased 4.7-fold (95% confidence interval 1.70-13.3) among subjects living within 100 m of a high-voltage power line. This finding was based on small numbers. The authors recommend that attempts be made to strive for a better understanding of the exposure characteristics in relation to the onset and course of depression.  PMID:  9420528  [PubMed - indexed for MEDLINE]</p> <ul style="list-style-type: none"> <li>• □</li> <li>• Relation between suicide and the electromagnetic field of overhead power lines.</li> </ul> <p>Reichmanis M, Perry FS, Marino AA, Becker RO.  Abstract  Laboratory studies have shown that electromagnetic fields similar to those from high-voltage transmission lines can produce biological effects. Surveys of the actual effects of such lines on exposed individuals usually have been hampered by complicating factors tending to blur the data. By means of a new approach, however, correlation has been established between the presence of transmission-line fields and the occurrence of suicides in part of the Midlands of England.  PMID:  542502  [PubMed - indexed for MEDLINE]</p> <p>The mental health, psychological and emotional impact of condemning homes and altering neighborhoods is not addressed. Nor is impact and cost of construction.  8.3.1</p>
3/10/2016 20:01:49	Kathleen	Sherman	<p>was the species <i>Bombus occidentalis</i> specifically investigated?  There are many hedgerows along the pipeline corridor and hedgerows are ecologically important how is this address?  There have been multiple reports of bobcats in the area. Some pictures or on NextDoor. Although bobcats are more common in suburban areas these pictures do not show the spotted bobcat coat pattern The may be young canadian lynx. This need to be investigated</p>
3/10/2016 23:32:36	Erik	Hollingsworth	<p>I object to scaring our Eastside neighborhoods with massive 230kV transmission lines. No convincing evidence has been provided to show these measures to be necessary. There are other options that are not a detriment to the character of the city and would better serve those living in the affected areas. Alternative 2 or Alternative 1C are the only options that are somewhat reasonable. Alternative 1A is completely ridiculous and should not be considered.</p>

3/11/2016 9:46:34	Bill	Picatti	<p>This comment is related to the proposed project titled Energize Eastside, and their draft EIS. I disagree with some of their assumptions that drove their outcome of needing to expand capacity by winter 2017-18. Their growth projection is far higher than for other like utilities in this area, their winter loading but summer derating factors are conflicting, and their omission of conservation upgrades lead to what I consider to be a false outcome. Also, I disagree that we (the Northwest) should sacrifice our environment, lifestyle and health, not to mention our money, in order to support the power needs for Canada.</p> <p>Other power projection studies using more true-to-life assumptions show that we are not in dire needs for a system expansion at this time, and that we appear to have at least a couple of decades before this issue really needs to be discussed. Promotion of cost effective efficiency updates should come first before an expensive (and unhealthy?) expansion of our utility infrastructure.</p>
3/11/2016 11:53:46	Conald	Kucera	<p>My name is Conald Kucera. My home, which I live at is 8300 128th Lane SE in Newcastle, WA in the Olympus subdivision community. I have lived there for over 27 years. My email address is cjkucera@hotmail.com. My West property line abuts onto the PSE electrical powerline easement. I am greatly concerned with the proposed construction of the 230 KVA transmission powerlines and the transmission towers along the powerline easement corridor which also contains two hazardous underground gasoline and aviation fuel distribution pipelines and their impact on me and my neighbors and residents along the PSE powerline easement, our health, safety and our very lives; as well as everyone else who lives along the proposed PSE transmission line route.</p> <p>Alternative 1-option A—is PSE’s favored route. This route through Newcastle currently has wooden H-poles along with the Olympic gas pipelines. These proposed steel monopole towers will be 85’-100’ tall! This is almost twice as tall as the existing wood poles. The power will increase from 115KVA to 320KVA, doubled!</p> <p>#1 concern is safety of construction, heavy equipment, tower footings 25’-50’ underground, in close proximity to the gas pipelines. See Chapter 2-page 23 of the Phase 1 Draft EIS 715 page document. Under PSE current proposal 1/2 of the transmission towers through Olympus will be in residential backyards. The steel monopole tower bases will be 36” to 42” in diameter and the concrete footings will be around 5 to 6 feet in diameter. This will destroy people’s backyards: trees and landscaping and gardens destroyed, patios and decks removed, and accessory structures (ie. storage sheds, gazebos, greenhouses, etc.) demolished.</p> <p>#2 concern is they will buy homes to accomplish this as they will need to widen the right of way 20’-50’. See Chapter 2-page 23. And Chapter 10-page 20. DEIS says impact to housing is “significant” in Olympus. See Chapter 10 page 21. PSE needs to respond to their plans for what becomes for those properties that are needed to place their power towers. If the properties are condemned and the houses are torn down what happens to the lot. Who maintains the grounds? PSE does next to nothing to maintain the existing powerline easement. Who wants to live next to a vacant trash filled lot. This will even further destroy the character of the neighborhood. Removal of homes will further reduce remaining property values, see item #3.</p> <p>#3 concern is destroying our neighborhood character and affecting home values—they admit up to 20% home value depreciation. See Chapter 11-page 29.</p>

#4 Major safety concern when I spoke to PHSMA-Pipeline & Hazardous Material Safety Admin.—Western Regional office in Colorado. and is also outlined in the DEIS—Chapter 16-page 14.

"Electromagnetic interference"—consequence of high voltage where power lines and petroleum pipelines run parallel for a distance sharing the same corridor causes pipe corrosion over time. Corrosion accounts for 23% of the significant pipeline failures!

A chart done by industry expert DMV-GL says danger is off the charts at 5,000 feet in this scenario running parallel together —Energize Eastside will run about 16 miles under this condition. This could result in a catastrophic gas explosion like which occurred on June 10, 1999 in Bellingham, WA on the same pipeline, only we live in a more densely populated area.

#5 concern—is the EMF—electro-magnetic field corrodes pipes above—it cannot be safe for humans!! Increasing the existing 115 KVA to 320 KVA doubles our EMF exposure!

#6 DEIS states this corridor will be wired now for both lines to carry 230kV power in the future—with a flip of the switch in the future! The communications wire will also be there as well as a lightning wire. So is that 8 wires now or 9?—I can't keep up!!

#7 We are along the Seattle Fault Zone for earthquakes—described as seismically "active" area. See chapter 3-page 8. Seismic activity is likely to occur during life of the project and could be substantial damage or death—quoted in DEIS.

#8 Holes can be created in pipelines by "electrical arcing" from downed lines leading to leaks and explosions. See chapter 8-page 24.

#9 Lightning Strikes could send current to anything metal in area—and can create holes in pipeline.

#10 Views will be impacted—we have great Mt. Rainier views from many homes. Rated "significant"—views will be affected for 750' in neighborhoods. See Chapter 11-page 32. and poles will create contrast in the sky.

#11 This project will require removal of 8000 trees in the 18 miles and "significant" requirement of 327 acres of vegetation destroyed. See Chapter 11-page 32. Where the steel monopoles and their footings are in peoples backyards will destroy their trees and landscaping and gardens, patios and decks removed, and accessory structures (ie. storage sheds) demolished.

#12 "Significant" impact on loss of habitat for animals—and will negatively affect enjoyment of the area. See Chapter 12 pages 13 and 14.

#13 Along gas pipelines—concern of heavy machinery and angerring (drilling). —pipe disturbances (home damage?). See Chapter 16-page

		21.	<p>#14 Aviation fuel—which the underground pipelines carry—is a flammable liquid and vapor —it ignites by many sources—static electricity, cell phones—vapors travel considerable distances to a source of ignition, ignite, flash back or explode. See Chapter 8-page 10. Exactly what happened in the Bellingham disaster—cloud of smoke to 30,000 feet —visible from Canada!! Same Olympic Pipeline running through Olympus and other neighborhoods. Nothing is more important that safety!!</p> <p>#15 Vineyards residents/other neighborhoods near—Seattle City Light Corridor (ERECTOR SET TOWERS) defined as Alternative 1-Option B in the DEIS. SEE CHAPTER 2-PAGE 25. This corridor could be used if they get SCL permission. The ROW distance is would not have to be widened, homes would not have to be purchased. They may be forced to go here as FERC order 1000 requires companies to work together in a region as one utility. But a big safety issue —they say they would leave those towers powered up during construction! This solution has been off the radar and appeared in the DEIS to our surprise. Beware-- since this is the only public comment time for this DEIS—they could be slipping this in without residents aware, pick this solution as a cheaper alternative to widening the PSE existing corridor and purchasing homes—and all those along this corridor.</p> <p>The Lauckhart-Schiffman Load Flow Study shows this PSE powerline transmission project as proposed not needed. This is a for profit scheme by PSE to make money for their shareholders and we the PSE ratepayers get to pay for it!! In my own words—it will be consumer fraud—if they proceed at the scale they desire!</p> <p>There are new technologies PSE can utilize in addition to keeping the existing 115 KVA power transmission lines to offset those times of winter peak power usage which occurs a few times a year, such as storage batteries, fuel cells power plants, trash to energy power generation at the Factoria waste transfer station, and utilizing other localized power generation facility technologies. These options are far more economical and provide power directly to areas of use rather than traveling hundreds of miles from PSE's power production facilities. There is always a power loss over long transmission distances that have to be compensated.</p> <p>I wholeheartedly agree and endorse CENSE position and their finding, solutions, and their documents submitted in response to PSE's EIS as my own.</p> <p>Sincerely, Conald Kucera</p> <p>8300 128th Lane SE Newcastle, Washington cjkuera@hotmail.com</p>
3/11/2016 14:50:47	Sahny	Johnson	I have come to have doubts about the Energize Eastside project. I would like us to wait for at least a year to weigh both the true scope of our needs (not Canada's or PSE's)nand alternatives to additional overhead lines in our communities. More broadly, I'd like us to investigate moving to a public utility company for our public utilities. Tired of being cannon fodder for coal, oil, and now electricity.

