Is Energize Eastside needed?

Questioning PSEs Motive and Proof

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Why am I involved?

- I now live in California and will not experience the negative environmental impacts of EE

- But I don't like it when large corporations promulgate a "Scam" on the public to enhance their profitability.

What insights do I have?

- I did not have insights to “blow the whistle” on the VW emissions cheating scam
- I did not have insights to “blow the whistle” on Bernie Madoff’s investment scam.
- I did not have insights to “blow the whistle” on Enron’s scam.
- But I do have insights and expertise to “blow the whistle” on PSE’s EE scam.

What have I done to communicate my insights?

- I have written a paper on PSE's motivation to build the EE project.
- I have written a paper Setting the Record Straight on Energize Eastside's Technical Facts
- This presentation provides an overview of what is in those two papers.

PSE's motivation for building EE

- In 2007 PSE and Macquarie announced that Macquarie intended to purchase all of the common stock of PSE
- PSE and Macquarie worked through a long process to get regulatory approval
- In 2009 PSE and Macquarie completed the purchase
- As a result, Macquarie is now the decision maker for PSE

Why did Macquarie want to purchase PSE?

- PSE gets a regulated “rate of return” on its investments. That rate of return is approximately 10%
- Macquarie has access to a large amount of funds that it wants to invest and earn as large a return as possible.
- Where else can Macquarie make 10% on new investments today?

What did Macquarie say publicly about why it wanted PSE?

- Christopher Leslie, chief executive of Macquarie Infrastructure Partners stated:

  "We don't have employees. We're not the neighboring utility. Combining work forces and eliminating redundancies is not the story. ***Our interest is to grow the business.****"*

  Mercer Island Reporter…November 25, 2008

- By "growing the business" Macquarie can invest new funds and get a regulated return of approximately 10%

How much Money did Macquarie plan to use to grow the business?

- Macquarie stated they were committed to investing $5 Billion dollars in **new** PSE infrastructure.

  - This is no small amount given that the total price paid by the investment group to purchase PSE then **existing** infrastructure was $7.4 billion dollars

How is Macquarie progressing on its plan to make $5 Billion in new investments in PSEs regulated business?

- Indications are that it is not going well:
  - Since its 2007 announcement, the economic slowdown reversed the trend of increasing energy consumption
  - New technology and more focused conservation efforts continued to reduce electricity and natural gas consumption, even as population growth and economic activity rebounded in the Puget Sound region.
  - Part of PSEs service territory has been converted to Public Utility District (PUD) ownership and operation, reducing the need for new investment.

What kind of infrastructure does Macquarie need to invest in to meet its goals?

- New generation and conservation is problematic for Macquarie because of the "competitive bidding" rules that PSE must comply with
- New Transmission Lines and Distribution lines are the best investments…no "competitive bidding" rules

But what do you do if there is no need for $5 Billion of new transmission and distribution line investment?

- You try to justify projects that are not needed
- Avoid using PSE staff to make the “justification” because there might be questions about it
- Use scare tactics like “Blackouts will occur without the project”
- In order to “ hide” the fact that the investments are not needed and that blackouts will not occur, refuse to show the “justification” or “proof” of the need

