Saturday, January 27, 2018

Dear UTC Commissioners:

Subject: COMMENTS ON UE-160918 AND UG-160919: PSE COST OF CARBON AND OTHER ANALYSIS ASSUMPTIONS

I believe *PSE 2017 IRP* contains several significant deficiencies in its application of carbon pricing. Specifically:

1. PSE uses prices for carbon that are too low.
2. PSE uses specious logic in rejecting use of a social cost of carbon framework.
3. PSE inappropriately applies cost of carbon and other assumptions leading to anomalous results that are in conflict with the intent of modeled climate regulations and the IRP process.

I address each of these concerns separately below.

1. Price Assumptions

The Northwest Power and Conservation Council's Seventh Power Plan (Power Plan) is an important benchmark for utility planning in the Pacific Northwest. Washington's Energy Independence Act ties conservation planning to the Council's process for conservation planning.[1] The table below shows the carbon pricing assumptions used in *PSE 2017 IRP* along with those used in the Power Plan.

***PSE 2017 IRP* and Power Plan CO2 Prices for Low, Medium, and High Scenarios Using Adjusted Figures for Comparison[2]**

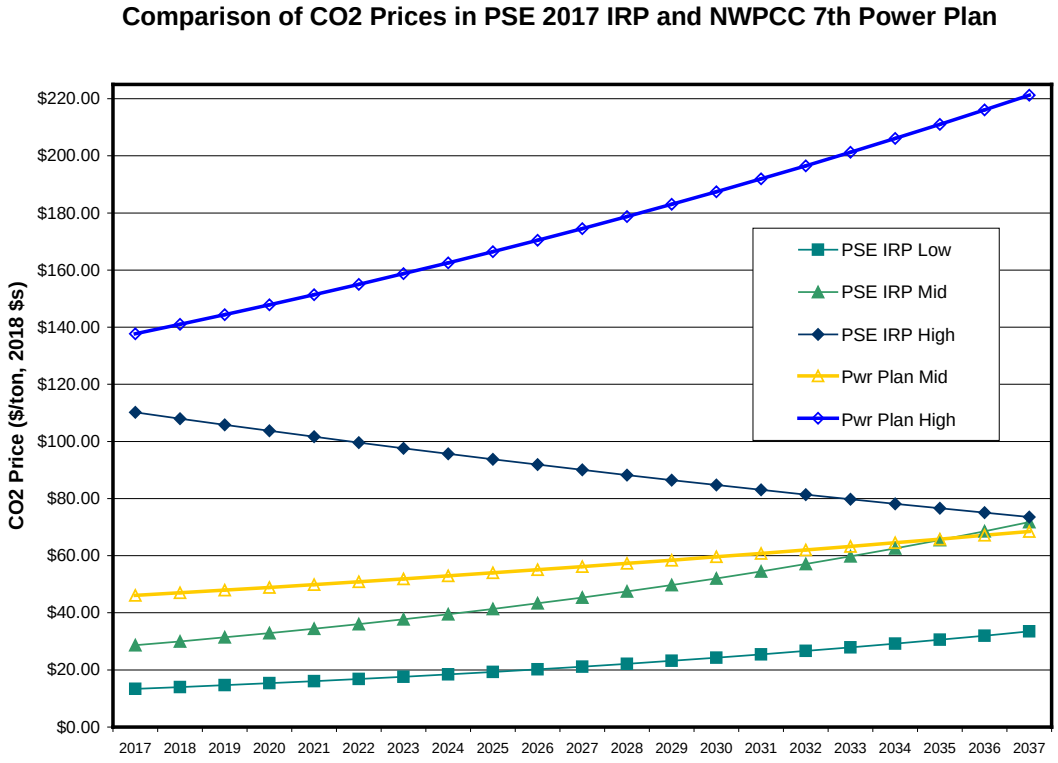
	Low CO_2 Price ($/ton)		Med. CO_2 Price ($/ton)		High CO_2 Price ($/ton)	
	PSE's IRP	**NWPCC**	**PSE's IRP**	**NWPCC[i]**	**PSE's IRP**	**NWPCC[ii]**
Price (2018 $s)	14	---	30	47	108	141
Esc. Rate (Real)	4.7%	---	4.7%	2.0%	-2.0%	2.4%

i – Values from *Social Cost of Carbon - Mid-Range*: Scenario 2B_F
ii – Values from *Social Cost of Carbon - High-Range*

[1] See RCW 19.285.040 (1) (a) here: http://apps.leg.wa.gov/RCW/default.aspx?cite=19.285.040.