3/12/2016 9:45:30	Scott	Jeffcoat	<p>Hi:</p> <p>These comments concern the proposed Energize Eastside Project's environmental review, and your outreach for public comments. My wife and I support these two alternatives in the Phase 1 EIS, in our order of preference:</p> <ul style="list-style-type: none"> <li>-Alternative 4 (no action)</li> <li>-Alternative 2(integrative resource approach)</li> </ul> <p>We find alternatives 1 and 3 unacceptable, and PSE's studies supporting them unconvincing. Let's not build a dinosaur project using early 20th century transmission technologies and instead focus on conservation, and green energy production and storage/transmission methods. Let's not destroy our beautiful wooded environment and vistas, which are one of the primary reasons that people want to live on the Eastside. Let's not diminish property values with these unsightly transmission lines!</p> <p>Thank you, Scott Jeffcoat &amp; Han Gao</p>
3/12/2016 14:50:13	Marlo	Straub	<p>This was a very lengthy report, and the risks don't seem to outweigh the benefits. I am particularly concerned about risks related to the Olympic Pipeline (rupture or explosion), as that would be potentially damaging and costly to fix. As a homeowner with a young family only two blocks from current power lines and two blocks from the Olympic Pipeline (we walk this trail every day), I prefer the No Action alternative. From what I've learned about the Energize Eastside project, all of this is to supply demand that may not actually be necessary, as well as to serve Canada.</p> <p>Our family will look at ways to reduce energy consumption and we are currently exploring Solar Panels for our home.</p> <p>Sincerely, Marlo Straub</p>

3/12/2016 15:03:31	Kristofer	Straub	<p>Dear PSE,</p> <p>After reviewing the report and discussing with neighbors, I cannot endorse Alternative 1 or Alternative 3. I am skeptical of the true need for this project. If the demand for energy is truly as PSE states, I would prefer Alternative 2, for these reasons:</p> <ul style="list-style-type: none"><li>• Safe (no concerns about accidents with the Olympic pipeline)</li><li>• Cost effective (it is easier to scale to our local needs, and will reduce future utility bills for customers)</li><li>• Reliable (it doesn't put all our energy eggs in one basket the way a huge transmission line does)</li><li>• Better for the environment (preserves 8,000 trees and reduces carbon emissions)</li><li>• Respectful of neighborhood character (no giant utility poles running through residential areas)</li><li>• Secure (less vulnerable to terrorism than big utility poles over petroleum pipelines)</li><li>• Smart (in line with conservation and energy policies in the Seventh Northwest Power Plan)</li></ul> <p>The cities of the Eastside must invest in more progressive energy solutions. My family and I are planning on getting solar panels installed.</p> <p>Sincerely,</p> <p>Kristofer Straub</p>
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3/12/2016 17:03:36	Jennifer	Wilson	<p>I write in strong opposition to Alternative 1 from the Draft EIS for Energize Eastside, and particularly Option A, which proposes a new 230kV transmission line as well as a new transformer. My reasons for opposing Alternative 1 are as follows:</p> <ul style="list-style-type: none"> <li>•The new high-voltage line is not needed. While PSE argues, and the Chapter 1.3 of the Draft EIS states, that a new high-voltage power line is necessary to meet short term energy needs on the Eastside, the Lauckhart-Schiffman Load Flow Study (from 2/18/2016) shows that this is not the case. To quote that study, “PSE’s system can avoid overloads and outages even when two critical transformers have failed during winter peak usage.”</li> <li>•A new high-voltage power line that follows, and towers above, the aging Olympic gas pipeline is a catastrophe waiting to happen. <ul style="list-style-type: none"> <li>oChapter 16.3.7 of the Draft EIS mentions pipeline corrosion. Electromagnetic interference leads to pipeline corrosion, meaning a potential leak and devastating fire at any time during or after construction. Dr. Y. Frank Cheng of the University of Calgary and an expert on pipeline safety, has submitted, via CENSE, information confirming the dangers of locating high voltage power lines in close proximity to gas pipelines.</li> <li>oThe installation of the poles for the power lines, as well as any maintenance activities further down the line, would be a dangerous enterprise. Though downplaying those dangers, the Draft EIS does note (Chapter 8.5.3.1.2) that “significant adverse impact to public safety could occur if a leak or an explosion... resulted from the project” and (Chapter 8.6.1.2) that “ongoing maintenance activities during operation could theoretically damage or break the OPLC pipelines or other pipelines in the area, leading to a chemical release or explosion.”</li> <li>oThe location of the gas pipelines underground can shift over the years due to soil erosion, potentially bringing the (aged) pipelines into closer proximity to the power lines and leading to further dangers during maintenance activities. Keep in mind that the pipeline is already many decades old and has already had one major explosion (Bellingham, WA in 1999) resulting in loss of life.</li> <li>oBP, the operator of the Olympic Pipeline, noted that “the location of the pipelines may be found anywhere within the easement from the center of the right-of-way to either side” and as a result recommended against route segments Oak and Willow. Yet Oak and Willow are the only two routes still being considered.</li> <li>oAs noted by CENSE, the Bellevue Fire Department writes in their Standards of Response Coverage, “Given that pipeline incidents continue to occur in this country, and many for undetermined reasons, the community is still at risk. The combination of a highly flammable liquid, in large quantities, and in [an] urban environment translates into a significant consequence risk that approaches the ‘catastrophic’ level.” Thus, local emergency responders feel this is a dangerous proposition.</li> <li>oMost importantly, this entire proposed power line lies upon a major fault line. As recent media attention has shown, and as has been confirmed by national government agencies, the Pacific Northwest is long overdue for a major earthquake. A high voltage power line on top of an aging gas pipeline that runs through almost exclusively residential neighborhoods will cause a catastrophic and easily predictable loss of life. In the Somerset and Eastgate neighborhoods alone, aside from running through many residents’ back yards, the pipeline/powerline combination runs underneath and above the neighborhood swim and tennis pool, where multi-generational families spend their summer days and evenings. The combination runs over and below the public Tyee Middle School, where hundreds of local children spend 8-9 hours</li> </ul> </li> </ul>
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			<p>a day, 5 days a week studying. The combination runs right alongside a Bright Horizons daycare facility, where our community's youngest, most vulnerable (and least likely to be successfully evacuated) members spend their days year-round. Somerset/Eastgate is but one of the many potentially-impacted neighborhoods. Further south in Newport Hills, these lines will come dangerously close to yet another public school, Jing Mei Elementary. Other neighborhoods will be similarly impacted.</p> <p>In sum, choosing Alternative 1 is a negligent, if not clearly reckless, choice on the part of our local governments and government agencies. Alternative 2 from the Draft EIS for Energize Eastside is the only safe option. The EQL Energy study, submitted by CENSE, shows that Alternative 2, if properly implemented, would be much more energy efficient for our wider community and have lower long-term costs. It will have a much lower impact on the local community than Alternative 1 (see Chapter 10.7.1 and Chapter 11.6.3.5.1 of the Draft EIS), which, in addition to all of the concerns listed above, requires the widening of the existing utility corridor and thus the destruction of many homes and other community resources – indeed, it's hard to fathom how places like the Somerset Community Pool could continue to exist if Alternative 1 is put into place since it is well within the 120-150 foot "clear zones" that Alternative 1 requires (Chapter 11.6.3.5.1). Alternative 2 options were not adequately analyzed during the Draft EIS process and should be given greater attention going forward. Our community leaders should not allow a foreign-owned, private, and profit-driven company (PSE) to determine the course of our energy future.</p>
3/13/2016 0:01:02	Marlene	Meyer	<p>For over a year, I have read about the proposed PSE Energize Eastside transmission lines, and recently the DEIS. I have come to the conclusion that the proposed Alternate 1-A is not necessary and will cause more problems than what it proposes to help. It appears the DEIS is inaccurate and incomplete about the hardships, costs, and dangers for the residents of Bellevue and surrounding cities. The major concerns include destruction of natural landscapes and homes through which these lines will run, the health risks from possible explosions of high voltage lines near pipelines as well as not having definite proof of no effects from EFMs (electromagnetic fields), especially high-voltage lines. Finally, there seem to be an array of costs unaccounted for in this study that have been pointed out at various city hall meetings, and an investment interest by the owner bank Macquarie Group Limited.</p> <p>In addition, the proposal for this project was initially a concern for depletion in energy with the growth of our city. Apparently the independent study by a group hired by CENSE shows that when the proper parameters are placed into the test, there is not the danger that PSE seems to be presenting. The tests did not include an acceleration of new sustainable energy systems, such as wind and solar power. For example, Iowa now shows a 30% energy gain from wind power. Solar energy installations are now effective, even in states such as ours where we think we do not have enough available sun. Are we pushing enough in these progressive avenues to be less reliable on electric needs and to reduce our carbon footprint? The high voltage lines are a step backward.</p> <p>Finally, the DEIS does not include specialty concerns such as the following: First is danger to wildlife in the sky, including our bird population. National Audubon has done studies of power lines in the United States and the results show 175 million bird deaths occur per year from these power lines. Think of the effects for even higher and more powerful energy lines. Second, is noise factors from wires. I live near a power station and at 12 midnight there is a bus noise that comes through our walls. It keeps me from sleeping at night. I can imagine how loud the high voltage might sound like at night to those who live near it.</p> <p>All of these concerns for this project lead me to ask for our city to consider an alternative. We are a progressive and growing city that should not be looking backward to such out-of-date and disruptive methods. There are healthier and more progressive methods. When you drive into Bellevue, you see our amazingly new architectural city scape - we look like we are growing and progressive, so let's act like it by making this a city that knows how to grow in the right way. A way that honors and respects its citizens.</p> <p>I ask for No Action at this time, or for Alternative 2. Please way your considerations carefully and listen closely to the concerns of your citizens who you represent.</p> <p>Thank you, Marlene J. Meyer</p>

