

Monday, January 15, 2018

Dear UTC Commissioners:

Subject: COMMENTS ON UE-160918 AND UG-160919 - IRP GAS SECTIONS ARE OUT OF TOUCH WITH SCIENTIFIC AND POLITICAL REALITIES. NO NEW GAS INFRASTRUCTURE IS NEEDED.

On June 1, 2017, Governor Inslee along with New York Governor Cuomo, and California Governor Brown announced the formation of the United States Climate Alliance, “a coalition that will convene U.S. states committed to upholding the Paris Climate Agreement and taking aggressive action on climate change.”¹ Under the Paris Climate Agreement, the United States pledged to reduce its greenhouse gas emissions by 26% to 28% by 2025, based on 2005 levels.²

In order for the state of Washington to achieve the greenhouse gas reductions that we have committed to under the Climate Alliance agreement, we would need to reduce emissions by about 2.5% in each of the next eight years.³ Other state-level climate commitments propel us down that same path.

Recent polling shows that nationally voters want the United States to participate in the Paris Climate Agreement by a five to one margin.⁴ Analyses by the Yale Program on Climate Communications show that citizens living in PSE’s service territory have some of the highest levels of concern about climate change and some of the strongest levels of support for policies to address climate change in the nation.⁵ The margin of support for achieving these goals is far about five to one in PSE’s service territory.

PSE’s IRP offers us not a single scenario that achieves what citizens of this state clearly want. Instead PSE provides multiple scenarios that involve growing greenhouse gas emissions from direct sales of natural gas through 2038. As can be inferred from *Figure 1-7: Gas Sales Design Peak Day Resource Need* (copied below), gas consumption and attendant greenhouse gas emissions are projected to continue to grow, reaching levels in 2038 that range between 20% and more than 40% higher than today.

¹ <https://www.governor.wa.gov/news-media/inslee-new-york-governor-cuomo-and-california-governor-brown-announce-formation-united>.

² <https://www.theguardian.com/science/2016/sep/26/us-climate-change-emissions-miss-2025-target-research>.

³ Annual US emissions data: 2,615 billion metric tons CO2 in 2005, 2,327 billion metric tons CO2 in 2016, 28% reduction target is 1,883 billion metric tons in 2025. Source: “Table 12.1 Carbon Dioxide Emissions From Energy Consumption by Source” Link available from: <https://www.eia.gov/totalenergy/data/browser/>
Math for the required reduction rate: $1 - (1883/2327)^{(1/8)} = 0.026$.

⁴ <http://climatecommunication.yale.edu/publications/5-1-voters-say-u-s-participate-paris-climate-agreement/>.

⁵ <http://climatecommunication.yale.edu/visualizations-data/ycom-us-2016/?est=futuregen&type=value&geo=state>.

