

## **SECTION 5: INTRODUCTION**

### **Rebuttal to Asserted Need for Project**

PSE justifies the *need* for Energize Eastside by forecasting an annual growth of peak demand of 2.4%. However there is insufficient data to support this conclusion. PSE refused multiple requests for the substation peak-load data necessary to document the actual annual growth rate of annual peak demand on the Eastside.

PSE claims its load flow studies prove that the project would provide *reliable* electricity. However, the studies are based on assumptions that far exceed the Transmission Planning requirements of the North American Electric Reliability Corp (NERC). Therefore, the load flow studies do not *realistically* demonstrate that the project is needed for electrical reliability on the Eastside. In addition, the load flow studies on which the project is based are over five years old, beyond the NERC requirement for updated studies, and NO load flow studies have been conducted using data for only the South Segment of the proposed project.

PSE mounted an expensive and aggressive public relations campaign to sell Energize Eastside. The ads are filled with half-truths that raise fear about the adequacy of our electrical grid for future needs.

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# McCULLOUGH RESEARCH

**ROBERT F. McCULLOUGH, JR.**  
**PRINCIPAL**

Date: March 19, 2019  
To: Rick Aramburu  
From: Robert McCullough  
Subject: Needs and Costs of Energize Eastside

Since 2009 the transmission project known variously as the “North King County Capacity Increase” (2009), “Sammamish-Lakeside-Talbot Sensitivity” (2010), “Eastside Transmission Project” (2014-2017), “Lakeside 115 KV Transmission Project” (2014), “Lakeside Project” (2013), “Lakeside Substation Project” (2012), and since 2013, “Energize Eastside” has spent \$54,634,345 on planning and public relations.<sup>1,2</sup> In spite of the multiplicity of names and corresponding studies, actual details remain sketchy. Specifically, data on the need for the project and its costs are difficult to find.

More recently, in August 2017, the configuration of this long-awaited project was entirely changed.<sup>3</sup> The new project, the “Talbot Hill/Lakeside Transmission Line”, is now proposing to replace the “Energize Eastside” proposal with a less ambitious plan that will only construct 4.8 miles of the original 8.8 miles originally considered. In February of this year PSE stated:

“PSE has not completed an application for the transmission line segment running from the proposed Richards Creek substation north and cannot accurately estimate the timing of the timing of this submittal until additional work permitting the Project’s south half is complete.”<sup>4</sup>

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<sup>1</sup> 2017 Puget Sound Energy FERC Form 1, page 216.

<sup>2</sup> \$54,634,345 is the figure as of December 31, 2017. A more reasonable forecast to year end 2018 would be \$61,668,850.

<sup>3</sup> “Progress on Energize Eastside continues with PSE submitting its first permit application to the City of Bellevue. PSE plans to build and energize the new Richards Creek substation in Bellevue and upgrade the existing transmission lines in south Bellevue, Newcastle and Renton by the summer of 2018.

Permit applications for the rest of the southern portion of the project in Newcastle and Renton will be submitted this fall. After that, PSE anticipates submitting permit applications for the northern portion in Bellevue and Redmond in late 2017 – early 2018.”

<https://energizeeastside.com/news>, September 18, 2017.

<sup>4</sup> Declaration, Daniel Kock, PSE, February 11, 2019.

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For newcomers to electric transmission planning, this seems like a minor adjustment. If a building is too tall for local zoning standards, a developer can simply agree to build a building half as tall without refiling the various plans and applications. This is a reasonable solution in almost all land use cases.

Electric transmission is entirely different. Planning studies in electric transmission planning must be undertaken on a system level. This is due to the physics of electricity transmission. While the line itself can be easily plotted on a map, the actual flows often diverge significantly from our geographic intuitions. This reflects two factors: First, the flows of electricity are not contract paths, but the results of flows across the entire grid. A specific line may well have implications on neighboring lines – or even lines at some distance. Electrons are notoriously uninterested in contracts since they follow the path of least resistance. Second, contingencies on the system are very different when the line's proposed path changes. The new Talbot Hill/Lakeside Transmission Line will be less vulnerable to contingencies from the north – specifically since it will no longer connect to the north.

In practice this means that the vintage studies performed in 2012, 2013, and 2015 are no longer pertinent to the project under discussion and would not be regarded as appropriate in normal planning discussions.<sup>5,6,7,8</sup>

Since electrons do not follow maps, the coincidence that part of the new Talbot Hill/Lakeside Transmission Line coincides with the previously proposed project is not relevant since electrons may trace entirely different paths under the newly proposed configurations. This is exacerbated by the fact that all evidence available in state and federal filings of Puget Sound Energy clearly indicates that the assumed peak loads have not materialized – and overall electric peak loads on their system are declining.

To fulfill the requirements of the Bellevue Municipal Code (Section 20.20.255.E.3), Puget Sound Energy must establish the need for any electrical facility it proposes to build in the city:

The applicant shall demonstrate that an operational need exists that requires the location or expansion at the proposed site;

And the Newcastle Municipal Code Section 18.44.052.A.3) addresses the question of need in a similar fashion:

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<sup>5</sup> City of Bellevue Electrical Reliability Study Phase 2 Report, Exponent, February 2012.

<sup>6</sup> Eastside Needs Assessment Report, Quanta Technology, October 2013.

<sup>7</sup> Supplemental Eastside Needs Assessment Report, Quanta Technology, April 2015.

<sup>8</sup> Independent Technical Analysis of Energize Eastside, Utility System Efficiencies, April 28, 2015.

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- a. Describe how the proposed utility facility regional location is a consequence of needs or demands from customers located within the city or service area; and
- b. Describe why the operational needs of the facility require locating the utility facility regional at the proposed site.

It is a truism of investor owned utility planning that as the sums increase in the construction work in progress accounts, defense of the project becomes financially more and more important. In this case, requests for updated data has been rejected more and more forcefully as time progresses. The most recent requests for relevant load data have been refused on the ground that the summary data might expose individual consumer data.<sup>9</sup>

When the project commenced in 2010, Puget Sound Energy forecasted overall peak loads for 2017 as 5,843 MW.<sup>10</sup> The actual winter peak load in 2017 was 4,206 MW.<sup>11</sup> If, as there is every reason to believe, the lack of load growth over the past decade (and the most recent forecast indicating a lack of load growth for the next decade) makes the need for a major infrastructure project on the eastside both speculative and premature.<sup>12</sup>

Need for the project has changed considerably over the past eight years. Initially, a significant focus was on the need to deliver the Canadian Entitlement. This shows up in the documentation available at ColumbiaGrid, a planning body that represents a variety of pacific Northwest utilities – including Puget Sound Energy.

The focus on the Canadian Entitlement is a bit odd given that British Columbia, the recipient of the Canadian Entitlement under an agreement dating from 1964, had rejected depending on U.S. supplies in legislation enacted in 2005.<sup>13,14,15</sup>

As British Columbia Hydro testified a year ago at the British Columbia Utilities Commission:

Canadian Entitlement to the Down Stream Benefits under the Columbia River Treaty: The Canadian Entitlement has been eliminated as an alternative resource both due to the legislated self-sufficiency requirement but al-

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<sup>9</sup> Marshall, George. *Re: CEII Requests dated June 9,2018 and July 8,2018* September 19, 2018.

<sup>10</sup> 2009 IRP Addendum, page 8.

<sup>11</sup> 2017 Puget Sound Energy FERC Form 1, page

<sup>12</sup> 2019 IRPAG Meeting #2, PSE, August 28, 2018, page 24.

<sup>13</sup> McCullough, Robert. *Comments on Commission Alternative Resource Portfolios BCUC Site C Inquiry testimony F35-21*, October 18, 2017, page 4.

<sup>14</sup> U.S. Benefits from the Columbia River Treaty – Past, Present and Future: A Province of British Columbia

Perspective BC Ministry of Energy and Mines, June 25, 2013. Page 8.

<sup>15</sup> Canadian Entitlement, U.S. Entity, April 2013, page 2.

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so given current negotiations between Canada and the US, the current energy reliance and limited firm transmission availability through the I5 corridor to BC.<sup>16</sup>

External market reliance (including Canadian Entitlement)**	-	-	<p>Reliability concerns and uncertain long term availability.</p> <p>Also legislatively barred through section 6(2) of the <i>Clean Energy Act</i> – the legal requirement to be self-sufficient requires “solely from electricity generating facilities within the province”</p>
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BC Hydro has not explicitly relied upon the Canadian Entitlement (CE) to the Down Stream Benefits (DSBs) under the Columbia River Treaty (CRT) in developing the portfolios used in this application (except for a short term bridging or contingency resource). BC Hydro does not believe the CE to be an appropriate resource to rely upon in its portfolio development for the following reasons:

1. The Clean Energy Act requires that BC Hydro be self-sufficient for energy and capacity by being able to supply mid-level load forecasts planning to average water from heritage hydro contracted with or own;<sup>18</sup>

Given British Columbia's 2005 Clean Energy Act and the ongoing renegotiation of the Columbian Entitlement, the need for this transmission line to carry energy and capacity north has been quietly dropped. Even more importantly, the plan to build the transmission line in stages would make wheeling to Canada over the line impossible.<sup>19</sup>

This conclusion was underscored by the response to concerns over the use of the line to wheel the Canadian Entitlement:

As described in the Phase I Draft EIS, transmission of electrical power outside of PSE's service territory is not an objective of the project.<sup>20</sup>

The Canadian Entitlement is one of a number of issues currently under negotiation between the United States and British Columbia Hydro. The economics of BC Hydro's

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<sup>16</sup> BC Hydro Submission to the British Columbia Utilities Commission Inquiry into the Site C Clean Energy Project, August 30, 2017, page 60.

<sup>17</sup> Ibid., Appendix L, page 4.

<sup>18</sup> Ibid., Appendix L, page 49.

<sup>19</sup> As noted earlier, the remote possibility that changes in British Columbia law and integrated resource plans might change to include imports from the U.S. would not be relevant to a line that terminates half-way.

<sup>20</sup> Final EIS Appendix J Phase 1 Comments & Responses, March 2018, Page JI-10.

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new 1,100 MW “mega-dam” at Site C depends on exports to the United States making the prospects of new imports from the U.S. even more remote.

In recent years, the eastside transmission project has relied on forecasts showing that rapid growth will create the required need for the project. The Final EIS comments favorably on the dated studies that use these forecasts:

PSE's Eastside Needs Assessment Report prepared by PSE, the Supplemental Eastside Needs Assessment Report prepared by Quanta Technology and PSE, and the Independent Technical Analysis prepared by Utility System Efficiencies, Inc. for the City of Bellevue confirms the project need. Stantec reviewed the analyses and found them to be in accord with standard industry practice for electrical system planning.<sup>21</sup>

The EIS response has missed the point. Even if the studies are well prepared, their relevance is severely limited when the assumptions used in them have become obsolete. PSE's original needs assessment utilized forecasts from 2012.<sup>22</sup>

Rapid changes in the electric industry have rendered older load forecasts obsolete. The following chart shows PSE's official load forecasts against actuals for the past decade:

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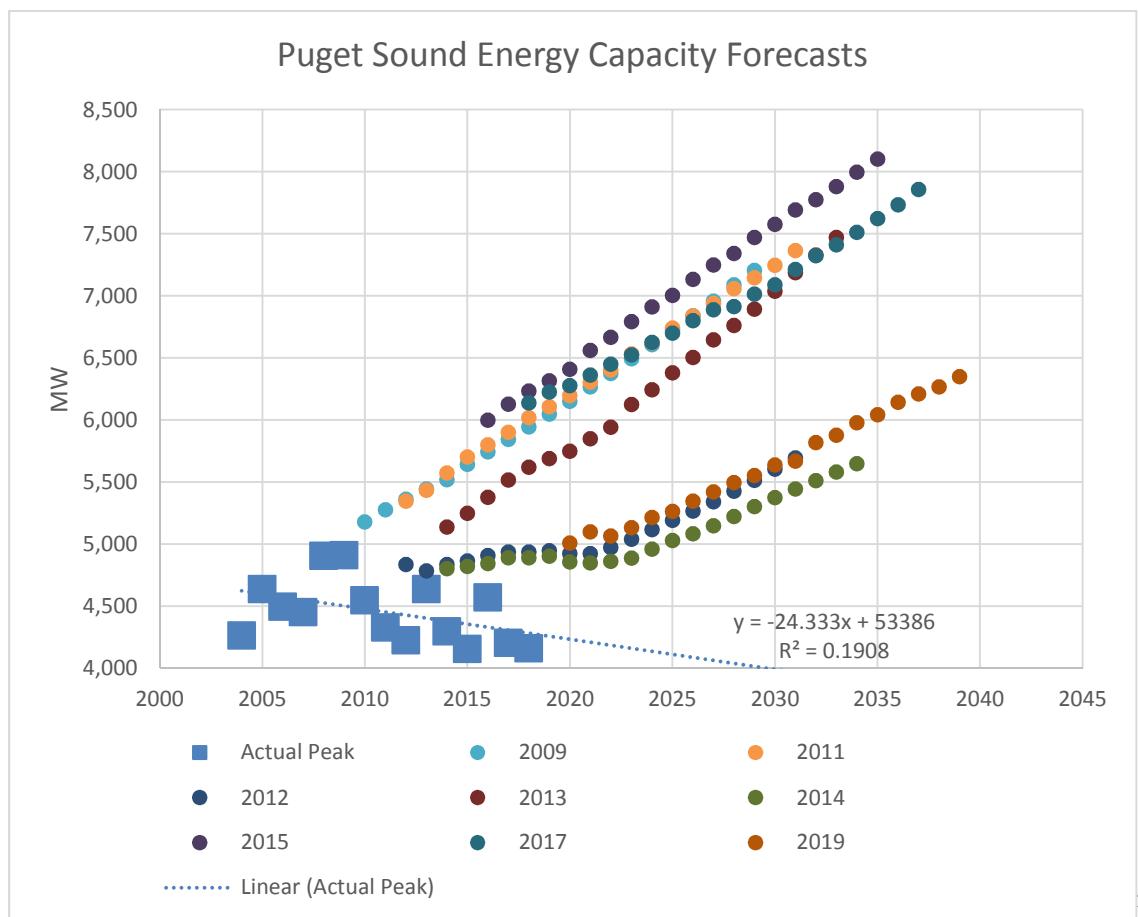
<sup>21</sup> Ibid., page J1-16.

<sup>22</sup> Eastside Needs Assessment Report, October 2013, page 7.

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These charts are referred to as “porcupine charts” since the older forecasts stand out like a porcupine’s quills. The blue boxes represent actual peak data. This is the “body” of the porcupine. Puget Sound Energy’s actual peaks are declining over time. The dotted line that decreases over time shows a simple statistical model of Puget’s decline in peak loads.

As can be seen clearly from “quills” of the porcupine, PSE’s peak load forecasts have fallen sharply over the transmission project’s ten-year life. When the project was first originated, PSE expected its capacity loads to be 39% higher than the actual peak experienced in the winter of 2017/2018. Not only have the assumed growth rates for capacity been unrealistically high, but the actual trend in actual peaks has been negative:

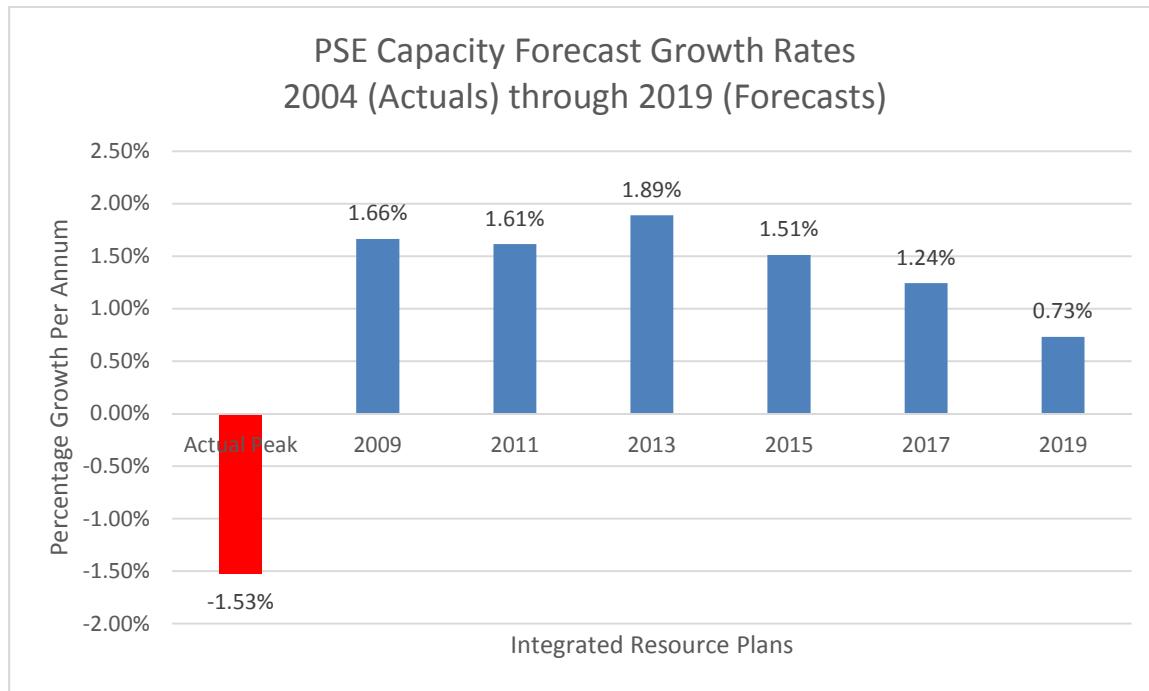
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<sup>23</sup> Sources for this chart are the PSE IRPs for 2009 through the preliminary materials for 2019. Actual peaks are from the PSE FERC Form 1s and from the 2018 Form 3-Qs. The fourth quarter of 2018 has been interpolated from EIA-930 reports.

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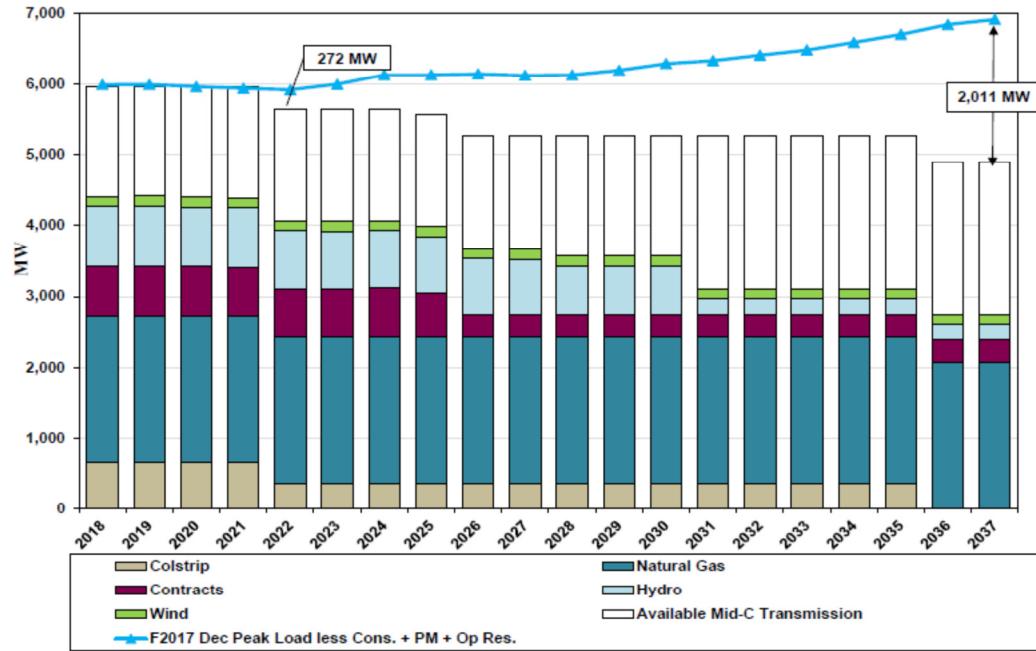


PSE's most recent preliminary forecasts released in the advisory committee for the 2019 Integrated Resource Plan effectively estimate no growth rate for the next decade:

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The load forecasts used in the studies cited in the EIS response are now obsolete. These older forecasts were used to establish the need for the transmission project.

The chart that best illustrates PSE's needs analysis can be found in the Supplemental Eastside Needs Assessment Report:

<sup>24</sup> 2019 IRPAG Meeting #2, PSE, August 28, 2018, page 24.

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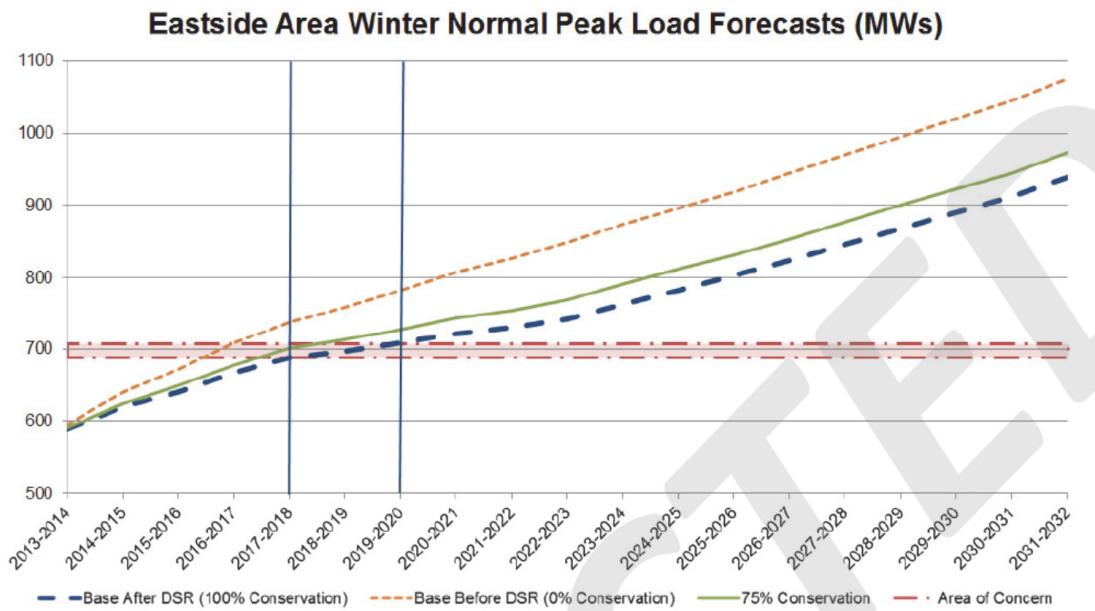


Figure 3-1: Capacity Need Results with 2015 Updated Information

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This table illustrates a need for the project in the winter 2017/2018 time frame – as the load forecast crosses the line representing “the area of concern”. The “area of concern” is represented by the horizontal line approximating 700 MW.<sup>25</sup>

If the load forecast is lower than 700 MW, the need for the upgrade is minimal at best. We know the actual loads five years from the City of Bellevue Independent Technical Analysis.<sup>27</sup>

In the chart below the dashed red line indicates the actual values for winter 2008/2009 through 2013/2014. As is clear from the revised chart, actuals were significantly below forecasts through winter 2013/2014.

<sup>25</sup> Supplemental Eastside Needs Assessment Report, PSE, April 2015, page 15.

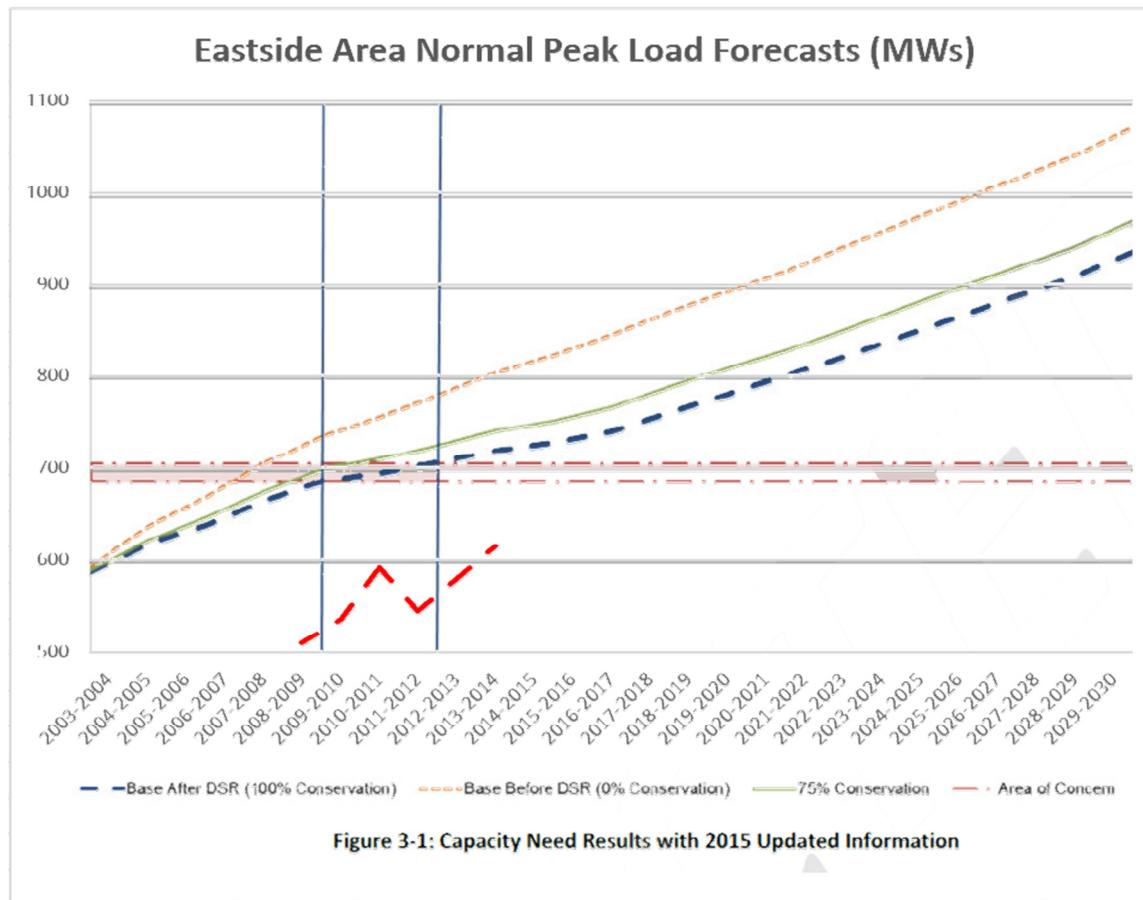
<sup>26</sup> PSE’s actual language is a bit confusing on whether the chart represents MVA (active plus reactive load) or MW, the standard measure used in load forecasting. We have assumed MW since this is the amount cited in the following paragraph.

<sup>27</sup> Independent Technical Analysis of Energize Eastside for the City of Bellevue, WA. Utility System Efficiencies, Inc., April 28, 2015, page 34.

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Puget Sound Energy has not released eastside actual capacity figures since the winter of 2013/2014. It is logical to infer that the data may follow trends in the industry of low (or negative) rates of load growth. We have estimated eastside capacity loads using an econometric forecast based on the relationship between PSE and Eastside capacity loads in the Independent Technical Analysis.<sup>28</sup> In the words of the econometrician, the relationship is significant at the 95% level. Translated into standard English, this means that rejecting the relationship as just pure chance would be wrong nineteen times out of twenty.