[2] In order to enable a direct comparison of the two sets of carbon prices and escalation rates, it was necessary to adjust for several differences in the form in which the information is presented—metric vs. inch-pound units, real (i.e., constant) vs. inflated dollars, and different reference years. All values were converted to inch-pound units and real 2018 dollars. *PSE 2017 IRP* makes it clear that the CO2 prices are in units of short tons, but it does not make it clear whether the prices are in inflated dollars or real dollars. Given that the values appear in a graph showing prices in future years with no indication of any inflation adjustment, it seems reasonable to infer that the lines shown in Figure 2-12 represent inflated dollars. For simplicity, I assumed a 2% inflation rate, which is roughly consistent with the long-term US inflation rate projected by the World Bank and OECD here: https://knoema.com/kyaewad/us-inflation-forecast-2017-2018-and-up-to-2060-data-and-charts.

The figure below is similar to Figure 2-12 in *PSE 2017 IRP*, page 2-25, except that CO2 prices are expressed in real (inflation adjusted) dollars and the mid and high carbon prices from the Power Plan have been added. The Power Plan did not contain a "Low" CO2 price scenario comparable to the one in the IRP. PSE's Mid CO2 price begins at 37% below the Power Plan's Mid price but reaches parity after 18 years. PSE's High CO2 price begins 20% below the Power Plan's High price but is only one third of the price by the end of the 20 years study period.



The lower rates used by PSE favor fossil-fuel generation and disadvantage energy efficiency, demand response, storage, wind, solar, and other carbon-free energy sources. The vast majority of Washingtonians want less fossil-fuel generation and more of the climate-friendly alternatives. It is a disservice to PSE customers and to Washington residents to allow PSE discretion in their analysis assumptions when those assumptions are in conflict with the public interest and the political will of our region.

2. Rejection of Social Cost of Carbon

PSE rejected the use of social cost of carbon in their analyses and provided the rationale for the decision in the sidebar that has been copied below. In contrast, the Power Plan did use social cost of carbon leading to optimization results more favorable to CO2 emission reductions. I believe PSE uses specious reasoning in their rationalization for rejecting use of social cost of carbon.

Sidebar from *PSE 2017 IRP*, Page 4-16

Why model carbon price regulation instead of the societal cost of carbon?

By rule, the IRP focuses on the costs and benefits that will be experienced by the utility and its customers. Costs and benefits outside of this construct are called externalities. The societal cost of carbon does not fit this regulatory model. Reducing carbon emissions may benefit society as a whole, but the population of our service territory is only 2.6 million (0.04 percent of world population). To reflect the externality impact of carbon reductions to PSE's customers would require either a reasonable estimate of the economic impact on the Pacific Northwest region (which is not available) or prorating the societal benefits that will accrue to our customers only. This explains why internalizing these externalities in typical IRP analyses is not a substitute for federal-level carbon regulation policies.

PSE appears to reason that: a) its actions are insignificant relative to a global problem, b) service area economic impacts from carbon emissions are not calculable, c) the benefits from ratepayer expenses may accrue to free riders, and d) pricing externalities should wait for federal action. I don't believe any of these are valid reasons for rejecting use of a social cost of carbon framework. Flaws in each of PSE's reasons are identified below.

a. Scale - The IRP states that the population of PSE's service territory is only 0.04 percent of world population. But scale is irrelevant to the issue. Being but one individual in a large country doesn't absolve you of responsibilities of citizenship, such as to vote, pay taxes, or clean up your garbage. PSE's suggestion that scale is relevant here is pernicious.

b. Estimating Economic Impact – PSE's statement that cost estimates of the impact of carbon emissions on PSE's service territory are not available is simply false. Countless studies have been done that estimate the impact of climate change on Washington's forests, agriculture industry, fisheries, marine infrastructure, tourist industry, power supply, public health, etc. But it is totally unnecessary to compile these data and prorate the impacts, because we already know with high confidence what such a study would find—that reducing carbon emissions returns dramatically more in avoided costs than would be expended to reduce emissions.

That fact was established definitively and unassailably by the *Stern Review* released in October 2006.[3] In the ensuing 11 years, the estimated costs of human-induced warming have increased and both human and economic costs have come far earlier than projected. At the same time, the costs of carbon-free energy sources capable of mitigating emissions have plummeted.

c. Free Riders - PSE is concerned that benefits may accrue to "society as a whole" as opposed to "our customers only." In the context of the global problem of soaring atmospheric carbon, the concern seems both petty and ahistoric. The United States, which has done more than any other country to create the climate crisis, has been for decades a free-rider on the efforts of other countries to reduce carbon emissions. Both George W. Bush and Donald Trump have worked to undermine international cooperation under the United Nations Framework Convention on Climate Change.