3/13/2016 4:25:30	Julia	Ziobro	<p>In order of preference for me and my family:  Alternative 2  Alternative 1, Option C  Alternative 4  We consider Alternative 1, Options A/B/D and Alternative 3 unacceptable.  Eastside residents are not doing enough to conserve, and for a tiny fraction of what is being proposed, could be incentivized to conserve much more.  Expand the appliance replacement program back to 1990.  Expand the LED light bulb rebates/discounts (and get ALL city buildings 100% LED fitted in 2016 - no excuses!)  Expand EV charging rebates/programs - yes, this is counterintuitive, but EVs are much better for the environment overall and do most of their charging overnight when the grid has excess capacity).  Make sure all Eastside schools are 100% LED.  Add solar panels to most or all city buildings.  There is so much that we can do! You could go bananas with all kinds of programs and spend less than 10% of the crazy amounts being proposed for giant, ugly, tree-slaughtering high-tension transmission lines!</p>
3/13/2016 14:00:55	Thomas	Neighbors	<p>To Energize Eastside:</p> <p>I write in strong opposition to Option A of Alternative 1 from the Draft EIS for Energize Eastside, which proposes a new 230kV transmission line as well as a new transformer. My reasons for opposing that option are as follows:</p> <ul style="list-style-type: none"> <li>•The new high-voltage line is not needed. While PSE argues, and the Chapter 1.3 of the Draft EIS states, that a new high-voltage power line is necessary to meet short term energy needs on the Eastside, the Lauckhart-Schiffman Load Flow Study (from 2/18/2016) shows that this is not the case. To quote that study, "PSE's system can avoid overloads and outages even when two critical transformers have failed during winter peak usage."</li> <li>•A new high-voltage power line that follows, and towers above, the aging Olympic gas pipeline is a catastrophe waiting to happen.</li> <li>•Chapter 16.3.7 of the Draft EIS mentions pipeline corrosion. Electromagnetic interference leads to pipeline corrosion, meaning a potential leak and devastating fire at any time during or after construction. Dr. Y. Frank Cheng of the University of Calgary and an expert on pipeline safety, has submitted, via CENSE, information confirming the dangers of locating high voltage power lines in close proximity to gas pipelines.</li> <li>•The installation of the poles for the power lines, as well as any maintenance activities further down the line, would be a dangerous enterprise. Though downplaying those dangers, the Draft EIS does note (Chapter 8.5.3.1.2) that "significant adverse impact to public safety could occur if a leak or an explosion... resulted from the project" and (Chapter 8.6.1.2) that "ongoing maintenance activities during operation could theoretically damage or break the OPLC pipelines or other pipelines in the area, leading to a chemical release or explosion."</li> <li>•The location of the gas pipelines underground can shift over the years due to soil erosion,[1] potentially bringing the (aged) pipelines into closer proximity to the power lines and leading to further dangers during maintenance activities. Keep in mind that the pipeline is already many decades old and has already had one major explosion (Bellingham, WA in 1999) resulting in loss of life.</li> <li>•BP, the operator of the Olympic Pipeline, noted that "the location of the pipelines may be found anywhere within the easement from the center of the right-of-way to either side" and as a result recommended against route segments Oak and Willow.[2] Yet Oak and Willow are the only two routes still being considered.</li> <li>•As noted by CENSE, the Bellevue Fire Department writes in their Standards of Response Coverage, "Given that pipeline incidents continue to occur in this country, and many for undetermined reasons, the community is still at risk. The combination of a highly flammable liquid, in large quantities, and in [an] urban environment translates into a significant consequence risk that approaches the 'catastrophic' level." [3] Thus, local emergency responders feel this is a dangerous proposition.</li> <li>•Most important, this entire proposed power line lies upon a major fault line. As recent media attention has shown, and as has been</li> </ul>

confirmed by national government agencies, the Pacific Northwest is long overdue for a major earthquake. A high voltage power line on top of an aging gas pipeline that runs through almost exclusively residential neighborhoods could cause a catastrophic and easily predictable loss of life. In the Somerset and Eastgate neighborhoods alone, where my daughter lives, aside from running through many residents' back yards, the pipeline/powerline combination runs underneath and above the neighborhood swim and tennis pool, where multi-generational families spend their summer days and evenings. The combination runs over and below the public Tyee Middle School, where hundreds of local children spend 8-9 hours a day, 5 days a week studying. The combination runs right alongside a Bright Horizons daycare facility, where our community's youngest, most vulnerable (and least likely to be successfully evacuated) members spend their days year-round. Somerset/Eastgate is but one of the many potentially-impacted neighborhoods. Further south in Newport Hills, these lines will come dangerously close to yet another public school, Jing Mei Elementary. Other neighborhoods will be similarly impacted.

In sum, choosing Alternative 1 Option A is a negligent, if not clearly reckless, choice on the part of our local governments and government agencies. If this alternative is selected based on flawed data and a catastrophic occurs, all associated proposing and approving parties are legally culpable with limitless liability.

Based on the data presented, Alternative 2 from the Draft EIS for Energize Eastside is the only safe option. The EQL Energy study, submitted by CENSE, shows that Alternative 2, if properly implemented, would be much more energy efficient for our wider community and have lower long-term costs. It will have a much lower impact on the local community than Alternative 1 Option A (see Chapter 10.7.1 and Chapter 11.6.3.5.1 of the Draft EIS), which, in addition to all of the concerns listed above, requires the widening of the existing utility corridor and thus the destruction of many homes and other community resources – indeed, it's hard to fathom how places like the Somerset Community Pool could continue to exist if Alternative 1 is put into place since it is well within the 120-150 foot "clear zones" that Alternative 1 requires (Chapter 11.6.3.5.1). Alternative 2 options were not adequately analyzed during the Draft EIS process and should be given greater attention going forward. Our community leaders should not allow a foreign-owned, private, and profit-driven company (PSE) to determine the course of our energy future.

#### REFERENCES

[1] Frank Cheng. 2013. Stress Corrosion Cracking of Pipelines. Section 8.7.1.

[2] For a copy of the letter from the Olympic Pipeline Company, follow the link at the following web address: <http://sane-eastside-energy.org/2014/04/02/olympic-pipeline-company-opposes-transmission-lines-over-its-pipelines-for-several-reasons-including-safety/>

[3] [http://www.bellevuewa.gov/pdf/Fire/Standards\\_of\\_Coverage.pdf](http://www.bellevuewa.gov/pdf/Fire/Standards_of_Coverage.pdf), p. 66