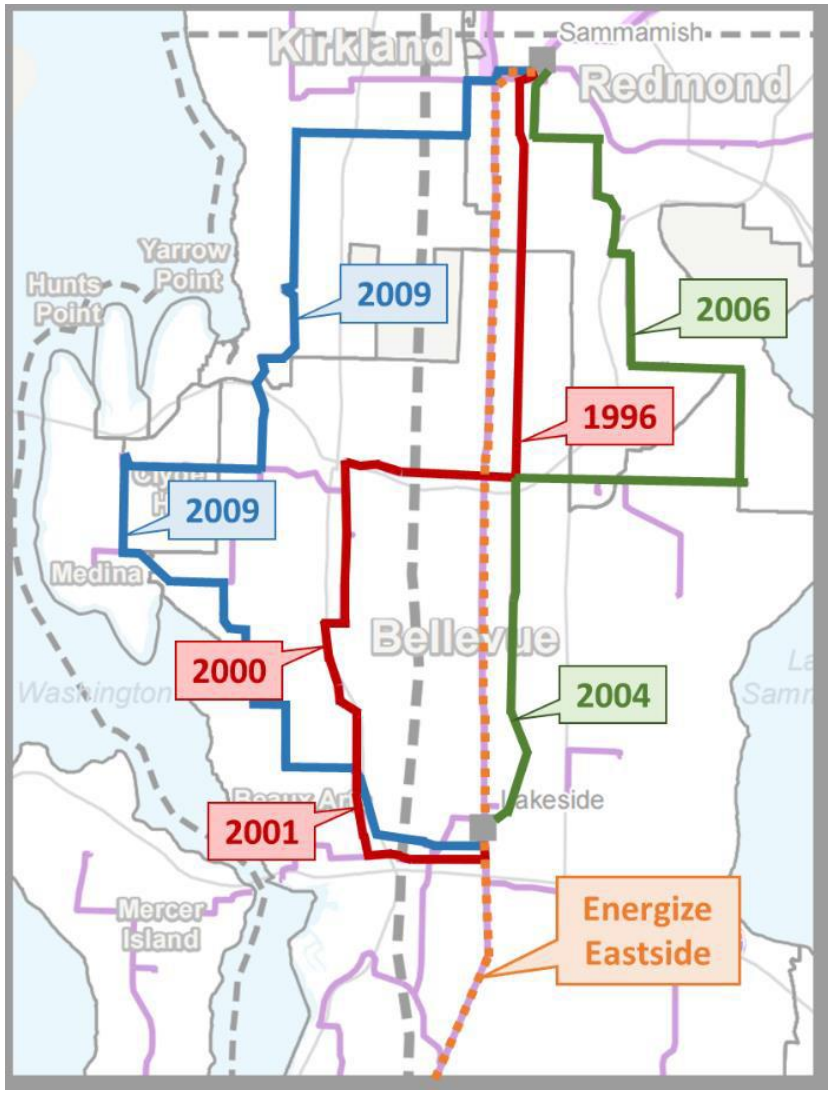
What can be said about Macquarie's attempt to justify EE?

- **Transmission investments can only be justified by use of a "load flow" study**
  - The Macquarie/PSE attempt to justify EE, by saying "nothing has been done to the 'backbone' for 50 years", is **not sufficient**. Only a load flow study can show if the system needs fixing or not.
  - Macquarie/PSE actually used the load flow study approach in their "Eastside Needs Assessment"

The statement "*nothing has been done to the 'backbone' for 50 years*" is wrong!

- In recent years a number of new 115 KV lines have been built on the eastside to serve growing loads
- In essence, the "backbone 115 KV" on the eastside has been replaced with a "Network 115 KV" system.
- See graphic next page…
- **The needed load flow study will necessarily reflect this network of 115 KV lines**