The United States Climate Alliance, through which Governor Inslee has committed the State of Washington to uphold our obligations under the Paris Agreement, is an attempt to strengthen the Paris Agreement by faithfully achieving our fair share of emission reductions. It is the opposite of exposing PSE customers to free riders: it leverages the efforts of the 195 other signatory countries to the agreement by simply committing to shoulder Washington state's fair share of the burden. Our state cannot meet our Governor's commitment if PSE is allowed to thwart our efforts. Before allowing PSE to prevail in its preposterous suggestion that its rate payers will get a raw deal if it pursues carbon reduction efforts, the UTC should require PSE to provide evidence.

d. Federal Inaction – PSE's asserts that internalizing the cost of climate-damaging pollution is not an adequate substitute for federal-level carbon regulation but fails to offer valid arguments for this. Economists agree that the best economic outcomes will occur if greenhouse gas emissions are accurately priced. Social cost of carbon can be based on the best available science and robust economic analyses. Federal carbon pricing, when it finally arrives, will be based on political compromise, if not graft and corruption. Waiting for action that changes the federal price on carbon emissions from zero to a price acceptable to the fossil-fuel interests, who have disproportionate influence on Congress, would not serve the interests of our state or PSE ratepayers.

Finally, if there is any argument that a social cost of carbon framework does not belong within a utility regulatory model, such a position would not be consistent with findings in other jurisdictions.[4] A recent decision of the Colorado Utilities Commission[5] and an earlier decision

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[3] The *Stern Review on the Economics of Climate Change* is a 700-page report developed for the UK Government by economist Nicholas Stern, that nation's most renowned economist. The report's executive summary can be found here: https://www.webcitation.org/5nCeyEYJr?url=http://www.hm-treasury.gov.uk/sternreview_index.htm.

[4] Seth R. Belzley and Stephen J Humes, "Colorado Utilities Commission Requires Consideration of Social Cost of Carbon," Energy and Natural Resources Blog, May 2, 2017. Available here: https://www.hklaw.com/energyblog/colorado-utilities-commission-requires-consideration-of-social-cost-of-carbon-05-02-2017/#_ftn4.

[5] Decision No. C17-0316 BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF COLORADO, PROCEEDING NO. 16A-0396E Available here: https://www.dora.state.co.us/pls/efi/efi_p2_v2_demo.show_document?p_dms_document_id=863402.

of the New York Public Service Commission[6] found in favor of use of social cost of carbon in a utility regulatory setting.

3. Erroneous Assumptions in Least-Cost Optimizations

PSE's plan to build gas peaking plants reflects misplaced concreteness in the definition of the optimization objective function that PSE used in their electric resource planning.

On page 6-89 PSE writes: "In this IRP, the lowest cost thermal resource varied between the frame peaker and the CCCT depending on the scenario. But the stochastic analysis indicates that frame peakers reduced the cost and risk of the portfolio. This is because the CO2 regulations modeled targeted baseload thermal plants like CCCT and coal plants, not the peaker plants."

It is true that simple cycle gas turbines are exempted in the Clean Power Plan (CPP). However, it is a state responsibility to decide how to implement the CCP. For example, the Regional Greenhouse Gas Initiative,[7] does not exempt peakers, as doing so would be inconsistent with their "more aggressive carbon reduction goals."[8] Whether the CPP will be implemented at all is a matter now under litigation. It is doubtful in any case that CPP would have any relevance to Washington state, because we are likely to exceed its modest targets for CO2 reduction due to other policies.

Slavish adherence to details within a prescriptive compliance path of the CPP is not a sound basis for long-term utility planning for our region. Overwhelmingly, Washingtonians do not want to see their power system designed around loopholes in federal climate regulations. It is disturbing to see regulations implemented to curtail carbon emissions used by PSE to justify selection of the least efficient and most greenhouse-gas intensive option for their plan. A necessary step in any large optimization study is to evaluate whether the results conform with common sense. This result does not.