3/13/2016 16:09:52	Eric	Zhuang	<p>I am a resident in Somerset neighborhood. One of the PSE's proposed routes (alternative 1A) goes next to my backyard about 50 feet away.</p> <p>I strongly oppose the PSE preferred alternative 1A which builds 230KV lines goes through the Somerset neighborhood as well as many of the eastside neighborhoods.</p> <p>There are many reasons to be concerned on PSE's 230KV lines. But I am going to focus on safety. My house is merely 50 feet next the proposed power lines. Safety of my family is the paramount concern of me. Especially, my 8 years old daughter often plays with her friends in the backyard which is almost under the proposed line.</p> <p>1. Olympic pipeline. I am an electrical engineer with a master's degree in EE. Constructing a high power transmission line right on top of an aging gasoline pipeline is unheard of, especially given the notorious safety record of Olympic pipeline, known by its 1999 Bellingham explosion which kills 3 people. (<a href="https://en.wikipedia.org/wiki/Olympic_Pipeline_explosion">https://en.wikipedia.org/wiki/Olympic_Pipeline_explosion</a>) Quote from Wikipedia: "After a three-year investigation, investigators pointed to a series of failures, and not just a single error, most of which were the fault of Olympic Pipeline. Olympic Pipeline had failed to properly train employees, and had to contend with a faulty computer system and pressure relief valve. In 1994, five years before the accident, an IMCO construction crew, working on behalf of the City of Bellingham damaged the pipeline while constructing the city's water treatment plant and Olympic Pipeline had failed to find or repair the damage."</p> <p>As we can clearly see from this accident, it was caused by a construction five years ago and Olympic Pipeline failed to find and repair the damage. It is exactly what we have here in PSE's proposed new power line project. But the risk is much higher and the consequence is much worse.</p> <p>(i) The pipeline is much older now, more susceptible to construction accident.</p> <p>(ii) This is high power line, instead of water treatment work in Bellingham, which will produce natural ignition source by arcing and Electromagnetic Field differentials. Any gas leak, even not caused by construction, will introduce enormous risks.</p> <p>(iii) Eastside is much more densely populated. The pipeline and power line are going through backyards, schools, parks. If accident happened, it would cause much more casualties and damages.</p> <p>2. Landslide and earthquakes. My backyard is not only next to powerline but also has a steep slope between the power line and my house. It is defined as Critical Area by the City of Bellevue. There are many similar areas in Somerset along the proposed route. Any major movement in the earth could trigger a catastrophic pipe burst and fire. This has happened many times throughout the world.</p> <p>In conclusion, the easement PSE has over my property was created many years back. In fact, I was not even born at that time. I would imagine no one could foresee how PSE abused this easement by overburdening it disregarding the basic safety concerns. I have been to all PSE's public sessions last year. I could clearly see they had already fixed their favorite "alternative" before the public comments, simply because it was more convenient and profitable to them. They disregarded the overwhelming opposition and concerns. Their public sessions are merely a procedure for show.</p> <p>However, we could still change this disastrous alternative 1A. The alternative 2 is way people friendly, environmental friendly, and forward-looking. While CENSE org's independent study has casted doubts on the vary root assumption to PSE's entire project, it is time to give this high-stake project some more time and REAL alternative thoughts before we are too late to change the worst disastrous outcome from happening.</p> <p>Thank you! Eric Zhuang 4809 Somerset DR SE, Bellevue, WA 98006</p>
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3/13/2016 16:55:52	Pat	McGiffert	<p>Concerns about the PSE project to be driven through the beautiful Bellevue Bridle Trails neighborhood, continue to be alarming. My first choice is conservation, efficiency and solarization.</p> <p>One of the chosen routes, C, collocates the 230 kV lines with the existing Olympic Pipelines. Two very large pipes that carry a variety of fuels including aviation fuel that go right through my back yard. Looking at studies done, by other states as well, show that there are many factors that make this hazardous. The collocation length affects the magnitude of induced AC potential that causes corroding in metal pipes. Whereas, crossing over the pipes at 90 degrees, for the least impact, is not as hazardous. In addition to this risk, with the higher elevation of the properties near NE 40th and 42nd St., is lightning has struck a number of times, one time it caused a gas meter to explode and damage a home.</p> <p>I hope PSE will reconsider choosing route C, which would be a combination of high voltage 230 kV lines, 2 large Olympic pipelines and risk of construction damage to the pipelines, as a possible solution to the projected energy shortfall.</p> <p>I would suggest that PSE working with SCL's 230 kW corridor, for this project, could also improve SCL equipment replacing the old erector set towers to the more modern towers and updated wires, especially if both companies can coordinate the project.</p> <p>Instead of this huge, controversial 230 kV project, I also stress that any other alternative power and modern technology, such as solar power panels that now can work well even when in part shade or on cloudy days be a supplemented option for home owners. I encourage additional rounds of Solarize Bellevue and Kirkland projects. Take this and conservation / efficiency routes as the first choice. Thank you for your consideration.</p>
3/13/2016 18:06:13	Mary	Ryker	<p>We are against the new power line with its impact on my view and my house value in Newcastle.</p>
3/13/2016 22:35:46	Paul	McKee	<p>My comment is that the Energize Eastside project proposed by PSE is not justified. I believe PSE may have economic motives for wanting to build the project, but as a ratepayer, I object to paying for infrastructure improvements that aren't really needed. PSE seems have done a sloppy job in their studies that purport to show that the project is required. The independent analysis of load flows by Lauckhart and Schiffman demonstrates that PSE's analysis is flawed.</p> <p>I am sympathetic to complaints that the proposed project suffers from safety and aesthetics problems, but for me simply the fact that it is expensive (where I am among those ultimately paying the bill) and unnecessary is enough for me to ask that the proposal be rejected.</p>
3/13/2016 23:15:38	Gary	Albert	<p>PSE was allowed to determine the assumptions and conditions used to determine if there is a need for Energize Eastside. Other contractors examined the methodology PSE used but no one ever investigated if the assumptions and conditions used to predict a potential an energy deficiency in 2017 were valid. Jens N. with PSE had said in several community meetings if someone could get a CEII clearance then they could review PSE's work product. When CENSE got a retired Puget Power/PSE expert qualified for clearance, Jens N. stonewalled them saying they already had several contractors (USE, Stantec, etc.) look at their work product and validate the need, therefore the CENSE consultant no longer had a need to know and was never allowed access. So what are they afraid of? The answer came out when CENSE hired two of their own consultants that showed 1500kV being sent to Canada as part of the project need is a false requirement. They found out that the peaker plants that are to be used as emergency back up in high demand times were not utilized to the extent available. They found out that the transformer load factor was set for summer conditions instead of winter conditions. All of these things need to be investigated to the fullest extent before this project is allowed to go forward. When you use false requirements and data you will get fake results. The energy use has been going down with all the new Energy Star rated appliances replacing old equipment. Energy companies are trying to line their pockets with infrastructure projects like this for their shareholders, earning a 10% return. Please hold off on this project until this can be thoroughly vetted by independent opposition.</p>

3/13/2016 23:28:35	Gary	Albert	<p>I am opposed for safety reasons installing new power poles in the same easement with the Olympic Pipeline. I have heard of instances where the 115kV lines have fallen to the ground and electrical current has jumped to a neighbors invisible dog fence and irrigation system, exploding control boxes placed in the garage and causing fire damage. Also have heard of similar arcing damage to the Olympic Pipeline almost burning a hole in the line from a downed power line. With an upgrade to 230kV, the power companies categorize these not as High Power but as Ultra High Power lines.... four times the power, this is an unacceptable risk that homeowners don't need to take on. Recently, there have been other instances where buildings have been blown up from gas leaks. Fortunately, these have been in commercial areas and not residential areas. New power lines and gas or liquid gas need to be separated and kept out of residential neighborhoods. Use commercial, city or state property where they belong.</p>
3/14/2016 9:14:56	Kathy	Judkins	<p>My home is on the easement off SE 44th in Somerset. I have been misslead on two occasions now with one on one meetings with PSE personnel. First on a phone call last March or April with Darby Broyles, the Right of Way person for PSE. I was considering solar panels for my home at a cost of 19,000 and synthetic turf for another \$19,000 I wanted to make sure my home would not be condemned or purchased for the Energize the Eastside project. The current wood poles are on my property. The Olympic Pipeline runs down the private drive to my assessed over a million dollar home on the easement. Darby assured me that my home would not be needed. Now After I have had solar panels and synthetic turf installed I read that this will not be true. The second incident was a coffee with Keri Plavitz and Jackson Taylor. They called and asked me to meet with them in my role as Somerset Community Association President. At this coffee Jackson told me that the current wood poles in my yard would be removed simutaneously when the new up to 135 foot towers were installed. I informed him that is not what he stated at the Newport Community Center meeting (filmed)early on with PSE. He stated that it would take up to three years to remove current poles if my route was chosen. I told him what he said on film. He denied saying it. This project will block access to my home for weeks for my driveway and garage. The money spent so far for nailing tag numbers into every tree and naming the kind of tree is huge plus another crew for wetlannd delineation. They were working on my 8 house easement for three weeks. I told them there was a water problem from the hundreds of underground springs in Somerset. The men were not aware of that. Two homes of the 8 have had severe mold problems due to the underground springs. One next door to me was torn down and a new foundation poured to rectify this problem. Another one is being totally fixed right now. A 30 foot tree next to the poles in my yard fell across my driveway due to the underground spring soaking . I had to get help to remove it so I could access my garage.</p> <p>Please consider Alternative 2. I am against Alternative 1 which is not needed.</p> <p>I do not know one person in Somerset who approves of this project which will blight the City of Bellevue forever.</p> <p>Thank you. Kathy Judkins</p>

3/14/2016 12:33:10	Ron	Wilson	<p>I write in strong opposition to Option A of Alternative 1 from the Draft EIS for Energize Eastside, which proposes a new 230kV transmission line as well as a new transformer. My reasons for opposing that option are as follows:</p> <ul style="list-style-type: none"><li>· The new high-voltage line is not needed. While PSE argues, and the Chapter 1.3 of the Draft EIS states, that a new high-voltage power line is necessary to meet short term energy needs on the Eastside, the Lauckhart-Schiffman Load Flow Study (from 2/18/2016) shows that this is not the case. To quote that study, "PSE's system can avoid overloads and outages even when two critical transformers have failed during winter peak usage."</li> <li>· A new high-voltage power line that follows, and towers above, the aging Olympic gas pipeline is a catastrophe waiting to happen.</li> <li>o Chapter 16.3.7 of the Draft EIS mentions pipeline corrosion. Electromagnetic interference leads to pipeline corrosion, meaning a potential leak and devastating fire at any time during or after construction. Dr. Y. Frank Cheng of the University of Calgary and an expert on pipeline safety, has submitted, via CENSE, information confirming the dangers of locating high voltage power lines in close proximity to gas pipelines.</li> <li>o The installation of the poles for the power lines, as well as any maintenance activities further down the line, would be a dangerous enterprise. Though downplaying those dangers, the Draft EIS does note (Chapter 8.5.3.1.2) that "significant adverse impact to public safety could occur if a leak or an explosion... resulted from the project" and (Chapter 8.6.1.2) that "ongoing maintenance activities during operation could theoretically damage or break the OPLC pipelines or other pipelines in the area, leading to a chemical release or explosion."</li> <li>o The location of the gas pipelines underground can shift over the years due to soil erosion,[1] potentially bringing the (aged) pipelines into closer proximity to the power lines and leading to further dangers during maintenance activities. Keep in mind that the pipeline is already many decades old and has already had one major explosion (Bellingham, WA in 1999) resulting in loss of life.</li></ul>
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o Most importantly, this entire proposed power line lies upon a major fault line. As recent media attention has shown, and as has been confirmed by national government agencies, the Pacific Northwest is long overdue for a major earthquake. A high voltage power line on top of an aging gas pipeline that runs through almost exclusively residential neighborhoods will cause a catastrophic and easily predictable loss of life. In the Somerset and Eastgate neighborhoods alone, where I live, aside from running through many residents’ back yards, the pipeline/powerline combination runs underneath and above the neighborhood swim and tennis pool, where multi-generational families spend their summer days and evenings. The combination runs over and below the public Tye Middle School, where hundreds of local children spend 8-9 hours a day, 5 days a week studying. The combination runs right alongside a Bright Horizons daycare facility, where our community’s youngest, most vulnerable (and least likely to be successfully evacuated) members spend their days year-round. Somerset/Eastgate is but one of the many potentially-impacted neighborhoods. Further south in Newport Hills, these lines will come dangerously close to yet another public school, Jing Mei Elementary. Other neighborhoods will be similarly impacted.

In sum, choosing Alternative 1 Option A is a negligent, if not clearly reckless, choice on the part of our local governments and government agencies.