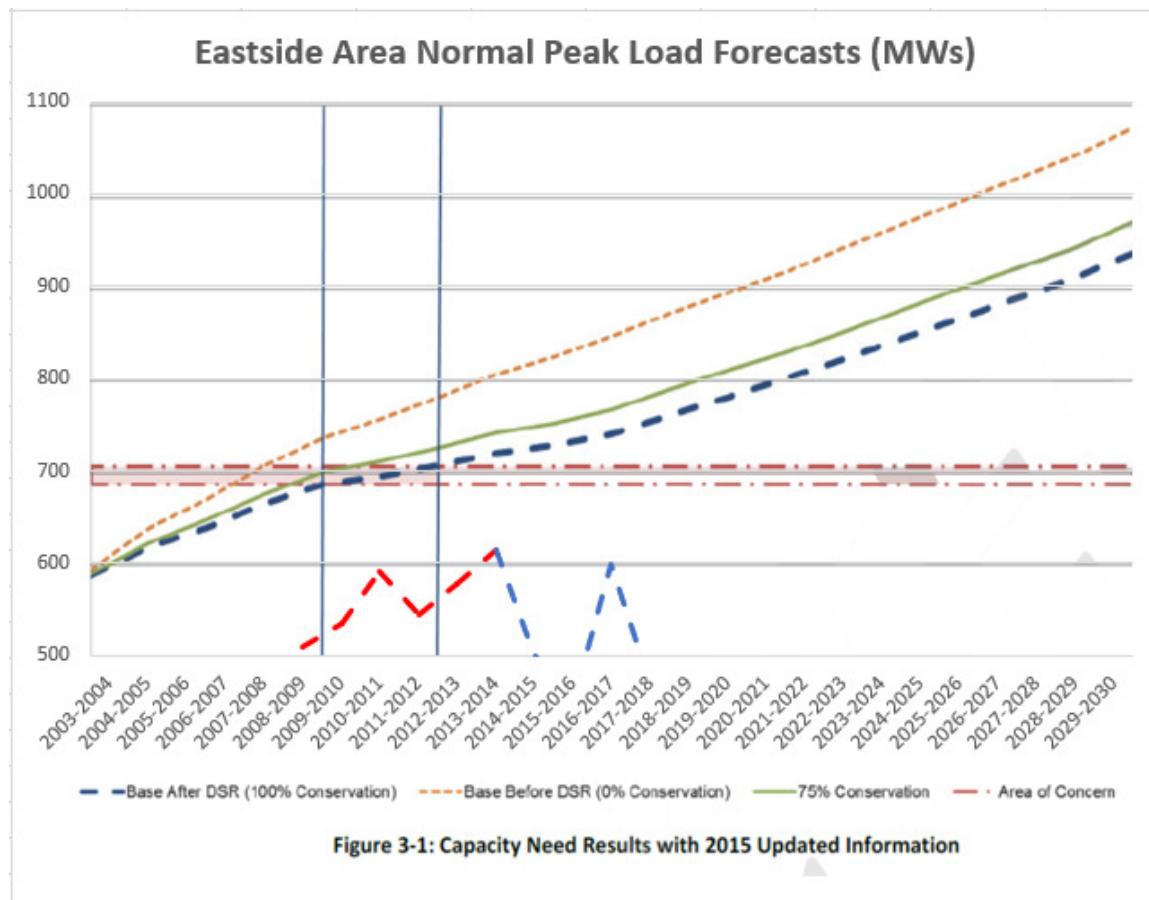
Using this relationship, we can fill in actuals through last winter:

<sup>28</sup> Ibid., page 34.

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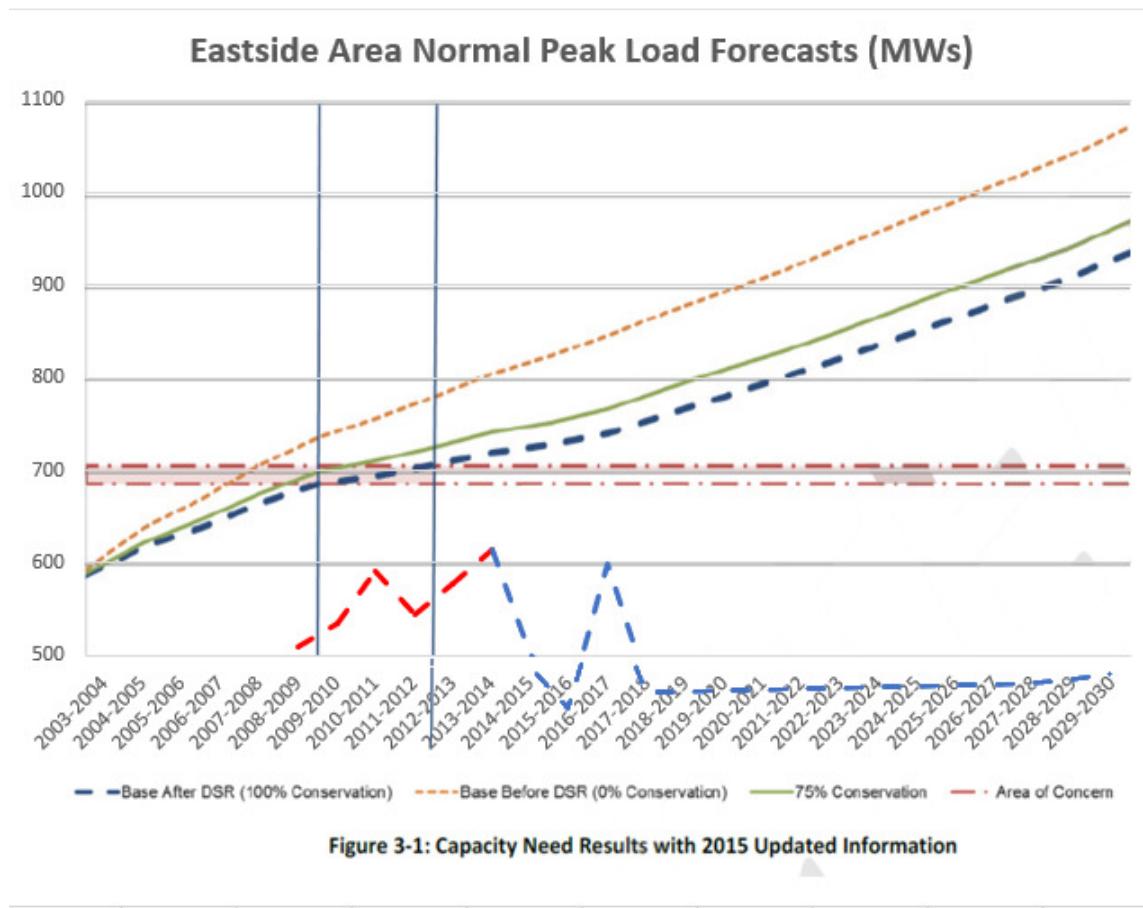
The blue dashed line represents a best guess of actuals for the past four winters. As can be seen, the values remain low since overall Puget Sound Energy capacity loads are falling. The areas of the chart where the blue line disappears represent years where the values are lower than the minimum level shown in Puget's chart.

We can extend the estimate into future years using Puget's own forecast. They estimate a growth rate of just one quarter of one percent over the next decade. This value can be used to forecast eastside loads for the next decade:

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The evidence so far released by Puget Sound Energy indicates that actual eastside capacity loads will not reach the “area of concern” in many years to come.

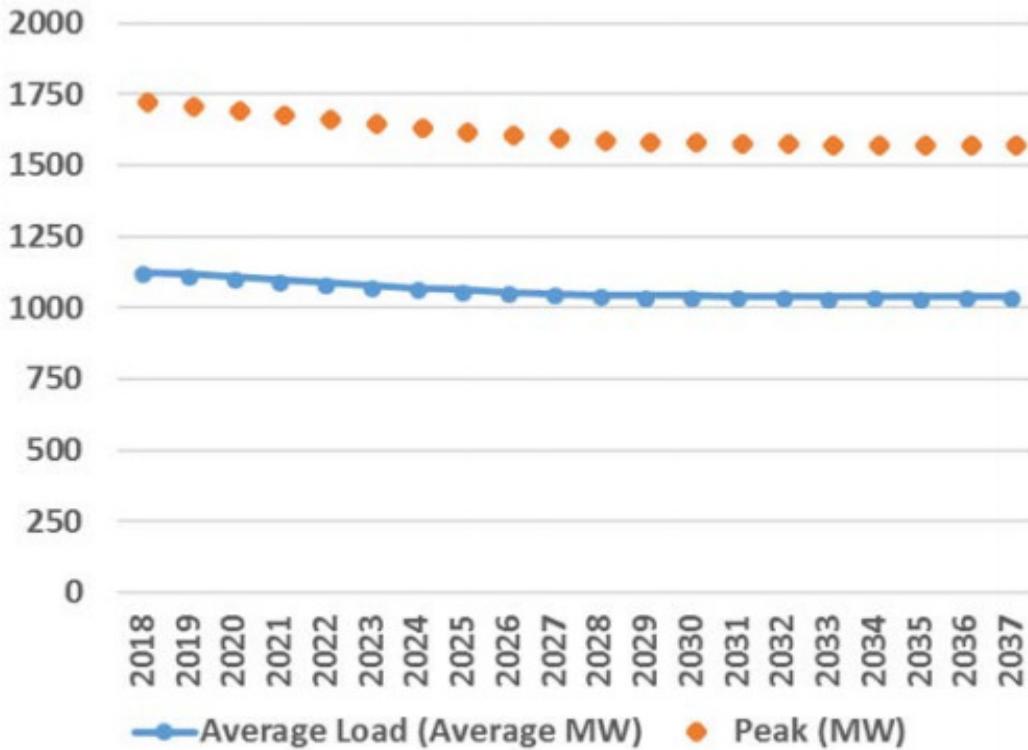
It is logical to question the rapid change in capacity load forecasts over the past five years.

Reductions in peak loads are now common in the industry. Seattle City Light --Puget Sound Energy's closest neighbor sharing similar weather and demographics – has just issued a new load forecast showing peak load reduction far into the future:

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*Figure 1. City Light's normal peak and retail load forecast*

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Overall, substantial evidence exists that the high growth scenarios presented in early integrate resource plans did not materialize.

PSE's continued enthusiasm for this project is more likely to be explained by costs and their regulatory treatment than engineering.

The cost of Energize Eastside is a mystery. In the beginning, PSE indicated that the project had a price tag of \$70 million.<sup>30</sup> For some years, PSE has indicated that the costs are between \$150 and \$300 million.<sup>31,32</sup>

<sup>29</sup> 2018 Progress Report, Seattle City Light, September 4, 2018, Page 10.

<sup>30</sup> 2013 Biennial Transmission Expansion Plan, ColumbiaGrid, February 2013, page 6.

<sup>31</sup> "We don't yet know the total cost of the project, but estimates range from \$150 million to \$300 million." <https://energizeeastside.com/faq/who-will-pay-for-the-project-and-how-much-will-it-cost>

<sup>32</sup> "[Willow] is the least expensive (\$154 million total cost; \$0.90 estimated monthly increase to an average residential customer)", PSE Energize Eastside Community Advisory Group Final Report, January 2015, page 22.

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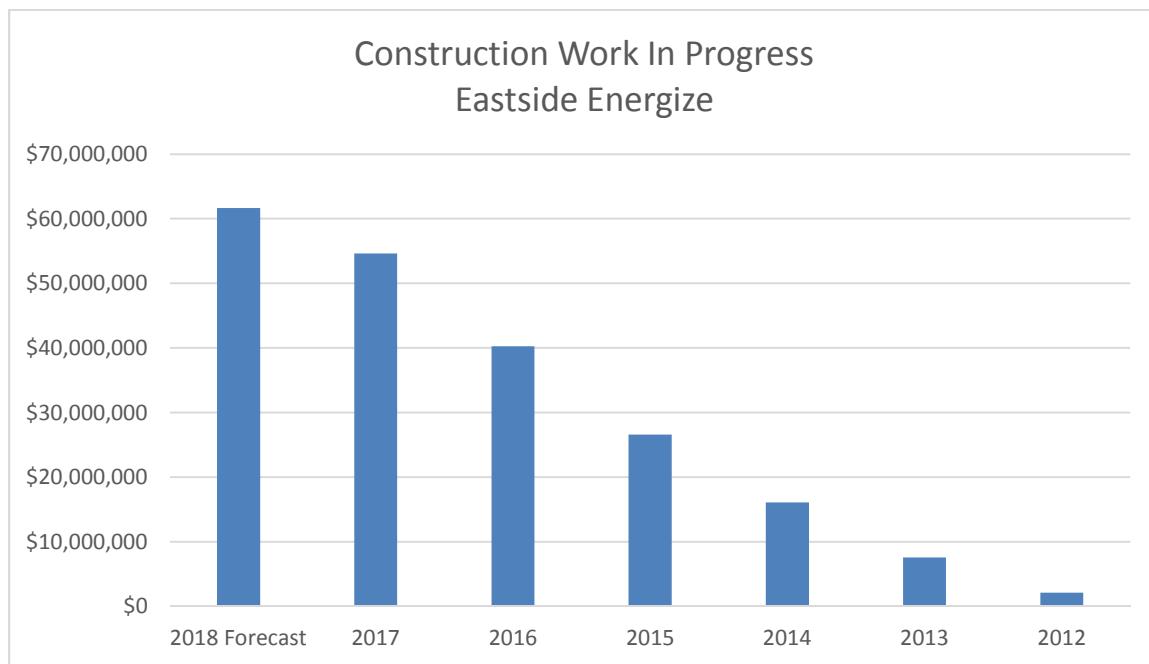
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Utilities are usually very good at cost estimation. A whole industry has grown up around the estimation and control of construction costs. The “Critical-Path Method” was introduced in a 1959 article published in 1959 Proceedings of the Eastern Joint Computer Conference.<sup>33</sup> It represented a significant application of the mathematical programming and computer developments pioneered in the Manhattan Project during the Second World War. A common tool in the industry to implement this approach is software named Primavera. This program assembles the relevant data and helps the engineers develop a logical construction schedule as well as detailed cost estimates.

It is not credible that eight years into the project has been able to use standard industry tools to generate solid cost estimates.

While we do not know the cost of the project, we can track the project from the Construction Work in Progress (CWIP) accounting contained in PSE’s FERC Form 1s:



The most recent ColumbiaGrid report indicates an in-service date of 2020 with an instantaneous cost of \$110 million:

<sup>33</sup> The term was coined by James Kelley and Morgan Walker in the 1950s and first published in their jointly authored article: *Critical-Path Planning and Scheduling* 1959 Proceedings of the Eastern Joint Computer Conference, pages 160-173.

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No	Project Name	Region	Description	Sponsor	Scheduled Completion	Cost Estimate
11	Denny - Broad and Massachusetts - Union - Broad 115 kV Series Inductors	Puget Sound	Add 6 ohm inductors on Denny - Broad and Massachusetts - Union - Broad 115 kV underground cables. 115kV Capacitor Bank at Broad Substation.	SCL	2018	\$22 M
12	Denny Substation (Phase 1)	Puget Sound	New 225 MVA substation in the north downtown Seattle area. Loop existing East Pine-Broad 115 kV line.	SCL	2018	\$209 M
13	East King County Transformer Capacity (Lake Tradition)	Puget Sound	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	2025+	\$15-\$30 M
14	Eastside Project: Lakeside 230/115 kV Transformer and Sammamish-Lakeside-Talbot Line Rebuilt to 230 kV	Puget Sound	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	2020	\$110 M

<sup>34</sup>

At this point, PSE has a \$110 million incentive to proceed with the project whether it is needed or not. When completed, PSE can submit the costs to the Washington Utilities and Transportation Commission for reimbursement from rate payers – including those in Bellevue.

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<sup>34</sup> 2018 System Assessment, ColumbiaGrid, September 2018, page 60.

## **Robert McCullough – *Curriculum Vitae***

Principal

*McCullough Research, 3816 S.E. Woodstock Place, Portland, OR 97202 USA*

## Professional Experience

- |              |  |
|--------------|--|
| 1985-present | Principal, McCullough Research: provide strategic planning assistance, litigation support, and planning for a variety of customers in energy, regulation, and primary metals   |
| 1996-present | Adjunct Professor, Economics, Portland State University  |
| 1990-1991    | Director of Special Projects and Assistant to the Chairman of the Board, Portland General Corporation: conducted special assignments for the Chairman in the areas of power supply, regulation, and strategic planning   |
| 1988-1990    | Vice President in Portland General Corporation's bulk power marketing utility subsidiary, Portland General Exchange: primary negotiator on the purchase of 550 MW transmission and capacity package from Bonneville Power Administration; primary negotiator of PGX/M, PGC's joint venture to establish a bulk power marketing entity in the Midwest; negotiated power contracts for both supply and sales; coordinated research function  |
| 1987-1988    | Manager of Financial Analysis, Portland General Corporation: responsible for M&A analysis, restructuring planning, and research support for the financial function; reported directly to the CEO on the establishment of Portland General Exchange; team member of PGC's acquisitions task force; coordinated PGC's strategic planning process; transferred to the officer's merit program as a critical corporate manager   |
| 1981-1987    | Manager of Regulatory Finance, Portland General Electric: responsible for a broad range of regulatory and planning areas, including preparation and presentation of PGE's financial testimony in rate cases in 1980, 1981, 1982, 1983, 1985, and 1987 before the Oregon Public Utilities Commission; responsible for preparation and presentation of PGE's wholesale rate case with Bonneville Power Administration in 1980, 1981, 1982, 1983, 1985, and 1987; coordinated activities at BPA and FERC on wholesale matters for the InterCompany Pool (the association of investor-owned utilities in the Pacific Northwest) since 1983; created BPA's innovative aluminum tariffs (adopted by BPA in 1986); led PGC activities, reporting directly to the CEO and CFO on a number of special activities, |

including litigation and negotiations concerning WPPSS, the Northwest Regional Planning Council, various electoral initiatives, and the development of specific tariffs for major industrial customers; member of the Washington Governor's Task Force on the Vancouver Smelter (1987) and the Washington Governor's Task Force on WPPSS Refinancing (1985); member of the Oregon Governor's Work Group On Extra-Regional Sales (1983); member of the Advisory Committee to the Northwest Regional Planning Council (1981)

1979-1980 Economist, Rates and Revenues Department, Portland General Electric; responsible for financial and economic testimony in the 1980 general case; coordinated testimony in support of the creation of the DRPA (Domestic and Rural Power Authority) and was a witness in opposition to the creation of the Columbia Public Utility District in state court; member of the Scientific and Advisory Committee to the Northwest Regional Power Planning Council

Economic Consulting

- |                |  |
|----------------|--|
| 2018 – present | Expert witness in West Moberly v British Columbia  |
| 2018           | Advisor of a landowner in solar project development  |
| 2018           | Expert witness for NCEMC   |
| 2017 – present | Advisor to the Coalition of East Side Neighborhoods on proposed Seattle area transmission                            |
| 2017-2019      | Advisor to Enpex on power contract litigation  |
| 2017-present   | Advisor to North Pacific Paper Corporation (NORPAC) on power contracts and business strategy                         |
| 2017           | Advisor to Peace Valley Landowners Association on Site C   |
| 2016-2017      | Expert witness to the U.S. Department of Justice on nuclear rate case  |
| 2016-present   | Advisor to the City of Logansport on utility project development and decision-making                                 |
| 2016           | Expert testimony for Gratl and Company before the Supreme Court of British Columbia on costs of Site C project delay |

2015-present	Advisor to Huu-ay-aht tribe on Sarita Bay LNG project in British Columbia
2015-2017	Analysis and expert testimony for Illinois Attorney General in official FERC complaint against MISO
2015-present	Advisor to Calbag Metals on generation project
2015-2016	Advisor to Oregon Department of Justice in the investigation of taxes owed the state by Powerex Corp.
2015	Economic analysis of the proposed 1100 MW hydro project, Site C, for the Peace Valley Landowner Association
2014-2015	Market analysis of the NYISO for the New York State Assembly
2014	Advisor to the Grand Council of the Cree on uranium mining in Quebec
2014-2018	Support for the investigation of Barclays Bank
2013-2018	Retained to do a business case analysis of the Columbia Generating Station by the Physicians for Social Responsibility
2013	Advisor to Environmental Defense Fund on gasoline and oil issues in California
2013	Advisor to Energy Foundation on Ohio competitive issues
2013	Export market review in the Maritime Link proceeding
2011	Consultant to Citizens Action Coalition of Indiana on Indiana Gasification LLC project
2010	Analysis and expert witness testimony for Block Island Intervenors concerning Deepwater offshore wind project
2010	Analysis for Eastern Environmental Law Center of 25 closed cycle plants in New York State
2010	Advisor on BPA transmission line right of way issues
2009-2010	Advisor to Gamesa USA on a marketing plan to promote a wind farm in the Pacific Northwest
2009-2010	Expert witness in City of Alexandria vs. Cleco

2009	Expert witness in City of Beaumont v. Entergy
2008-2009	Consultant to AARP Connecticut and Texas chapters on the need for a state power authority (Connecticut) and balancing energy services (Texas)
2008	Expert witness on trading and derivative issues in Barrick Gold litigation
2008-2014	Advisor to Jackson family in Pelton/Round Butte dispute
2007-2014	Advisor to the American Public Power Association on administered markets
2006-present	Advisor to the Illinois Attorney General on electric restructuring issues
2006-2007	Advisor to the City of Portland in the investigation of Portland General Electric
2006	Expert witness for Lloyd's of London in SECLP insurance litigation
2005-2007	Expert witness for Federated Rural Electric Insurance Company and TIG Insurance in Cowlitz insurance litigation
2005-2007	Advisor to Grays Harbor PUD on market manipulation
2005-2007	Advisor to the Montana Attorney General on market manipulation
2005-2006	Expert witness for Antara Resources in Enron litigation
2005-2006	Advisor to Utility Choice Electric
2004-2005	Expert witness for Factory Mutual in Northwest Aluminum litigation
2004	Advisor to the Oregon Department of Justice on market manipulation
2003-2006	Expert witness for Texas Commercial Energy
2003-2004	Advisor to The Energy Authority
2002-2005	Advisor to the U.S. Department of Justice on market manipulation issues

2002-2004	Expert witness for Alcan in Powerex arbitration
2002-2003	Expert witness for Overton Power in IdaCorp Energy litigation
2002-2003	Expert witness for Stanislaus Food Products
2002	Advisor to VHA Pennsylvania on power purchasing
2002	Expert witness for Sierra Pacific in Enron litigation
2002-2004	Advisor to U.S. Department of Justice
2002-2007	Expert witness for Snohomish PUD in Enron litigation
2002-2010	Expert witness for Snohomish in Morgan Stanley investigation
2001-2008	Expert witness for City of Seattle, Seattle City Light and City of Tacoma in FERC's EL01-10 refund proceeding
2001-2008	Advisor to VHA Southwest on power purchasing
2001-2005	Advisor to Nordstrom
2001-2005	Advisor to Steelscape Steel on power issues in Washington and California
2001	Advisor to California Steel on power purchasing
2001	Advisor to the California Attorney General on market manipulations in the Western Systems Coordinating Council power markets
2000-2007	Expert witness for Wah Chang in PacifiCorp litigation
2000-2001	Expert witness for Southern California Edison in Bonneville Power Administration litigation
2000-2001	Advisor to Blue Heron Paper on West Coast price spikes
2000	Expert witness for Georgia Pacific and Bellingham Cold Storage in the Washington Utilities and Transportation Commission's proceeding on power costs
1999-2002	Advisor to Bayou Steel on alternative energy resources

1999-2000	Expert witness for the Large Customer Group in PacifiCorp's general rate case
1999-2000	Expert witness for Tacoma Utilities in WAPA litigation
1999-2000	Advisor for Nucor Steel and Geneva Steel on PacifiCorp's power costs
1999-2000	Advisor to Abitibi-Consolidated on energy supply issues
1999	Expert report for the Center Helios on Freedom of Information in Québec
1999	Advisor to GTE regarding Internet access in competitive telecommunication markets
1999	Advisor to Logansport Municipal Utilities
1998-2001	Advisor to Edmonton Power on utility plant divestiture in Alberta
1998-2001	Energy advisor for Boise Cascade
1998-2000	Advisor to California Steel on power purchasing
1998-2000	Advisor to Nucor Steel on power purchasing and transmission negotiations
1998-2000	Advisor to Cominco Metals on the sale of hydroelectric dams in British Columbia
1998-2000	Advisor to the Betsiamites on the purchase of hydroelectric dams in Québec
1998-1999	Advisor to the Illinois Chamber of Commerce concerning the affiliate electric and gas program
1998	Intervention in Québec's first regulatory proceeding on behalf of the Grand Council of the Cree
1998	Market forecasts for Montana Power's restructuring proceeding
1997-2004	Expert witness for Alcan in BC Hydro litigation
1997-2003	Advisor to the Manitoba Cree on energy issues in Manitoba, Minnesota and Québec; Advisor to the Grand Council of the Cree on hydroelectric development

1997-1999	Advisor to the Columbia River Intertribal Fish Commission on Columbia fish and wildlife issues
1997-1998	Advisor to Port of Morrow regarding power marketing with respect to existing gas turbine plant
1997-1998	Expert witness for Tenaska in BPA litigation
1997	Advisor to Kansai Electric on restructuring in the electric power industry (with emphasis on the California markets)
1996-1997	Bulk power purchasing for the Association of Bay Area Cities
1996-1997	Advisor to Texas Utilities on industrial issues
1996-1997	Expert witness for March Point Cogeneration in Puget Sound Power and Light litigation
1996	Advisor to Longview Fibre on contract issues
1995-2000	Bulk power supplier for several Pacific Northwest industrials
1995-1999	Advisor to Seattle City Light on industrial contract issues
1995-1997	Advisor to Tacoma Utilities on contract issues
1995-1996	Expert witness for Tacoma Utilities in WAPA litigation
1994-1995	Advisor to Idaho Power on Southwest Intertie Project marketing
1993-2001	Northwest representative for Edmonton Power
1993-1997	Expert witness for MagCorp in PacifiCorp litigation
1992-1995	Advisor to Citizens Energy Corporation
1992-1994	Negotiator on proposed Bonneville Power Administration aluminum contracts
1992	Bulk power marketing advisor to Public Service of Indiana
1991-2000	Strategic advisor to the Chairman of the Board, Portland General Corporation
1991-1993	Chairman of the Investor Owned Utilities' (ICP) committee on BPA financial reform

1991-1992	Financial advisor on the Trojan owners' negotiation team
1991	Advisor to Shasta Dam PUD on the California Oregon Transmission Project and related issues
1990-1991	Advised the Chairman of the Illinois Commerce Commission on issues pertaining to the 1990 General Commonwealth Rate Proceeding; prepared an extensive analysis of the bulk power marketing prospects for Commonwealth in ECAR and MAIN
1988	Facilitated the settlement of Commonwealth Edison's 1987 general rate case and restructuring proposal for the Illinois Commerce Commission; reported directly to the Executive Director of the Commission; responsibilities included financial advice to the Commission and negotiations with Commonwealth and interveners
1987-1988	Created the variable aluminum tariff for Big Rivers Electric Corporation: responsibilities included testimony before the Kentucky Public Service Commission and negotiations with BREC's customers (the innovative variable tariff was adopted by the Commission in August 1987); supported negotiations with the REA in support of BREC's bailout debt restructuring
1981-1989	Consulting projects including: financial advice for the Oregon AFL-CIO; statistical analysis of equal opportunity for Oregon Bank; cost of capital for the James River dioxin review; and economic analysis of qualifying facilities for Washington Hydro Associates
1980-1986	Taught classes in senior and graduate forecasting, micro-economics, and energy at Portland State University

## **Education**

Unfinished Ph.D.	Economics, Cornell University; Teaching Assistant in micro- and macro-economics
M.A.	Economics, Portland State University, 1975; Research Assistant
B.A.	Economics, Reed College, 1972; undergraduate thesis, "Eurodollar Credit Creation"