Accounting shenanigans have no place in the IRP process. PSE's recurrent poor judgment in allowing arbitrary accounting decisions to drive important portfolio decisions points to a systemic problem. PSE was reprimanded in the UTC's settlement letter for *PSE 2015 IRP* for switching major peaking plant maintenance expenses from fixed to variable costs. This resulted in their model showing no dispatch "(zero MWh) from peaking plants over the 20-year planning horizon."[9] Similarly, according to Synapse's comments on *PSE 2017 IRP*,[10] PSE erroneously

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[6] STATE OF NEW YORK PUBLIC SERVICE COMMISSION, CASE 15–E–0302, Proceeding on Motion of the Commission to Implement a Large-Scale Renewable Program and a Clean Energy Standard, August 1, 2016. Available here: http://documents.dps.ny.gov/public/MatterManagement/MatterFilingItem.aspx?FilingSeq=164621&MatterSeq=48235.

[7] Regional Greenhouse Gas Initiative (RGGI) is a cooperative effort of the states of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont to reduce greenhouse gas emissions.

[8] William Opalka, "Panel: New England Will Meet CPP Goals Regardless of Court Outcome," RTO Insider, January 26, 2018. Available here: https://www.rtoinsider.com/new-england-clean-power-plan-cpp-28970/ .

[9] Letter from Mr. Ken Johnson, Re: Puget Sound Energy's 2015 Electric and Natural Gas Integrated Resource Plan UG-141169 and Docket UE-141170, May 9, 2016, page 8.

includes inflated O&M costs for wind as variable costs. Industry standard accounting for wind machines treats these as fixed costs. And on page 10 of their comments, Synapse notes that the Colstrip and Montana Intertie lines represent a sunk cost. PSE's erroneous assignment of those costs to Montana wind results in an overstatement of transmission costs by more than 50%.

While *PSE 2017 IRP* displays wind machines prominently on its cover, the contents reveal that PSE has no plans to acquire additional wind power and is not planning to acquire any additional renewable capacity before 2023. Steve Wright, former CEO and Administrator of BPA, in an interview on the NWPCC's web site states, "...the electricity industry is moving away from least-cost planning to reliably meet load...Today, we're driven by goals for greenhouse gas emissions reductions."[11] PSE has not gotten this message. They have created a planning document that will take us to a place that no one in the Puget Sound region wants to go. In Synapse's review, they state on page 13, "PSE should similarly model a declining emissions cap that reflects the progression toward a zero-carbon future envisioned by the state of Washington." And Wright goes on to say, "We need an analytical approach to least-cost planning for GHG reductions." Requiring PSE to implement such an approach is overdue. *PSE 2017 IRP* is a roadmap for moving the region in the opposite direction and is a waste of precious time and energy.

I have the following requests of the UTC:

1. Take a careful look at the merits of using social cost of carbon. Doing so would avoid the pitfalls evident in *PSE IRP 2017* from misplaced specificity and would make possible a plan for energy infrastructure investment that is consonant with the values and aspirations of our region. Consider the findings on social cost of carbon from other jurisdictions. Instruct PSE to include social cost of carbon in future IRPs.

2. Instruct PSE planners to heed the advice of Steve Wright, Synapse, and myriad of others and refocus the IRP process on least-cost planning for GHG reductions. Have them model a declining emissions cap in accordance with goals articulated by Washington state government. Also, include a more aggressive ramp, such as zero net company-wide emissions by 2030. That is the one Washingtonians now want, the one climate science tell us is necessary, and, very possibly, the one we will be following.

3. Find *PSE IRP 2017* in substantial violation of WAC 480-100-238 and WAC 480-90-238, specifically the requirement that the integrated resource plan must consider "public policies regarding resource preference adopted by Washington state or the federal government and the cost of risks associated with environmental effects including emissions of carbon dioxide."[12,13]

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[10] Avi Allison et al., "Comments on Puget Sound Energy's 2017 Integrated Resource Plan: Washington Utilities and Transportation Commission Docket Nos. UE-160918 & UE-160919," Prepared for Sierra Club, January 19, 2018.

[11] Carol Winkel, "Steve Wright's Perspective on the State of the Electricity Industry: Chelan PUD general manager and former BPA administrator talks about reducing GHG emissions, least-cost planning, and the impact of California's energy policies on the Northwest," nwcouncil.org, Sep 21, 2017. Available here: https://nwcouncil.org/news/blog/steve-wright-presentation/.

[12] Washington Administrative Code 480-100-238 (2) (b). Available here: http://apps.leg.wa.gov/WAC/default.aspx?cite=480-100-238.

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[13] Washington Administrative Code 480-90-238 (2) (b). Available here: http://apps.leg.wa.gov/WAC/default.aspx?cite=480-90-238.