Alternative 2 from the Draft EIS for Energize Eastside is the only safe option. The EQL Energy study, submitted by CENSE, shows that Alternative 2, if properly implemented, would be much more energy efficient for our wider community and have lower long-term costs. It will have a much lower impact on the local community than Alternative 1 Option A (see Chapter 10.7.1 and Chapter 11.6.3.5.1 of the Draft EIS), which, in addition to all of the concerns listed above, requires the widening of the existing utility corridor and thus the destruction of many homes and other community resources – indeed, it’s hard to fathom how places like the Somerset Community Pool could continue to exist if Alternative 1 is put into place since it is well within the 120-150 foot “clear zones” that Alternative 1 requires (Chapter 11.6.3.5.1). Alternative 2 options were not adequately analyzed during the Draft EIS process and should be given greater attention going forward. Our community leaders should not allow a foreign-owned, private, and profit-driven company (PSE) to determine the course of our energy future.

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[2] For a copy of the letter from the Olympic Pipeline Company, follow the link at the following web address: <http://sane-eastside-energy.org/2014/04/02/olympic-pipeline-company-opposes-transmission-lines-over-its-pipelines-for-several-reasons-including-safety/>

[3] [http://www.bellevuewa.gov/pdf/Fire/Standards\\_of\\_Coverage.pdf](http://www.bellevuewa.gov/pdf/Fire/Standards_of_Coverage.pdf), p. 66

3/14/2016 14:18:31	Tamra	Kammin	<p>I have been a resident of the Olympus neighborhood for nearly 28 years. I have serious objections to Alternative 1 of the PSE Energize Eastside project. My primary objections are Safety Concerns and Neighborhood Character.</p> <p>Clearly, safety is the most critical requirement for any action taken to address power needs in this area. Alternative 1, Option A introduces a high risk of explosion and/or fire both during construction and in the on-going operation of co-located power, gas, and potentially natural gas lines. This is well documented in the report from Dr. Frank Cheng. As stated in the DEIS, PSE workers have knowledge of the risks and we have regulations in place, however, we know that accidents do occur. Only last week, there was a natural gas explosion in Greenwood, destroying multiple businesses.</p> <p>In section 11.1.2 of the DEIS, Property Values are briefly discussed. Relying on the technical designation by the King County Assessor of what properties have a view that affects the value of the property does not even touch the impact of a neighborhood forced to view massive towers of from 85-135 feet ripping through the development. Not only are they unsightly, but they also “look” dangerous. Alternative 1 will have a significant negative effect on property values for the homes that remain and that assumes that current properties surrounding the affected areas could even be sold. In section 11.2.9 of the document, the Newcastle plan states that power is to be provided that is aesthetically acceptable to the community. This alternative violates that requirement.</p> <p>Section 2.5 of the DEIS provides the benefits and disadvantages of delaying the proposal, which could easily be applied to taking the steps identified in Alternative 2. All benefits identified are key and important. The most dramatic impact of the delay is that major investments would be avoided prior to actually identifying if they are even partially needed. There are only 2 disadvantages identified. First, power outages could develop over time. Given the results of the Lauckhart-Schiffman Load Flow Study, this appears very unlikely, especially given the conservation steps suggested AND rewarded by PSE. The second disadvantage is that development would be discouraged with the risk of power outages. Development would be discouraged even more from unsightly and dangerous massive power lines built through the neighborhoods.</p> <p>Given the risks, impacts, and unproven need of this project, it is my strong belief that Alternative 2 could be implemented over time to satisfy all power requirements of the area without destroying the character of the Eastside. I would be most interested in reviewing the business case for this project, which is not part of the DEIS.</p> <p>Sincerely, Tamra Kammin 8604 129th CT SE Newcastle, WA 98056</p>
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3/14/2016 14:52:47	James	Loring	<p>I would urge you to adopt Alternative 4, "No Action."</p> <p>There is enough documentation submitted in this EIS process to cast doubt on the assumptions Puget Sound Energy has made in its rationale for this 8 mile, 230,000-volt transmission line and has failed to identify all adverse environmental impacts resulting from this proposal.</p> <p>It has been asserted by local community groups and private experts that PSE has been less forthcoming in providing the rationale or data for its assumptions. Indeed, nationally recognized power and transmission planners have been unable to duplicate PSE's modeling under the assumptions the PSE has made in justification of this project.</p> <p>The Lauckhart and Schiffman report submitted for your consideration indicates decades will pass before demand exceeds supply capacity for the area under study. PSE appears to be using a summer rating capacity for its transformers during a winter peak scenario. The winter rating is up to 31 percent higher, significantly increasing the capacity available for winter peak demand. PSE Further, the project proponent assumes little or no generation in the Puget Sound area while continuing transmission to Canada in the event of major disruption or winter peak scenario.</p> <p>Puget Sound Energy's faulty assumptions permeate this proposal. Its justifications for the necessity of new power lines unfounded. While building major regional electrical transmission infrastructure through residential neighborhoods destroying some 8,000 trees, promoting blight across public parks, wetlands, and recreational facilities, it does nothing to bring the Puget Sound region's power grid to any semblance of the "Smart Grid" of the future. It is simply ignored in the assumption stringing more wire is the future. We deserve better.</p> <p>The "No Action" Alternative 4 is the best course at this juncture. It's time Puget Sound Energy went back to the drawing board, seeking a more collaborative approach with the local jurisdictions and community groups such as CENSE.</p>
3/14/2016 15:36:14	Kim	Stanford	<p>Alternative 1A is the best solution for the Eastside. PSE should be able to rebuild the line in it's existing corridor. This would be the least impactful option and the least costly. The thought of making PSE develop a brand new corridor and purchase rights and property would generate unnecessary costs that would be passed on to rate payers for years. I've lived in Bellevue since the 1980s and I have seen the growth in Bellevue, it is time to build a robust electric system that will support that growth.</p>

3/14/2016 15:45:29	Richard	Bateman	<p>March 14, 2016</p> <p>Energize Eastside EIS</p> <p>Puget Sound Energy has proposed a new transmission line that runs from Renton to Redmond based on 1960's technology. However this is 2016, and today the rules are different.</p> <p>One example of the differences was demonstrated in a recent meeting between the community and PSE: PSE showed their slide show and a member of the community asked to see the data that supported one of PSE claims on the charts. He was told that PSE could not provide the data to him until he gets clearance from the Department of Homeland Security.</p> <p>We have been told that the United States needs to protect our critical infrastructure against the threat of terrorism. We have seen major changes implemented toward meeting this goal. One spectacular example is the new Highway 93 bridge over the Colorado River which bypasses the road over the top of Hoover Dam in Nevada. Cars are no longer allowed on the top of this and other dams.</p> <p>So in the interest of national security which is better: a new transmission line encased in concrete and buried underground, or a new transmission line dangling on the top of a 130 foot steel pole? In addition PSE insists putting lighting on top of these new poles in some places making them greater targets.</p> <p>Thank you for your consideration.</p> <p>Richard Bateman 4565 135th Place SE Bellevue, WA 98006 (425) 747-7775 rebateman@msn.com</p>
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3/14/2016 16:23:15	William	Keppler	<p>It has come to my attention that the load flow modeling done by PSE was based on inaccurate, unreliable, and inappropriate, information and assumptions. As a consequence of utilizing bad information and inappropriate modeling assumptions the results of the load modeling are inaccurate and misleading. Since the PSE load modeling study is the primary document substantiating PSE's argument for the need to increase it's distribution and generation capacity, I would advocate that the City of Bellevue hire an independent expert to conduct another load study to either refute or confirm the results and conclusions of the PSE load study. I am confident that a load study done utilizing appropriate, rational information and realistic assumptions will yield results that are significantly different then those presented in PSE's load study.</p> <p>Based on information contained in the Lauckhart-Schiffman Load Flow Study and the EQL Energy LLC reports, I am convinced that Alternative 2- "Integrated Resource Approach" in the DEIS is the best and least cost solution to satisfying the Eastside's electrical power needs into the mid-century.</p> <p>The Integrated Resource Approach is smart, effective, reliable, diversified, eco-sensitive and the lowest cost solution to satisfying the Eastside's ongoing need for reliable electric power.</p> <p>Sincerely, Bill Keppler - Renton</p>
3/14/2016 16:47:28	Michelle	Hall	<p>PSE project Alternative 1-A - NO, NO, NO: -threatens community safety w/high voltage lines close to jet fuel increasing risk of catastrophic explosion. Electromagnetic interference w/pipeline causes corrosion+damage to pipeline. Taller poles + higher voltage expose more schools, children + homes to risk if earthquake, extreme weather or terrorist attack! Seismic hazards of Puget Sound increase risks of steep slope, Coal Creek, + slope liquefaction. - removal of 8,000 trees loses beneficial CO2 to Oxygen process provided by trees and impedes the reduction of noise and runoff absorption. PSE is not using honest data! Bellevue citizens are not their priority. PSE's financial bottom line is their "raison d'etre". Don't be fooled. Project alternative 1-A is scary!! Modern energy technologies are what Bellevue, the City in the Park, should embrace! Thank you.</p>