Areas of specialization include micro-economics, statistics, and finance

## Publications

- March 21, 2019                    “The End of Big Iron” *The Public Utility Fortnightly*
- January 23, 2019                    “The End of Big Hydro” *The Lawyer’s Daily*
- December 26, 2017                 “Taking the Path Less Followed”, *Vancouver Sun*
- November 21, 2017                 “Updating Bonneville’s Strategic Plan”
- October 30, 2017                 “Site C Proponents Fall Prey to Sunk Costs Fallacy”,  
*Vancouver Sun*
- August 22, 2017                 “Lessons from Manitoba Hydro’s Financial Problems”
- June 22, 2017                 “Trump plan to sell BPA lines misguided”
- April 11, 2017                 “Affordable power or Site C power: British Columbia must choose”
- February 28, 2017                 “My View: Trade tariffs would hurt Americans”, *The Portland Tribune*
- January 8, 2017                 “Many lives of Jordan Cove may have come to an end”, *The Oregonian*
- July 22, 2016                 “Balancing an aging Hanford nuke plant against cheaper firm market power purchases”, *The Oregonian*
- July 7, 2016                 “More roads needed to handle growth”, *The Portland Tribune*
- July 7, 2016                 “Close the expensive Columbia Generating Station”, *The Oregonian*
- June 29, 2016                 “Our future is in green energy, not aging, costly nuclear plants”, *The Seattle Times*
- May 12, 2016                 “Diesel tax on heavy trucks is the right move”, *The Portland Tribune*
- May 2016                 “Aspirational Planning: A Statistical Model of Hawthorne Bridge and Tilikum Crossing Bicycle Ride Counts”, *Hoffield Graduate Journal of Public Affairs 1(1)*.
- January 19, 2016                 “A good time for a sensibly managed Portland gas tax”,  
*The Oregonian*

- October 15, 2015                    “A plan to fix Portland's roads”, *The Portland Oregonian*
- June 2015                            “Estimating the Longevity of Commercial Nuclear Reactors”,  
*Public Utilities Fortnightly*
- December 2014                    “Nuclear Winter”, *Electricity Policy*
- July 2013                            “Mid-Columbia Spot Markets and the Renewable Portfolio Standard”, *Public Utilities Fortnightly*
- April 14, 2013                    “Selling Low and Buying High”, *The Oregonian*
- December 2012                    “Are Electric Vehicles Actually Cost-Effective?”, *Electricity Policy*
- November 30, 2012                “Portland's Energy Credits: The trouble with buying ‘green’”,  
*The Oregonian*
- July 2009                            “Fingerprinting the Invisible Hand”, *Public Utilities Fortnightly*
- February 2008                    Co-author, “The High Cost of Restructuring”, *Public Utilities Fortnightly*
- March 27, 2006                    Co-author, “A Decisive Time for LNG”, *The Daily Astorian*
- February 9, 2006                  “Opening the Books”, *The Oregonian*
- August 2005                        “Squeezing Scarcity from Abundance”, *Public Utilities Fortnightly*
- April 1, 2002                        “The California Crisis: One Year Later”, *Public Utilities Fortnightly*
- March 13, 2002                    “A Sudden Squall”, *The Seattle Times*
- March 1, 2002                    “What the ISO Data Says About the Energy Crisis”, *Energy User News*
- February 1, 2001                  “What Oregon Should Know About the ISO”, *Public Utilities Fortnightly*
- January 1, 2001                    “Price Spike Tsunami: How Market Power Soaked California”,  
*Public Utilities Fortnightly*
- March 1999                        “Winners & Losers in California”, *Public Utilities Fortnightly*
- July 15, 1998                      “Are Customers Necessary?”, *Public Utilities Fortnightly*

March 15, 1998	“Can Electricity Markets Work Without Capacity Prices?”, <i>Public Utilities Fortnightly</i>
February 1998	“Coping with Interruptibility”, <i>Energy Buyer</i>
January 1998	“Pondering the Power Exchange”, <i>Energy Buyer</i>
December 1997	“Getting There Is Half the Cost: How Much Is Transmission Service?”, <i>Energy Buyer</i>
November 1997	“Is Capacity Dead?”, <i>Energy Buyer</i>
October 1997	“Pacific Northwest: An Overview”, <i>Energy Buyer</i>
August 1997	“A Primer on Price Volatility”, <i>Energy Buyer</i>
June 1997	“A Revisionist’s History of the Future”, <i>Energy Buyer</i>
Winter 1996	“What Are We Waiting for?” <i>Megawatt Markets</i>
October 21, 1996	“Trading on the Index: Spot Markets and Price Spreads in the Western Interconnection”, <i>Public Utilities Fortnightly</i>

## McCullough Research Reports

January 14, 2019	“The End of Big Iron: How Wind and Solar Became Cheaper than Hydro, Coal, and Nuclear”
December 10, 2018	“Why Have PJM Capacity Markets Decoupled from Actual Capacity Bids?”
April 20, 2018	“Privatizing BPA’s Assets and Liabilities”
April 12, 2018	“ASC 980 and the Decision to Complete Site C”
March 1, 2018	“Are Bitcoin Miners Suitable Electric Loads?”
February 14, 2018	“FY 2019 Update: Privatization of Bonneville Power Administration’s Transmission Assets”
January 23, 2018	“Update of the CGS costs and implications”
November 21, 2017	“Updating Bonneville’s Strategic Plan”
November 16, 2017	“Response to Questions Posed by the Deputy Minister of British Columbia What we have learned from the BCUC’s Final Report”

November 2, 2018	“What we have learned from the BCUC’s Final Report”
October 23, 2017	“Site C Inquiry Situation Report”
October 10, 2017	“Problems with British Columbia Hydro’s F1.11 Response”
October 10, 2017	“Problems with British Columbia Hydro’s F1.8 Response”
October 10, 2017	“Problems with British Columbia Hydro’s F1.7 Response”
October 10, 2017	“Problems with British Columbia Hydro’s F1.6 Response”
October 2, 2017	“Our answer to BC Hydro’s question 16”
October 2, 2017	“Our answer to BC Hydro’s question 20”
September 28, 2017	“A reflection on sunk costs”
September 28, 2017	“Our answer to BC Hydro’s questions 46 and 47”
September 24, 2017	“Our answer to BC Hydro’s question 22”
September 21, 2017	“British Columbia Utilities Commission’s Preliminary Findings”
September 13, 2017	“What we have learned about Site C”
September 11, 2017	“Deloitte LLP’s Two Site C Reports”
August 22, 2017	“Lessons from Manitoba Hydro’s Financial Problems”
June 13, 2017	“Privatization of Bonneville Power Administration’s Transmission Assets”
May 8, 2017	“Response to Public Power Council staff comments on replacing the Columbia Generating Station with lower cost renewables”
April 3, 2017	“Who actually pays for the Columbia Generating Station?”
February 15, 2017	“Replacing the Columbia Generating Station with Renewable Energy”
November 14, 2016	“Review of ‘Economic Analysis of Proposed Changes to the Single Dwelling Zone Development Standard’”

- October 5, 2016      “The Falling Price of Renewable Energy Relative to Conventional Generation”
- October 3, 2016      “Statistical Evidence on the Increase in Portland Home Values Correlated with Historic Districts”
- September 5, 2016      “Why are House Prices so high in the Portland Metropolitan Area?”
- July 8, 2016      “Historic District Econometric Literature Review”
- June 21, 2016      “Columbia Generating Station (CGS) Market Update”
- November 19, 2015      “Market Cost of the Columbia Generating Station During the FY 2014/2015 Refueling Cycle”
- September 30, 2015      “Decrypting New York’s “Secret” Electric Bids”
- September 9, 2015      “Market Power in West Coast Gasoline Markets: September Update”
- September 8, 2015      “August 10, 2015 PADD 2 Gasoline Spike at BP Whiting’s Pipestill 12”
- July 23, 2015      “Market Power in West Coast Gasoline Markets: July Update”
- June 23, 2015      “Market Power in West Coast Gasoline Markets: June Update”
- May 25, 2015      “Site C Business Case Assumptions Review”
- April 7, 2015      “2015 Paducah Update”
- April 6, 2015      “Market Power in West Coast Gasoline Markets: April Update”
- March 23, 2015      “Market Power in West Coast Gasoline Markets”
- March 20, 2015      “Daniel Poneman and the Paducah Transaction”
- January 2, 2015      “Data and Methodological Errors in the Portland Commercial Street Fee”
- December 15, 2014      Report to the Bureau d’audiences publiques sur l’environnement (BAPE), “Uranium Mining in Quebec: Four Conclusions”
- February 11, 2014      “Energy Northwest's Revised Analysis of the Paducah Fuels Transaction”

- January 25, 2014                    “Energy Northwest Losses in the 2013 Forward Purchase of Nuclear Fuel”
- January 2, 2014                    “Review of the November 2013 Energy Northwest Study”
- December 11, 2013                “Economic Analysis of the Columbia Generating Station”
- February 21, 2013                “McCullough Research Rebuttal to Western States Petroleum Association”
- November 15, 2012                “May and October 2012 Gasoline Price Spikes on the West Coast”
- June 5, 2012                      “Analysis of West Coast Gasoline Prices”
- October 3, 2011                    “Lowering Florida’s Electricity Prices”
- July 14, 2011                      “2011 ERCOT Blackouts and Emergencies”
- March 1, 2010                    “Translation” of the September 29, 2008 NY Risk Consultant’s Hydraulics Report to Manitoba Hydro CEO Bob Brennan
- December 2, 2009                “Review of the ICF Report on Manitoba Hydro Export Sales”
- June 5, 2009                      “New York State Electricity Plants’ Profitability Results”
- May 5, 2009                      “Transparency in ERCOT: A No-cost Strategy to Reduce Electricity Prices in Texas”
- April 7, 2009                    “A Forensic Analysis of Pickens’ Peak: Speculation, Fundamentals or Market Structure”
- March 30, 2009                  “New Yorkers Lost \$2.2 Billion Because of NYISO Practices”
- March 3, 2009                    “The New York Independent System Operator’s Market-Clearing Price Auction is Too Expensive for New York”
- February 24, 2009                “The Need for a Connecticut Power Authority”
- January 7, 2009                    “Review of the ERCOT December 18, 2008 Nodal Cost Benefit Study”
- August 6, 2008                    “Seeking the Causes of the July 3rd Spike in World Oil Prices”  
(updated September 16, 2008)
- April 7, 2008                    “Kaye Scholer’s Redacted ‘Analysis of Possible Complaints Relating to Maryland’s SOS Auctions’”

- February 1, 2008 "Some Observations on Societe Generale's Risk Controls"
- June 26, 2007 "Looking for the 'Voom': A Rebuttal to Dr. Hogan's 'Acting in Time: Regulating Wholesale Electricity Markets'"
- September 26, 2006 "Did Amaranth Advisors, LLC Attempt to Corner the March 2007 NYMEX at Henry Hub?"
- May 18, 2006 "Developing a Power Purchase/Fuel Supply Portfolio: Energy Strategies for Cities and Other Public Agencies"
- April 12, 2005 "When Oil Prices Rise, Using More Ethanol Helps Save Money at the Gas Pump"
- April 12, 2005 "When Farmers Outperform Sheiks: Why Adding Ethanol to the U.S. Fuel Mix Makes Sense in a \$50-Plus/Barrel Oil Market"
- April 12, 2005 "Enron's Per Se Anti-Trust Activities in New York"
- February 15, 2005 "Employment Impacts of Shifting BPA to Market Pricing"
- June 28, 2004 "Reading Enron's Scheme Accounting Materials"
- June 5, 2004 "ERCOT BES Event"
- August 14, 2003 "Fat Boy Report"
- May 16, 2003 "CERA Decision Brief"
- January 16, 2003 "California Electricity Price Spikes"
- November 29, 2002 "C66 and Artificial Congestion Transmission in January 2001"
- August 17, 2002 "Three Days of Crisis at the California ISO"
- July 9, 2002 "Market Efficiencies"
- June 26, 2002 "Senate Fact Sheet"
- June 5, 2002 "Congestion Manipulation"
- May 5, 2002 "Enron's Workout Plan"
- March 31, 2002 "A History of LJM2"
- February 2, 2002 "Understanding LJM"

January 22, 2002                    “Understanding Whitewing”

### **Testimony and Comment**

- November 26, 2018                 Affidavit in FERC ER19-155-000
- November 6, 2018                 Affidavit in FERC EL16-49-000
- June 1, 2018                       Four Rebuttal affidavits for West Moberly v British Columbia.
- January 31, 2018                 Expert report affidavit West Moberly v British Columbia
- November 30, 2017                 Presentation to the British Columbia Cabinet on Site C
- October 13, 2017                 Testimony before the British Columbia Utilities Commission on Site C
- June 7, 2017                         Testimony before the U.S. Court of Claims on Nuclear Storage Costs
- December 14, 2016                 Testimony to the U.S. Court of Federal Claims on behalf of the U.S. Department of Justice regarding nuclear rate case
- February 10, 2016                 Testimony before the Supreme Court of British Columbia on the costs and benefits of delaying Site C dam
- August 24, 2015                     Testimony to the New York State Public Service Commission on behalf of the New York State Legislative Assembly
- May 29, 2015                         Testimony before the Federal Energy Regulatory Commission on behalf of Illinois Attorney General Lisa Madigan
- December 15, 2014                 Testimony before the Bureau d’audiences publiques sur l’environnement (BAPE) in Quebec, “Uranium Mining in Quebec: Four Conclusions”
- November 15, 2012                 Testimony before the California State Senate Select Committee on Bay Area Transportation on West Coast gasoline price spikes in 2012
- July 20, 2010                         Testimony before the Rhode Island Public Utility Commission on the Deepwater offshore wind project
- April 7, 2009                         Testimony before the U.S. Senate Committee on Energy and Natural Resources on “Pickens’ Peak”

March 5, 2009	Testimony before the New York Assembly Committee on Corporations, Authorities and Commissions, and the Assembly Committee on Energy, “New York Independent System Operators Market Clearing Price Auction is Too Expensive for New York”
February 24, 2009	Testimony before the Energy and Technology Committee, Connecticut General Assembly, “An Act Establishing a Public Power Authority” on behalf of AARP
September 16, 2008	Testimony before the U.S. Senate Committee on Energy and Natural Resources, “Depending On 19th Century Regulatory Institutions to Handle 21st Century Markets”
January 7, 2008	Supplemental Comment (“The Missing Benchmark in Electricity Deregulation”) before the Federal Energy Regulatory Commission on behalf of American Public Power Association, Docket Nos. RM07-19-000 and AD07-7-000
August 7-8, 2007	Testimony before the Oregon Public Utility Commission on behalf of Wah Chang, Salem, Oregon, Docket No. UM 1002
February 23 and 26, 2007	Testimony before the Federal Energy Regulatory Commission on behalf of Public Utility District No. 1 of Snohomish County, Washington, Docket No. EL03-180
October 2, 2006	Direct Testimony before the Régie de l’énergie, Gouvernement du Québec on behalf of the Grand Council of the Cree
August 22, 2006	Rebuttal Expert Report on behalf of Public Utility District No. 1 of Snohomish County, Washington, Docket No. H-01-3624
June 1, 2006	Expert Report on behalf of Public Utility District No. 1 of Snohomish County, Washington, Docket No. H-01-3624
May 8, 2006	Testimony before the U.S. Senate Democratic Policy Committee, “Regulation and Forward Markets: Lessons from Enron and the Western Market Crisis of 2000-2001”
December 15, 2005	Direct Testimony before the Public Utility Commission of the State of Oregon on behalf of Wah Chang, Wah Chang v. PacifiCorp in Docket UM 1002
December 14, 2005	Deposition before the United States District Court Western District of Washington at Tacoma on behalf of Federated Rural Electric Insurance Exchange and TIG Insurance

- Company, Federated Rural Electric Insurance Exchange and TIG Insurance Company v. Public Utility District No. 1 of Cowlitz County, No. 04-5052RBL
- December 4, 2005      Expert Report on behalf of Utility Choice Electric in Civil Action No. 4:05-CV-00573
- July 27, 2005      Expert Report before the United States District Court Western District of Washington at Tacoma on behalf of Federated Rural Electric Insurance Exchange and TIG Insurance Company, Federated Rural Electric Insurance Exchange and TIG Insurance Company v. Public Utility District No. 1 of Cowlitz County, Docket No. CV04-5052RBL
- May 6, 2005      Rebuttal Testimony before the Federal Energy Regulatory Commission on behalf of Public Utility District No. 1 of Snohomish County, Washington, Docket No.EL03-180, et al.
- May 1, 2005      Rebuttal Expert Report on behalf of Factory Mutual, Factory Mutual v. Northwest Aluminum
- March 24-25, 2005      Deposition by Enron Power Marketing, Inc. before the Federal Energy Regulatory Commission on behalf of Public Utility District No. 1 of Snohomish County, Washington, Docket No.EL03-180, et al.
- February 14, 2005      Expert Report on behalf of Factory Mutual, Factory Mutual v. Northwest Aluminum
- January 27, 2005      Supplemental Testimony before the Federal Energy Regulatory Commission on behalf of Public Utility District No. 1 of Snohomish County, Washington, Docket No. EL03-180, et al.
- April 14, 2004      Deposition by Enron Power Marketing, Inc. and Enron Energy Services before the Federal Energy Regulatory Commission on behalf of Public Utility District No. 1 of Snohomish County, Washington, Docket No.EL03-180, et al.
- April 10, 2004      Rebuttal Testimony on behalf of the Office of City and County Attorneys, San Francisco, California, City and County Attorneys, San Francisco, California v. Turlock Irrigation District, Non-Binding Arbitration
- February 24, 2004      Direct Testimony before the Federal Energy Regulatory Commission on behalf of Public Utility District No. 1 of Snohomish County, Washington, Docket No.EL03-180, et al.

March 20, 2003	Rebuttal Testimony before the Federal Energy Regulatory Commission on behalf of the City of Seattle, Washington, Docket No. EL01-10, et al.
March 11-13, 2003	Deposition by IdaCorp Energy L.P. before the District Court of the Fourth Judicial District of the State of Idaho on behalf of Overton Power District No. 5, State of Nevada, IdaCorp Energy L.P. v. Overton Power District No. 5, Case No. OC 0107870D
March 3, 2003	Expert Report before the District Court of the Fourth Judicial District of the State of Idaho on behalf of Overton Power District No. 5, State of Nevada, IdaCorp Energy L.P. v. Overton Power District No. 5, Case No. OC 0107870D
February 27, 2003	Direct Testimony before the Federal Energy Regulatory Commission on behalf of the City of Tacoma, Washington and the Port of Seattle, Washington, Docket No. EL01-10-005
October 7, 2002	Rebuttal Testimony before the Federal Energy Regulatory Commission on behalf of Public Utility District No. 1 of Snohomish County, Washington, Docket No. EL02-26, et al.
October 2002	Expert Report before the Circuit Court of the State of Oregon for the County of Multnomah on behalf of Alcan, Inc., Alcan, Inc. v. Powerex Corp., Case No. 50 198 T161 02
September 27, 2002	Deposition by Morgan Stanley Capital Group, Inc. before the Federal Energy Regulatory Commission on behalf of Nevada Power Company and Sierra Pacific Power Company, Docket No. EL02-26, et al.
August 8-9, 2002	Deposition by Morgan Stanley Capital Group, Inc. before the Federal Energy Regulatory Commission on behalf of Nevada Power Company and Sierra Pacific Power Company, Docket No. EL02-26, et al.
August 8, 2002	Deposition by Morgan Stanley Capital Group, Inc. before the Federal Energy Regulatory Commission on behalf of Public Utility District No. 1 of Snohomish County, Washington, Docket No. EL02-26, et al.
June 28, 2002	Direct Testimony before the Federal Energy Regulatory Commission on behalf of the City of Tacoma, Washington, Docket No. EL02-26, et al.

June 25, 2002	Direct Testimony before the Federal Energy Regulatory Commission on behalf of Public Utility District No. 1 of Snohomish County, Washington, Docket No. EL02-26, et al.
June 25, 2002	Direct Testimony before the Federal Energy Regulatory Commission on behalf of Nevada Power Company and Sierra Pacific Power Company, Docket No. EL02-26, et al.
May 6, 2002	Rebuttal Testimony before the Public Service Commission of Utah on behalf of Magnesium Corporation of America in the Matter of the Petition of Magnesium Corporation of America to Require PacifiCorp to Purchase Power from MagCorp and to Establish Avoided Cost Rates, Docket No. 02-035-02
April 11, 2002	Testimony before the U.S. Senate Committee on Commerce, Science and Transportation, Washington DC
February 13, 2002	Testimony before the U.S. House of Representatives Subcommittee on Energy and Air Quality, Washington DC
January 29, 2002	Testimony before the U.S. Senate Committee on Energy and Natural Resources, Washington DC
August 30, 2001	Rebuttal Testimony before the Federal Energy Regulatory Commission on behalf of Seattle City Light, Docket No. EL01-10
August 16, 2001	Direct Testimony before the Federal Energy Regulatory Commission on behalf of Seattle City Light, Docket No. EL01-10
June 12, 2001	Rebuttal Testimony before the Public Utility Commission of the State of Oregon on behalf of Wah Chang, Wah Chang v. PacifiCorp in Docket UM 1002
April 17, 2001	Before the Public Utility Commission of the State of Oregon, Direct Testimony on behalf of Wah Chang, Wah Chang v. PacifiCorp in Docket UM 1002
March 17, 2000	Rebuttal Testimony before the Public Service Commission of Utah on behalf of the Large Customer Group in the Matter of the Application of PacifiCorp for Approval of Its Proposed Electric Rate Schedules and Electric Service Regulations, Docket No. 99-035-10
February 1, 2000	Direct Testimony before the Public Service Commission of Utah on behalf of the Large Customer Group in the Matter of the Application of PacifiCorp for Approval of Its Proposed

Electric Rate Schedules and Electric Service Regulations,  
Docket No. 99-035-10

**Presentations**

- January 18, 2019                    “The End of Big Iron” Portland State University
- May 15, 2018                    “The Tower of Bitcoin” CAPRE Portland Summit Blockchain Panel.
- April 11, 2018                    “Breakdown and Post-Analysis of the Site C Review”
- January 26, 2018                    “Prudence, Recovery, and Rates”, Site C Summit
- December 11, 2017                    “Final Decision Review”, PVLA Press Conference
- January 23-24, 2017                    “Are Electric Markets Obsolete?”, Buying & Selling Electric Power Conference, Seattle, Washington
- December 3, 2015                    “Ozymandias: Seventeen years of administered markets, high costs, and poor eligibility”, Utility Markets Today, Rockville, Maryland
- May 6, 2014                    “Economic Analysis of the Columbia Generating Station”, Energy Northwest, Boise, Idaho
- April 30, 2014                    “Economic Analysis of the Columbia Generating Station”, Portland State University, Portland, Oregon
- April 22, 2014                    “Economic Analysis of the Columbia Generating Station”, Clark County, Vancouver, Washington
- January 9, 2014                    “Economic Analysis of the Columbia Generating Station”, Northwest Power & Conservation Council, Portland, Oregon
- January 1, 2014                    “Economic Analysis of the Columbia Generating Station”, Bonneville Power Administration, Portland, Oregon
- December 2, 2013                    “Economic Analysis of the Columbia Generating Station”, Skamania, Carson, Washington
- December 1, 2013                    “Peak Peddling: Has Portland Bicycling Reached the Top of the Logistic Curve?” Oregon Transportation Research and Education Consortium, Portland, Oregon
- July 12, 2013                    “Economic Analysis of the Columbia Generating Station”, Tacoma, Washington

- June 21, 2013                    "Economic Analysis of the Columbia Generating Station", Seattle City Light, Seattle, Washington
- January 29, 2013                "J.D. Ross (Who)", Portland Rotary Club, Portland, Oregon.
- January 13, 2011                "Estimating the Consumer's Burden from Administered Markets", American Public Power Association conference, Washington, DC
- October 15, 2009                "The Mysterious New York Market", EPIS, Tucson, Arizona
- October 14, 2009                "Do ISO Bidding Processes Result in Just and Reasonable Rates?", legal seminar, American Public Power Association, Savannah, Georgia
- June 22, 2009                    "Pickens' Peak Redux: Fundamentals, Speculation, or Market Structure", International Association for Energy Economics
- June 5, 2009                    "Transparency in ERCOT: A No-cost Strategy to Reduce Electricity Prices in Texas", Presentation at Texas Legislature
- May 8, 2009                    "Pickens' Peak", Economics Department, Portland State University
- April 7, 2009                    "Pickens' Peak: Speculators, Fundamentals, or Market Structure", 2009 EIA energy conference, Washington, DC
- February 4, 2009                "Why We Need a Connecticut Power Authority", presentation to the Energy and Technology Committee, Connecticut General Assembly
- October 28, 2008                "The Impact of a Volatile Economy on Energy Markets", NAESCO annual meeting, Santa Monica, California
- April 1, 2008                    "Connecticut Energy Policy: Critical Times...Critical Decisions", House Energy and Technology Committee, the Connecticut General Assembly
- May 23, 2007                    "Past Efforts and Future Prospects for Electricity Industry Restructuring: Why Is Competition So Expensive?", Portland State University
- February 26, 2007                "Trust, But Verify", Take Back the Power Conference, National Press Club, Washington, DC
- May 18, 2006                    "Developing a Power Purchase/Fuel Supply Portfolio"

- February 12, 2005 "Northwest Job Impacts of BPA Market Rates"
- January 5, 2005 "Why Has the Enron Crisis Taken So Long to Solve?", Public Power Council, Portland, Oregon
- September 20, 2004 "Project Stanley and the Texas Market", Gulf Coast Energy Association, Austin, Texas
- September 9, 2004 "Back to the New Market Basics", EPIS, White Salmon, Washington
- June 8, 2004 "Caveat Emptor", ELCON West Coast Meeting, Oakland, California
- June 9, 2004 "Enron Discovery in EL03-137/180"
- March 31, 2004 "Governance and Performance", Public Power Council, Portland, Oregon
- January 23, 2004 "Resource Choice", Law Seminars International, Seattle, Washington
- January 17, 2003 "California Energy Price Spikes: The Factual Evidence", Law Seminars International Seattle, Washington
- January 16, 2003 "The Purloined Agenda: Pursuing Competition in an Era of Secrecy, Guile, and Incompetence"
- September 17, 2002 "Three Crisis Days", California Senate Select Committee, Sacramento, California
- June 10, 2002 "Enron Schemes", California Senate Select Committee Sacramento, California
- May 2, 2002 "One Hundred Years of Solitude"
- March 21, 2002 "Enron's International Ventures", Oregon Bar International Law Committee, Portland, Oregon
- March 19, 2002 "Coordinating West Coast Power Markets", GasMart, Reno, Nevada
- March 19, 2002 "Sauron's Ring", GasMart, Reno, Nevada
- January 25, 2002 "Deconstructing Enron's Collapse: Buying and Selling Electricity on The West Coast", Seattle, Washington

- January 18, 2002 "Deconstructing Enron's Collapse", Economics Seminar, Portland State University
- November 12, 2001 "Artifice or Reality", EPIS Energy Forecast Symposium, Skamania, Washington
- October 24, 2001 "The Case of the Missing Crisis" Kennewick Rotary Club, Kennewick, Washington
- August 18, 2001 "Preparing for the Next Decade"
- June 26, 2001 "Examining the Outlook on Deregulation"
- June 25, 2001 Presentation, Energy Purchasing Institute for International Research (IIR), Dallas, Texas
- June 6, 2001 "New Horizons: Solutions for the 21st Century", Federal Energy Management-U.S. Department of Energy, Kansas City, Kansas
- May 24, 2001 "Five Years"
- May 10, 2001 "A Year in Purgatory", Utah Industrial Customers Symposium-Utah Association of Energy Users, Salt Lake City, Utah
- May 1, 2001 "What to Expect in the Western Power Markets this Summer", Western Power Market Seminar, Denver, Colorado
- April 23, 2001 "Emerging Markets for Natural Gas", West Coast Gas Conference, Portland, Oregon
- April 18, 2001 "Demystifying the Influence of Regulatory Mandates on the Energy Economy" Marcus Evans Seminar, Denver, Colorado
- April 4, 2001 "Perfect Storm", Regulatory Accounting Conference, Las Vegas, Nevada
- March 21, 2001 "After the Storm 2001", Public Utility Seminar, Reno, Nevada
- February 21, 2001 "Future Imperfect", Pacific Northwest Steel Association, Portland, Oregon
- February 12, 2001 "Power Prices in 2000 through 2005", Northwest Agricultural Chillers, Bellingham, Washington
- February 6, 2001 Presentation, Boise Cascade Management, Boise, Idaho

January 19, 2001	“Wholesale Pricing and Location of New Generation Buying and Selling Power in the Pacific Northwest”, Seattle, Washington
October 26, 2000	“Tsunami: Market Prices since May 22nd”, International Association of Refrigerated Warehouses, Los Vegas, California
October 11, 2000	“Tsunami: Market Prices since May 22nd”, Price Spikes Symposium, Portland, Oregon
August 14, 2000	“Anatomy of a Corrupted Market”, Oregon Public Utility Commission and Oregon State Energy Office, Salem, Oregon
June 30, 2000	“Northwest Market Power”, Governor Locke of Washington, Seattle, Washington
June 10, 2000	“Northwest Market Power”, Oregon Public Utility Commission and Oregon State Energy Office, Salem, Oregon
June 5, 2000	“Northwest Market Power”, Georgia Pacific Management
May 10, 2000	“Magnesium Corporation Developments”, Utah Public Utilities Commission
May 5, 2000	“Northwest Power Developments”, Georgia Pacific Management
January 12, 2000	“Northwest Reliability Issues”, Oregon Public Utility Commission

## Volunteer Positions

2015-present	Board member, Portland State University Master in Public Policy Advisory Committee
2016-2017	Eastmoreland Neighborhood Association, Treasurer
2013-2016	Eastmoreland Neighborhood Association, President
2013-2017	Southeast Uplift Neighborhood Coalition, President
2013-Present	City of Portland Office of Management and Finance Advisory Committee
1990-Present	Chairman, Portland State University Economics Department Advisory Committee

## **Membership**

American Economic Association  
American Financial Association  
Econometric Society  
Western Economic Association

## ACKNOWLEDGEMENT

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I am now and at all times herein mentioned a citizen of the United States, over the age of 18 and competent to testify as a witness herein. I am the author of the preceding report, "Needs and Costs of Energize Eastside".