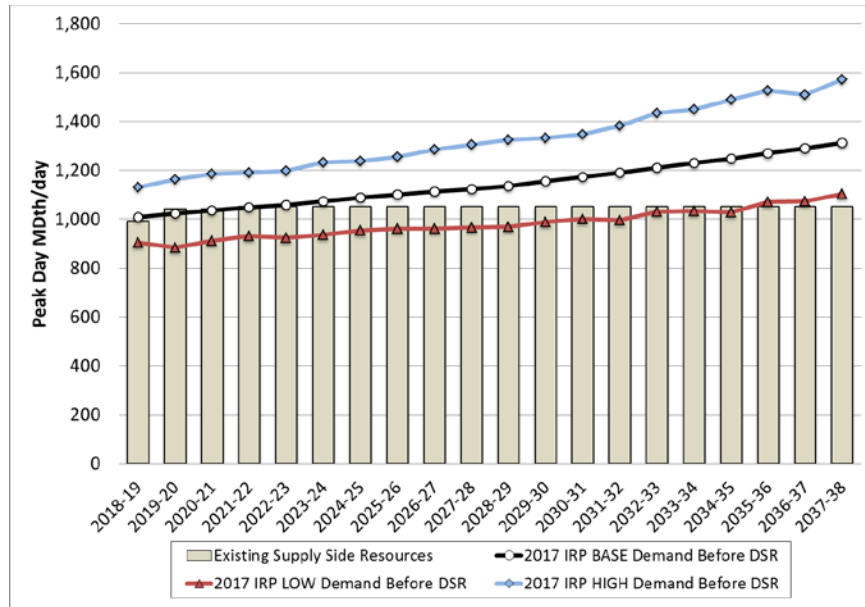


Figure 1-7: Gas Sales Design Peak Day Resource Need

The business-as-usual scenario that PSE is planning for is a nightmare scenario of runaway climate change. It puts at risk the economy of our state, the health and well being of its citizens, the prospects for our children, and every aspect of the natural environment that we cherish here in the Puget Sound area. We are in a climate emergency. I could include many scientific references to support that statement, but I believe our UTC Commissioners understand this quite well.

PSE’s IRP tells us that per customer gas demand is already flat or declining. PSE has been promoting gas conversions (as illustrated by the promotional material copied below) to both residential and business customers. In view of the likelihood of future carbon pricing, such materials should be considered predatory marketing.⁶

On page 1-11, PSE states its intention to acquire “14 MDth per day of capacity by 2022 through energy efficiency program savings and savings from codes and standards.” That amounts to improving gas use efficiency at a rate of only 0.3% per year, and some portion of that is attributable to codes and standards rather than to PSE programs.⁷ This is an appallingly low number given the enormous opportunities that exists to reduce energy waste. It is a huge disservice to its customers that PSE shows so little ambition in this area. It is also an indication that the necessary incentives are not being provided through the regulatory process to encourage PSE to aggressively pursue the demand-side resource potential.

⁶ I consider this predatory marketing because carbon taxation (which PSE acknowledges is likely, p. 4-15) will raise the cost of operation of gas equipment making it uneconomic to operate. In many cases, the equipment will need to be retired before it has reached the end of its normal service life. PSE does not appear to disclose in these marketing materials its expectation that carbon taxes will be implement sometime in the coming 20 years.

⁷ Here is the math: 1,000 MDth/day is roughly PSE’s current peak demand, and they propose to save 14 MDth/day of peak demand over the coming five years. $1 - ((1000-14)/1000)^{0.2} = 0.0028$.

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*You must be a current PSE residential electric customer. You must use electricity as the primary source of your home's space and/or water heating. Any upgrades that include space heating are subject to electric usage requirements. Related fuel conversion rebates must be pre-approved by PSE. Rebate amount is limited to 75% of total equipment and installation cost. Other qualifications and restrictions apply.

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Promotional material recently included with PSE utility bills

Virtually every energy need currently being met using natural gas can cost-effectively be served with equipment powered using carbon-free electricity.⁸ Replacements are readily available for the full spectrum of gas equipment now in service. They represent mature technologies that could easily be scaled to meet the demands of a rapid transition away from natural gas. Most are already widely deployed, and many are already life-cycle cost competitive with gas equipment.

With very little effort, PSE could achieve a modest negative growth rate for gas sales. Doing so would be the lowest cost option for PSE customers, as they would not have to pay for any new gas infrastructure. However, failure to do this comes with substantial financial risk. As PSE admits, carbon taxes are likely in the future. Those carbon taxes are likely to price fugitive methane emissions based on their global warming potential. Carbon pricing will result in a significant jump in the cost of service for PSE's gas customers,^{1(Endnote)} and could lead to rampant

⁸ Niche markets that cannot be met using electricity, such as for cooks who insist on cooking with gas, can be met using electrofuels derived from renewable electricity or biofuels. Alternative energy carriers that are not greenhouse gases are the best candidates to fill this niche. Because methane is a potent greenhouse gas, it needs to be phased out quickly and completely.

defection of gas customers to electric equipment. This would burden the remaining gas customers with amortization costs for capacity that is no longer needed. Large defections of gas customers would bring risk to PSE's electricity customers as well, as gas is predominantly used for winter heating loads and PSE is a winter peaking electric utility. Planning ahead for the inevitable curtailment of natural gas for climate mitigation reasons is the low-risk path for PSE, its customers, and the Puget Sound region, as doing so will enable effective management of the resulting growth in peak electricity demand for heating.