3/14/2016 16:51:02	Marlene	Meyer	<p>For over a year, as a resident of Bellevue, I have listened to the the proposal for PSE Energize Eastside transmission lines, and recently have looked over the DEIS stating proposed alternatives. I have come to the conclusion that the proposed Alternate 1-A is the wrong direction and will cause more problems than what it proposes to help. In addition, the DEIS seems to be inaccurate and incomplete about the hardships to nearby homeowners, destruction of landscapes, costs, and possible dangers of this alternative for the residents of Bellevue and surrounding cities.</p> <p>The destruction of natural landscapes and homes through which these lines will run is not acceptable. People will be displaced, hundreds of trees cut down, and ugly-looking power lines for 18 miles of our city scapes. Then there are the undetermined health risks from EFMs (electromagnetic fields), especially with high-voltage lines. Finally, there seem to be an array of costs unaccounted for in this study that have been pointed out at various city hall meetings that will come back to the home owners and tax payers.</p> <p>In addition, the proposal for this project was initially a concern for depletion in energy with the growth of our city. However, as a member of Cense, I read about their independent study by Lauckhart-Schiffman that included more realistic parameters; the results for energy need was lower. And, PSE's test did not include an acceleration of sustainable systems, such as wind, solar, and better lighting. Other states, such as Iowa, are now showing a 30% energy gain from wind power. Solar energy installations are now effective, even in states such as ours, that are not sunshine states. Are we pushing enough in these progressive ways to be less reliable on electric and to reduce our carbon footprint? Or are we being pushed by an investment interest by the owner bank Macquarie Group Limited? The high voltage lines seem to be a step backwards.</p> <p>Finally, the DEIS does not include specialty concerns such as danger to wildlife in the sky and noise factors. National Audubon has done studies of power lines. The results show 175 million bird deaths occur per year from collision or being electrocuted by these power lines (Audubon.org/news May 22, 2015). Second, is the noise factor from the voltage lines. I live 1/2 block from what I believe is a power substation and at 12 o'clock midnight hear a buzzing noise come through our walls. It keeps me from sleeping at night. I can imagine how loud the high voltage might sound to those who will live along the 18-mile structures.</p> <p>These are only some of the concerns for this project, but these alone lead me to ask for our city to consider an alternative. We are a progressive and growing city that should not be looking backward to such out-of-date and disruptive methods. When you drive into Bellevue, you see our amazingly new architectural city scape - we look like we are a progressive city. So, let's progress in a way that makes for a sustainable and pleasant environment. I ask for No Action at this time, or for Alternative 2.</p> <p>Thank you, Marlene J. Meyer (member of Cense) at 2408 131st Place NE, Bellevue, WA. 98005</p>
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3/14/2016 18:40:54	David	Herbig	<p>The Lauckhart - Schiffman report titled Load Flow Modeling for Energize Eastside of February 18, 2016, uses the accepted techniques for modeling electrical load such as that proposed by PSE as justification for building this project. The report includes its assumptions that can be duplicated by anyone with the appropriate software and clearance. The PSE supplied load flow study does not disclose all of its assumptions and using the assumptions that are disclosed, the result is a low voltage condition which could cause blackouts rather than prevent them. Either PSE has chosen to hide its true assumptions or their load flow forecasters are incompetent. The Lauckhart - Schiffman study reveals that with commonly used assumptions about transformer performance and realistic energy demand growth, that this project is not needed for 20 years or more.</p> <p>There are many environmental impacts already outlined in the EIS. If the Lauckhart-Schiffman study is correct, all of these environmental impacts can be avoided! There are alternative approaches that could reduce demand or increase generation and there are many years before a decision and expenditures can be made.</p> <p>The EIS seems to assume that the PSE study is adequate justification for proceeding while very experienced engineers using the same load flow modeling approach compute it to be otherwise. No decision to proceed should be allowed until the PSE assumptions are made public and reviewed by others.</p> <p>This project will have serious impacts on the safety of the pipelines running under the proposed routes, and has significant economic consequences to the people in Bellevue. The project will cost over \$1 Billion dollars over 10 years. The only beneficiary of this expenditure appears to be PSE as it will allow them to increase rates to provide an adequate return on their investment in the project. This is how they plan to increase revenues in anticipation of selling PSE by 2020 as stated by the hedge fund which used a leveraged buyout to purchase PSE.</p> <p>The EIS includes several alternative scenarios which PSE brushes aside as being too expensive or not technologically proven without disclosing how they arrived at their conclusions. Until a unbiased look at the cost and impact of the alternatives is undertaken, we are taking the word of a company owned in Australia that seeks to benefit from building a system that is unneeded at best and tragically costly to the residents of Bellevue.</p> <p>For example, the cost of the reduction is the value of homes is not computed because it "does not support a conclusion that property value shifts would occur that lead to negative impacts on land uses." While this may be true it misses the point that people are part of the environment and what affects them financially is important . Other studies have shown that the impact on property value of a powerline running close to residential property can be in the range of a 3-6.3% reduction in property value. The EIS states: "Higher-end properties are more likely to experience a reduction in price than lower end properties." Most of the properties in Bellevue are "higher end" compared</p>
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3/14/2016 18:47:50	Dale	Hall	<p>My first comment is that this process should not be going on this far. This is a foreign owned company seeming to dictate to our elective officials a plan that is not backed by the citizens of Bellevue.</p> <p>Safety Gas Pipeline/Electrical Power Lines. This is a recipe for disaster.</p> <p>Easements will have to be enlarged and therefore homes demolished. Shame on Bellevue for doing this.</p> <p>Homes will be devalued on the market. Many homes that are close to the powerline easement will experience that their homes aren't worth as much. Most people of their greatest asset in their home. Again, a foreign entity is dictating that Bellevue's residents personal wealth will be lessened.</p> <p>Tearing down vast amounts of trees and vegetation.</p> <p>The power is not needed!!!!!!!!!!!!!! Please read the CENSE study</p>

3/14/2016 18:50:59	Jim	Berglind	<p>To: Heidi Bedwell, Energize Eastside EIS Program Manager From: [Your Name]</p> <p>Dear Ms. Bedwell,</p> <p>I am very concerned about Puget Sound Energy's "Energize Eastside" project, which proposes to build 18 miles of high-voltage transmission lines through four Eastside cities (Alternative 1A).</p> <p>PSE tries to justify the need for the project using an impossible scenario that would cause regional blackouts, according to the Lauckhart-Schiffman Load Flow Study, available at CENSE.org.</p> <p>Alternative 1A would place new lines and poles much too close to aging petroleum pipelines. Responsible safety standards require at least a 50 foot separation. A construction or operational accident could cause a catastrophic pipeline explosion like the one that killed three Bellingham residents in 1999. This risk is not adequately addressed in the EIS.</p> <p>Alternative 2, the Integrated Resources Approach, is a safer and less costly alternative. But the solution described in the EIS was not developed or reviewed by independent experts that have suitable experience with modern electrical grid technologies, including Demand Side Management and Distributed Energy Resources. The costs and capabilities are based on inaccurate and obsolete studies. As the Northwest Power Council's Seventh Power Plan makes clear, a carefully developed plan would easily beat alternative 1A in cost, safety, and support for the environment.</p> <p>The other transmission line options (1B, 1C, 1D and Alternative 3) are not practical for financial or political reasons.</p> <p>Ratepayers are asked to spend more than a billion dollars over the lifetime of PSE's transmission line. The Draft EIS must answer these basic questions in order to convince residents that we are getting the best possible plan for our energy future.</p>
3/14/2016 18:58:45	Susan	Rosales	<p>I live in Olympus and am protesting EIS transmission lines running through our neighborhood. The 230 kV lines and tall monopoles will create visual blight as well as environmental hazard. We have lived here since 1993 and love the tranquil neighborhood and views. I beg you to stop ruining the peace and tranquility we have moved here to enjoy. I am sensitive to environmental EMF's and will be forced out of our home we love. In addition this is going to cause us to lose property value. Please listen to us and do not allow this to proceed</p>