I declare under the penalty of perjury under the laws of the State of Washington that the preceding report is true and correct to the best of my knowledge and belief.

DATED this 23rd day of March, 2019.

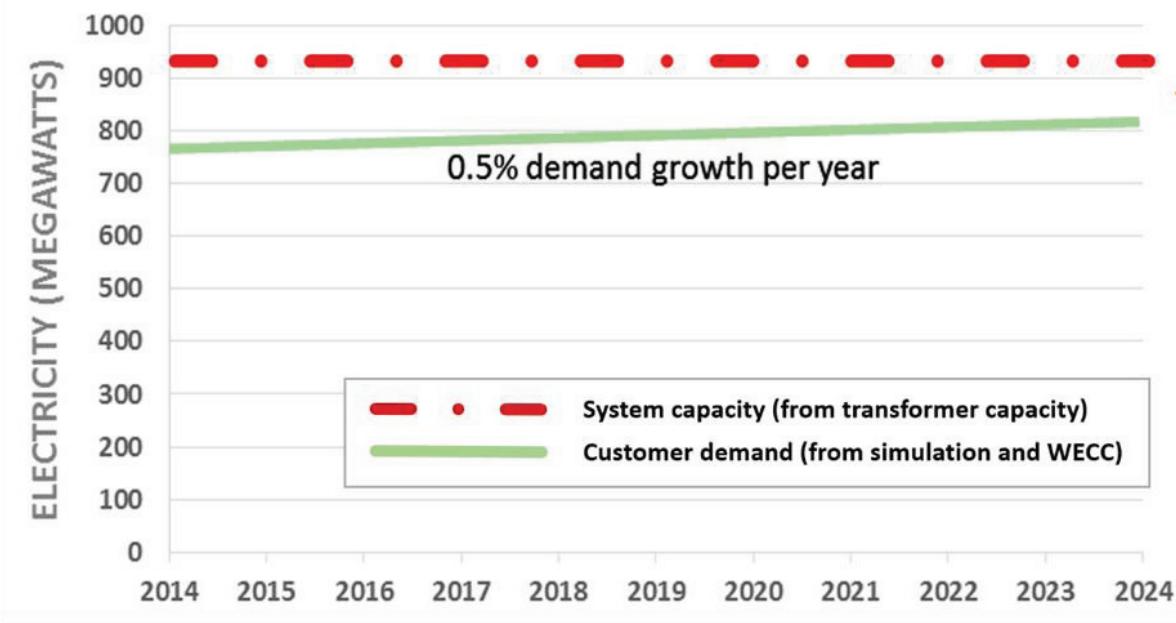
Signature:



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Printed Name: Robert McCullough

## 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.

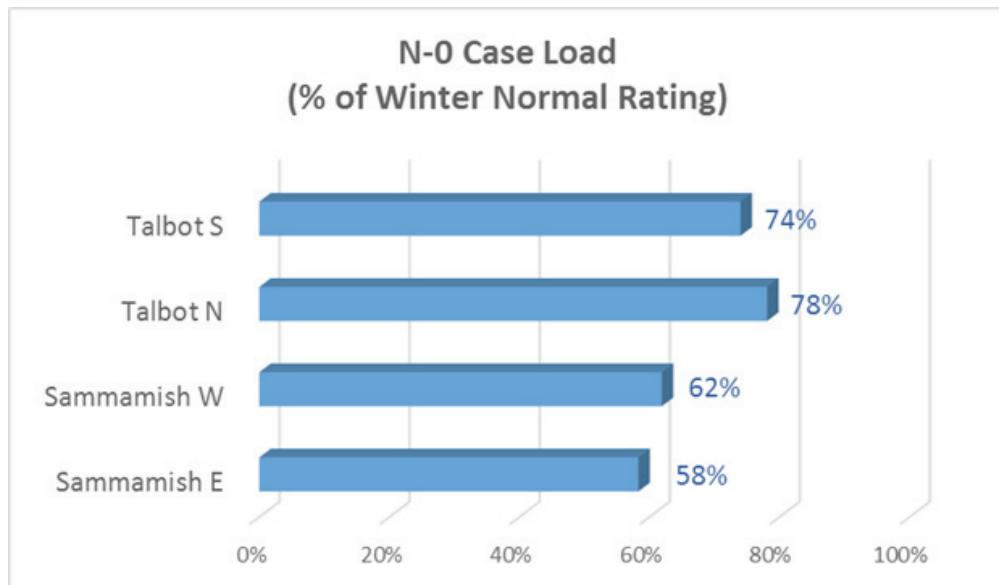
# Results

## 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.

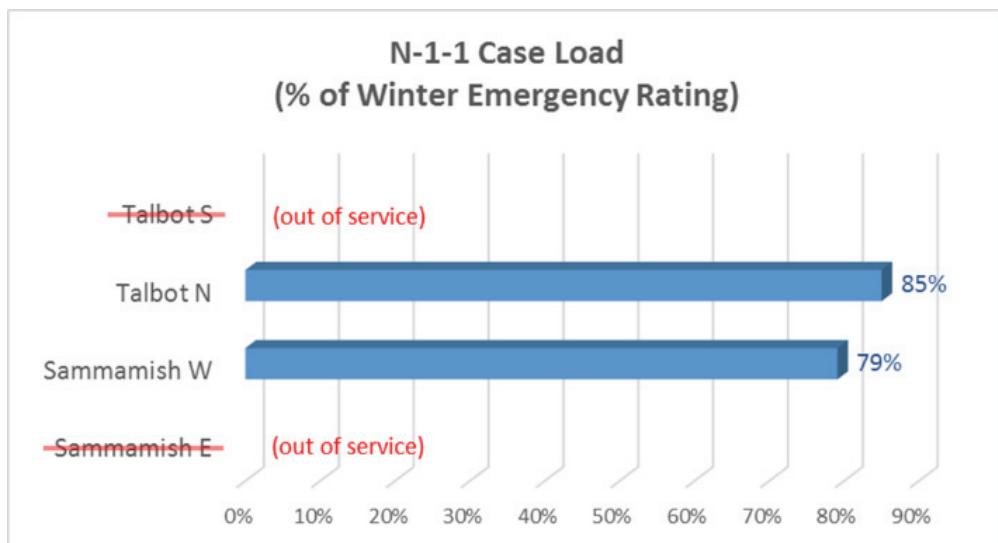


Figure 2: Loads on two remaining transformers are in a safe range.

# 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.

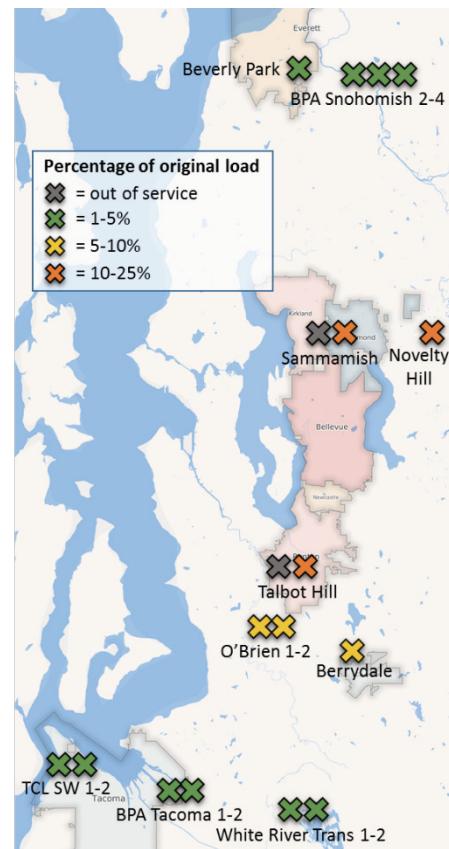


Figure 3: Load is distributed among other transformers after two transformers fail.

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.

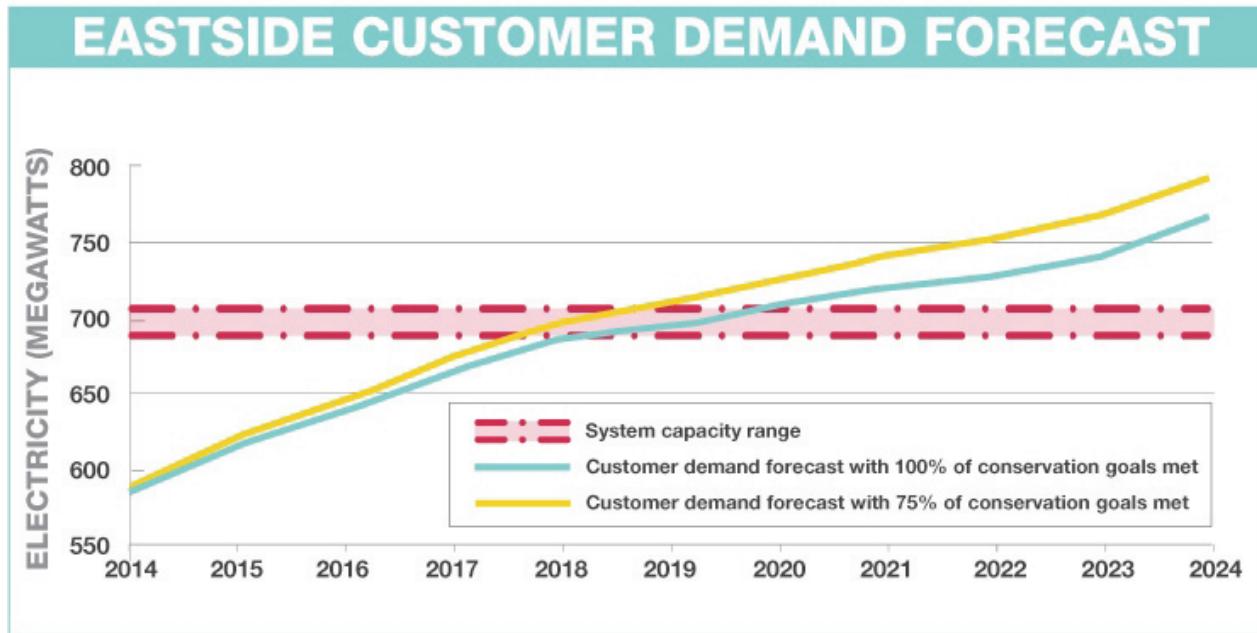


Figure 4: PSE's graph shows customer demand exceeding system capacity in 2018.<sup>2</sup>

<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.

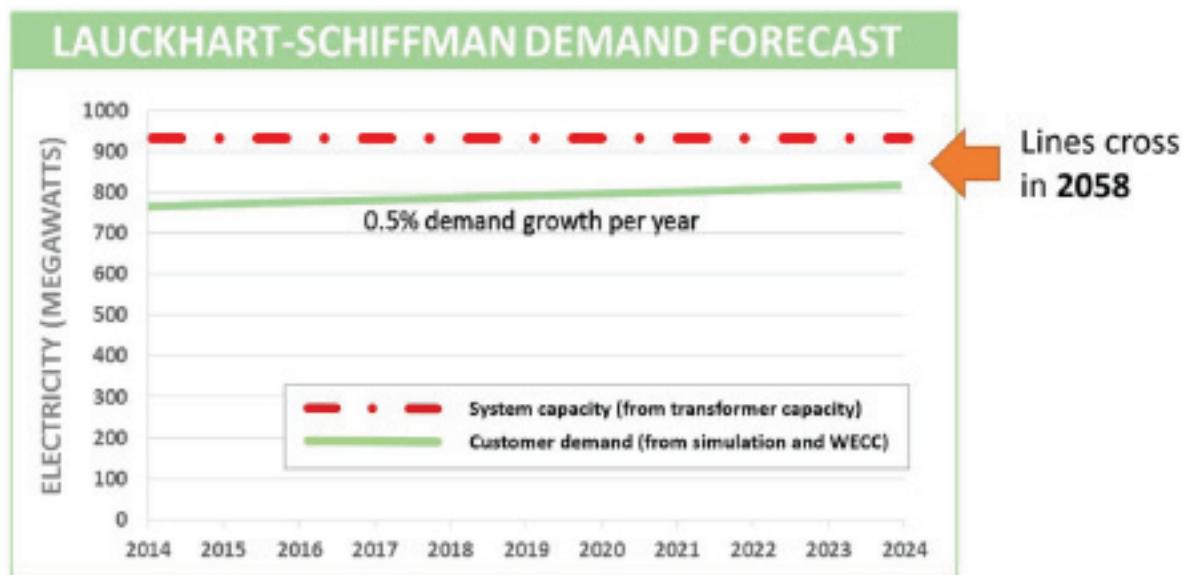


Figure 5: Alternative Demand Forecast shows slower demand growth and higher system capacity (based on "winter emergency" transformer ratings).

# 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 black ink 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.

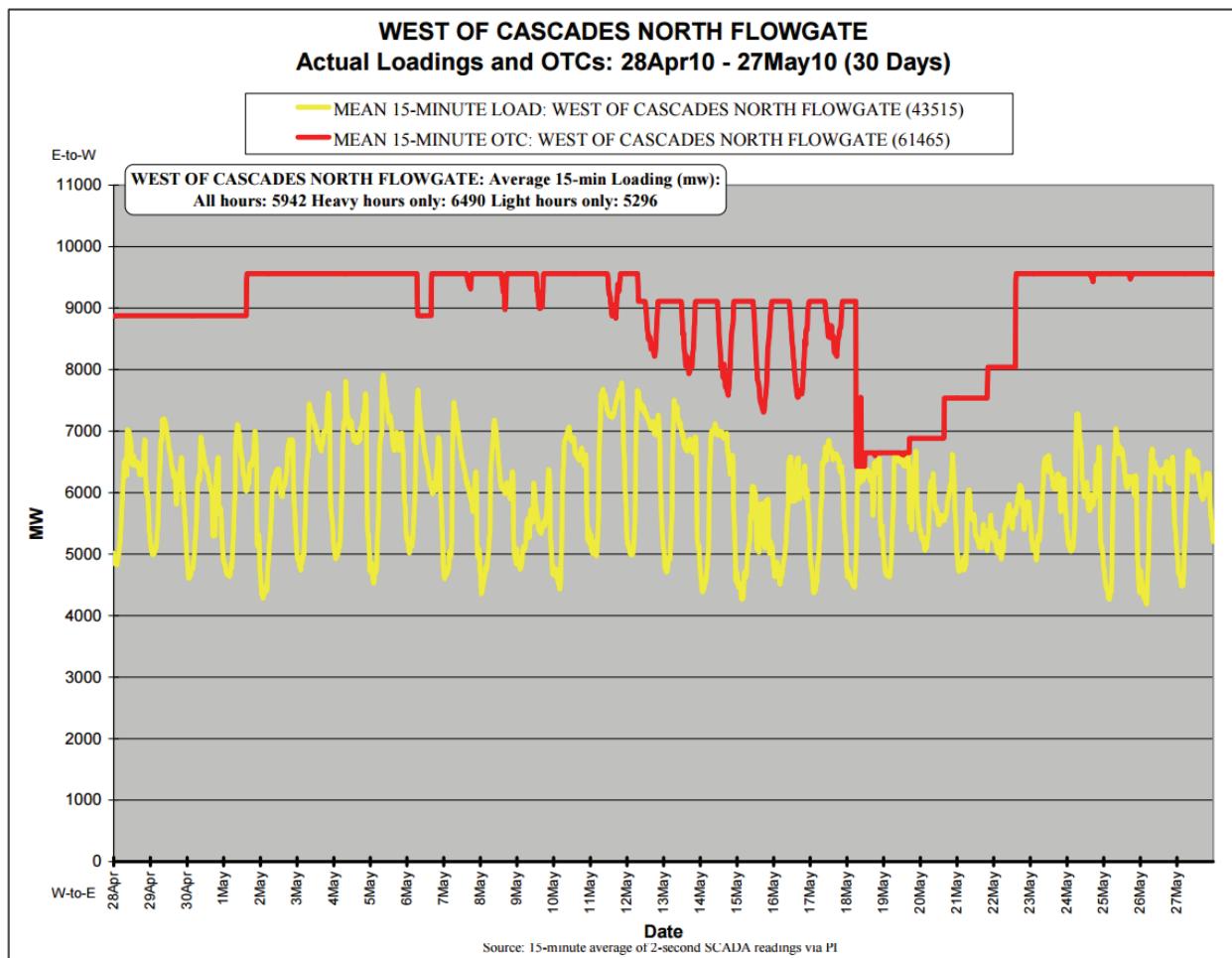


Figure 6: Chart from BPA shows load (in yellow) and maximum capacity (in red) for the WOCN path.

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

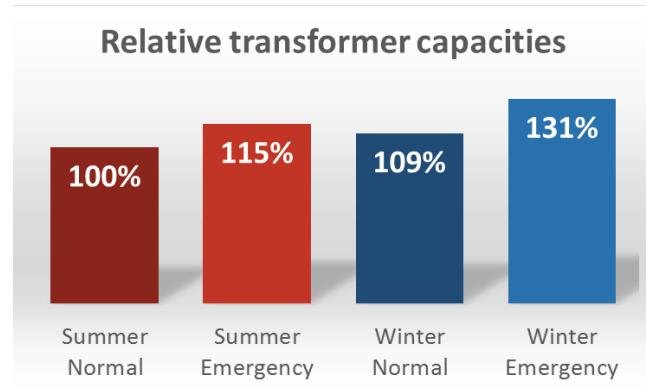


Figure 7: Ratings for different scenarios, normalized to Summer Normal rating.

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**

# RICHARD LAUCKHART

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## 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

# RICHARD LAUCKHART

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

## ***Leviton & 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***

# RICHARD LAUCKHART

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## **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 RISKSJM 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, Ventyx, 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.

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**EDUCATION***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.

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**PUBLICATIONS**

*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)**

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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.



## **Appendix A**

Draft Expert Report

Richard Lauckhart

My Qualifications are included in Attachment 3 at its Appendix H

Alternatives to Energize Eastside

**Executive Summary:**

*To Be Developed...see conclusion below.*

**I. Background and PSE failure to appropriately look at alternatives:**

Puget Sound Energy (PSE) claims that the Energize Eastside project is needed in order to maintain reliability on the Eastside of Lake Washington. I have written a report that demonstrates there is no need for Energize Eastside. This report explains that PSE has many alternatives to Energize Eastside that need to be properly analyzed if there is ever deemed to be a legitimate reliability problem on the Eastside of Lake Washington.

As I describe in my “needs” report, a reliability problem on the grid can only be identified with a load flow study. As I further describe in that report, if the load flow study points the utility to areas that need to be fixed on the transmission system, there can be many alternative approaches to fix any identified problems on the grid. The load flow modeling is then used to examine each of these alternatives that might be able to fix the problem. The best alternative solution will balance the cost and environmental impact of any fixes that can solve the indicated reliability problem.

PSE not only failed to properly run its load flow studies in which they attempted to demonstrate the need for Energize Eastside, PSE also failed to properly identify and analyze alternatives to Energize Eastside if a legitimate reliability problem is identified.

The Energize Eastside Final Environmental Impact Statement also fails to properly discuss alternatives to Energize Eastside. The details on the many alternatives I describe in this paper are not reflected in the Final EIS in Appendix J (Section J-1) where alternative in the EIS are discussed. The Final EIS is woefully inadequate in its discussion of alternatives.

I have previously written a paper on alternatives to Energize Eastside. That paper is attached to this document as *Attachment 1*.

**II. The Redispatch Alternative:**

The first and most rational alternative to solving an identified reliability problem is to check to see if generation re-dispatch can solve the problem. There is considerably more generation available to the grid than is needed to meet load on any hour. In part this excess supply of generation is caused by diversity in peak load times between utilities. Most utilities have a requirement to have a certain measure of more generation under their control than is needed to meet their own peak. This surplus margin is needed for reliability purposes. But some utilities are summer peaking utilities and others are

winter peaking utilities. So there is always more generation available to the grid than is needed for any peak load season. In the case of PSE, they are a winter peaking utility. So during their winter peak, there are many surplus power supplies located in other areas of the Western Interconnected Systems that are summer peaking. So it is possible for PSE to attempt to meet its peak load by using the excess generation in the summer peaking areas rather than using their own resources. But if a load flow study finds a reliability problem when PSE attempts to use these non-PSE generating plants, then the first thing to check is to see if the reliability problem goes away if PSE uses its own generating resources rather than the surplus generating resources of others. PSE has failed to do this by not attempting to solve their identified reliability problem by simply running their own resources in the Puget Sound Area.

There are other legitimate alternatives to Energize Eastside that PSE has not properly identified and studied with proper load flow studies. These alternatives can be categorized as “wired” alternatives and “non-wired alternatives.

### **III. “Wired” alternatives that PSE has not properly studied:**

As discussed further in Attachment 1, there are several wired alternatives to Energize Eastside that would likely be better solutions to any identified reliability problem on the Eastside. These include:

- a. PSE should look at the alternative of building a 230/115 KV transformer at Lake Tradition. The plan to install a new 230/115 KV transformer at Lake Tradition has been on Puget's list for several years. The existing Lake Tradition substation does not have a 230/115 KV transformer, but it does have 115 KV line connections that serve the Eastside. The Bonneville Power Administration has a 230 KV line that passes very close to the Lake Tradition substation. It is common practice for PSE to connect to BPA lines to meet PSE reliability needs. PSE did not consider this alternative in their Eastside Needs Assessment.
- b. Another solution would be for PSE to simply add a third 230/115 KV transformer at Talbot Hill or replace the existing two 230/115 KV transformers with larger 230/115 KV transformers so that if one fails the other has more capacity to pick up the load. PSE did not consider this alternative in their Eastside Needs Assessment.
- c. Seattle City Light has a double circuit 230 KV line that runs parallel and very close to the proposed 18 mile Energize Eastside line. Another solution would be to install the 230/115 KV transformer at the Lakeside substation, but rather than building 18 miles of new double circuit 230 KV alongside the Olympic pipeline, PSE would get Seattle City Light to loop their existing 230 KV line through the Lakeside substation. PSE says they did not pursue this alternative because SCL told them they preferred not to do this. The PSE website on Energize Eastside discusses this matter. See

<https://energizeeastside.com/faqs>

One Q&A on that website is as follows:

*Q. “Why can’t PSE use the Seattle City Light corridor that runs from Redmond to Renton?”*

*A. “PSE looked into using the Seattle City Light corridor and yes, if rebuilt, the corridor could work to meet the Eastside’s energy needs. However, PSE has been told by Seattle City Light that this corridor is a key component of their transmission system and is not available for our use.”*

But PSE never made a proper request to Seattle for use of the Seattle City Light line using the request procedures described in the FERC Open Access Transmission Tariff. Seattle City Light has recently provided a letter saying that if the appropriate request was made, they would proceed as required by the FERC Open Access Transmission Tariff. See *Attachment 2*. I have previously provided a written paper demonstrating this Seattle City Light option is a legitimate and better alternative to Energize Eastside if PSE would use the procedures of the FERC Open Access Transmission Tariff that are available to PSE. See *Attachment 3*. So PSE admits the Seattle City Light line option could work to meet the Eastside's energy needs, but that would only happen if PSE makes a proper formal request. PSE has chosen not to make that request.

#### **IV. “Non-Wired” alternatives that PSE has not properly studied:**

As discussed further in Attachment 1, there are several non-wired alternatives to Energize Eastside that would likely be better solutions to any identified reliability problem on the Eastside. These include:

- a. Implementation of targeted and enhanced DSM programs. Such programs were identified by EQL Energy in their February 15, 2016 report titled “Alternatives to Energize Eastside.”
- b. Installation of appropriately located battery banks of the type that Tesla is installing for many utilities. See  
<https://www.greentechmedia.com/articles/read/tesla-plans-to-triple-battery-deployments-in-2018#gs.KcNMVNw>
- c. Installation of a properly located small peaker plant. A small peaker plant is a type of generator that is sold by several vendors. These plants are generally located strategically on the grid so they can inject power into the grid at that location. These generators come in different sizes and technology depending on the specific need and generally require little land. These generators would be expected to operate only a few hours during any year and only during years when there are low probability stresses occurring on the system. They would not be expected to operate at all in most years. The technology is a generator powered by either (1) a turbine engine similar to an airplane jet engine, or (2) an internal combustion reciprocating engine like those used in large trucks. They are generally fueled by either natural gas or oil. Their contribution to global warming and other emissions is very small because of their design and because of the fact that they almost never run. The appropriate design and location will be driven by the nature of the emergency that it will ultimately be determined needs to be protected against. This alternative would burn very little natural gas because it would almost never run, so among other benefits it would not make any material contribution to global warming.

These three non-wired alternatives would not only likely be better solutions to meeting any future reliability need on the Eastside, but they would have the dual benefit of helping PSE meet its Total System Peak load.

PSE has not adequately studied any of these alternatives to Energize Eastside to see which alternative would be the best solution when balancing cost and environmental impact. But it seems likely that they would all be better than building Energize Eastside.

**V. Conclusion:**

While all indications are that nothing is needed to be built on the Eastside now or in the near future in order to provide reliable service, it is important to keep in mind that there are several other likely better alternatives to Energize Eastside should a legitimate reliability problem be identified. The alternatives identified in this paper have not been appropriately analyzed by PSE. It is my opinion that a prudent utility would properly analyze all these alternatives in a load flow study before any decision would be made to build Energize Eastside. PSE has failed to properly analyze these alternatives to date. But they need not be analyzed until there is a legitimate finding of a reliability problem on the Eastside.

