From:	Shirley Storms
To:	UTC DL Records Center
Subject:	Requested comments on PSE IRP
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Attachments:	UTC Comments PSE IRP.docx Jackson Prairie vs LNG tank for UTC.xlsx

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Attached are the written comments requested during the oral comments I gave at the PSE IRP meeting yesterday. During my 1 minute comment period, the Commission requested a chart and I promised to send the backup information.

Feel free to contact me if you have any questions.
Thank you for your attention on this critical issue.

Steven Storms

Storms123@aol.com
253 202-9925

Dear WUTC Feb 22, 2018

I am writing in response to the 1 minute testimony I gave during the comments portion of the PSE IRP meeting in Renton yesterday. You requested my chart and I promised to send you some more information.

My comments were directed at the claimed need that PSE makes, that the LNG plant in Tacoma is necessary to meet the peak-shaving demands of Tacoma.

First, I would like to make it clear that I am a retired Engineer with over 40 years experience in the energy and environmental field. My degree was in Chemical Engineering and I was a Licensed Professorial Engineer in the State of Washington. I retired from Weyerhaeuser after 30 years as the Project Director of Process Evaluation. Evaluating both Weyerhaeuser's and competitors' facilities and capital projects is what I specialized in. Benchmarking was one of our key tools.

While, I could speak on many problems with the LNG facility, (Safety, Environmental and Financial) I was only able to comment on my analysis of the "need" for the LNG facility. I would be glad to share my observations on the other problems if you would consider my input. I will touch on some of them briefly as it concerns the "need" below.

There is a strong indication that the need for the LNG peak-shaving has been highly exaggerated. I can think of several reasons that this would benefit Puget Sound Energy. From their own claims, the peak-shaving would only be needed on maybe half a dozen days per year when the temperatures were very low and the demand for natural gas was increased. I would assume this would only happen in the winter in the

months of December, January and February. From the Final Environmental Impact Statement, (FEIS) they claim that only about 7% of the capacity would be needed to handle this need. They also claim that 6 million of the 8 million gallons storage capacity would be held in reserve to handle this 7% need. If the need for this peak-shaving capacity were real, it would still allow the LNG plant to utilize all 8 million gallons of the storage capacity for most of the year. This would relegate the capital allocation of $133 million (43%) to a much lower rate.

Next, the LNG will be supplied by a 16 inch natural gas pipeline that is tied into a major natural gas transmission pipeline in Fife. This transmission pipeline in Fife is also 16 inches. My claim is that the LNG plant will use about 20% of the natural gas being provided to Tacoma. While PSE may claim that there is a need for peak-shaving capacity, this need is being caused by the consumption used by the LNG plant. With this fictional need being caused by the LNG plant, it allowed PSE to claim that the public should be required to pay for the peak-shaving demand caused by the LNG plant demand.

In the Integrated Resource Plan in the Executive Summary, PSE LNG Distribution Upgrade (Page 1-26) it states that,

"*The PSE LNG peaking facility currently under construction in Tacoma allows the company to withdraw gas from the storage tank and deliver it directly into PSE's local distribution system. This upgrade is not an expansion of the LNG facility itself, but an expansion of the distribution network's capacity east of Tacoma that will allow more gas to flow from the LNG facility into PSE's gas supply network. <u>The analysis</u>*

forecasts that this will be needed and cost effective by the 2027/28 heating season."

"The analysis forecasts that this will be needed and cost effective by the 2027/28 heating season." This statement if taken as being true, means that the LNG peak-shaving will not be needed for nearly 10 years and will not be cost effective until then. Can it also be inferred that during those nearly 10 years that the 6 million gallon reserved capacity will not be needed and will be used for some other purpose or that it will be used but at a rate the will not be cost effective? Either way, it appears the rate paying consumer is not being treated fairly. We are paying for something that is not needed or something that will increase our rates.

Puget Sound Energy owns the 14th largest underground natural gas facilities in the US. This is located in Jackson Prairie, WA, which is about 100 miles south of Seattle. On the PSE website, they claim the facility stores 25 billion cubic feet of working natural gas.