New 115 KV lines built in the eastside in recent years

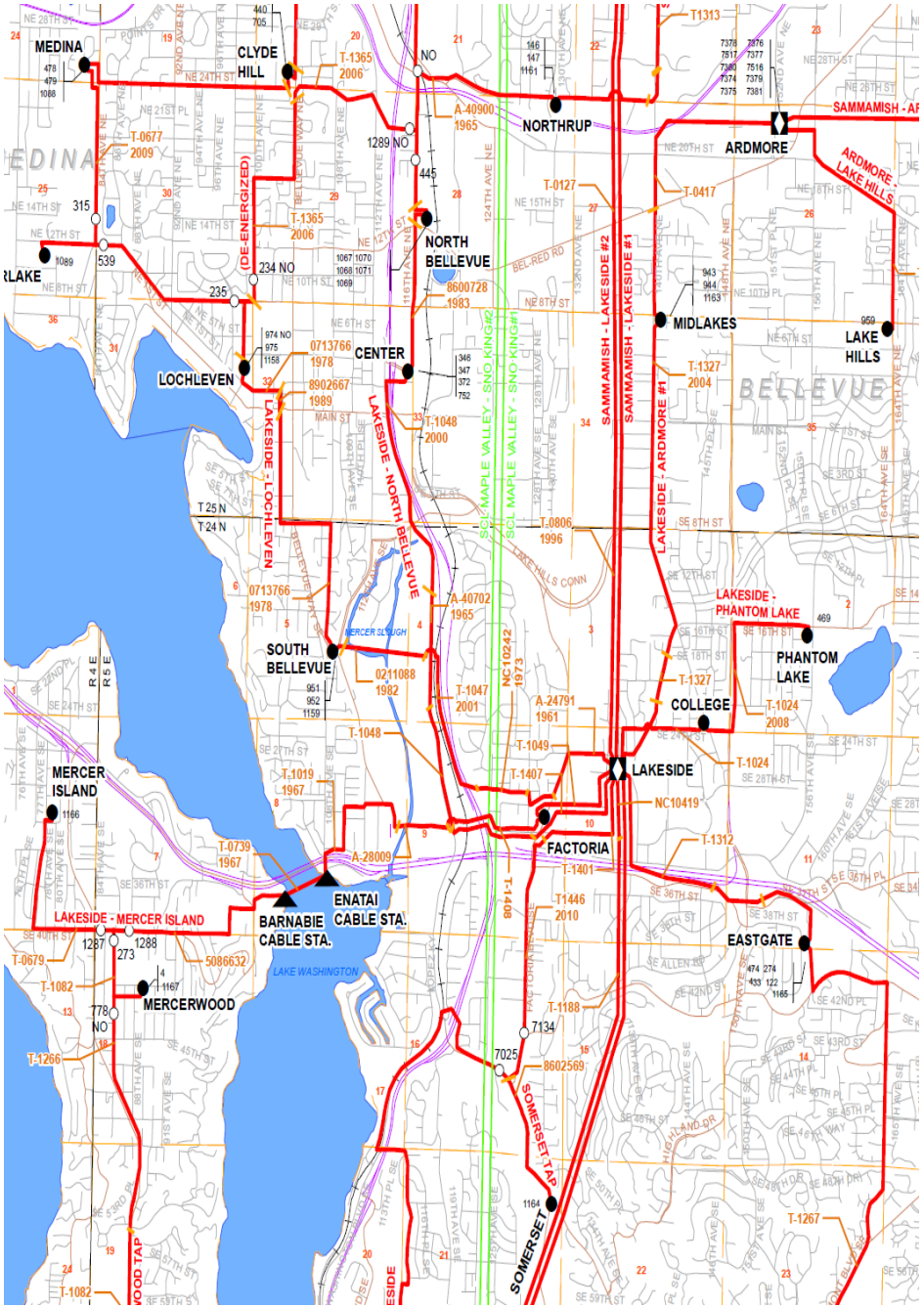


Who did Macquarie/PSE use to perform the load flow study?

- In order to perform the needed load flow study in 2013, Macquarie/PSE took the unusual step of hiring an outside consultant (**Quanta**) to perform the load flow study to prove the need for Energize Eastside. Not using PSE's in-house experts.

Note: Quanta has done considerable consulting work for Macquarie in other areas of the country. Quanta will want to keep Macquarie happy.

What is a *"load flow study?"*



Grids can get complicated.

We use computer simulations to study how the grid reacts in different situations.

Red lines show *transmission* lines not *distribution* lines.

Load flow study

Inputs

- Physical layout of grid
- How much electricity is needed
- How much electricity can be generated
- Resistance in each wire

Outputs

- How much electricity passes through each part
- Warning if any part overloads
- Warning if voltage drops too much

Did Quanta correctly perform the study?

– No, Quanta did not correctly perform the study. In doing their load flow analysis, Quanta:
  - changed the data that PSE reports to federal energy agencies and
  - made a number of questionable assumptions that go beyond normal industry practice.

What does this information cause you to conclude?

- I believe that Macquarie/PSE are pursuing this project for the sole purpose of increasing profits for Macquarie.
  - The transmission line will be expensive for PSE's customers,
  - It won't increase reliability or provide other benefits to PSE customers
  - It will damage the environment.

PSE has provided no legitimate "proof" of the need for EE

- Again…Transmission investments can only be proven necessary by use of a "load flow" study
- The Eastside Needs Assessment performed by PSE/Quanta states the need was identified by a load flow study.
- Quanta concluded that PSE's equipment might overload under extraordinary conditions:
  - simultaneous failure of two transformers,
  - on the coldest day of the year,
  - at the same time a huge amount of electricity is being transmitted to Canada, and
  - half a dozen local generation plants are shut down.

What was your initial reaction to these assumptions?