**The PSE Application for a Conditional Use Permit for the Energize Eastside project should be rejected.  
PSE has not proven the need for the project and has not properly looked at alternatives to Energize Eastside.**

## ATTACHMENT 1

### Alternatives to Energize Eastside....

From: Richard Lauckhart (lauckjr@hotmail.com)

Mon 8/14/2017 8:47 AM

To:

records@utc.wa.gov

Attachment:

Comment on Phase 2 Draft EIS Section 2.2.1 Seattle City Light Transmission Line option.pdf66 KB

Dear Records-

Please file this email and its attachment as comments under PSE IRP Docket No. UE-160918.

I have previously filed the Lauckhart-Schiffman load flow study that demonstrates there is no need for Energize Eastside.

A. The best alternative for PSE to solve any possible future reliability problem on the east side is for PSE to run all of its Puget Sound Area generation. PSE did not consider this alternative in their Eastside Needs Assessment.

B. The next best alternative for PSE to solve any possible future reliability problem on the east side is for PSE to implement enhanced DSM programs including the possible installation of battery banks on the east side. These programs have been discussed in the Energize Eastside EIS. These programs have the added benefit of helping PSE meet its Total System Peak deficiency. PSE did not consider these alternatives in their Eastside Needs Assessment.

C. If any work **on the transmission grid** is needed to provide reliable service to the greater Bellevue area, then a clear alternative that should be studied is looping the Seattle City Light line through Lakeside substation. PSE has rejected this alternative because they claim SCL will not allow them to do that. But PSE never made a formal request to have SCL loop their line through Lakeside. If PSE would make that formal request, SCL is required under FERC Order 890 to respond in accordance with the FERC ProForma Open Access Transmission Tariff (OATT). See Attachment to this email. Only when PSE gets that response can they determine if the SCL line option is the best alternative for providing reliable service to the east side. PSE did not properly consider this alternative in their Eastside Needs Assessment.

D. Further, PSE should look at the alternative of building a 230/115 KV transformer at Lake Tradition. The plan to install a new 230/115 KV transformer at Lake Tradition has been on

Puget's list for several years. PSE did not consider this alternative in their Eastside Needs Assessment.

E. There is another alternative to Energize Eastside that many utilities are using today. They are building small peaker plants in the vicinity of power constrained areas. This is a particularly good option if the constraint would be expected to come in to play only very rarely as is the case in the greater Bellevue area. That constraint only comes in to play when the temperature reaches 23 degrees or below during peak load hours and when at the same time two major 230/115 KV transformers on the east side fail. The small peaker plant is low cost and takes little space and likely could be located at the Lakeside substation. It would almost never run and if needed would run for only a short period of time. This alternative has the added benefit helping PSE meets its Total System Peak deficiency. PSE did not consider this alternative in their Eastside Needs Assessment.

In their draft IRP report coming out in a few months, PSE needs to describe these alternatives and why they are not being analyzed in the IRP as alternatives to Energize Eastside.

Rich Lauckhart  
Energy Consultant  
Davis, California  
On behalf of a large number of citizens that are concerned about transmission matters in the greater Bellevue area.

## **ATTACHMENT 2**

April 25, 2017 letter from Seattle City Light to Larry Johnson

## **ATTACHMENT 3**

May 10, 2017

Heidi Bedwell  
City of Bellevue Development Services Department  
450 110<sup>th</sup> Avenue NE  
Bellevue, WA 98004

Re: Comment for Energize Eastside Phase 2 Draft EIS

Dear Ms. Bedwell:

I am writing to submit comment on the Energize Eastside Phase 2 Draft EIS.

**This comment relates to page 2-52 of the Phase 2 Draft EIS. In particular section 2.2.1 "Seattle City Light Transmission Line" option.**

In order to understand how this option works, one needs to be familiar with FERC's ProForma Open Access Transmission Tariff that Seattle City Light needs to comply with. It is a very long document that utilities need to make available to folks who want to use their lines. That FERC ProForma Open Access Transmission Tariff (OATT) can be found at:

<https://www.ferc.gov/industries/electric/indus-act/oatt-reform/order-890-B/pro-forma-open-access.pdf>

Section 6 of the OATT discusses "Reciprocity". If SCL uses the lines of one or more FERC directly regulated utility, then SCL will have agreed to these terms when they use those lines. Meaning under reciprocity, SCL agrees to also deal with requests for use of their transmission grid under the FERC OATT approach.

Other sections of interest to this SCL Transmission Line option are:

Section 15. Service Availability

Section 16. Transmission Customer Responsibility

Section 17. Procedures for arranging for Firm Point to Point transmission service

*[This section is particularly relevant to how PSE needs to ask SCL for use of its line to serve a new 230/115 KV transformer at Lakeside. There is a requirement to make a formal application in the format that is described in the OATT. PSE has never made such an application. An informal request does not meet the required format for making a request to use the SCL line. PSE needs to make this formal request to SCL].*

Section 19. Additional studies procedures for Firm Transmission

With an understanding of how FERC's OATT works, it is clear that just about every sentence in the discussion of the SCL option is wrong...meaning these sentences are not consistent with the OATT.

First sentence:

*"SCL has indicated to the City of Bellevue that they expect to need the corridor for their own purposes and are not interested in sharing the corridor with PSE (SCL, 2014)."*

The EIS staff should already be aware that FERC does not allow a utility like SCL to "hoard" its transmission capability. Further, the FERC OATT requires a utility like SCL to increase the rating of its infrastructure (with needed construction) if that is what it takes to honor a request for transmission and the requesting utility agrees to pay what FERC requires them to pay. No one has performed a System Impact Study (as required by the OATT) to see what it would take to honor a PSE request to use the SCL line to serve a new 230/115 KV transformer at Lakeside.

Second sentence:

*"The existing SCL line would have to be rebuilt to provide a feasible solution for the Energize Eastside project, because the current rating of the SCL line is insufficient to meet PSE's needs (Strauch, personal communication, 2015)."*

If it can be shown that the existing SCL line would need to be rebuilt to provide a feasible solution for the Energize Eastside project, then that is what the FERC OATT would require be done as long as PSE agrees to pay what FERC would require them to pay for that construction. Until a study is done, one cannot tell for sure what the rebuild cost would be. But it certainly would be less than the cost of EE. Further, it should be clear that the request to use the SCL line is only for purposes of serving a new 230/115 KV transformer at Lakeside. The study to determine what this cost must not include a requirement to deliver 1,500 MW to Canada unless BPA makes that request and BPA would pay the bulk of the needed cost if the SCL line is also being used to increase the ability of BPA to deliver power to Canada.

Third Sentence:

*"PSE has estimated that rebuilding the SCL line would provide sufficient capacity for a period of less than 10 years, which does not comply with PSE's electrical criteria (as described in Section 2.2.1 of the Phase 1 Draft EIS) to meet performance criteria for 10 years or more after construction."*

Under the FERC OATT rules that SCL needs to comply with, SCL does not get to stop serving Lakeside after ten years even if SCL has a legitimate need for more use of its SCL line at that time. The FERC OATT has clear rules on how a utility like PSE can assure its transmission service from SCL can be retained even after SCL decides it needs the line for its own use. The FERC OATT protects a utility like PSE from SCL stopping to provide them transmission service.

Fourth Sentence:

*"Neither the City nor PSE can compel SCL to allow the use of this corridor; therefore, this option is not feasible and was not carried forward."*

This statement is wrong. PSE can compel SCL to use its line to serve a new 230/115 KV transformer by making a FERC Order 888 request (under the FERC OATT) for such transmission service. If SCL refuses, FERC will compel them to do so. FERC uses its "reciprocity" ruling to compel SCL. If SCL refuses, FERC will refuse to let SCL use any transmission lines that are under direct FERC jurisdiction. SCL could not meaningfully fulfill its service obligations to its own customers without using the transmission lines of FERC directly jurisdictional utilities.

Fifth Sentence:

"Even if compelled use of the corridor were allowed, the negotiations would likely prove lengthy, and would likely preclude completion of the project within the required timeline to meet project objectives."

The FERC OATT has tight timelines for dealing with requests for transmission service. FERC intentionally put in these tight timelines to prohibit a utility like SCL from denying service by delaying service. Further, PSE currently is not saying when it thinks it needs a new 230/115 KV transformer to be in service at Lakeside. Any needed construction on the existing SCL line will take considerably less time than permitting and building EE. Further, according to the only reasonable load flow study done regarding serving the east side (the Lauckhart-Schiffman Load Flow study), there is plenty of time before any new 230/115 KV transformer is needed at Lakeside.

Thank you for the opportunity to clarify how this SCL Transmission Line option would work.

Sincerely,

Richard Lauckhart  
Energy Consultant  
Davis, California  
530-759-9390  
[lauckjr@hotmail.com](mailto:lauckjr@hotmail.com)

## RICHARD LAUCKHART

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### **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

## RICHARD LAUCKHART

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

### ***Levitin & 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***

## RICHARD LAUCKHART

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### **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 RISKSJM 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.

## Appendix G: Roger Schiffman resume

# 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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EMAIL: ROGER\_SCHIFFMAN@YAHOO.COM

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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, Ventyx, 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.

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**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.

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**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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**TESTIMONY (CONTINUED)**

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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."

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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."

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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)

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."

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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.

**BEFORE THE HEARING EXAMINER  
FOR THE CITY OF BELLEVUE, WASHINGTON**

In Re

No. 17-120556-LB  
17-120557-LO

Puget Sound Energy, Inc.

**Energize Eastside Conditional Use Permit  
File No. 17-120556-LB and Critical Areas  
Land Use Permit File No. 17-120557-LO**

# DECLARATION OF RICHARD LAUCKHART ACKNOWLEDGING AUTHORSHIP

Richard Lauckhart, under penalty of perjury under the Laws of the State of Washington, declares as follows:

1. I am over the age of 18 and competent to testify as a witness in this matter.
  2. I am the co-author of the Lauckhart Schiffman Report included in the CENSE Notebook prepared for the Administrative Hearing in this matter.
  3. The contents of that report are true and accurate.

Dated this 22nd day of March, 2019.

Richard Landkroft

Richard Lauckhart

## Regional Origins of Energize Eastside

### Abstract

Energize Eastside was conceived nearly a decade ago as a dual project to serve both local and regional transmission needs. While a dual approach might have made sense from an engineering standpoint, high costs to communities and the environment were not considered. As time has passed, low growth of local demand for electricity and changes in Canada have reduced both local and regional needs. Consequently, Energize Eastside has become an outdated, over-sized solution to a problem that no longer exists.

### Table of Contents

1. ColumbiaGrid
2. Moving Forward
3. Opposition Grows
4. Seattle City Light (SCL) Option
5. Conclusion

### 1. ColumbiaGrid

ColumbiaGrid is a consortium of Northwest utilities founded in 2006 to “improve the operational efficiency, reliability, and planned expansion of the Northwest transmission grid.”<sup>1</sup>

In 2010, a ColumbiaGrid study team tackled the difficult problem of transmitting large amounts of electricity through the Puget Sound region at the same time transmission lines and transformers are busy serving peak demand.

A 2011 document titled “*Updated Transmission Expansion Plan for the Puget Sound Area to Support Winter South-to-North Transfers*” summarizes the team’s progress as follows:

*In October of 2010, the Puget Sound Area Study Team issued a report entitled “Transmission Expansion Plan for the Puget Sound Area.” The report is available via the ColumbiaGrid website. The report details a transmission plan for the Puget Sound region that would, as a basic requirement, provide for reliable system performance while significantly improving the ability of the transmission grid to support power transfers between the Northwest and British Columbia.<sup>2</sup>*

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<sup>1</sup> <https://www.columbiagrid.org/client/pdfs/2015SAfinal.pdf>

<sup>2</sup> <https://www.columbiagrid.org/PSAST-documents.cfm?SortOrder=Date>

In the same report, ColumbiaGrid notes a change of plan. Until 2011, the preferred plan was to place heavier wires on a 230 kV transmission line through the Eastside, owned and operated by Seattle City Light (SCL). Seattle is not directly served by this transmission line, known as the “Maple Valley-SnoKing” line. Instead, the utility leases the line to the Bonneville Power Administration (BPA) to help facilitate regional transfers of electricity.

Here is how the report describes an alternative plan using PSE’s lines instead:

*Since the development of the original plan, Puget Sound Energy has further developed their plan to rebuild two 115 kV lines to 230 kV (Sammamish-Lakeside-Talbot #1 and #2) and provide new 230/115 kV transformation at their Lakeside Substation. As stated in the prior report, this facility addition can delay the need to reconduct the Maple Valley-SnoKing 230 kV lines beyond the ten year transmission planning horizon. The study team decided that since Puget Sound Energy is moving forward with this plan, the Sammamish-Lakeside-Talbot project should be listed as the proposed project in the plan instead of the Maple Valley-SnoKing reconductor.*

Essentially, PSE convinced ColumbiaGrid to choose a two-for-one solution. Instead of a clear delineation of a regional project serving Canada and California, and a local project serving the Eastside, a single project could serve all needs.

It seemed like a plan all the stakeholders could love. As non-profit entities, neither SCL nor BPA had any incentive to stick with the previous plan. Both were happy to have more transmission capacity in the Puget Sound, funded by PSE’s customers.

PSE had much to gain. By assuming responsibility to support larger regional transfers, PSE could justify building a local project whose need was not clear. Initial studies that demonstrate need for the project include these regional transfers as a key assumption as shown in Figure 1 from the “Eastside Needs Assessment Report.”

## **Study Assumptions**

The following key assumptions were adopted to more fully understand the potential reliability impacts:

- The study horizon selected was the ten year period from 2012 to 2022.
- System load levels used the PSE corporate forecast published in June 2012.
- Area forecasts were adjusted by substation to account for expected community developments as identified by PSE customer relations and distribution planning staff.
- Generation dispatch patterns reflected reasonably stressed conditions to account for generation outages as well as expected power transfers from PSE to its interconnected neighbors.
- Winter peak Northern Intertie transfers were 1,500 MW exported to Canada.
- Summer peak Northern Intertie transfers were 2,850 MW imported from Canada.

**Figure 1:** Key assumptions from initial study justifying Energize Eastside

After years of declining revenues, PSE needed new sources of revenues. PSE would welcome the generous allowance Washington State provides for infrastructure projects (amounting to more than a billion dollars over the lifetime of this project).

Unfortunately, two important stakeholders weren't represented as ColumbiaGrid and PSE finalized their plans:

- **Ratepayers** would be on the hook for hundreds of millions of dollars to build a project that may never provide any local reliability benefit. Once in the rate base, customers would pay higher electric bills for many decades to provide PSE with its coveted rate of return on the project.
- **Hundreds of homeowners, several schools, and even a few parks** would be impacted by the taller poles and higher voltages PSE proposed. The aesthetic and environmental costs were never mentioned in any of ColumbiaGrid's studies.

Even from a financial perspective, Energize Eastside makes little sense. In Appendix B of the ColumbiaGrid report, reconductoring the SCL line (a.k.a. "SnoKing – Maple Valley") is significantly less expensive than Energize Eastside (a.k.a. "Sammamish-Lakeside – Talbot"). Figure 2 shows the SCL upgrade is estimated to cost \$16 million, while Energize Eastside weighs in at \$70 million. (PSE has already spent almost that much just promoting and preparing for the project; total up-front costs, excluding interest, could exceed \$200 million).

Reconducto the SnoKing - Maple Valley 230 kV lines with high temperature conductor	\$16
Rebuild the SnoKing - Maple Valley 230 kV lines with bundled conductor	\$51
Lakeside 230/115 kV transformer and Sammamish-Lakeside - Talbot 230 kV upgrade (part of the preferred option)	\$70

**Figure 2:** Cost estimates for regional transmission plans

## **2. Moving Forward**

In early 2012, PSE, BPA, and SCL signed a Memorandum of Agreement to proceed with the plan outlined by ColumbiaGrid. In a BPA press release, the partners applauded the new plan:

*"This was a truly collaborative effort that allowed us to develop a solution to an issue that has been discussed and studied for more than 15 years," said Hardev Juj, vice president of Planning and Asset Management, BPA Transmission Services. "Without the cooperation of our partner utilities, we could not have reached this agreement."*

*When large amounts of energy are being delivered to 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.*

*Energy demand projections for the Puget Sound area and the potential for additional energy delivery from the Northwest to Canada have transmission system planners projecting increased curtailments by the end of this decade.<sup>3</sup>*

The Sammamish-Lakeside-Talbot transmission line, rebranded Energize Eastside, was announced to the public the following year. To sell the project to a skeptical public, PSE warned that imminent blackouts would affect homes and businesses if the project weren't built. According to PSE, Energize Eastside would remove a severe threat to our safety and economic vitality.

However, PSE was not entirely honest about how curtailments would work. If equipment becomes stressed in the unlikely scenario PSE described, the curtailments would affect BPA and utilities located in Canada or California. It is extremely unlikely that PSE would intentionally turn off power to Eastside customers in order to maintain regional transfers to consumers outside the company's service area.

## **3. Opposition Grows**

Opposition to Energize Eastside increased as residents realized the project wouldn't improve local reliability, but would destroy thousands of mature trees, and increase risk of an accidental breach of the co-located petroleum pipelines. Former employees of the company began to speak out against the project.

By 2014, it appears BPA and SCL were growing anxious about their roles in the project. In response to a FOIA request, BPA produced the following note written by an unnamed engineer in early 2014, only a few months after PSE unveiled the project:

*Regarding Figures 3 and 4: The handwritten notes are from documents produced for Larry Johnson, attorney for Citizens for Sane Eastside Energy by Seattle City Light per his documents request a few years ago. This document relates to a meeting held early in the EE process between BPA, SCL and PSE. Larry*

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<sup>3</sup> <https://www.bpa.gov/news/newsroom/releases/Documents/20120124-PR-5-12-Joint-transmission-system-projects-to-improve-system-reliability.pdf>

believes the purpose of the meeting was to discuss how and what BPA and SCL would contribute to the cost of EE. There are other documents with this same person's handwriting.

Puget-

- starting community outreach for line build - released segment maps
- 2 advisory group mtgs and 2 public meetings
- Major issues - why not working with SCL, <sup>they are</sup> and want it underground.
- No question regarding need for project - mostly NIMBY
- design & permitting 2015 hoping to have permits in hand 2017

Figure 3: Notes from a BPA engineer shortly after Energize Eastside is announced

As indicated in the engineer's notes, people were puzzled why PSE and SCL weren't working together to develop a joint solution using existing lines. Residents couldn't believe that a line like this was being proposed to run overhead, when many cities were placing transmission infrastructure underground.

The engineer's comments also appear to indicate relief that no one was questioning the need for the project. Those concerns would arise later.

But there was another potential problem. If BPA were transparently involved with the project, a NEPA environmental review would be required using national standards, as opposed to the less stringent state SEPA review. Crucially, NEPA requires impacts on property values to be evaluated; SEPA does not.

To avoid the issue, BPA tried to minimize its role in the project. From the same notebook:

- re environmental review -
  - each PSE&N project will have its own NEPA review - each has its own benefits
  - SCL very concerned about roles and responsibilities regarding environmental review + interaction between projects -
- BPA
  - Uzma brought up the need for a separate letter agreement that specifies funding for PSE project be limited to transformer, not the line .

Figure 4: BPA and SCL express concerns about environmental review

By 2015, BPA and SCL had officially renounced their roles in Energize Eastside:

*Concerning the Puget Preferred Plan Projects identified in Section 3(b) of the MOA, the parties agree that the BPA funding originally intended for these projects will instead be directed under separate agreement to Puget's Whatcom County Transformer project. Accordingly, the parties acknowledge that BPA is not involved in any manner or capacity in PSE's Sammamish to Lakeside to Talbot Rebuild Project or its Lakeside 230 kV Transformer Addition Project.*

*Concerning the Puget Preferred Plan Projects identified in Section 3(b) of the MOA, the parties agree that the SCL funding originally intended for these projects will be directed to the Lakeside 230 kV Transformer Addition Project. Accordingly, the parties acknowledge that SCL is not involved in any manner or capacity in PSE's Sammamish to Lakeside to Talbot Rebuild Project.<sup>4</sup>*

Despite its cooperative inception and lofty press releases, Energize Eastside was now a local project pursued by PSE alone, untethered from its original regional purpose. PSE knew that the need for the lines would be difficult to prove if the regional transfers were not included in its analysis, so the company insisted that NERC TPL-001-4 transmission planning standards mandated these transfers be included in project studies. "It's just a local project," PSE insisted. But as local consumption stopped growing, due to LED lighting and other efficient technologies, the local argument began to wobble as well. With both the regional and local needs retreating, PSE is left with no way to justify the project.

## 4. Seattle City Light (SCL) Option

Could the SCL lines still be used to meet regional needs for less cost than Energize Eastside?

Yes.

Could a short tap from the SCL lines be used to power a larger substation at Richards Creek?

Yes.

But is the need still there and is a transmission line still the best option in an age of energy storage, smart grids, and distributed generation? That has not been proven.

## 5. Conclusion

Many things have changed since the 2011 study by ColumbiaGrid. At that time, there were no large energy storage projects anywhere in the world. Now, big Tesla batteries are saving Australian consumers tens of millions of dollars. BPA recently cancelled an even bigger transmission line between Oregon and Washington, favoring smarter solutions and batteries to save customers money.

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<sup>4</sup> Letter dated January, 2015 from Toni L. Timberman, BPA Senior Transmission Account Executive, to Ms. Booga Gilbertson, PSE Vice President Operations Services, and Mr. Phillip West, SCL Customer Service Energy Officer

The Columbia River Treaty, which promised Canada a certain level of electricity transfers, is being renegotiated. Canada is no longer counting on large transfers from the U.S. By law, British Columbia must be independent of energy deliveries from Washington. The main utility in the province, BC Hydro, is building a large hydroelectric project named “Site C” which may make British Columbia a net energy exporter.

For these reasons, it's less likely that large transfers through the Puget Sound will be critical to keeping lights on in Canada or California or anywhere else.

Transmission lines are still necessary in cases where energy sources are located far from energy consumers. But a relatively short line through densely populated residential areas is a different case. Energize Eastside is not needed to solve an ongoing capacity issue. The need for Energize Eastside is gone and unlikely to return.

## Eastside Customer Demand Forecast

### *Abstract*

PSE's Energize Eastside project is based on a forecast of customer demand that is more than five years old and not reflective of current consumption trends. The forecast has not been adjusted for slowing population growth, warming winters, or increasing electrical efficiency. Neighboring utilities that serve Seattle and Tacoma have issued more recent forecasts that show declining demand. If PSE's forecast were updated, the need to build Energize Eastside would evaporate.

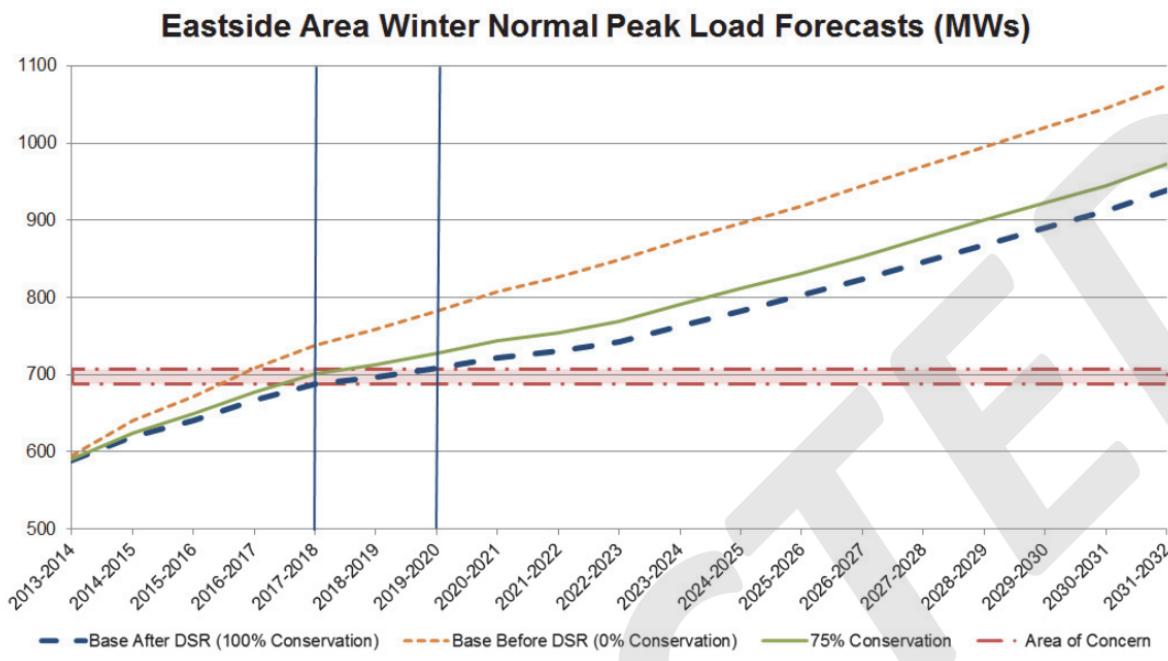
### *Table of Contents*

1. PSE's Forecast
2. Population Growth
3. Other Factors that Affect Demand
4. Evolution of PSE Forecasts
5. Conclusion

## 1. PSE's Forecast

When PSE first announced its Energize Eastside project in late 2013, the company showed a forecast of Eastside electrical demand that predicted reliability problems after 2017. The “Eastside Needs Assessment Report” showed demand increasing from 646 MW in 2012 to 818 MW in 2026, an average annual rate of growth of 1.7%.<sup>1</sup>

Two years later, the company revised its forecast. The “Supplemental Eastside Needs Assessment Report” increased urgency to build the project using the graph shown in Figure 1.<sup>2</sup>



**Figure 1 – PSE’s 2015 forecast with “updated information”**

The 2015 forecast shows demand increasing from 590 MW in 2013 to 935 MW in 2031, an average compound growth rate of more than 2.4%. The rate of growth increased dramatically in just two years. What might explain such a significant revision?

<sup>1</sup>

[https://energizeeastside2.blob.core.windows.net/media/Default/Library/Reports/Eastside\\_Needs\\_Assessment\\_Final\\_Draft\\_10-31-2013v2REDACTEDR1.pdf](https://energizeeastside2.blob.core.windows.net/media/Default/Library/Reports/Eastside_Needs_Assessment_Final_Draft_10-31-2013v2REDACTEDR1.pdf), pp. 31 and 76

<sup>2</sup>

[https://energizeeastside2.blob.core.windows.net/media/Default/Library/Reports/SupplementalNeedsAssessmentReport\\_Redacted\\_April2015.pdf](https://energizeeastside2.blob.core.windows.net/media/Default/Library/Reports/SupplementalNeedsAssessmentReport_Redacted_April2015.pdf), p. 15

The supplemental report lists eight changes that have “substantial impact,” summarized here:

1. Updated facility ratings are “effectively **reducing** the overloads on facilities throughout the PSE system.”
2. “Seattle City Light Load Levels **Decreased**.”
3. “Peak demand and energy consumption were **reduced** by a forecast amount of conservation based on conservation target determined as optimal from the 2013 Integrated Resource Plan (IRP).”
4. “The 2012 load forecast assumed faster recovery of the US economy from the recession than the 2014 load forecast.”
5. “The 2014 load forecast used updated US population growth forecast from the US Bureau of Census, which is **lower** compared to what was used in the 2012 load forecast.”
6. “Because of slower housing recovery, customer growth and customer counts in the 2014 load forecast are **lower** than the 2012 load forecast.”
7. “Peak load growth and peak load levels for the system and for King County are projected to be **lower** in the 2014 load forecast as compared to the 2012 load forecast.”
8. “Based on PSRC’s population and employment growth forecasts, Eastside peak loads in the 2014 load forecast are projected to grow by 2.4% per year in the next 10 years, which is driven by growth in the commercial sector and high density residential sector. Also, updates to block loads over the study period influenced the load growth in the Eastside area.”

