

August 15, 2017

Dear Commissioners,

Members of the citizen group CENSE and other members of PSE's Integrated Resource Plan Advisory Group (IRPAG) have been asking for more thorough analysis and discussion of PSE's transmission projects in the IRP, especially the expensive and controversial "Energize Eastside" project.

Our three top questions are:

1. Is Energize Eastside truly mandated by federal reliability requirements? Specifically, do NERC standards require PSE to facilitate export of 1,500 MW of non-firm electricity to Canada while the Eastside is suffering an N-1-1 emergency failure, six local generation plants are offline, and demand is at its highest peak of the year?
2. Is a 230 kV transmission line through heavily populated residential areas and within feet of two half-century old pipelines the safest and most cost-effective solution?
3. Given recent advances in battery technology (and the cancellation of a large transmission line by BPA), shouldn't we ask some hard questions before spending \$300 million on a transmission line?

The need for Energize Eastside was first described in PSE's 2013 IRP. At that time, batteries were too small, too expensive, and perhaps too risky to consider as a solution for the Eastside.

In 2015, PSE engaged Strategen to reevaluate batteries.¹ Unfortunately, this report has problems:

1. Strategen uses data from 2014. Storage projects have been installed since that date that call into question some of the figures used in this report.
2. The study requires batteries to exactly match the strengths of the upgraded transmission line. Specifically, **batteries are required to eliminate all Corrective Action Plans (CAPs)** (see page 23: "In order to completely resolve the need, the energy storage device would need to (a) eliminate the need for CAPs...") This isn't a NERC requirement, but rather an easy way for PSE to disqualify batteries of a reasonable size. One could turn the tables by requiring the transmission line to match the advantages of batteries, like reduced carbon emissions or preservation of mature trees. Obviously, each solution has different strengths and weaknesses. Ratepayers want PSE and the WUTC to make enlightened tradeoffs of costs and features.
3. The study does not consider the scalability of batteries. PSE could initially install the capacity required to serve peak demand expected during the next few years. Additional capacity could be acquired shortly before it is needed. A deferred purchase saves money because the cost of batteries continues to decline rapidly. Some forecasts anticipate a decline of 50% by 2020. Purchases can be avoided altogether if demand grows more slowly than the forecast rate (PSE expects customer demand to grow 2.4% annually, which we find difficult to believe).
4. The study uses an "effectiveness factor" that requires battery sizes to be scaled up by a factor of **five** over the size of the need. This figure is based on load flow studies that PSE will not allow us to review. Were these studies conducted reasonably and without error?

¹ http://www.energizeeastsideis.org/uploads/4/7/3/1/47314045/eastside_system_energy_storage_alternatives_screening_study_march_2015.pdf

The unexpected and dramatic decline of battery prices is reflected in the latest cost analysis that was shared by PSE at the August 11 meeting of the IRPAG. PSE found a **4-hour flow battery** has become the second least expensive peaking power supply. Batteries aren't quite as cheap as a "Frame Peaker" gas plant, but that is because a loophole in carbon pricing regulations gives peakers a pass on prices that are charged for a gas-fired Combined Cycle plant.

With these facts in mind, we believe it is prudent to reexamine some of the assumptions in Strategen's 2015 report. In Table 46, included here, Alternate #1 could be a feasible alternative to Energize Eastside if NERC-allowed CAPs are maintained. However, both the acreage and cost figures should be updated.

Table 46. Energy Storage Configuration Summary

Configuration	Power (MWp)	Energy (MWh)	Acreage	Est. Cost (\$MM)	Includes Non-Wires Alternatives ¹¹⁷	Technically Feasible	Meets Requirements
Baseline Normal Overload Reduction	328	2,338	19.6	\$1,030	✓	✗	✓
Alternate #1 Emergency Overload Elimination*	121	226	5.8	\$184	✓	✓	✗
Alternate #2 Normal Overload Elimination	545	5,771	45.7	\$2,367	✓	✗	✓

Using 4-hour flow batteries from a company like UniEnergy Technologies, densities of 40MW/acre can be achieved, requiring half the acreage quoted. These batteries could easily fit in the new Richards Creek substation that PSE is preparing to hold a new 230/115kV transformer.

The cost would probably be about half the \$184MM shown here, and about **1/3 the cost of Energize Eastside**, or even less if an incremental acquisition strategy is used.

The table assumes that battery cells degrade 2% per year. Vanadium flow batteries do not degrade.

We ask for a careful examination of PSE's "requirements" for energy storage. These requirements should be carefully vetted before they are used to disqualify batteries as a prudent alternative.

We also ask that the advantages of batteries be noted in any cost comparison. For example, batteries cover additional reliability scenarios that a transmission line does not. Batteries can store clean energy from renewable sources and thereby reduce carbon emissions. Batteries do not increase the risk of catastrophic pipeline explosions. Batteries do not require the destruction of thousands of valuable urban trees nor harm dozens of streams that provide fish habitat.

The cities and the EIS consultants do not question Strategen's analysis. In IRPAG meetings, PSE deflects all questions about transmission lines that are not necessary to support new generation. PSE does not agree that Energize Eastside should be examined in the IRP.

If PSE continues to stifle a discussion of these topics by the IRPAG, we ask the WUTC to schedule a public hearing so these important questions can be thoroughly and fairly considered.

Sincerely,



Don Marsh, President, CENSE.org