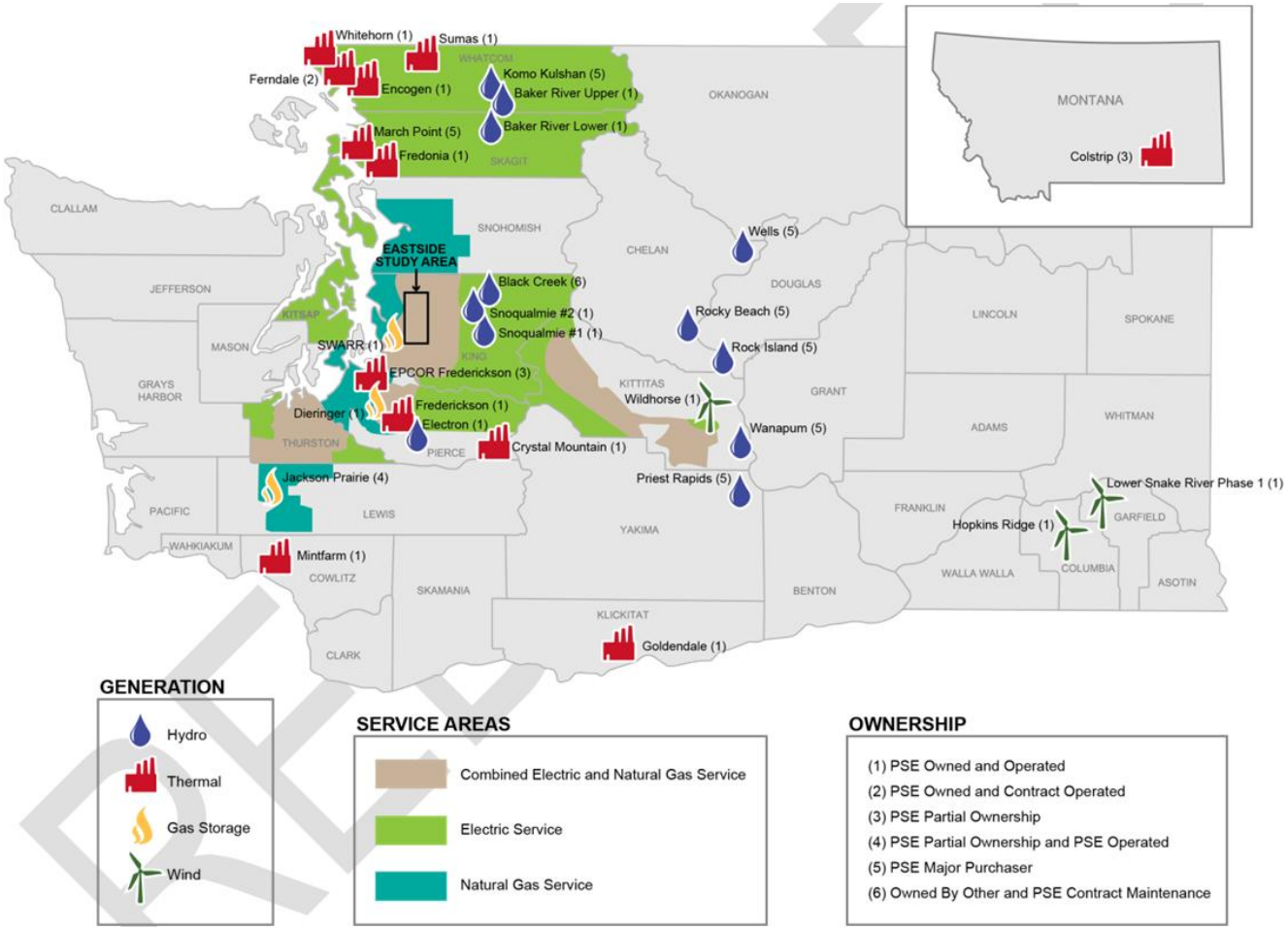
- First I was shocked that their study shut down not one, not two, but **six** local generation plants
  - I was vice president of power planning during the time we acquired these local generation plants. We worked hard to acquire them for the purpose of providing power *in exactly the type of need scenario that Energize Eastside is based on* - peak need on a very cold (less than 23F) winter day.
- After shutting down those six plants, PSE is very short on having sufficient power to cover their System Peak load. **Quanta did not say how PSE would meet its Total System load with these six plants shut down**.

What are the plants that Quanta shut down?

		Max MW	Quanta MW
CCCT	Encogen	185	125
CCCT	Ferndale	282	0
CCCT	Fredrickson 1 (PSE share)	141	0
CCCT	Goldendale	278	278
CCCT	Mint Farm	297	297
CCCT	Sumas	140	0
	sub total	1323	700
SCCT	Fredonia 1&2	225	0
SCCT	Fredonia 3&4	116	0
SCCT	Whitehorn 2&3	162	0
SCCT	Fredrickson 1&2	162	0
	sub total	665	0
	TOTAL	1988	700

Where are those 6 plants located?