Seven of the eight updates would lead to a lower annual growth rate or greater system capacity than the 2012 forecast. Only the final update might justify higher growth, but it's hard to understand how this factor alone increases the growth rate from 1.7% to 2.4% for the period shown in the forecast. The report does not contain any details about the block loads mentioned in this report.

## *2. Population Growth*

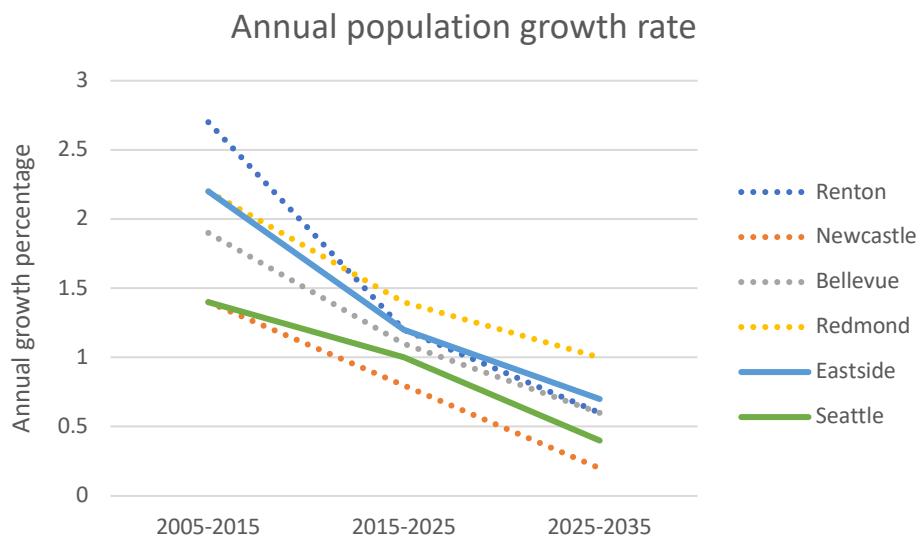
Of the factors that drive demand for electricity, population growth is the easiest for the public to understand. PSE frequently mentions rapid growth on the Eastside as a primary reason for needing to upgrade the transmission system. According to population figures published by Google and the Puget Sound Regional Council (PSRC), the Eastside grew at an annual rate of 2.2% during the ten year period between 2005 and 2015. By this measure, PSE’s forecast of 2.4% demand growth might seem reasonable.

However, the PSRC forecasts slowing growth during the next two decades.<sup>3</sup> For example, Bellevue grew by 1.9% per year from 2005 to 2015. During the next decade, PSRC predicts that pace will fall to 1.1%, and

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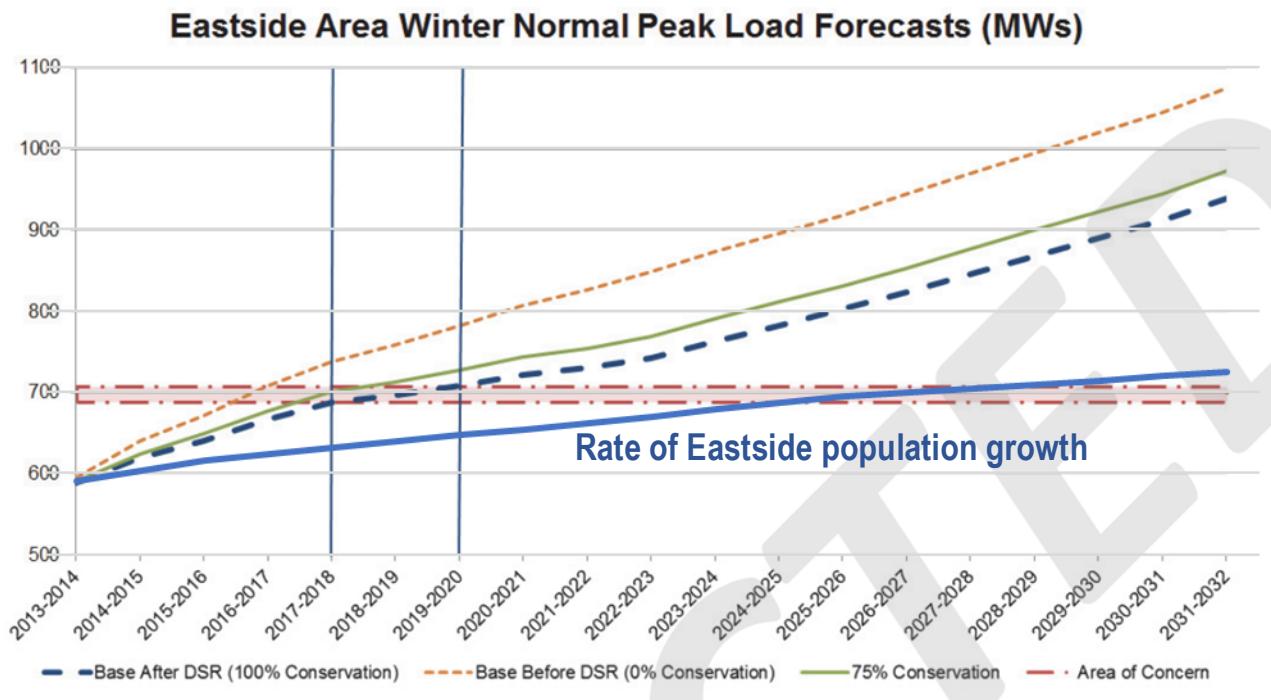
<sup>3</sup> [https://www.psrc.org/sites/default/files/landusevision2\\_final\\_0.xlsx](https://www.psrc.org/sites/default/files/landusevision2_final_0.xlsx)

0.6% in the decade after that. The graph shown in Figure 2 shows historical growth and PSRC's forecasts for four Eastside cities, the Eastside as a whole, and Seattle for comparison:



**Figure 2 – Historical and projected population growth rates**

If one simply assumes that electrical demand will follow population growth, slowing growth will delay the need for Energize Eastside. The blue line in Figure 3 shows electrical demand increasing at the same rate as the forecast for Eastside population growth. This line doesn't cross PSE's "Area of Concern" until 2024-2025 at the earliest:

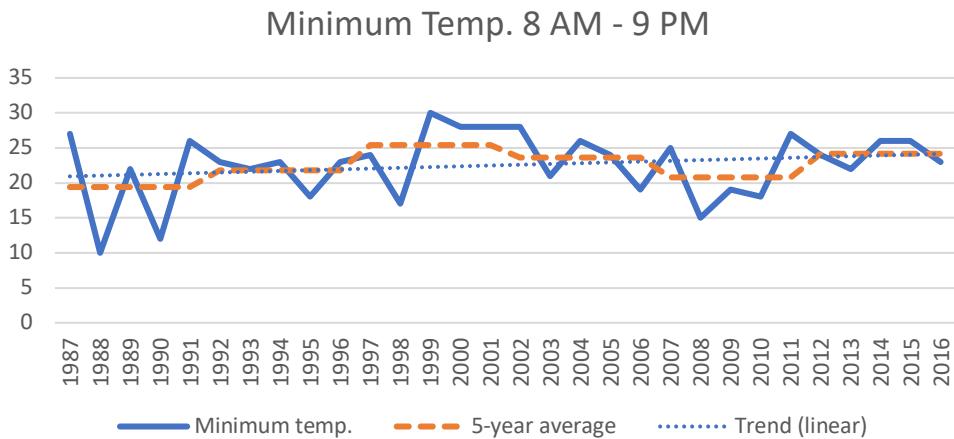


**Figure 3 – Adjusted for projected population growth**

### 3. Other Factors that Affect Demand

Demand for electricity is not driven solely by population growth. As a “winter peaking” utility, PSE’s highest loads occur when very cold temperatures persist in the Puget Sound region over multiple days. A good example is the 3-week cold snap that afflicted Northwest Washington in February 2019. According to a real-time website run by the Bonneville Power Administration, demand for electricity in the Puget Sound was more than 20% higher at 13 degrees than it had been a week earlier at 36 degrees.

Members of PSE’s Technical Advisory Group have complained for years that PSE is not correctly accounting and planning for the effects of climate change. Using data provided by PSE, Figure 4 shows the lowest temperatures that have occurred each year over a 30 year period. If one averages the highly variable data in 5-year chunks, it is apparent that low temperatures are rising by approximately one degree every 5 years. This phenomenon will lessen winter loads over time.



**Figure 4 – Minimum temperatures for past 30 years**

The increasing efficiency of computers, smartphones, smart thermostats, and appliances also has a big impact on electrical demand. PSE tries to justify Energize Eastside in its public presentations by asking people to think about all the new devices they are using that weren't available ten years ago. However, the public may not realize how much more efficient these new devices are. For example, if you spend just four hours writing documents and responding to emails on a desktop computer, you consume enough electricity to power a smartphone for an entire year. The more we use smartphones to accomplish our digital tasks, the more electricity we save compared to using a desktop.

Seattle city staff member Tony Kilduff explained why electricity use has been falling in Seattle for years:

*"All of the things we are seeing on the horizon are indicating that there is likely to be even less demand at the retail level for energy," Kilduff said. "We have ongoing improvements in energy efficiency components, not just LEDs; solar panels have become more cost effective because of all the subsidies provided for them, they are also becoming more efficient. And as battery technology has been improving, this is leading to the likelihood there will be less and less retail demand."<sup>4</sup>*

Seattle's utility, Seattle City Light, has been trying to adjust its forecasts to account for decreasing demand for years. Seattle Business Magazine published the graph shown in figure 5, showing lower and lower forecasts over a five year period, as actual demand continued to decline.<sup>5</sup>

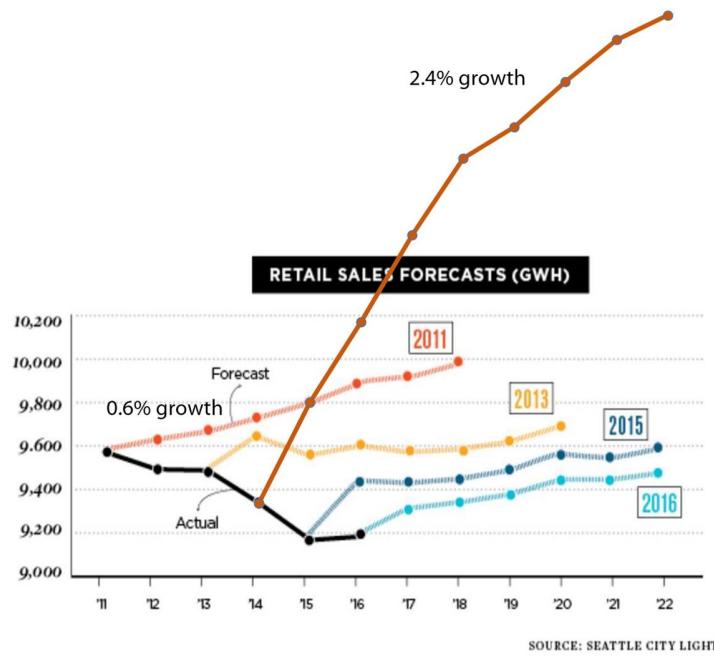
<sup>4</sup> <http://mynorthwest.com/647139/seattle-city-light-lost-revenue>

<sup>5</sup> <http://www.seattlebusinessmag.com/policy/how-climate-change-conservation-and-renewable-energy-are-changing-seattle-city-light>



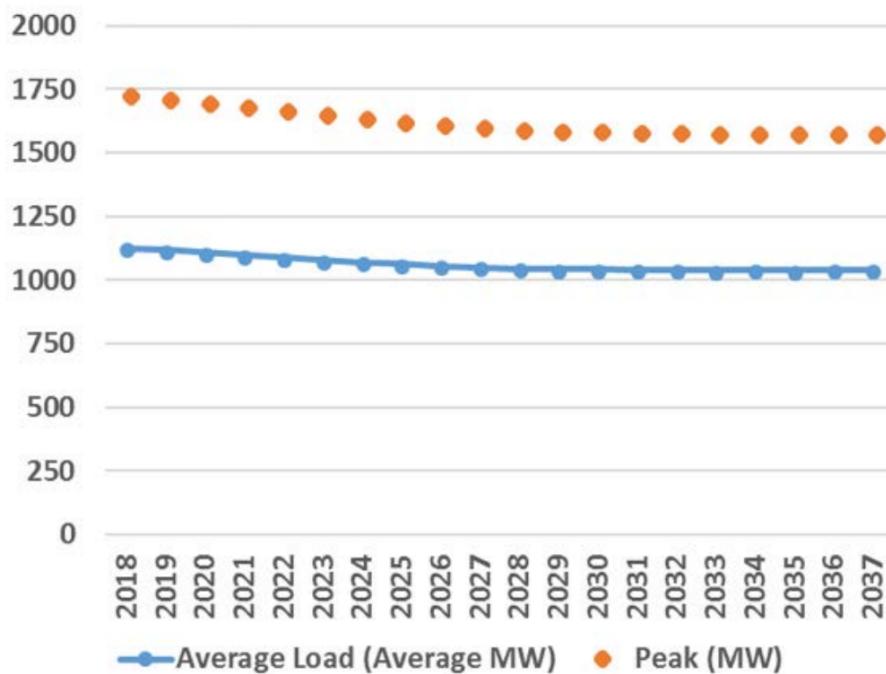
**Figure 5 – Seattle City Light lowers demand forecasts**

PSE has not followed Seattle's lead. In fact, if the 2.4% rate of growth anticipated in PSE's 2015 forecast is superimposed on Seattle's graph, the stark contrast in the rates of growth becomes clear:



**Figure 6 – Energize Eastside forecast compared**

After years of forecasts headed the wrong direction, Seattle City Light has finally come to terms with declining consumption. In its latest Integrated Resource Plan Progress Report, the utility forecasts falling peak demand and average consumption:<sup>6</sup>



**Figure 7 – Seattle City Light’s latest peak and load forecast**

Here is Seattle City Light’s explanation of this forecast:

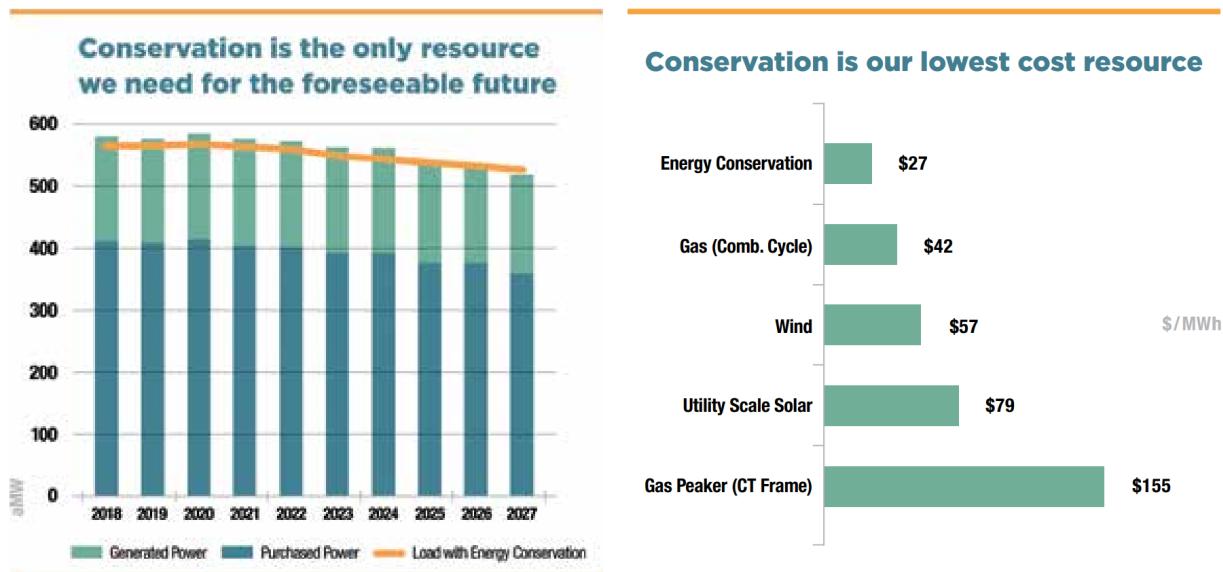
*City Light’s long-range forecast calls for retail load to decrease despite the projected economic and population growth for the region. Growth is declining because of changing regulations, building codes, and new customer behaviors. This is similar to regional and national trends.*

Seattle documents declining consumption in both the residential and commercial sectors, indicating that gains in efficiency are overwhelming growth in population and the economy.

The utility that serves customers in Tacoma, Washington forecasts not only declining demand, but finds that conservation is the most cost-effective resource for meeting future energy needs:<sup>7</sup>

<sup>6</sup> [http://www.seattle.gov/light/IRP/docs/2018\\_Integrated\\_Resource\\_Plan\\_Progress\\_Report.pdf](http://www.seattle.gov/light/IRP/docs/2018_Integrated_Resource_Plan_Progress_Report.pdf)

<sup>7</sup> [https://www.mytpu.org/file\\_viewer.aspx?id=64779](https://www.mytpu.org/file_viewer.aspx?id=64779)



**Figure 8 – Tacoma Power shows lower electricity consumption and benefits of conservation**

Tacoma's reliance on conservation aligns with the conclusions of the Northwest Power and Conservation Council's "Seventh Power Plan," which finds energy efficiency and conservation to be the best resources to serve the Northwest's energy needs in coming decades: "Using modeling to test how well different resources would perform under a wide range of future conditions, energy efficiency consistently proved the least expensive and least economically risky resource."<sup>8</sup>

Although Tacoma and the Conservation Council refer to energy generation resources, the same principles apply to a transmission line. If peak demand for electricity can be mitigated through efficiency and conservation, ratepayers will save money through lower energy bills. However, a profit-driven corporation like PSE does not have incentives to lower electricity consumption. PSE dismisses the potential for conservation on the Energize Eastside website: "Despite these aggressive conservation efforts, studies show demand is dramatically outpacing supply. Conservation alone is not enough to keep up with our region's growth. PSE works hard to encourage our customers to conserve electricity. However, our conservation programs are voluntary – it's the customer's choice to make a change. Our Eastside economy and population are growing far faster than our conservation efforts can keep up."<sup>9</sup>

In 2016, PSE contradicted these statements about runaway consumption in a promotional video featuring the company's vice president, Andy Wappler.<sup>10</sup> The video shows a Nest-branded smart thermostat, at the same time Mr. Wappler says, "While new technologies and significant conservation have **reduced energy consumption**, these lines need to be replaced. The upgraded lines will be built to the highest safety standards..."

<sup>8</sup> [https://www.nwcouncil.org/sites/default/files/7thplanfinal\\_chap01\\_execsummary\\_6.pdf](https://www.nwcouncil.org/sites/default/files/7thplanfinal_chap01_execsummary_6.pdf)

<sup>9</sup> <https://energizeeastside.com/faqs>

<sup>10</sup> <https://youtu.be/ryNAEqSUV8>

Mr. Wappler's admission refuted years of PSE claims about ever-rising energy consumption. Instead, he made a new argument for the project. He says the lines are old and due for replacement. If PSE wishes to replace existing lines with newer lines, that would not be controversial. But an *upgrade* that doubles the line voltage requires thousands of trees to be removed and taller poles to be installed to achieve mandatory safety clearances. PSE has not shown why this upgrade is necessary in an era of "reduced energy consumption."

#### **4. Evolution of PSE Forecasts**

In 2013, the same year Energize Eastside was unveiled to the public, PSE submitted an Integrated Resource Plan that anticipated electricity demand growing at an average rate of 1.08% per year for the following 10 years. By 2017, the same planning document had lowered the 10-year forecast to only 0.13% per year, a nearly 10-fold drop in the rate of growth in only four years. It's clear that something big is happening. But when PSE revised its Eastside forecast in 2015, the growth rate jumped 41%, from 1.7% to 2.4%. The local forecast dramatically diverged from the corporate forecast trend without any credible explanation.

CENSE repeatedly asked PSE to disclose several years of peak demand records for Eastside substations. This would allow the public to see where growth is occurring, and at what rate. In fact, this information is required by Bellevue Land Use Code 20.20.255.D.1, which states, "At least one of the alternative sites identified by the applicant shall be located in the **land use district to be primarily served** by the proposed electrical utility facility." CENSE asserts that alternatives cannot be properly evaluated without documenting which districts are primarily served by the proposed electrical infrastructure.

#### **5. Conclusion**

Energize Eastside is a big, costly project based on outdated forecasts that have proven to be inaccurate. Before permitting a project that will negatively affect ratepayers, property owners, and natural resources, city officials and regulators should take extra care to ensure the project is based on accurate and up-to-date analysis and data.



# energize**EASTSIDE**

## community advisory group **FINAL REPORT**

January 2015



## *Community Advisory Group (CAG) Dissenting Report*

**cense**

Coalition of Eastside Neighborhoods for Sensible Energy CENSE

## Excerpt from PSE's Community Advisory Group (CAG) Minority Report Appendix B

### Dissenting Report

We, the undersigned members of the "Community Advisory Group" (CAG) for PSE's Energize Eastside project, declare our dissent from the recommendations included in the Final Report of the CAG.

The CAG did not truly represent the wishes of the community for the following reasons:

1. CAG members were selected by PSE, not the community.
2. PSE misrepresented the full purpose of Energize Eastside.
3. PSE did not provide real data establishing the need for the project.
4. PSE did not provide a complete list of alternative solutions, and CAG members weren't allowed to discuss alternatives.
5. The CAG was not given real choices, because some of the route segments were never viable.
6. Few CAG members participated in critical evaluations.
7. The CAG facilitator was not impartial and frequently pressured members to support the group's conclusions.
8. CAG members were not asked to officially endorse the outcome of the CAG process.

The remainder of this report will provide additional detail regarding these eight objections.

#### 1. CAG selection

Composition of the CAG was determined by PSE, not the community. PSE diluted the votes of residential neighborhoods that had the most at stake. Only one quarter of the voting members represented neighborhoods, and many affected neighborhoods had no representative. Some members represented organizations which receive generous donations from the PSE Foundation.

#### 2. The full purpose of Energize Eastside

Documents available from ColumbiaGrid, Seattle City Light, and the Bonneville Power Administration make it clear that Energize Eastside solves three simultaneous problems: 1) load for PSE, 2) load for Seattle City Light, and 3) regional grid reliability for Bonneville Power Administration (a federal agency). According to a 2012 Memorandum of Agreement signed by PSE, SCL, and BPA, transmission lines in the Puget Sound region can become congested when high local needs coincide with high flows of electricity to British Columbia, especially when there are faults on BPA's trunk lines. This is a concern because the United States is obligated to provide electricity to Canada through the Columbia River Treaty. The large scale of the Energize Eastside project addresses both local and international electricity needs. However, Energize Eastside is not the only solution that can do this. It might not even be the most economical solution, when the project's impact on the community is considered. Reduced property values along the entire 18-mile length of the line cause declines in economic activity and tax receipts, which must be compensated by increasing tax rates on other residents, or decreasing support to people who need tax-funded services.

PSE never disclosed the whole purpose of the project to CAG members. The company sought to minimize regional questions by claiming only 3-8% of power flow serves Canada. While this might be true on a normal day, Energize Eastside is designed to handle extraordinary power flows that occur in rare emergency conditions. Without a full disclosure of the scope and purpose of the project, CAG members were not able to accurately represent the views of their constituents regarding the project.

### 3. Eastside need

PSE illustrates the need for Energize Eastside using a graph titled “Eastside Customer Demand Forecast.”<sup>1</sup> This graph has been simplified so it can be easily grasped by the public. It shows demand growing at an average rate of 1.9% per year, crossing the “System Capacity” line in 2017. According to PSE, electricity outages will become more likely after that.

CAG members are well-informed individuals who had months to understand the issues. Therefore, we expected PSE would provide CAG members with more detailed information regarding the need for the project. There are many questions that members had. How has the Eastside’s electricity demand grown over time? Why is demand supposedly growing at a much faster rate than population or economic growth? Why is PSE’s projection of Eastside’s demand growth more than double that of Seattle’s or Portland’s? Would programs such as Demand Response help mitigate our demand growth?

PSE did not answer these questions, saying that they were outside the scope of the CAG’s stated mission. The CAG was formed only to provide recommendations on which route the overhead lines should take through the five Eastside cities. PSE said that community input was not needed regarding any other aspect of the project.

### 4. Alternative solutions

CAG members also raised questions about alternative solutions. They wondered why alternatives were eliminated from consideration and further discussion of alternatives was not allowed.

We believe it is important to list reasonable and viable alternatives to Energize Eastside here, since these ideas do not appear in the limited Final Report. The alternatives described below address only the Eastside’s local need. BPA would have to build its own project to solve Canadian reliability issues, at a lower cost to PSE’s customers.

The issue of cost is of critical importance to many CAG members, especially organizations representing low-income residents like Hopelink and the YMCA. It is also of interest to businesses that are sensitive to the cost of electricity. Adding 1-2% to electricity costs for the next 40 years may affect their profitability. Many CAG members would have supported lower-cost alternatives if PSE had allowed them to be explored by the CAG.

- a. **Demand-side Resources.** Demand-side Resource (DSR) programs are used by utilities in almost every state to reduce the stresses of peak load service and avoid construction of new generation and transmission infrastructure. In the Northwest, Portland General Electric devotes 14 pages of its latest Integrated Resource Plan to descriptions of various programs, including a curtailment tariff, residential direct load control, critical peak pricing, and conservation voltage reduction. Similar programs were studied in a detailed report created by the Cadmus Group for PSE’s most recent IRP<sup>2</sup>. Which of these programs is PSE planning to implement? The IRP says, “Demand response program costs are higher than supply-side alternatives at this time, and PSE does not currently have a program in place.” Translation: it’s cheaper to burn coal in a plant located in Colstrip, Montana (one of the dirtiest coal plants in the nation) that provides nearly 1/3 of the Eastside’s electricity. The economics of cheap coal

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<sup>1</sup> [http://energizeeastside.com/Media/Default/AbouttheProject/2013\\_1030\\_Single\\_Line\\_Load\\_Chart\\_v3.png](http://energizeeastside.com/Media/Default/AbouttheProject/2013_1030_Single_Line_Load_Chart_v3.png)

<sup>2</sup> [https://pse.com/aboutpse/EnergySupply/Documents/IRP\\_2013\\_AppN.pdf](https://pse.com/aboutpse/EnergySupply/Documents/IRP_2013_AppN.pdf)

and guaranteed returns for capital improvements like Energize Eastside provide little financial incentive for PSE to pursue DSR programs.

- b. **Lake Tradition transformer.** For several years before Energize Eastside was conceived, PSE proposed to meet Eastside demand by adding a new 230/115 kV transformer located at Lake Tradition (near Issaquah). Additional power would be delivered on existing 115 kV lines to the Lakeside substation. PSE now claims that this solution causes other transformers to overload in power flow simulations conducted by the company. However, these simulations include the surge of electricity caused by faults in BPA's trunk lines. If BPA were to solve those problems with their own project, Lake Tradition might become a viable solution with much lower costs and community impacts than Energize Eastside.
- c. **Upgrade 115 kV lines.** It's possible to use thicker wire and higher capacity transformers on existing lines to increase capacity by approximately 29%. That is enough to delay further action for at least a decade. During that time, it's likely that technologies such as grid batteries, distributed generation, and increasing efficiency will make other solutions possible. This will be cheaper than Energize Eastside, and better for the environment. Upgrading the lines at their current voltage will spare nearly 8000 mature trees that must be cut or removed along the Oak or Willow routes to accommodate a 230 kV line (according to PSE's counts). There is no record that PSE studied this option. It was never mentioned during CAG meetings.
- d. **Gas powered plant.** PSE studied the possibility of meeting Eastside needs using a gas-powered generation plant. They dismissed this option in 3 sentences in their Solutions Study. Two of the potential sites for the plant were judged to be too difficult to permit, although this determination was made solely by the company without input from city officials. A third site was dismissed because it would require construction of transmission lines. Neither the CAG nor the cities were given further details about the costs of such a plant, where the transmission lines would be located, how reliability of local generation compares to remote generation, how it impacts the community, or how it might help reduce use of coal that creates much higher emissions of atmospheric carbon, mercury, and sulfur.
- e. **Micro-grids and small turbines.** A national expert says that the Puget Sound area is an ideal place to use small gas turbines to inexpensively and incrementally serve peak loads. There is no record that PSE studied this option.
- f. **Grid batteries.** PSE says grid batteries are likely to play an important role in the future. The company already has a pilot battery project in Bainbridge. But according to PSE, batteries are too expensive and too risky to use at this time. The company says it can forecast future demand, but it can't forecast the viability of technology solutions that might address that demand.