3/14/2016 19:00:49	John	Merrill	<p>John Merrill DEIS Comments re Puget Sound Energy Proposed Eastside Transmission Lines  March 14, 2016  Thank you for this opportunity to comment on an issue that is very high stakes for the future of the Eastside. I am a member of the Coalition of Eastside Neighborhoods for Sensible Energy (CENSE.org) and live at 4800 134th Place SE in Bellevue. My comments extend to all members of CENSE.  CENSE's Vision  CENSE envisions an Eastside energy future that embraces our community's values rather than clinging to an outdated alternative of the past which is not aligned with our values. The Eastside can and should be a leader in implementing modern energy solutions that reflect our high-tech community, reinforce the livability of our neighborhoods, are safe and reliable and enhance our environment. These values make the Eastside a wonderful place to live and work and provide our business community with a competitive advantage to recruit and retain the best employees. The Eastside gets so many growth issues right; we can also have a bright energy future aligned with our values.  High Level Comparison of Alternatives 2 and 1A  Alternative/Choice Criteria  Alternative 2: Integrated Resources *Alternative 1A – Proposed Overhead Lines  Desirability as place to work/live  Enhances community attractiveness  Degrades the attractiveness of our community  Technology  Uses modern technologies aligned with our high-tech community values  Uses outdated "dinosaur technology"  Reliability  Proven in communities across the U.S.  Exceeds Federal industry standard requirements  Safety  Safe  Increases risk of catastrophic fire for 18 miles  Environmental Impact  Benign * Significant negative impacts  Appropriate size  Incremental capacity increases over time  Grossly oversized  Alignment  Aligned with community values  Unaligned  ☐ With modifications (explained below)☐</p> <p>General Comments on the DEIS:  •We now have new information provided by Lauckhart and Schffman, two unassailably qualified experts in determining the timing for and quantity of need for new electrical infrastructure, which shows the Eastside has ample time to plan for and incrementally implement forward-thinking solutions to the Eastside's energy future rather than rushing into an inferior solution which has much greater impacts.  •The DEIS asserts that the need for Alternative 1A is justified because PSE used the industry standard methodology for determining need. This is false. Alternative 1A greatly exceeds the industry standard. It goes far beyond Federal minimum requirements which are the industry standard. It greatly exceeds the industry standard test of reliability by imposing not only the industry standard Federal N-1-1 outage criteria but further burdens the system with additional equipment outages, lower than standard component capacities and a significantly increased flow of power to non-Eastside customers, among other stressors.</p>
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- The Lauckhart Schiffman study shows unequivocally that the timing for and amount of need is not established. The EIS process must be corrected for this fundamental deficiency. Until such time as the timing for and amount of need is established through a transparent, fair and accurate process, the basis for the DEIS as written is invalid and any conclusions of the EIS process are, unfortunately, invalid.
- Puget Sound Energy's (PSE) 19 criteria listed in Chapter 2 are un-vetted by any unbiased and expert authority on the provision of a reliable supply of electricity to power the growth of the Eastside. PSE's assertion, for instance, that any selected alternative must be implementable by a 2018 timeframe is simply untrue and unnecessary. (Although Alternative 2 could do so.) PSE's project criteria, along with the way that Alternatives 2 and 3 are characterized, appear purposely designed to preclude serious consideration of more aligned solutions to the Eastside's actual needs. The argument that the Lead Agency or EIS Consultant has no responsibility to question the proponent's specifications of need and the project criteria of acceptable alternatives is highly questionable. If for instance, PSE proposed to build an above ground 500kV transmission line through downtown Bellevue which required a 200 foot wide right of way through the Downtown Park and the demolition of 20 high-rise buildings, the City of Bellevue as lead agency would certainly both seriously question the need as well as acceptable criteria for alternatives. The bias toward the proponent's preferred alternative shown by the Lead Agency's blind acceptance of PSE's definition of need and 19 project criteria, tragically, makes a mockery of the entire EIS process and further invalidates its conclusions.
- The lead agency has put the EIS team in a very difficult position by instructing the EIS team to proceed as if the timing for and quantity of need were credibly established. The City of Bellevue as lead agency must change the EIS process to credibly establish both the timing for and quantity of need before any EIS analysis can be considered valid. Unfortunately, at least some of the large amount of work that the EIS consultant team has obviously put into the Phase 1 DEIS will likely need to be redone when the timing of and quantity of need is accurately established.
- The definition, characterization and analysis of Alternative 2 is inaccurate, outdated and biased. For instance, to insist that 3 small peaking plants are a necessary component rather than one larger one or none at all and the inclusion of such a large battery storage facility both show either ignorance about these types facilities or willful bias against Alternative 2. Alternative 2, or a new Alternative, must be corrected by an expert in the field of 21st Century grid solutions to reflect both expertise in this relatively new field and up to date information. Alternative 2, or a new Alternative, should be changed to reflect recommendations of a consultant like EQL Energy which has relevant expertise and experience with 21st Century grid solutions that is not yet represented on the EIS team.
- A modified Alternative 2, or a new alternative, which reflects best practices in the implementation of 21st Century grid solutions, would both satisfy the need, even that which is used as the basis for the Phase 1 DEIS, and have the lowest environmental impacts of any alternative (perhaps other than no action). The Lauckhart Schiffman study shows unequivocally that the Eastside has time to incrementally implement forward-thinking solutions to the Eastside's energy future rather than implementing an oversized, outdated technology which has far greater impacts.
- The lack of a permit application with a specific design of Alternative 1A by the project proponent renders meaningful Phase 1 evaluation impossible. For instance, the absence of the locations of the proposed poles relative to the existing fuel pipelines makes evaluation of

safety subject to so much uncertainty as to be meaningless. We also do not know with certainty whether or not PSE would remove the existing 115kV system under Alternative 1A and the high likelihood that the old lines will remain indefinitely are not assessed in the DEIS. The ultimate width of the right of way under Alternative 1A and the potentially huge number of homes that will have to be destroyed are likewise unknown and thus the devastating impacts of widening the right of way cannot be adequately analyzed. Thus the DEIS is premature and its conclusions further compromised. The lack of detailed analysis of these major impacts is a glaring deficiency that can only be remedied after the proponent provides detailed design specifications.

- The DEIS does not adequately assess the safety of co-locating Alternative 1A with hazardous liquid transport pipelines. Numerous experts warn against the proximity of these two conflicting right of way uses and the risks have not been identified properly let alone analyzed in detail. The DEIS says that current regulations regarding pipeline safety are adequate to protect adjacent homeowners and their families. This is inadequate given that pipeline explosions and fires happen regularly in the presence of pipeline safety rules and the existing rules are not well enforced. For instance, in 2010 Texas had rules designed to prevent catastrophic conflicts between fuels pipelines and electrical infrastructure which did not prevent the death of 3 workmen installing transmission line poles. The first responders could not get within ½ mile of the victims for over an hour because the heat from the flames was so intense. If this accident had occurred in a neighborhood like those on the Eastside adjacent to the route of Alternative 1A, hundreds of deaths would have resulted and the fire and police departments would have been helpless to prevent them.

- The DEIS all but ignores the fact that Alternative 1 would encourage the use of more electricity leading to more environmental impact both locally and elsewhere whereas a modified Alternative 2 would decrease the use of electricity and reduce environmental impacts. Not evaluating the impacts of other pollutants from electricity production including acid gases, heavy metals and particulates is a glaring omission.

Other Alternatives: There are other and better alternatives which must be added to the Phase 1 analysis, including but not limited to:

- A modified Alternative 3 without miles of new wires. Relatively simple transformers additions and associated upgrades at Talbot Hill and/or Sammamish substations and possibly replacing existing conductors as needed would increase peak capacity by approximately 200MW. This would satisfy even PSE's exaggerated statement of need. It is also standard industry practice to run 230kV circuits on poles approximately the same height as the existing 115kV poles to replace one of the two existing circuits. In fact, PSE has such dual voltage circuits running side by side just north of Sammamish.

- A combination of pieces of a modified Alternative 3, as described above, and portions of Alternative 2 would best serve the Eastside's needs with the least impacts.

- PSE's 2015 Integrated Resource Plan shows that PSE plans to build several hundred MW of new gas-fired generation in Western Washington beginning in 2021. As stated above, the Lauckhart Schiffman report shows we have plenty of capacity until then. The addition of just 200 MW of additional capacity at 115kV would satisfy even PSE's exaggerated statement of local need.

- Flexible AC transmission system (FACTS) control devices – as described in the EQL paper attached would keep our existing 115kV

system from overloading eliminating the need to supplement it for many years while still providing reliable service.

Comments on specific parts of the DEIS:

Chapter 1 Introduction and Summary

1.1 Alternative 1A is grossly oversized to serve even PSE's exaggerated estimate of need over the next several decades. PSE asserts that the need in the next 10 years is 133 MW (Section 1.3) and the longer term need is roughly 200 MW. (note this is an exaggeration of need given this estimate of need greatly exceeds industry standard criteria.) Yet the installation of a single new transformer, utilizing only 1 of 2 new circuits on Alternative 1A, would increase capacity by roughly 350 MW. Alternative 1A could easily double increased capacity to 700 MW by energizing the second circuit at 230kV and adding a 6th transformer to the system. That would increase peak capacity by 100%. The conductors PSE has specified for the 2 new circuits on Alternative 1A would actually support the addition of a total of 8 new like-sized transformers before the conductor capacity was exceeded. Thus Alternative 1A would actually increase peak capacity by approximately 400% if fully utilized. This is grossly out of scale with even PSE's exaggerated estimate of local need but greatly increases PSE's contribution to the capacity of the regional grid to serve non-local customers including Canada. Again, this is grossly out of scale with local need.

Table 1-2 Construction Impacts Comparison shows that the DEIS concludes that Alternative 1A (Alt 1A) has negligible or minor impacts on Earth, Green House Gas Emissions, Plants and Animals, Energy and Natural Resources, Environmental Health, Land Use and Housing, and Views and Visual Resources. This is a gross understatement of the actual impacts. All these categories should show Significant Impacts for Alt 1A. To say that the impacts of Alt 1A is equal to the impacts of No Action or Alt 2 does not pass the common sense test. For instance, it is makes no sense to equate the Earth impact of 18 miles of heavy construction to the impact of Alt 2 if Alt 2 is correctly characterized without peaker plants.

1.3 The Stantec memorandum, which purportedly supports PSE's assertion of need, is not included in the DEIS as advertised. This memo is apparently an important basis of the DEIS determination of need. Without the opportunity to review and verify this memo, it is impossible for reviewers of the DEIS to concur. In the absence of this memo, the need cannot be determined to be established. By not including this memo, the DEIS reinforces the impression that the review team is biased toward the proponents preferred alternative.

The electrical load growth rate of 2.4% per year used by PSE in its determination of need appears highly exaggerated. PSE and the DEIS state that it is based upon 3 factors: a population increase of 1.2 % per year, an employment increase of 2.1 percent per year and the addition of "block loads" from proposed construction projects. The population increase rate is based on a credible, independent forecast from the Puget Sound Regional Council, however, the job growth rate forecast was done by PSE and lacks transparency and thus credibility. Moreover, including "block loads" double counts both the effects of population and employment growth depending on whether the block loads are residential or office buildings. To be credible, the methodology must be transparent and independently verified by experts.

The largest fallacy in the load growth rate projection, however, is the completely unsupported assertion that lower growth rates in both

population and job growth could somehow increase electricity use at a greater rate than either of them. This flies in the face of common sense when one understands that peak per capita electricity use, both at home and at work is falling - largely because energy conservation, such as switching to LED bulbs, greater use of energy efficient home appliances and increasing use of lower power computers and office equipment. More and more homeowners and businesses are also switching from electric space heat furnaces and electric hot water heaters as the price of natural gas continues at historic lows. PSE's assertion that peak electricity use is growing twice as fast as population and faster than employment growth has no rational basis and must be independently vetted before it can be used to justify the need for any alternative in the EIS.