Essentially the red plants in the Puget Sound Region on the map below

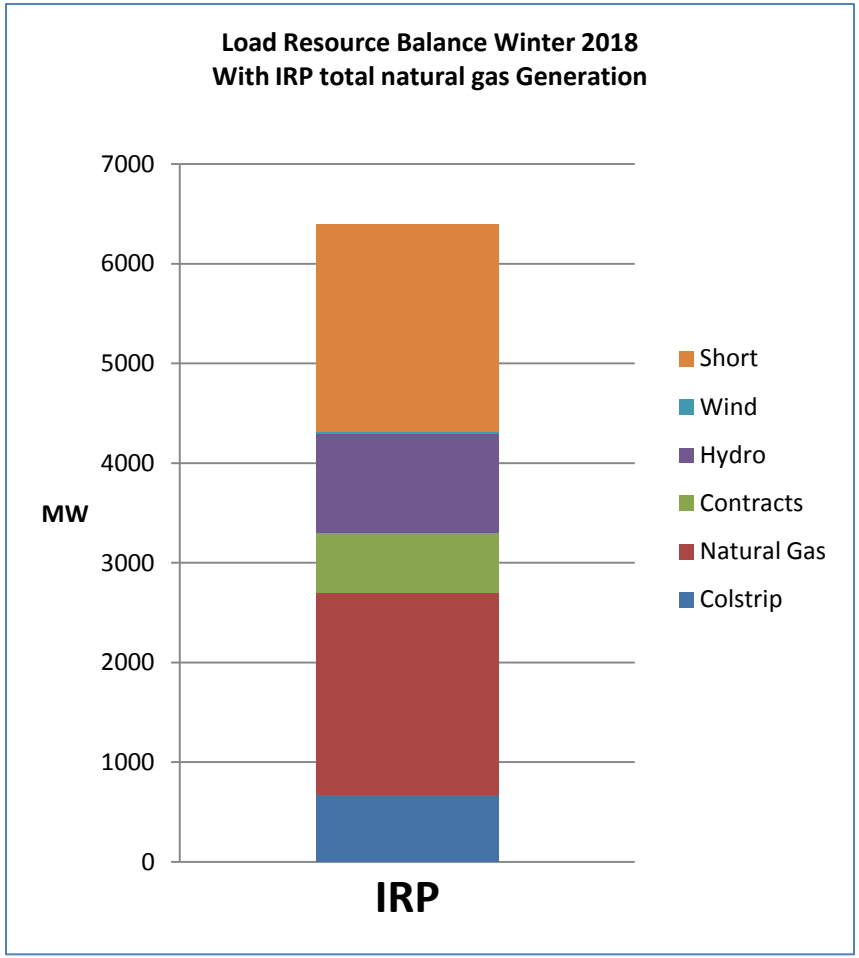


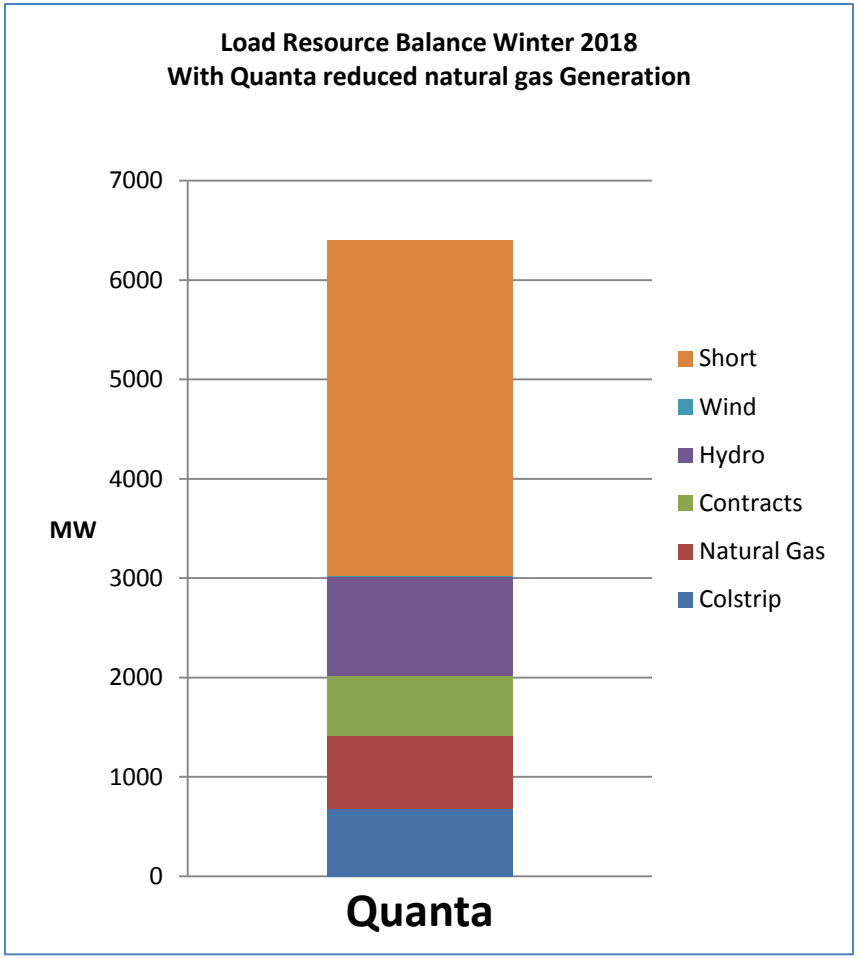
How Much Power does PSE need to meet its System Peak Load in Winter 2018?