We believe that one or more of the above solutions would address Eastside's demand and reliability needs for many years at a lower cost than Energize Eastside, allowing us time to develop clean, sustainable solutions rather than rushing a project that is out of scale for our needs as well as our beautiful scenery.

For completeness, we will mention two other alternatives that CAG members were interested in. Both of these would solve Canadian reliability issues as well as Eastside need, but for a considerably higher price tag:

- g. **Underground lines.** We list this alternative because it is the most frequently asked question by the public: “In this day and age, why can’t we bury our transmission lines?” PSE has made this option politically impossible, due to a tariff the company proposed to the Washington Utilities and Transportation Commission (and which the UTC subsequently adopted). The tariff requires each community who requests an underground line to bear the high cost of underground infrastructure on their own. With the exorbitant costs estimated by PSE, this is not a realistic option for any community. While this tariff seems reasonable for local distribution lines, we hope its application to regional transmission lines will be revisited by the UTC.
- h. **Underwater lines.** There are many examples in the U.S. of high-voltage transmission lines being placed in lakes, rivers, and bays. This technology is maturing rapidly. PSE said they would write a white paper on this alternative. The white paper was not released in time for consideration by the CAG.

## 5. No real choices

It should be no surprise that the final routes selected by the CAG mostly follow the existing transmission corridor. This is the result PSE expected from the beginning, and was confirmed by a senior PSE engineer who said the process of route selection was needed to help the public feel like they were involved in the project.

In particular, the choice between the L and M segments was a false choice. The L segment was never a legally viable option due to well-known conflicts and impacts. PSE should have known this. It is also highly questionable that the B segment was viable, due to the large amount of new right-of-way that would need to be acquired to construct that segment.

We believe the CAG process was more about PR for PSE than real choices for the community.

## 6. CAG participation

In several cases, only a few CAG members participated in important evaluations. For example, at the July 9<sup>th</sup> meeting, it was revealed that only 8 CAG members (less than a third of the CAG membership) participated in an evaluation process to eliminate potential routes. These low participation rates didn’t occur because CAG members were lazy or on vacation. Many of the residential representatives refused to participate because they objected to the process.

## 7. CAG process

The facilitator for the CAG was a contractor hired by PSE, harming the appearance of impartiality. The facilitator appeared to have two goals: 1) produce a route recommendation that isn’t too onerous to PSE, and 2) achieve this result using “consensus building” techniques.

Unfortunately, these goals were achieved by pressuring or cajoling CAG members to abandon their preferences and join the consensus view. For example, the facilitator would often say to a reluctant member, “Could you live with the emerging consensus of the group?” Or, “Do you want your name to be listed as the dissenting vote?” There were many times when a dissenting member would reluctantly

give up significant objections to avoid appearing obstinate or going against the other members. An anonymous ballot would have produced a different result than the facilitated outcome.

Do decisions made in this manner truly represent community values? One need only observe the audience at the final CAG meeting to answer that question. At least 90% of the 400-member audience enthusiastically supported dissenting remarks made by members of the CAG. We conclude the recommendations of the CAG do not represent the desires of the community.

This is also evident in the routes that were finally selected. Both the CAG and hundreds of residents voting online agreed that the top factor to be used to judge routes was "Avoids residential areas." For both the CAG and the community, this factor rated significantly higher than any other. However, in the rush to consensus, the CAG ignored the criterion they previously agreed was the most important and focused instead on cost. All of the routes inequitably burden residential neighborhoods with poles as high as 135 feet that are out of scale with residential land use codes.

## 8. No endorsements

As of December 15, CAG members were not asked to endorse the Final Report with their signatures. We note a stark contrast with the outcome of a different advisory group for a previous PSE project:

*"We, the members of the Sammamish-Juanita 115 kV Project Stakeholder Advisory Group, affirm and support this recommendations report to Puget Sound Energy. We believe PSE's community-involved siting process for this project has been transparent and reflects community input."*

Why aren't members of our CAG signing a similar statement in support of their recommendations for Energize Eastside? Could members of this CAG sign a positive statement like this in good faith?

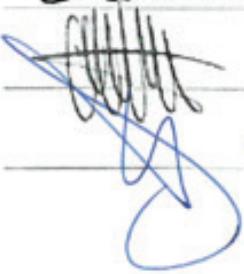
## Conclusion

Energize Eastside is one possible step towards our energy future. This is a decision that should be made by citizens and their elected representatives, taking into account values such as community impact, environmental impact, cost, reliability, and safety. This decision should not be made by a utility company or an advisory group with little community support.

### **The undersigned members of the CAG declare our dissent with the CAG's Final Report.**

(By signing this document, we are not rescinding the opinions we expressed or votes we cast during CAG meetings, but simply stating our dissent with the overall project and process.)

Norman Hansen CAG, BELLEVUE ORIOLE TRAILS COMMUNITY  
L Kaseburg



Tim McHarg, City of Newcastle

Darius F. Richards

Stend O'Donnell

Dave T. Evans

Lindy Bruce Sunset Community Assoc.

CENSE BACKGROUND REPORT / Jan Medley, Russell Borgmann, Daniel Elworth

## How PSE Is “selling” the Energize Eastside Transmission Line Project to the public

### Abstract

CENSE asserts that PSE is promoting an unneeded transmission line and substation project to create an additional revenue stream to offset losses from decreased electrical consumption. PSE can earn a 9.8% rate of return on infrastructure investments such as *Energize Eastside*.

CENSE also asserts that PSE did not reveal to the public that the Southern Segment of Energize Eastside (from Talbot Hill to the proposed Richards Creek substation) could independently provide the additional power PSE claims it needs and that the Northern Segment would merely provide redundancy.<sup>1</sup> These facts were known by PSE, but never disclosed to its Community Advisory Group (the CAG), nor in any public education materials, or messaging used in PSE’s massive newspaper ad campaign.

In Washington state, regulated utilities have two options for obtaining permits to build electrical infrastructure:

- Submit an application to the Washington State Energy Facility Site Evaluation Council (EFSEC) that provides a one-stop siting process for major energy facilities in the state<sup>2</sup>, or
- Apply to each city impacted by the project.

CENSE argues that because PSE does not have the data to substantiate the need for the project, it has opted to apply for permits from *four* cities, none of which have transmission engineers on staff to evaluate need, rather than submit *one* application to EFSEC whose staff are experienced in evaluating the need and appropriateness of electrical infrastructure projects.

In December 2013, PSE launched a massive public relations campaign for *Energize Eastside*, the new name for a project that, since 2007, had been known as the Sammamish-Lakeside-Talbot Hill transmission line project.<sup>3</sup> To manage the campaign, PSE retained Mark Williamson,<sup>4</sup> Partner and Chairman of PRW Communications, a Wisconsin-based public relations firm. Williamson is also a long-time professional colleague of Daniel Doyle, PSE’s Senior Vice President and Chief Financial Officer.<sup>5</sup>

Following the approach outlined in Williamson’s mantra, “*I elect transmission lines, power plants and pipelines to public office*,”<sup>6</sup> PSE adopted “political campaigning techniques”<sup>7</sup> to sell *Energize Eastside*. PSE’s advertisements in the *Bellevue Reporter* and the *Seattle Times*, as well as talking points to city decision makers claimed:

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1 [https://development.bellevuewa.gov/UserFiles/Servers/Server\\_4779004/File/pdf/Development%20Services/EnergizeEastside/Staff%20Report%20FINAL%201242019.pdf](https://development.bellevuewa.gov/UserFiles/Servers/Server_4779004/File/pdf/Development%20Services/EnergizeEastside/Staff%20Report%20FINAL%201242019.pdf) p.111

2 <https://www.efsec.wa.gov/council.html>

3 <https://energizeeastside.com/documents> (December 2013 Newsletter)

4 [http://prwcomm.com/now/?page\\_id=56](http://prwcomm.com/now/?page_id=56)

5 <https://www.pse.com/about-us/leadership>

6 [http://prwcomm.com/now/?page\\_id=24](http://prwcomm.com/now/?page_id=24)

7 [http://prwcomm.com/now/?page\\_id=15](http://prwcomm.com/now/?page_id=15)

- The “backbone” of the Eastside’s electric grid has not been upgraded in the last 50 years.
- Our population has grown eight-fold and soon demand from unprecedented growth will exceed the grid’s capacity.
- We must upgrade now to avoid rolling blackouts in the near future.
- Conservation alone is not enough to keep up with our growing economy and population.
- Energize Eastside will update the grid with modern infrastructure.

CENSE’s position is these claims cannot be substantiated and PSE is using them to generate fear that electricity on the Eastside is becoming less reliable and rolling blackouts are an imminent threat.

CENSE provides facts to disprove PSE’s claims and concludes that:

- Energize Eastside is *not* the backbone of the Eastside’s electrical grid.<sup>8</sup>
- Increased population growth is *no longer correlated* with an increase in electrical demand due to significant improvements in energy conservation and other technologies.<sup>9</sup>
- Demand is currently flat and rolling black outs are not in our immediate future.<sup>10</sup>
- Conservation, with other non-transmission line solutions, could effectively keep demand flat.<sup>11</sup>
- Higher voltage transmission lines (HVTL) are an archaic technology and the antithesis to modernizing the grid. Utilities world-wide are turning from HVTL in favor of technologies that provide customers with more cost-effective and reliable electricity.<sup>12</sup>

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<sup>8</sup> [http://www.energizeeastsideeis.org/uploads/4/7/3/1/47314045/final\\_electrical\\_reliability\\_study\\_phase\\_ii\\_report\\_2012.pdf](http://www.energizeeastsideeis.org/uploads/4/7/3/1/47314045/final_electrical_reliability_study_phase_ii_report_2012.pdf) p. 50

<sup>9</sup> <https://www.vox.com/energy-and-environment/2018/2/27/17052488/electricity-demand-utilities>

<sup>10</sup> <https://www.bpa.gov/news/pubs/FactSheets/fs200709-BPA%20to%20automate%20transmission%20curtailment%20procedure%20for%20the%20Puget%20Sound%20Area.pdf>

<sup>11</sup> <https://www.pse.com/pages/energy-supply/resource-planning>

<sup>12</sup> [https://www.bpa.gov/Projects/Projects/I-5/Documents/letter\\_I-5\\_decision\\_final\\_web.pdf](https://www.bpa.gov/Projects/Projects/I-5/Documents/letter_I-5_decision_final_web.pdf)

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### *1. Permits from cities rather than Washington State Energy Facility Site Evaluation Council (EFSEC)*

In Washington state, regulated utilities have two options for obtaining permits to build electrical infrastructure:

- Submit an application to the Washington State Energy Facility Site Evaluation Council (EFSEC) that provides a one-stop siting process for major energy facilities in the state<sup>13</sup>, or
- Apply to each city impacted by the project.

EFSEC's one-stop siting process includes coordinating all evaluation and licensing steps. If a project is approved, EFSEC specifies the conditions of construction and operation; issues permits in lieu of any other individual state or local agency authority; and manages an environmental and safety oversight program of facility and site operations. An applicant can choose to receive certification under EFSEC for electrical transmission facilities that are "at least 115 kilovolts and located more than one jurisdiction that has promulgated land use plans and zoning ordinances."<sup>14</sup>

CENSE argues that because PSE does not have the data to substantiate the need for the project, it has opted to apply for permits from *four* cities, none of which have transmission engineers on staff to evaluate need, rather than submit *one* application to EFSEC whose staff are experienced in evaluating the need and appropriateness of electrical infrastructure projects. CENSE also argues that PSE predicted that a public relations campaign would be more successful than an engineering justification in garnering the permits it needed to build *Energize Eastside*.

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13 <https://www.efsec.wa.gov/council.html>

14 <https://www.efsec.wa.gov/cert.html#Energy%20Facility>

## **2 Public relations campaign to promote Energize Eastside**

To sell city decision makers and ratepayers on the need for *Energize Eastside*, PSE launched a massive public relations campaign in December 2013.<sup>15</sup> The campaign was managed by Mark Williamson,<sup>16</sup> Partner and Chairman of PRW Communications, a Wisconsin-based public relations firm. Williamson is also a long-time professional colleague of Daniel Doyle, PSE's Senior Vice President and Chief Financial Officer.<sup>17</sup>

Williamson, who is “nationally renowned for his record of success for getting controversial projects done,” states to utility executives in PRW’s 2018 Statement of Qualifications:

*“I know after spending 3 decades as a utility executive that one of the most frustrating aspects of your job is getting critically-needed projects done. The public flatly does NOT want new infrastructure near them. Period. Let PRW help you develop a strategy that incorporates your own talented and experienced executives and un-stick the stuck vital projects your communities need.”<sup>18</sup>*

Using Williamson’s mantra, “*I elect transmission lines, power plants and pipelines to public office,*” PSE adopted “political campaigning techniques<sup>19</sup>” to sell *Energize Eastside*. Advertisements in the *Bellevue Reporter* and the *Seattle Times*, as well as talking points to city decision makers claim:

- The “backbone” of the Eastside’s electric grid has not been upgraded in the last 50 years.
- Our population has grown eight-fold and soon demand from unprecedented growth will exceed the grid’s capacity.
- We must upgrade now to avoid rolling blackouts in the near future.
- Conservation alone is not enough to keep up with our growing economy and population.
- Energize Eastside will update the grid with modern infrastructure.

Advertising for *Energize Eastside* targets the public’s fears. Residents are being told, “There could be rolling blackouts as soon as 2018.” Businesses are being told, “There won’t be enough power to grow your business.” City governments are being told, “You won’t be able to support future business development and support city growth.” However, these qualitative comments are NOT supported by quantitative facts. The underlying quantitative data are being ignored, while PSE pushes an aggressive, persistent PR campaign.

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15 <https://energizeeastside.com/documents> (December 2013 Newsletter)

16 <http://prwcomm.com/PRW-SOQ.pdf> (page 16)

17 <https://www.pse.com/about-us/leadership>

18 <http://prwcomm.com/PRW-SOQ.pdf> (page 16)

19 [http://prwcomm.com/now/?page\\_id=15](http://prwcomm.com/now/?page_id=15)

# PRW'S PROCESS



## OUR APPROACH

When PRW's Energy Division manages your controversial project as a political campaign and not as an engineering problem, you can dramatically improve the probability of getting badly needed utility infrastructure projects built, in service, on time and on budget.

## PROVEN SUCCESS

Transmission, generation and pipeline ... PRW and its clients have successfully put into service thousands of miles transmission lines and have been directly involved in the successful building of coal-fired and natural gas power plants as well as natural gas pipelines.

## THE WILLIAMSON FACTOR

Mark Williamson has more than 30 years of executive-level utility experience and is nationally renowned for his record of success in getting controversial projects done.

His mantra: "I elect transmission lines, power plants and pipelines to public office."

## CAMPAIGN TOOLBOX

Using election techniques – polling, town meetings, media relations, web design, blogging, open houses, paid advertising, door-to-door visits – can dramatically change the debate about a project's merits. We have the hands-on experience and record of success to bring a winning playbook to your projects.

- Printed materials
- Video production
- Radio campaigns
- Open Houses
- Communications Training
  - *Messaging*
  - *Construction techniques*
  - *Environmental practices*
  - *Personal approach*

**Figure1**

PRW's process for managing controversial projects as a "political campaign, and not as an engineering problem.<sup>20</sup>"

20 [http://prwcomm.com/now/?page\\_id=15](http://prwcomm.com/now/?page_id=15)

# MARK WILLIAMSON'S RESUME

## MARK WILLIAMSON

Mark Williamson is partner/Chairman of PRW Communications. His areas of expertise include all aspects of utility matters with special emphasis on infrastructure planning, permitting and construction. His unique skills and talents include assembling and directing teams that can repeat the process of getting projects done – on time and on budget – two key components utility CEOs and executives strive for when tackling large projects. Williamson has developed a strategic communications technique patterned on “election campaigning” – polling, message development and communication – tools that he has consistently employed to get utility projects approved, sited, built and on-line. He is a hands-on utility executive that gets the job done from day one.



### A note from Mark to utility executives

“I know after spending 3 decades as a utility executive that one of the most frustrating aspects of your job is getting critically-needed projects done. The public flatly does NOT want new infrastructure near them. Period. Let PRW help you develop a strategy that incorporates your own talented and experienced executives and un-stick the stuck vital projects your communities need.”



- Mark Williamson

Williamson has been associated with American Transmission Company (ATC) since its inception in 2001. He initially served on ATC's board of directors representing Madison Gas & Electric Company. Prior to his work at ATC, Mark served as Executive Vice President and Chief Strategy Officer with MG&E. While at MG&E, he was central to the negotiations that led to the formation of ATC, as well as Wisconsin's adoption of a utility infrastructure rebuilding period.

In June 2002, Williamson joined ATC as vice president of Major Projects. He oversaw external relations and the public participation process that included local relations, environmental, real estate and state regulatory functions. For ATC, he managed major transmission infrastructure projects including the 220-mile 345 kV Arrowhead-Weston transmission line and the 100-mile 345 kV improvements in central Wisconsin. Today he continues managing projects in Dane County, Wisconsin as a special consultant to ATC.

Williamson is a veteran utility executive. In his 16 years at MG&E, his responsibilities included general management of environmental and safety, power supply and transmission, operations and engineering, electric system planning, and gas rates and procurement. He has also been active in legislative initiatives affecting the utility industry. He was instrumental in negotiations leading to legislation that permitted guaranteed rate of return long-term leases for power plant construction, aiding construction of new coal fired power plants in Wisconsin, as well as legislation easing right-of-way acquisition for transmission projects.

Earlier in his career, Williamson was a trial attorney for the Madison-based law firm of Geisler & Kay, SC, which primarily focused on litigation relating to power plant and paper machine construction projects, product liability cases and general corporate legal support for electrical and mechanical contractors. Williamson earned a bachelor's degree in Mathematics from the University of Wisconsin-Madison in 1976, and received his law degree from the University of Wisconsin Law School in 1979.

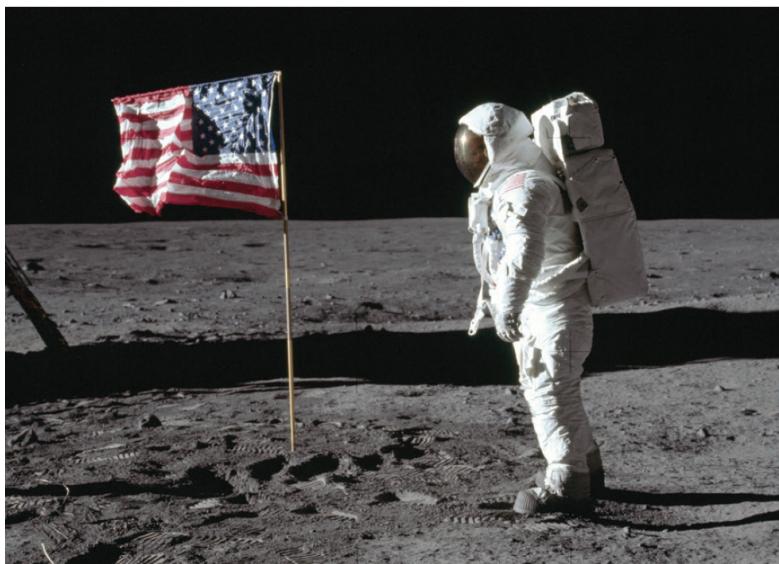
Figure 2

Mark Williamson's resume from PRW's 2018 Statement of Qualifications.<sup>21</sup>

21 <http://prwcomm.com/PRW-SOQ.pdf> (page 16)

### 3. Persistent advertising claims

Claim #1: The “Backbone” has not been upgraded in the last 50 years.



We haven't  
upgraded  
the grid since  
man first  
walked on  
the moon



The backbone of the Eastside's electric grid has not been upgraded since man made that one giant leap nearly 50 years ago. Soon, demand from record growth will exceed the grid's capacity, risking longer and more disruptive outages. Learn how PSE is working with your community on a safe, reliable solution.

[pse.com/energizeeastside](http://pse.com/energizeeastside)

 PUGET SOUND ENERGY

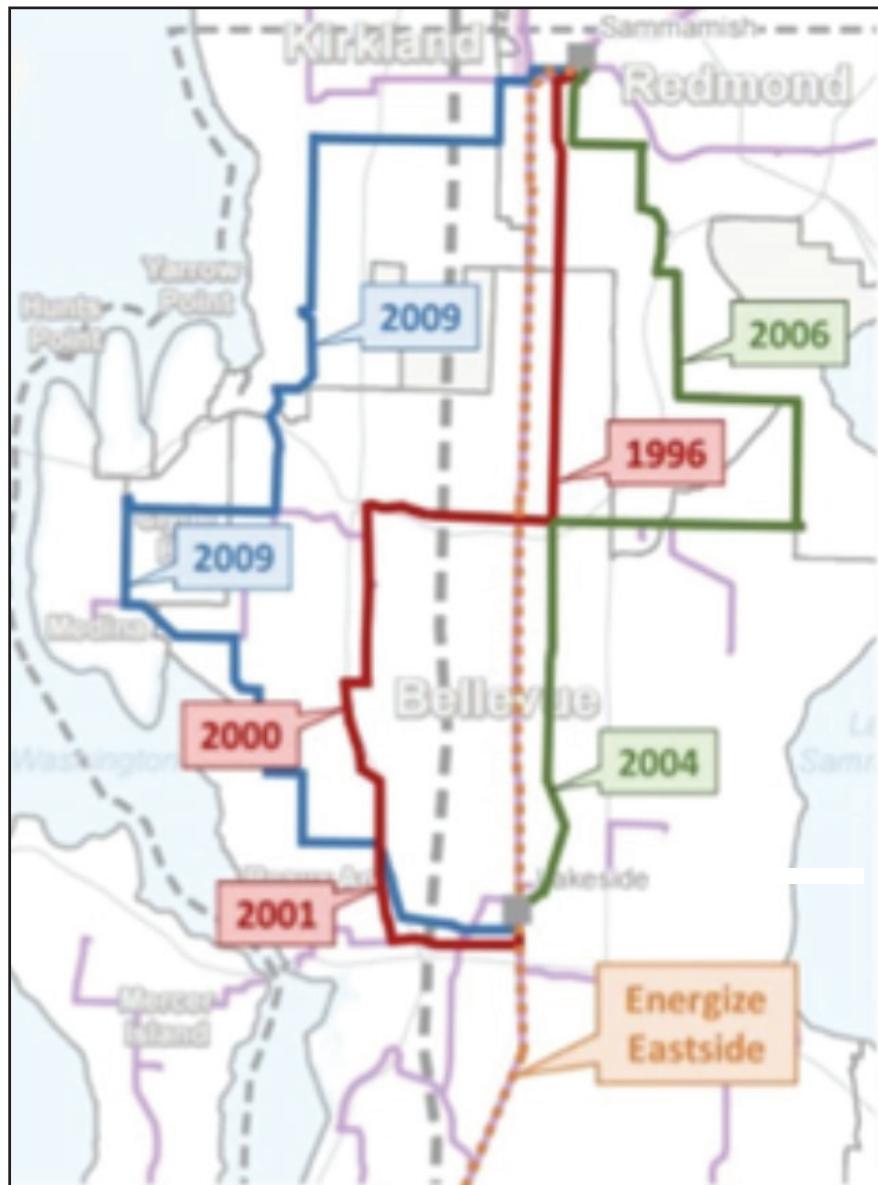
**Figure 3** OCTOBER 30 2015 *Bellevue Reporter*:

*“The backbone of the Eastside electric grid has not been upgraded since man made that one giant leap nearly 50 years ago. Soon, demand from record growth will exceed the grid's capacity, risking longer and more disruptive outages. Learn how PSE's working with your community on safe, reliable solutions.”*

In May 2016, Ms. Booga Gilbertson, Sr. Vice President, Operations at Puget Sound Energy stated, “The backbone of the electric system serving Bellevue, and the Eastside, was last upgraded in the 1960s.” Numerous PSE’s advertisements have also claimed that the Eastside electric system hasn’t been upgraded in over 50 years. This statement is not true.

The Eastside’s High Voltage Transmission Line (HVTL) grid (115kV lines and above) is exactly that – a GRID, a network with redundant paths. Our electricity grid is not a singular, centralized line subject to damage by accidents, storms, natural disasters, or attack. A “backbone” can be severed, lead to paralysis of the region. To operate reliably, it is essential that the grid act as a resilient multi-path network. There are many existing redundant paths for power at this voltage to reach the Bellevue Lakeside Substation from both the Talbot Hill (Renton) Substation and Sammamish (Kirkland) Substation.

Our transmission grid is a resilient network with redundant paths, and it **has been upgraded** on the eastside several times in the 1990s and as recently as 2009. Public Records searches with the City of Bellevue show that three of the five North-South High Voltage Transmission Lines through Bellevue were built over time during the last 20 years. HVTL segments were added in 1996, 2000, 2001, 2004, 2006, and 2009. **PSE has built 3 additional North-South high voltage transmission lines, increasing the Eastside's capacity from 2 lines to 5 lines - a 250% increase in capacity - in the last 15 years**, as shown in figure 4 below:



**Figure 4**

*Where's the backbone? Map of FIVE North-South Transmission lines in Bellevue.* <sup>22</sup>

22 [http://www.energizeeastsideeis.org/uploads/4/7/3/1/47314045/final\\_electrical\\_reliability\\_study\\_phase\\_ii\\_report\\_2012.pdf](http://www.energizeeastsideeis.org/uploads/4/7/3/1/47314045/final_electrical_reliability_study_phase_ii_report_2012.pdf) p. 50. The dates came from a Bellevue public records request, asking when the permits were granted to build each transmission line.