"Storage capacity - Jackson Prairie has undergone a steady increase in storage capacity over the years. In 2002, when maximum storage was approximately 18 billion cubic feet of deliverable "working" gas, Jackson Prairie's owners launched a 10-year effort to boost capacity by 34 percent. Today, following completion of the expansion project, Jackson Prairie can store 25 billion cubic feet of working natural gas. (Note: Jackson Prairie's total storage, including "cushion" natural gas used to provide pressure in the reservoirs, is approximately 47 billion cubic feet.)".
https://pse.com/aboutpse/psenewsroom/MediaKit/052_Jackson_Prairie.pdf

This is a huge storage capacity. The extra storage that the LNG plant would provide is miniscule compared to the Jackson Prairie Storage. The LNG storage tank is 8 million gallons of LNG with 6 million reserved for peak-shaving. Using the 6 million as the basis, this would provide only 0.48 billion cubic feet of extra capacity as compared the 25 billion cubic feet already available from Jackson Prairie. This would 50 times larger or only be an increase of 1.9%.

Again it appears that a claim for peak-shaving capacity is over exaggerated in order obtain the $133 million from the public to help pay for the LNG plant.

I think the claim is, PSE can purchase natural gas during low demand periods and prevent paying higher rates during the winter during the high demand periods. In theory this would be correct. In actuality, there is a flaw in this claim. Storage in the underground Jackson Prairie might meet these criteria, but storage as LNG is much more costly. First, the natural gas must be must be stripped of all impurities before converting to Liquefied Natural Gas (LNG). Then it must be cooled to negative 260 degrees F. These are additional costs. Then it must be maintained at the negative 260 degrees F until needed, maybe for months. This is an additional cost. Finally, it must be re-gasified in order to become natural gas again. Again, this is an additional cost. Now, the capital cost of the processing equipment and storage tank must be included. This makes the use of the LNG plant as a storage facility, much more expensive than the underground facility which does not require any of the added costs. This might be the reason that PSE claims that the LNG storage would not be cost effective until 2027/2028. The added expense of the capital cost might be written off by then.

On a little more financial note, but still related to need, the actual financial outlook as described in the FEIS indicates that the rate paying customers will never recover their $133 million investment. The FEIS states that the City of Tacoma will receive an additional $60,000 per year from sales taxes of the increased rates paid by the public for the peak-shaving gas sales.

"The city of Tacoma would also collect business and occupation taxes associated with the revenues generated by the Proposed Action. Tax receipts from this source are estimated to be approximately $75,000 per year. Finally, gas customers across PSE's service territory would experience a small rate increase associated with the portion of the Project that would provide peak-day gas service. This rate increase would in turn raise the utility taxes receipts associated with PSE's gas utility in the city of Tacoma by approximately $60,000 per annum."
FEIS 3.12.4.2 Operational Impacts, Tax Revenue for Local Governments 3.12-10 page 359. http://www.rosalux.eu/topics/social-ecological-transformation/methane-emissions/

I am not sure of the tax rate that should be used, but 10%b should be very close. A $60,000 increase in tax revenue would equate to at $600,000 increase to consumers on a per annum basis. The investment of $133 million because of the need for peak-shaving is going to cost the rate paying consumers not only the $133 million for capital, but an additional $600,000 per year in increased rates. I am sure that was not the intent of the WUTC in approving the project.

Even thought PSE claims that the peak-shaving is needed to meet future demand, they also claim that is not needed until 2027-2028 and that it will not be cost effective until then. They have established that

they own one of the largest underground storage facilities in the US at Jackson Prairie. This facility can handle 50 times the increase that the LNG facility will provide. They have stated in the FEIS that the customers will see an increase in rates from the LNG peak-shaving operation.

During my tenure working in a large industry, we purchased large quantities of both electricity and natural gas. With both commodities, we were able to buy both firm and interruptible supplies. Because the interruptible supplies had a stipulation on it, it was sold at a discount. Our facilities readily took the risk of having our supply reduced during heavy demand periods due to the large discount. Many of our boilers were also designed to burn mixed fuels, so we could switch from gas to alternative fuels such as bark, diesel or bunker fuel. It would appear to me that PSE also has the option to sell both firm and interruptible gas and electrical power. During high demand periods, the incremental gas demand could be pulled from the interruptible supply customers.