It would be wise for PSE to plan for an orderly withdrawal from their gas business, a move that climate science with increasing clarity and certainty is indicating is necessary. Fortunately, PSE could achieve that outcome through a series of simple low-cost (and no-cost) steps: 1) ceasing to accept new gas customers, 2) curtailing financial incentives for conversions to gas equipment, 3) ramping up energy efficiency programs for gas users, and 4) announcing a long-term plan to meet carbon emission targets through reduced gas sales while reducing the carbon intensity of their electricity business. The later can be accomplished by closing fossil-fueled generating plants and replacing their output with efficiency, demand response, storage, and carbon-free generation. Given industry trends, that would appear to simply involve transitioning to the lowest cost energy sources available.⁹ Using a 5% per year reduction target, the transition could be completed in 20 years.

I have three requests of the UTC:

1. Convey to PSE that they have not made a convincing case that any new gas infrastructure is needed and that the UTC is unlikely to allow any cost recovery for new gas infrastructure, including the Tacoma LNG peaking facility.
2. Instruct PSE to develop a least-cost plan for its direct natural gas sales business that will lead to greenhouse gas reductions (as measured using CO₂eq) consistent with US commitments under the Paris Agreement or current climate policies of the state of Washington, whichever is more stringent.
3. Address the need for regulatory reform that will enable PSE to make a fair profit as they phase out of their natural gas business. PSE should be rewarded well financially for excellent performance, such as completing the phase-out early, while at the same time fully meeting the energy-service needs of their customers at the low true costs. If legislative changes are needed to support a more performance-oriented approach to utility regulation and appropriate performance metrics, I ask the UTC to work proactively with the Washington Legislature to define those needed changes.

⁹ Lazard, "Levelized Cost of Energy Analysis 10.0," Dec 15, 2016. Available here: <https://www.lazard.com/perspective/levelized-cost-of-energy-analysis-100/>.

Respectfully submitted,

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¹ I illustrate the gas price concern with an example. Consider a typical residential gas customer using 100 therms of gas per month priced at 40¢ per therm, with a basic charge of \$10, and a gas delivery charge of \$50, for a monthly total bill (winter) of \$100. With a carbon tax of \$49/ton CO₂eq, the before and after numbers would look like this:

Basic Charge	\$10.00
Delivery Charge	\$50.00
Gas cost @ 40¢/therm	\$40.00
Total before carbon tax	\$100.00
Tax: \$49/ton CO ₂ eq (CO ₂ only)	\$28.70
Tax: \$49/ton CO ₂ eq (CH ₄ loss @ 9.5%)	\$84.90
Total with carbon tax	\$213.60

The 9.5% leakage calculation is based on PSE's estimated 30%-70% mix of conventionally produced gas and gas produced using hydraulic fracturing. With industry reforms and methane leakage rates for fracked gas reduced to the levels that have been measured for conventionally produced gas, the CH₄ tax component could be reduced significantly as shown below. However, all of the carbon tax bills that were introduced in Congress in 2017 had escalation clauses that would raise carbon prices at a rate above inflation (typically 2% to 4% above). It is unclear that natural gas will be able to compete with renewable electricity under any scientifically sound carbon tax formulation. I have provided additional documentation and references for these calculation in a separate comment with the following subject line: COMMENTS ON UE-160918 AND UG-160919: PSE IRP COST OF CARBON ANALYSES CONTAIN CRITICAL OMISSION.

Tax: \$49/ton CO ₂ eq (CH ₄ loss @ 3.8%)	\$33.80
Total with carbon tax and reduced methane losses	\$162.50

Calculations:

$$\text{Cost of CO}_2: \$49/\text{ton} / 2000 \text{ lb/ton} \times 117 \text{ lb CO}_2/10^6 \text{ Btu} \times 0.1 \text{ } 10^6 \text{ Btu/therm} = \$0.287/\text{therm}$$

Cost of CH₄ (Conventionally produced): $0.038 \times 31 \times \$0.287/\text{therm} = \$0.338/\text{therm}$
Cost of CH₄ (Fracked): $0.12 \times 31 \times \$0.287/\text{therm} = \$1.068/\text{therm}$
Cost of CH₄ (PSE mix): $0.3 \times \$0.338/\text{therm} + 0.7 \times 1.068/\text{therm} = \$0.849/\text{therm}$