1.6 Paragraph 3 is totally disingenuous in that it implies that only Alternative 1 meets PSE's 19 project criteria as Alternatives 2 and 3 only "address the objectives sufficiently enough to be reasonable for consideration" in Phase 1 of the DEIS, but by inference not in Phase 2. This reinforces the conclusion that the DEIS is designed to support only PSE's proposal and eliminate all other alternatives. This does not serve the intent or purpose of an EIS when there in fact are other viable alternatives.

1.12.1 PSE's need evaluation process has NOT been conducted according to industry standards. The evaluation criteria used by PSE and its consultants greatly exceed the standards required by NERC and WECC and are not standard in the industry. The load flow simulations run by PSE and subsequently by its consultants and Utility Systems Efficiencies go well beyond federal and regional reliability requirements which are the industry norm. For instance, PSE's and its consultants load flow studies simulate not just the required N-1-1 situation, which is the industry standard wherein two critical pieces of equipment fail sequentially during a rare peak demand event as required by NERC and WECC. The PSE studies go far beyond the requirement by taking another approximately 8 pieces of critical equipment (Western Washington gas-fired generators, some of which are "peaking plants" designed and built specifically to run during peak demand hours) offline IN ADDITION TO the required and industry standard N-1-1 equipment outages. In addition to this non-industry-standard simulation of a highly unrealistic "N-1-1-8" event, PSE and its consultants further stress an already highly compromised system by subjecting it to a huge flow of power to Canada. (There is no firm contract to deliver power to Canada during a peak demand event on the Eastside and PSE has not produced any evidence that there is such an obligation.) The simulation of an N-1-1-8 event, with or without the added stress of enormous power flows to Canada, is not "in accordance with industry standards for utility planning" as asserted in the DEIS. In its load flow modelling, PSE apparently also incorrectly used summer ratings for the remaining operating transformers during the winter peak event simulation. This yet further stresses the system reducing its ability to adequately handle load. Thus the need for any alternative, other than no action, is not yet established. The need must be transparently established in accordance with industry standard practices (i.e., based on NERC and WECC minimum requirements of an N-1-1 event during peak demand hours alone) without additional, non-standard stresses modeled on the system before the Phase II DEIS scoping can proceed.

#### Chapter 4 Greenhouse Gas Emissions

Alternatives 1 A, C and D would have a very significant impact on GHG emissions (GHGs). With regard to construction, the metal

extraction from the earth, transportation of ore, manufacture of metal, fabrication of metal, and shipping of the rebar, conductors and towers would emit significant quantities of Scope 1, 2 and 3 emissions as well as the installation.

With regard to operation, the DEIS ignores the relationship between the production of electricity using carbon-intensive fuels and the construction of Alt 1. Alt 1 encourages the use of both local and distant carbon-intensive generation plants like Colstrip whereas Alt 2 would actually decrease the amount of electricity used from all sources. Alt 1A is an enabler of PSE's plans, as documented in its 2015 Integrated Resource Plan, to build hundreds of megawatts of new gas-fired, carbon intensive generators beginning in 2021 and prolong the life of Colstrip. For instance, without the construction of an Alt 1, which would be treated as a sunk cost in an economic analysis of new gas-fired generators, new gas-fired generators would not be built because they would not be a least cost source of power. Colstrip might even be shut down sooner if Alt 1 is not implemented. Simply put, if these fossil fuel-fired plants were burdened with the cost of transmission, they would not be built or their life extended. Thus the impacts of any of the Alt 1 options must account for the increase in electricity use they enable. The amount of new or existing carbon intensive generation capacity they enable is at least 1000 MW. 1000MW capacity is the difference between the 1500 MW of Canadian flow in the PSE load flow studies used to justify the need for Alt 1 and the 500 MW of Canadian flow in the PSE base case and Lauckhart Schiffman studies.

4.5.3.1.2 The implicit assertion that only the production of concrete and not the production of steel, aluminum and other metals does not produce GHGs in significant quantities is simply wrong. The extraction and production of metals is extremely energy intensive and produces huge quantities of GHGs. To include the impacts of production of battery storage components under 4.5.4.4.2 but not the impacts of production of components of Alt 1 shows bias for Alt 1 and must be corrected.

Ignoring the significant production of GHGs from these activities directly caused by Alt 1A biases the analysis against Alternative 2, which absent peaker plant which are not needed in an effective Integrated Resource solution, produce little to no GHGs.

4.5.3.1.3 In general, the use of the State quantitative criteria for determining GHG impacts is inadequate and misleading given the negligible impacts from a corrected Alt 2 which does not require peaker plants and only small storage amounts. Alt 2 can and should rely primarily on energy efficiency, conservation, demand side management and non-impactful distributed energy resources. The DEIS analysis and results imply that the impacts of Alt 2 are somehow in the same ballpark as the other alternatives, especially Alt 1A, which is entirely biased and misleading.

The statement that 44 acres of forested land "under a worst case scenario" would be deforested is not adequately supported. First it is less than half of the roughly 110 acres that would have to be added to the 100 foot right of way for expansion by 50 feet. Second, the assertion that the expansion would have to be only 50 feet is not adequately supported elsewhere in the EIS. The actual expansion required may be 100 feet or more in order to provide adequate separation of Alt 1A and the two high-pressure fuel lines as well as the 115kV lines in the existing right of way. The described impacts are not worst case.

4.6.4.4 No peaking capacity is needed for Alt 2 to satisfy the need, even though PSE's quantification of need is overstated. It is misleading to include peaking plants in Alt 2 in the first place, let alone to include a moderate impact "warranting mitigation" to color people's impression of Alt 2.

4.9 The conclusion that none of the alternatives would significantly impact GHG emissions, as stated above, ignores the cause-effect relationship between Alt 1 and the generation of more carbon fuel-generated electricity as well as the construction of up to 1000 MW of new carbon intensive generation capacity. This is a glaring defect in the analysis and must be corrected by experts who understand these relationships and their consequences for GHGs and other impacts.

#### Chapter 7 Energy and Natural Resources

The assertion in the side bar in 7.1 that Alt 2 would lead to Eastside generation of non-renewable power rests on the faulty characterization of Alt 2. Alt 2 does not require new Eastside peaking capacity to be an effective solution to even PSE's exaggerated quantification of need. Moreover, if Alt 1 is built, fossil fuels will be burned and water consumed and contaminated somewhere else to satisfy the increased demand for electricity it enables and it is wrong to ignore distant impacts. The impacts of PSE's Colstrip plant for instance are ignored. The fact remains that Alt 2 would reduce demand for energy and Alt 1 would significantly increase both capacity of and demand for electrical energy.

7.6.3 and 7.6.4 Again, the assertion that Alt 1A would not lead to additional need for new power generation or additional use of resources is not supported and ignores the cause-effect relationship between the construction of transmission and the construction of new and increased use of existing resource-intensive generators. This relationship must be adequately analyzed by experts who understand these relationships and their consequences. Alt 1 would enable the construction of up to 1000MW of new generation and the attendant energy resource use impacts.

#### Chapter 10

10.7.3.1.2 Alt 1A does not comply with King County, Redmond and Kirkland policies or regulations that specifically prohibit co-locating new or expanded transmission lines with hazardous material pipelines. The reasons for this prohibition should be analyzed and an in-depth assessment of risk to neighboring communities included in the DEIS. The feasibility of Alt 1A is questionable given these regulations.

10.7.3.1.1 The DEIS states that Alternative 1A could require up to 327 acres of housing, businesses and other land uses to be condemned and demolished for use as a utility corridor. It also states that at a minimum an additional 50 feet width of adjacent property would have to be added to the existing right of way. This would be an additional approximately 109 acres of housing and businesses that would have to be cleared of structures and trees. This analysis likely underestimates the amount of land required because it does not contain an analysis

			<p>of how far away from the hazardous material pipelines the new lines must be built. If either of the two pipelines in the existing right of way are near the edge of the existing right of way, the proposed transmission lines in Alt 1A would, to be safe, have to be located at least 50 feet away. And to that 50 feet another 50 or so feet would have to be cleared of houses and other structures in order to maintain sufficient clearance from the new power lines. The current analysis is also inadequate because it does not include a discussion of the number of homes, businesses, other structures and trees which would have to be torn or cut down. For instance, if the average housing lot size along the right of way is 1/3 of an acre, the addition of 109 acres of additional right of way could require the condemnation and removal of up to 327 homes which is equivalent to every home located on one side or the other of the existing right of way. To obscure this impact in the fine print of such a long document and to label the impact of this amount of dislocation and trauma to the communities along the right of way anything less than beyond significant is untruthful and disingenuous at best.</p> <p>10.7.1.4 The cost discussion and analysis provided is totally inadequate because it relies entirely on only one out-of-date study which may or may not be relevant to property values in this particular location. The analysis contains no evidence that the study is applicable to the Eastside. Real estate values are widely known to depend on location, location, location yet the analysis makes no attempt to enlist the knowledge and expertise of local real estate experts. This must be done, otherwise the analysis is inadequate.</p> <p>Documents Incorporated By Reference</p> <ol style="list-style-type: none"> <li>1.Lauckhart Schiffman Load Flow Study</li> <li>2.The Best Alternative document by EQL Energy</li> <li>3.Alternatives To Energize Eastside by EQL Energy</li> <li>4.Grow Eastside Smart Transmission Project Local Economic Study Request Oct 31, 2015 (Flexible AC transmission system (FACTS) control devices) by EQL Energy</li> </ol>
3/14/2016 21:26:27	Scott	Kaseburg	<p>It has become clear that the analysis for the need for the project is flawed. Assuming that six of the eight peak demand back-up generators don't come on and sending 150MW to Canada while we are at a peak load does not make sense. There is plenty of time to monitor and work alternatives. I appreciate the work of CENSE and Richard Lauckhart. See: <a href="https://youtu.be/jnV8TL_U_g0">https://youtu.be/jnV8TL_U_g0</a></p>