The whole demand "need" claimed by PSE is highly questionable. It appears that it is a key block in the argument that the public needs to pay for 43% of the capital costs. Without this contribution, the economics of this plant would not be sufficient to build. Much like several other plants that have recently been curtailed, the falling price of LNG made the projects financially unsound. The export price of LNG has fallen from $15/1000 cubic feet to $5/1000 cubic feet. This alone should make anyone leery of investing in the LNG plant.
https://www.eia.gov/dnav/ng/hist/n9133us3m.htm

The whole project is contingent on the $133 million contribution from the public. I believe the original capital cost was indicated to be $275

million. PSE claimed a $37 million NPV, which a rough calculation would indicate a 13.5% Return on Investment (ROI). For a public utility type company, this is very good. When the capital cost increased by $35 million to $310 million, it would cut the NPV to only $2 million with a Return of only 0.6%. A project with less than 1% return on investment would never be viable. This is when PSE claimed the public should pay for a large portion of the project. The public contribution did not change the project financial forecast, but it did change the economics for PSE. Instead of PSE paying the whole amount, the $133 million from the public, reduced the contribution by PSE to only $177 million. Instead of looking at the return from the whole project, we need to look at the return that PSE would be making. For their $177 million contribution, they would still get the $2 million NPV plus the additional $133 million from the public contribution (for a total of $135 million). The PSE return now becomes a 76% ROI ($135MM/$177MM). This is an astronomical return for a public utility type project. There is no wonder that they are building the plant as fast as possible. They have spent millions in advertisements to present their project as a clean environmental project that has no safety risks. They have proceeded to build the project without obtaining the building permits from Puget Sound Clean Air Agency. The returns are so high that even the threats of civil monetary penalties do not discourage them. The financial return has been elevated to such a high level that they can afford several million dollars in penalties. The whole project is predicated upon the assumption that PSE must include a peak-shaving component that requires the public to contribute to such a large amount. Without this contribution, the economics for PSE are unfavorable. In fact, the economics for the total project are already unfavorable, but the

economics for PSE can still make them a fantastic return at the expense of the public.

Please do not let the PSE LNG plant lock the public into a long term project that is doomed from the start. If the project was profitable enough to stand independently, PSE would not need the contribution from the public. Their demand that the public needs to contribute is a made up demand. If the project were financially feasible, PSE would not have any problem borrowing the money. Only if they cannot borrow the money should we be concerned. A lending agency would look at the prospectus and either approve or deny an application for funds. It appears that PSE had to come to the public trough for funding because they could not get it anywhere else. The current structure makes PSE millions of dollars and it is all because they made a claim that is false and cannot be supported.

Please review the claims that I made above and I believe you will concur that PSE is using the system to make false claims so that "they" can reap an enormous return on a project that is not even viable.

I would be glad to provide more detailed information if you are interested. You can contact me at

Storms123@aol.com

253 202-9925

Steven Storms

BSChE, PE – (retired)

Comparison of Jackson Prairie underground storage to the LNG peak-shaving capacity.

Information taken from PSE website - https://pse.com/aboutpse/psenewsroom/MediaKit/052_Jackson_Prairie.pdf

		LNG		Natural Gas	
Jackson Prairie Underground Storage					
	Storage Capacity	Nat Gas		**25,000,000,000**	**cubic feet**
	Can Deliver	Nat Gas		1,150,000,000	cubic feet per day
	Can deliver 25% of regional demand on cold day on cold day.			1,150,000,000	cubic feet per day
	Regional demand on cold day	Nat Gas		4,600,000,000	cubic feet per day
		Nat Gas			
LNG Plant					
	Storage Tank	LNG	8,000,000 gallons	641,625,451	cubic feet
	Reserved for Peak-Shaving	LNG	6,000,000 gallons	481,219,088	cubic feet

Conversions used for calcualtions.

600	Expansion of LNG to Natural Gas
7.481	gallons per cubic foot
1.1	Assume 10% loss of natural gas

	Jackson Prairie	LNG Storage
	MM Cubic Ft	MM Cubic Ft
	25,000	481

	Jackson Prairie	LNG Storage
Storage Capacity	25,000	481
Daily Available	1,150