- *According to PSE's IRP, PSE needs 6,500 MW of supply to meet its System Peak plus reserve requirements in the winter of 2018*
- *According to PSE's IRP, PSE is "short" by about 2100 MW of having sufficient generation to cover this need.*
- *While that is a very large "shortage", it gets even larger (nearly 3,400 MW) under the Quanta Load Flow model assumptions…an untenable shortage.*

  – *See graphic on next slide*

PSE “Short”: IRP vs Quanta





What other assumptions did Quanta make that you found problematic?

- The assumption that 1,500 MW would be flowing to Canada under this extreme cold event was another problem.
  - I am aware that the Columbia River Treaty does not mandate that 1,500 MW be delivered to Canada under such an extreme cold event.
- I was interested in seeing the Quanta load flow input data file to see what other assumptions that they might have made that I thought were problematic.

Did you ask to see the Quanta files?

- Yes, I requested that PSE provide me the Quanta files
- **PSE denied my request**, which was surprising to me since I had already received the requisite security clearance from the Federal Energy Regulatory Commission (FERC). FERC stated that I had a legitimate need to review the data.

Why did PSE deny your request?

- PSE refuses to show me the Quanta load flow study data file because they fear that I may use the data to find weaknesses in the grid which will allow me to perform terrorist outages on the grid.
- I already have significant knowledge about the grid and the weaknesses in it. I already have the information I would need to perform terrorist activities if I were so inclined, which I am not.
- PSE's reason for denying my request is not legitimate.
  - I believe that PSE is denying my request because they know that I will find (and point out) that the Quanta load flow study is flawed.

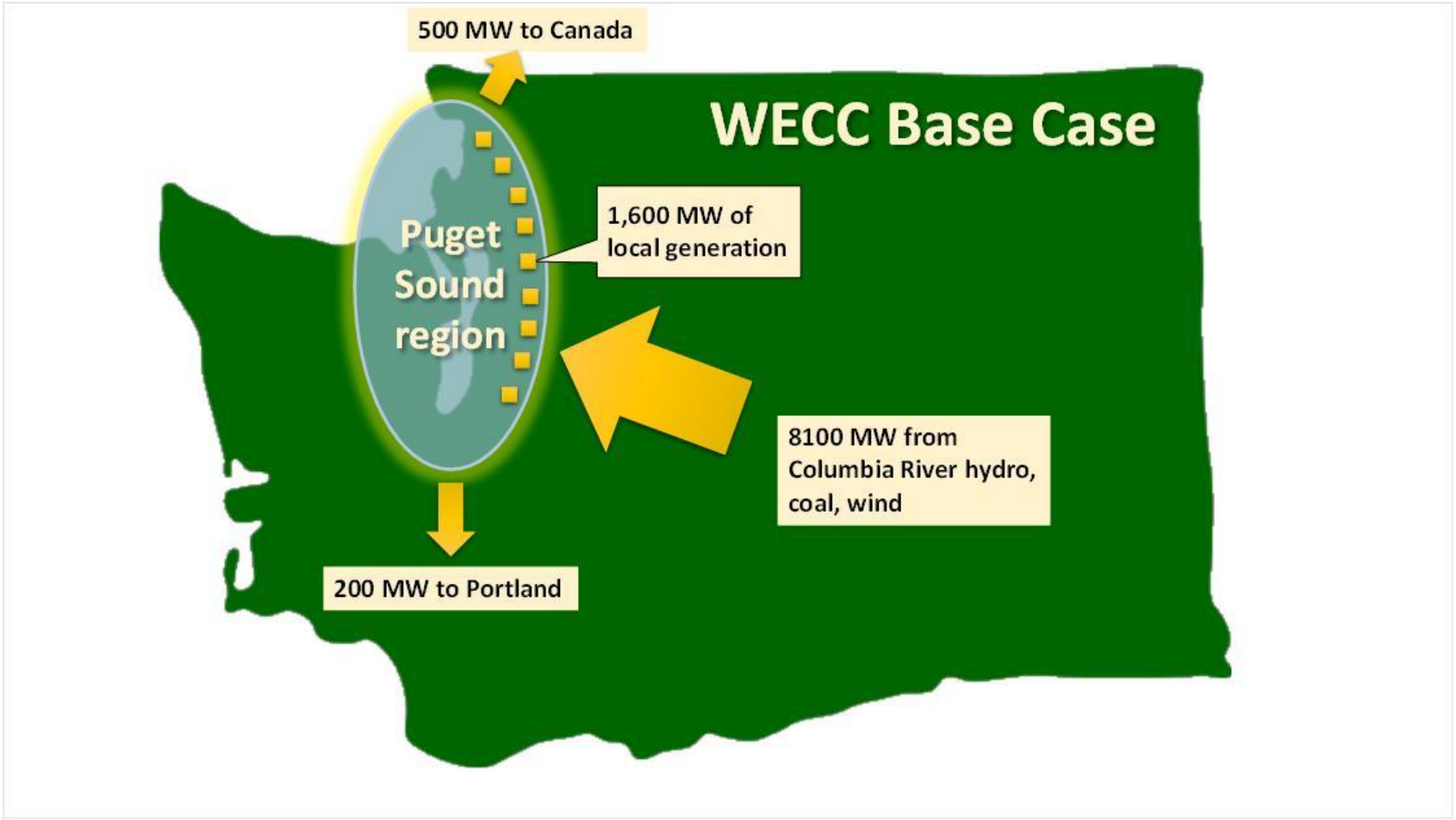
What did you do after PSE denied your request?