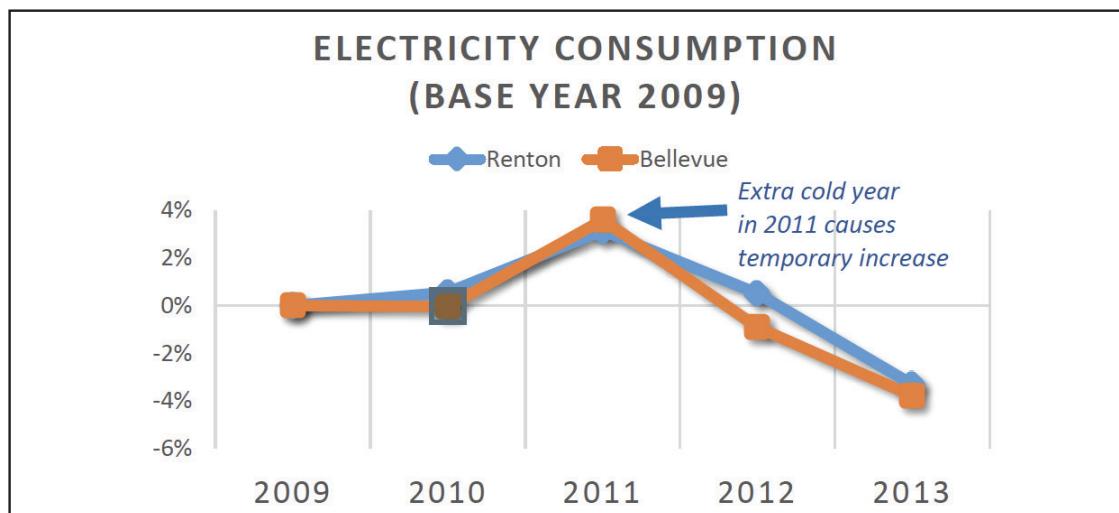
Each year, PSE is required to review our electricity infrastructure, identify risks, and update the system. **PSE would have been negligent in their regulated duty to provide reliable power to the region, if they had not upgraded the Eastside transmission infrastructure in over 50 years.**

PSE uses the word “backbone” without specifically defining the term. We are left to assume it means the existing North-South 115kV lines that traverse Newcastle, Somerset, connect to Lakeside Substation and continue north, roughly along 140th Ave NE through Bridle Trails. Mr. Jens Nedrud (former Senior Project Manager, Puget Sound Energy – *Energize Eastside* Project) has publicly stated that **this existing line can be taken out of service for up to 9 MONTHS without grid ramifications**. The multi-path network nature of our grid allows for reliable flexibility. It is NOT an important “backbone” if it’s non-essential during construction of *Energize Eastside*.

**Claim #2: “Our population has grown eight-fold and soon demand from unprecedented growth will exceed the grid’s capacity.”**

The *Energize Eastside* advertising campaign implies that energy demand is driven mainly by population and economic growth. At the same time, technology and energy efficiency are reducing demand. In recent years, declining consumption is seen at the national level<sup>23</sup> as well as in PSE’s service area, where electricity sales have been shrinking since 2008 as shown in figure 5.

To be clear, total consumption is different than peak loads (or “demand” as PSE uses the term), but consumption and demand are related, as PSE notes in their documents. PSE has not provided consumption data specifically for the Eastside, so CENSE used revenue generated by electricity taxes in Bellevue and Renton to produce estimates for consumption in those cities. Figure 5 below shows flat or declining consumption for every year except 2011, when the Eastside had colder weather than normal. Contrary to PSE’s inferences, increases in population and economic activity have not led to rising electricity use during the last 5 years.



**Figure 5**

*Electrical consumption for Bellevue and Renton, determined by revenue generated by electricity taxes<sup>23</sup>*

23 <https://www.vox.com/energy-and-environment/2018/2/27/17052488/electricity-demand-utilities>

### **Claim #3: “We must upgrade now to avoid rolling blackouts in the near future.”**

A 2007 BPA Factsheet states:

*“It is unlikely anyone’s lights will go out when the automated curtailment system is used. BPA will alert utilities in the affected area when the system looks as though a curtailment would be needed. All affected utilities need to know in order to shift some generation and transmission patterns to avoid the need for the curtailment. For another, once a curtailment is announced, the utilities have the same options of shifting generation or transmission to assure that they have sufficient energy.*

*“In a perfect world, BPA and the regional utilities would determine if additional transmission lines would alleviate the Puget Sound Area Northern Intertie (PSANI) congestion. Many people, however, oppose having transmission lines in their neighborhoods, and BPA and the regional utilities would have to sort out who is responsible for the new transmission lines and would have to make arrangement for financing the upgrades. This may happen, but it will be a long time in the future.”<sup>24</sup>*

Bonneville Power Administration also states that, “it is unlikely that anyone’s lights will go out” because if necessary BPA’s transmission planning (Day-Ahead and Hour-Ahead planning) manages peak load events via an automated system BPA implemented and has been using since 2007. More than 15 years of data, contains not a single example of the U.S. exporting anywhere near 1,500MW of power to Canada, especially during peak load events. BPA says that their automated system ensures there is sufficient electricity to the Puget Sound<sup>25</sup>

### **Claim #4: “Conservation alone is not enough to keep up with our growing economy and population.”**

It is misleading to claim that conservation alone cannot meet future electrical demand. This implies that no other non-wire solutions are available to use in conjunction with conservation to provide reliable electricity for the Eastside. PSE submits an Integrated Resource Plan<sup>26</sup> to the WUTC biennially that describes how other non-wired solutions such as demand-response, distributed energy resources and storage used with conservation can reduce the need for higher-voltage transmission lines.

### **Claim #5: “Energize Eastside will update the grid with modern infrastructure”**

Higher-transmission lines are NOT modern infrastructure. They exemplify reliance on a 20<sup>th</sup> century, centralized-grid to deliver electricity from a very distant source of generation. Modern infrastructure is trending towards smaller grids with their own source of nearby generation, making them less vulnerable to long-duration outages and potential cyber-hacking.<sup>27</sup>

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<sup>24</sup> <https://www.bpa.gov/news/pubs/FactSheets/fs200709-BPA%20to%20automate%20transmission%20curtailment%20procedure%20for%20the%20Puget%20Sound%20Area.pdf>

<sup>25</sup> <https://www.bpa.gov/news/pubs/FactSheets/fs200709-BPA%20to%20automate%20transmission%20curtailment%20procedure%20for%20the%20Puget%20Sound%20Area.pdf>

<sup>26</sup> <https://www.pse.com/pages/energy-supply/resource-planning>

<sup>27</sup> [https://www.bpa.gov/Projects/Projects/I-5/Documents/letter\\_I-5\\_decision\\_final\\_web.pdf](https://www.bpa.gov/Projects/Projects/I-5/Documents/letter_I-5_decision_final_web.pdf)

## *4. Conclusion*

CENSE asserts that PSE has not provided adequate data to document growing electrical demand on the Eastside and that PSE is using unsubstantiated claims to influence decision makers to approve the project.

CENSE argues that in order for PSE to create an additional revenue stream to augment its declining electrical- consumption revenue, PSE is proposing an infrastructure project that will promise a 9.8% rate of return. If approved, CENSE believes PSE will roll all project costs, including advertising and the 9.8% return on investment into its petition to the WUTC for increased rates. The result: An unneeded project that will drastically alter the landscape of the Eastside, higher costs for ratepayers, and, over the 50-year life of the project, a billion dollar return to PSE on a \$300 million investment.<sup>28</sup>

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<sup>28</sup> King, Jeffrey. Lifetime cost analysis for Energize Eastside. What will Energize Eastside cost customers over its lifetime? February 17, 2016.

**ADVERTISEMENT**

# Why would PSE propose unnecessary project? | Letter

Few know that PSE is proposing a project that will cost ratepayers over \$1 billion.

Friday, March 9, 2018 12:29pm | [LETTERS TO THE EDITOR](#)

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We depend upon electricity as much as the air we breathe. Yet most go about their business without giving electricity a second thought. Few people understand how under-regulated utilities really are. The Washington Utilities and Transportation Commission only reviews utility projects after they are built, not before.

Few realize that Puget Sound Energy customers pay the highest electricity rates in Washington. Few know that PSE derives 37 percent of its electricity from burning coal, and a full 60 percent from burning fossil fuels. Few know that PSE is owned by foreign private equity shareholders, not publically-held. And even fewer realize that despite increasing population and economic growth, electricity demand is falling. How can that be? Today's energy-sipping appliances, efficient building techniques, and micro-generation have broken the link between economic growth and electricity demand.

Few know that PSE is proposing a project that will cost ratepayers over \$1 billion. Energize Eastside must be needed, right? Why would a utility propose something that isn't necessary? PSE's revenues are falling along with electricity demand. Their costs are not. It's about money. Energize Eastside will cost all ratepayers dearly. Energize Eastside is nothing more than an extension cord strung through four Puget Sound eastside cities to power PSE's profits.

Russell Borgmann  
Bellevue

**ADVERTISEMENT**

**Energize Eastside**  
will help sustain a healthy economy for decades to come.

[MORE](#) **PUGET SOUND ENERGY**

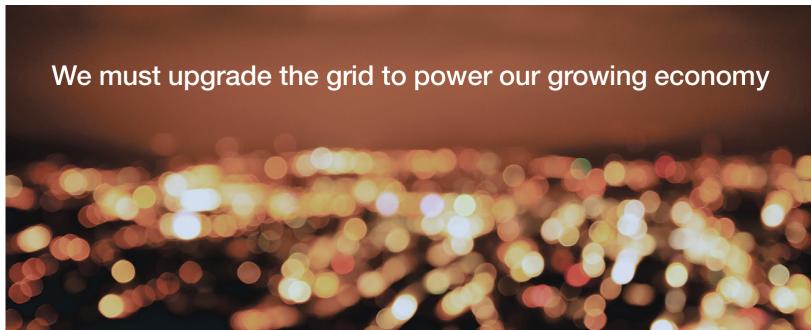
**ADVERTISEMENT**

Reliable infrastructure is vital to the Eastside's growing economy.

**Figure 6**

An ironic twist. A PSE ad for Energize Eastside flanks a letter to the editor of the *Bellevue Reporter* from CENSE member, Russell Borgmann.

## 5. Gallery of Energize Eastside ads in Bellevue Reporter



We must upgrade the grid to power our growing economy



The Eastside is growing faster than any other region in Washington. Yet, demand for reliable electricity will exceed capacity in the near future. We need a plan to meet this challenge now. Conservation alone won't do it — we need substantial electric infrastructure upgrades. That's why PSE is working with Eastside communities on a safe, reliable solution to make sure your lights keep glowing and businesses keep humming for decades to come.

[pse.com/energizeeastside](http://pse.com/energizeeastside)

PSE PUGET SOUND ENERGY



Conservation alone  
can't keep up with  
the Eastside's  
growing energy  
needs.



Eastside communities have excelled at conservation. But now our growing economy and population are outpacing even our best conservation efforts. We need to upgrade our electric grid now. Learn how PSE is working with your community on a safe and reliable solution.

[pse.com/energizeeastside](http://pse.com/energizeeastside)

PSE PUGET SOUND ENERGY



Renton, 1960s: Image #1991.007.9242, Courtesy of the Renton History Museum, Renton, Washington.

We've  
updated  
everything  
since then...  
except the  
Eastside's  
electric grid



It's been 50 years since the last major upgrade to the backbone of the Eastside's electric grid. Since then, our population has grown eight-fold and our economy relies on technologies the grid wasn't built for. It's time to upgrade — learn how PSE is working with your community on a safe, reliable solution.

[pse.com/energizeeastside](http://pse.com/energizeeastside)

PSE PUGET SOUND ENERGY

OCTOBER 3 2014  
BELLEVUE REPORTER

*The Eastside is growing faster than any other region in Washington. Yet, demand for reliable electricity will exceed capacity in the near future. We need a plan to meet this challenge now. Conservation alone won't do it - we need substantial infrastructure upgrades. . . .*

MARCH 20 2015  
BELLEVUE REPORTER

*Eastside communities have excelled at conservation. But our growing economy and population are outpacing even our best conservation efforts. We need to upgrade our electric grid now. Learn how PSE is working with your community on a safe and reliable solution.*

JUNE 12, 2015  
BELLEVUE REPORTER

*It's been 50 years since the last major upgrade to the backbone of the Eastside's electric grid. Since then, our population has grown eight-fold and our economy relies on technologies the grid wasn't built for. It's time to upgrade — learn how PSE is working with your community on a safe, reliable solution.*



Let's make  
sure Eastside  
communities  
have reliable  
power when  
we need  
it most



In the event of an emergency, first responders depend on a reliable flow of electricity. Yet, the Eastside's electric grid is feeling the strain from unprecedented economic and population growth. We must upgrade the grid now. Learn how PSE is working with your community on a safe, reliable solution.

[pse.com/energizeeastside](http://pse.com/energizeeastside)

PSE PUGET SOUND ENERGY



Guess  
what has  
not been  
upgraded  
since the  
1960s?



The backbone of the Eastside's electric grid has not been upgraded in 50 years. Soon, demand from new technologies and our unprecedented growth will exceed the grid's capacity. We must upgrade now. Learn how PSE is working with your community on a safe, reliable solution.

[pse.com/energizeeastside](http://pse.com/energizeeastside)

PSE PUGET SOUND ENERGY



When will  
Eastside  
growth  
overload  
the electric  
grid?



It could happen as soon as 2017. Since the 1960s, Eastside population has grown eight-fold, but the backbone of our electric grid has not had a major upgrade. We must upgrade now to avoid longer and more disruptive outages. Learn how PSE is working with your community on a safe, reliable solution.

[pse.com/energizeeastside](http://pse.com/energizeeastside)

PSE PUGET SOUND ENERGY

JULY 10 2015

## BELLEVUE REPORTER

*In the event of an emergency, first responders depend on a reliable flow of electricity. Yet, the Eastside's electric grid is feeling the strain from unprecedented economic and population growth. We must upgrade the grid now. . . .*

AUGUST 7 2015

## BELLEVUE REPORTER

*The backbone of the Eastside's electric grid has not been upgraded in 50 years. Soon, demand from new technologies and our unprecedented growth will exceed the grid's capacity. We must upgrade now. Learn how PSE is working with your community on a safe, reliable solution.*

SEPTEMBER 4 2015

## BELLEVUE REPORTER

*It could happen as soon as 2017. Since the 1960's Eastside population has grown eight-fold, but the backbone of our electric grid has not had a major upgrade. We must upgrade now to avoid longer and more disruptive outages. Learn how PSE is working with your community on a safe, reliable solution.*



We haven't upgraded the grid since they first danced the Twist



The backbone of the Eastside's electric grid has not been upgraded since the 1960s. Soon, demand from unprecedented growth will exceed the grid's capacity, risking longer and more disruptive outages. Learn how PSE is working with your community on a safe, reliable solution.

[pse.com/energizeeastside](http://pse.com/energizeeastside)

PSE • PUGET SOUND ENERGY



Can conservation alone power the Eastside's energy future?



Eastside communities excel at conservation. But even our best conservation efforts cannot keep pace with our growing economy, population and energy needs. We need to upgrade the backbone of the Eastside's electric grid now. Learn how PSE is working with your community on a safe, reliable solution.

[pse.com/energizeeastside](http://pse.com/energizeeastside)

PSE • PUGET SOUND ENERGY



To keep your family warm and secure, our electric grid needs more capacity



The backbone of the Eastside's electric transmission grid had its last capacity increase in the 1960s, when our population was one-eighth the size it is today. To keep your family warm and secure, PSE is working with your community on a safe, reliable solution.

[pse.com/energizeeastside](http://pse.com/energizeeastside)

PSE • PUGET SOUND ENERGY

## OCTOBER 2 2015 BELLEVUE REPORTER

*The backbone of the Eastside's electric grid has not been up upgraded since the 1960s. Soon, demand from unprecedeted growth will exceed the grid's capacity, risking longer and more disruptive outages. Learn how PSE is working with your community on a safe, reliable solution.*

## DECEMBER 25 2015 BELLEVUE REPORTER

*Eastside communities excel at conservation. But even our best conservation efforts cannot keep pace with our growing economy, population and energy needs. We need to upgrade the backbone of the Eastside's electric grid now.*

## JANUARY 22 2016 BELLEVUE REPORTER

*The backbone of the Eastside's electric transmission grid had its last capacity increase in the 1960s, when our population was one-eighth the size it is today. To keep your family warm and secure, PSE is working with your community on a safe, reliable solution.*



## UPDATE:

### One step closer to a safer and more reliable electric grid



After listening to and working with Eastside communities, we have identified the preferred route for the capacity upgrade of the electric grid. It primarily will follow the existing utility corridor. This will help us meet growing demand and minimize the risk of disruptive outages. Learn more about this update and how PSE is working on a safe, reliable solution.

[pse.com/energizeeastside](http://pse.com/energizeeastside)

PSE PUGET SOUND ENERGY

## Keeping the lights on for our children and grandchildren

The backbone of the Eastside's electric grid was last upgraded over half a century ago. Today, the aging infrastructure is being pushed beyond its capacity to serve our growing 21st-century communities.

The Energize Eastside project will upgrade the old grid with modern infrastructure to keep Eastside lights on for years to come.

It will be built to the highest safety standards and run mostly along the corridor of the existing grid.

Get all the facts at [pse.com/energizeeastside](http://pse.com/energizeeastside).



PUGET SOUND ENERGY



## A new grid to keep pace with the new Eastside

So much has changed on the Eastside since the 1960s. Our population has grown eight-fold. And new technologies have driven an economic boom across the region. But one thing hasn't changed—the backbone of our electric transmission grid is more than 50 years old. Now its aging infrastructure is being pushed beyond capacity to serve our communities.

We need to act now.

The Energize Eastside project will upgrade the old grid with modern infrastructure to keep Eastside lights on for years to come. It will be built to the highest safety standards and run mostly along the same corridor of the existing grid.

Get all the facts at [pse.com/energizeeastside](http://pse.com/energizeeastside).



PUGET SOUND ENERGY



## MARCH 25 2016 BELLEVUE REPORTER

*After listening to and working with Eastside communities, we have identified the preferred route for the capacity upgrade of the electric grid. It primarily will follow the existing utility corridor. This will help us meet growing demand and minimize the risk of disruptive outages.*

## AUGUST 12 2016 BELLEVUE REPORTER

*The backbone of the Eastside's electric grid was last upgraded over half a century ago. Today, the aging infrastructure is being pushed beyond its capacity to serve our growing 21<sup>st</sup> century communities.*

*The Energize Eastside project will upgrade the old grid with modern infrastructure to keep Eastside lights on.*

## OCTOBER 7 2016 BELLEVUE REPORTER

*So much has changed on the Eastside since the 1960s. Our population has grown eight-fold. And new technologies have driven an economic boom across the region. But one thing hasn't changed - the backbone of our electric transmission grid is more than 50 years old.*

## Upgrading the grid for historic Eastside growth

The Eastside's population has grown eight-fold since the 1960s—faster than any other region across our state.

But the backbone of the electric transmission grid we rely on is **more than 50 years old**. Now this infrastructure is being pushed beyond its capacity to serve our communities.

We need to act now.

The **Energize Eastside** project will upgrade the old grid with modern infrastructure to keep Eastside lights on for years to come. It will be built to the highest safety standards and run mostly along the same corridor of the existing grid.

Get all the facts at [pse.com/energizeeastside](http://pse.com/energizeeastside).



## Eastside electricity demand may soon exceed capacity

It's been 50 years since the last major upgrade to the backbone of the Eastside's electric transmission grid. Our population has grown **eight-fold** since then, and now demand for electricity is growing far faster than even our most aggressive energy conservation efforts can match.

We need to act now to avoid having to plan for rolling blackouts in the very near future.

The **Energize Eastside** project will upgrade the old grid with modern infrastructure to keep Eastside lights on for years to come. It will be built to the highest safety standards and run mostly along the same corridor of the existing grid.

Get all the facts at [pse.com/energizeeastside](http://pse.com/energizeeastside).



## Our electric grid is being pushed beyond capacity

Eastside population has grown eight-fold since the 1960s.

But the backbone of our electric transmission grid is **more than 50 years old**.

**Energize Eastside** will upgrade the old grid to keep Bellevue's lights on for years to come.

Get all the facts at [pse.com/energizeeastside](http://pse.com/energizeeastside).



## DECEMBER 2 2016 BELLEVUE REPORTER

*The Eastside's population has grown eight-fold since the 1960s - faster than any other region across our state.*

*But the backbone of the electric transmission grid we rely on is **more than 50 years old**. Now this infrastructure is being pushed beyond its capacity to serve our communities . . .*

## DECEMBER 30 2016 BELLEVUE REPORTER

*It's been 50 years since the last major upgrade to the backbone of the Eastside's electric transmission grid. . . Demand for electricity is growing far faster than even our most aggressive energy conservation efforts can't match.*

*We need to act now to avoid having to plan for rolling blackouts in the very near future.*

## JUNE 2 2017

## SEPTEMBER 20, 2018

## OCTOBER 10, 2018

## BELLEVUE REPORTER

*Eastside population has grown eight-fold since the 1960s.*

*But the backbone of our electric transmission grid is **more than 50 years old**.*

***Energize Eastside** will upgrade the old grid to keep Bellevue's*

## A vital upgrade—improved by Eastside residents' input

The Energize Eastside project will upgrade the backbone of the Eastside's 50-year-old electric transmission grid.

For nearly four years, Puget Sound Energy has shared information about the project with thousands of residents. This includes an environmental impact statement process led by the City of Bellevue in cooperation with the cities of Kirkland, Newcastle, Redmond and Renton.

We've been listening and learning and—thanks to your feedback—improving the upgrade to best serve Eastside communities.

Get all the facts at [pse.com/energizeeastside](http://pse.com/energizeeastside).

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## JUNE 30 2017 BELLEVUE REPORTER

*The Energize Eastside project will upgrade the backbone of the Eastside's 50-year old electric transmission grid.*

*For nearly four years, Puget Sound Energy has shared information about the project with thousands of residents. This includes an environmental impact statement process . . .*



## An urgent upgrade for the Eastside

It's been 50 years since the last major upgrade of the Eastside's electric transmission grid. Since then, our population has grown eight-fold, and now the grid is being pushed beyond its capacity.

Conservation and new energy technologies are essential, but they alone cannot ensure reliable electricity for Eastside communities.

We need to upgrade the grid's infrastructure **now**.

That's exactly what the **Energize Eastside** project will do—upgrade the grid's capacity to keep Eastside lights on for years to come.

Get all the facts at [pse.com/energizeeastside](http://pse.com/energizeeastside).

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## Safety and the environment guide route selection for the electric grid upgrade

PSE has selected the final route for **Energize Eastside**—the first major upgrade to the backbone of the Eastside's electric transmission grid in more than 50 years.

Our decision was guided by two key priorities:

- **Protecting your safety.** It will be built to the highest safety standards and follow the same utility corridor as the existing line.
- **Protecting the environment.** The route affects the fewest trees and avoids construction of new corridors.

Get all the facts at [pse.com/energizeeastside](http://pse.com/energizeeastside).

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## AUGUST 4 2017 BELLEVUE REPORTER

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**AUGUST 18 2017  
BELLEVUE REPORTER**  
*PSE has selected the final route for Energize Eastside - the first major upgrade to the backbone of the Eastside's electric transmission grid in more than 50 years.*

## Why Eastside businesses support Energize Eastside

"Eastside businesses have thrived by adapting to the challenges of our fast-growing region and the global economy. But our ability to remain competitive is now at risk because the backbone of the local electric grid we all rely on hasn't seen a major upgrade in over 50 years."

"Lack of adequate power impacts everyone—homes, schools and businesses alike. That's why we support Energize Eastside—the urgently-needed upgrade of the Eastside's aging electric grid."

—Kari Magill, Rowley Properties

Get all the facts at [pse.com/energizeeastside](http://pse.com/energizeeastside).



**OCTOBER 6 2017  
BELLEVUE REPORTER**  
*"Eastside businesses have thrived by adapting to the challenges of our fast-growing region and the global economy. But our ability to remain competitive is now at risk because the backbone of the local electric grid we all rely on hasn't seen a major upgrade in over 50 years. . ." Kari Magill, Rowley Properties*



## Eastside Innovation Leaders Support Energize Eastside

"The Eastside's economy is powered by a highly talented workforce and some of the most innovative businesses in the world."

"Our ability to continue attracting the best depends so much on the quality of our region's infrastructure."

That's why we support Energize Eastside—the urgently-needed upgrade of the backbone of the Eastside's aging electric grid."

—Bart Phillips, OneRedmond

Get all the facts at [pse.com/energizeeastside](http://pse.com/energizeeastside).



**NOVEMBER 17 2017  
BELLEVUE REPORTER**  
*"The Eastside's economy is powered by a highly talented workforce and some of the most innovative businesses in the world."*

*"Our ability to continue attracting the best depends so much on the quality of our region's infrastructure. . ." Bart Phillips, OneRedmond*

## Another step closer to a more reliable Eastside electric grid

With completion of a multi-year environmental review process, Puget Sound Energy's **Energize Eastside** project is another step closer to construction.

Energize Eastside will upgrade the backbone of the old grid to serve the Eastside's growing population. The project will be safely built and operated, and by replacing poles and wires along the existing corridor, we will limit the impact on Eastside communities.

Get all the facts at [pse.com/energizeeastside](http://pse.com/energizeeastside).



**MARCH 23 2018  
BELLEVUE REPORTER**  
*With completion of a multi-year environmental review process, Puget Sound Energy's Energize Eastside project is another step closer to construction.*

*Energize Eastside will upgrade the backbone of the old grid to serve the Eastside's growing population. The project will be safely built and operated. . .*

## Energize Eastside will use the existing utility corridor

Energize Eastside will upgrade the backbone of our electric grid to serve the Eastside's growing population and economy.

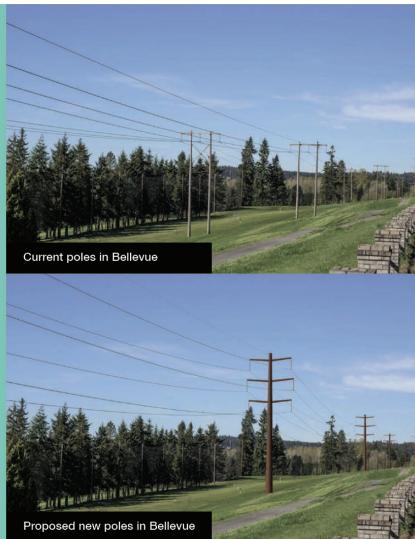
PSE evaluated several options for the best route to locate the new poles and wires.

We chose to follow the same corridor as the existing lines—to maximize safety and minimize impact on the environment and surrounding neighborhoods.

Get all the facts at [pse.com/energizeeastside](http://pse.com/energizeeastside).



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### APRIL 20 2018 BELLEVUE REPORTER

*Energize Eastside will upgrade the backbone of our electric grid to serve the Eastside's growing population and economy.*

*PSE evaluated several options for the best route to locate the new poles and wires.*

*We chose to follow the same corridor as the existing lines. .*



## An Upgrade our Booming Economy Can Rely on

They say that healthy infrastructure is the backbone of a healthy economy.

That's why Energize Eastside is so vital to the Eastside's future.

It will provide the first major upgrade to the backbone of the Eastside's electric grid in over 50 years.

Energize Eastside will help ensure that our dynamic economy can keep growing, innovating, and creating jobs for decades to come.

Get all the facts at [pse.com/energizeeastside](http://pse.com/energizeeastside).



PUGET SOUND ENERGY

### JUNE 8 2018 BELLEVUE REPORTER

*They say that healthy infrastructure is the backbone of a healthy economy.*

*That's why Energize Eastside is so vital to the Eastside's future.*

*It will provide the first major upgrade to the backbone of the Eastside's electric grid in over 50 years. .*



## A cool upgrade for hot summers

As temperatures climb during the summer, increased air conditioning heats up demand for electricity.

Energize Eastside will help meet growing demand by upgrading the Eastside's electric grid with more reliable infrastructure.

That's pretty cool for Eastside communities.

Get all the facts at [pse.com/energizeeastside](http://pse.com/energizeeastside).



PUGET SOUND ENERGY

### JULY 20 2018 BELLEVUE REPORTER

*As temperatures climb during the summer, increased air conditioning heats up demand for electricity.*

*Energize Eastside will help meet growing demand by upgrading the Eastside's electric grid with more reliable infrastructure. .*



## Conservation alone will not meet Eastside electricity demand

Eastside growth is pushing demand for electricity beyond the capacity of the existing electric grid.

While Eastside communities excel at conservation—and new energy-saving technologies are essential—these efforts alone cannot ensure reliable electricity.

We also must upgrade the backbone of our electric transmission grid. And that's exactly what **Energize Eastside** will do—upgrade the grid's capacity and keep Eastside lights on for years to come.

Get all the facts at [pse.com/energizeeastside](http://pse.com/energizeeastside).



PUGET SOUND ENERGY

AUGUST 23 2018  
BELLEVUE REPORTER

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