- I asked FERC to provide to me the load flow Base Case data that PSE had filed with FERC.
- FERC provided me that PSE load flow Base Case data.
- I observed that PSE's load flow Base Case data for the winter of 2018 has more appropriate assumptions in this cold winter situation regarding (a) local area generation operation and (b) flows to Canada.
- I recruited another transmission expert, Roger Schiffman, to obtain the utility standard load flow study computer model and we conducted our own load flow study of the need for Energize Eastside starting with the load flow Base Case data that PSE filed with FERC.

What did you learn from the Lauckhart-Schiffman load flow study effort?

- I learned that Energize Eastside is not needed if appropriate assumptions are reflected in the load flow study. No blackouts will occur if EE is not built.
  - [See Lauckhart-Schiffman *Load Flow modeling for "Energize Eastside"* report dated February 18, 2016]
- I learned that the greater Puget Sound Region of the grid will experience major problems (aka blackouts) with or without Energize Eastside being built *based on Quanta's problematic assumptions.*
- I learned that in order for Quanta to avoid these other blackout problems with their assumptions, that Quanta must have made other changes to the PSE Base Case load flow data for the winter of 2018.

PSE's Winter 2018 Base Case



The PSE/Quanta Problematic Scenario

And resulting Cross-Cascades problem

Has PSE provided any information that helps you develop an educated guess of what other changes Quanta made?

- Yes. In the EIS process for Energize Eastside, PSE provided a listing of a number of "electrical criteria" it was using in its studies of the need for Energize Eastside.
- Three of those criteria jumped out at me as being particularly inappropriate

What was the first criterion you found problematic?

- **PSE stated criterion number 7**: "*Adjust regional flows and generation to stress cases similar to annual transmission planning assessment.*"

  Here is what that means!!!:

  - In 2013, ColumbiaGrid had run a "stressed load flow case" **for information purposes** just to see how the system would respond if the Base Case was adjusted to significantly increase stresses on the system. (e.g. shut down Puget Sound Area generation and increase flows to Canada)
  - ColumbiaGrid indicated that this "stressed load flow case" caused significant adverse impacts on the system but there was no need to make any fixes to the system to address those problems as a result of this stressed case run because **the case exceeds NERC Reliability Criteria**.
- *BUT PSE has made this the main scenario for looking at the need for EE!* ***That makes no sense.***

What were other criteria you found problematic?

- **PSE stated criterion number 8**: "*Take into account future transmission improvement projects that are expected to be in service during the study period*."
- **PSE stated criterion number 2**: The "Study Period" was from 2015-2024.

It appears that in order for Quanta to make their Load flow study work without causing blackouts in the greater Puget Sound area that Quanta assumed that at least one and probably two new Cross North-Cascades transmission lines are built. No one is currently pursuing these infrastructure improvements.

What do you conclude about the Quanta load flow study?

- In a nutshell Macquarie/PSE/Quanta have decided to run a Load Flow study to determine the need for EE, which load flow study has major flaws.
- First it starts with a scenario that has negligible probability of occurring.
- A Scenario that vastly exceeds FERC/NERC reliability criteria.
- Then in order to make that Scenario work electrically, Quanta seems to have modeled new Cross North-Cascades transmission lines that no one is working on.
- And no one is working on them because any load flow scenario that is consistent with FERC/NERC reliability criteria shows the new Cross North-Cascades transmission lines are not needed.

Is the Quanta load flow study appropriate for examining the need for Energize Eastside?

- No. This Macquarie/PSE/Quanta load flow study is completely inappropriate for studying the reliability of power service to the Eastside.
- The Lauckhart-Schiffman load flow study is the appropriate way for studying the reliability of power service to the Eastside.
- **The Lauckhart-Schiffman study demonstrates that EE is not needed.**

Has PSE provided "proof" of the need for EE?

- No. PSE has not provided the load flow study that it claims demonstrates the need for Energize Eastside.
- The Lauckhart-Schiffman load flow study, which is based on PSE's Base Case, demonstrates that Energize Eastside is not needed.
  - *PSE has criticized the Lauckhart-Schiffman load flow study for running all the Puget Sound area generation and for not sending 1,500 MW to Canada. These criticisms have been fully rebutted [see attachment to Lauckhart email to EnergizeEastsideEIS dated April 29, 2016]. The Lauckhart-Schiffman assumptions are more in line with what regulators expect and which correctly balance environment, cost and risk of outage. The Lauckhart-Schiffman assumptions are also consistent with PSE's Base Case filed with FERC*

By all indications……

- PSE is promulgating a “scam” on the public to enhance their profitability

- The “scam” imposes significant adverse environmental impacts on the public but no benefits

It must be stopped

Action that the four cities and EBCC should take

- Issue the following ultimatum to PSE

> "***If you do not make your load flow studies available for inspection by individuals that have CEII clearance from FERC, we will not even consider issuing a permit for Energize Eastside.***"

Energize Eastside will provide no reliability benefit to the Eastside

- The Eastside has had numerous power outages in the past and will continue to have power outages in the future. These outages are primarily caused by wind blowing trees and limbs into the localized overhead 12 KV distribution lines.
- **Energize Eastside will do nothing to decrease these outages in the future**.

The EIS staff is wrong

- The December 21, 2016 *Phase 2 Draft EIS – Scope of Analysis* includes a discussion of the "No Action" alternative. The following sentence is included in that discussion:

  "*If no action is taken, load shedding (forced power outages within the Eastside) would likely be needed during the highest demand periods in the near future*."

- **As pointed out in the rest of this report, there is no legitimate evidence on the record that this statement is true. In fact, the legitimate evidence on the record is that this statement is false**

PSE's bogus scenario

One more (detailed) look

- Very cold (i.e. 23 degree) weather occurs on the eastside during evening peak load hours…an event that normally occurs only once in every few years
- At that same time, 1,500 MW is being delivered to Canada…but:
  - There is no requirement to deliver 1,500 MW to Canada under such an event. [*See comments filed by Christina Aron-Sycz dated August 1, 2016 which includes a White Paper entitled "Evidence that there is no requirement to deliver 1,500 MW to Canada on a Firm Basis….Resulting Conclusion is that EE is not needed."*], and
  - The Puget Sound Region in total would experience low voltage caused blackouts if 1,500 MW is being delivered to Canada during such a cold weather event.

PSE's bogus scenario (Cont.)

- At the same time PSE has shut down 6 of its Puget Sound Area generators…something that PSE would not do under such a cold event because
  - Puget would not be able to meet its own Total System Load without these generators running (*these generators were built to provide power under these circumstances and it is absurd to say they would not be operated under these circumstances*) , and
  - The Puget Sound Region in total would experience low voltage caused blackouts if 6 Puget Sound Area generators are shut down during such a cold weather event.
- At the same time two major 230/115 KV transformers fail at the same time when all these other things are happening…*But since all these other things cannot happen at the same time without there being low voltage caused blackouts, this scenario makes no sense*.

The EIS Record

- CENSE and Mr. Lauckhart have placed a number of documents on the EIS record that provide evidence that Energize Eastside will not reduce the number of outages on the PSE system on the eastside.

Conclusion from the EIS Record

- The scenario that PSE claims needs the Energize Eastside line in order to increase reliability of electricity supply to the Eastside will never happen. That justification for building Energize Eastside is not legitimate.
- The Lauckhart-Schiffman load flow study (which used PSE's Base Case data set for the Winter of 2018) demonstrates that Energize Eastside will provide no reliability benefit to the eastside.
- **The No Action alternative will not result in any blackouts on the eastside or elsewhere on the grid.**