August 16, 2013

Steven V. King
Executive Director and Secretary
Washington Utilities and Transportation Commission
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SUBJECT: Joint comments of Renewable Northwest Project and NW Energy Coalition regarding Puget Sound Energy's 2013 Integrated Resource Plan, Docket No. UE-120767 and UG-120768

Renewable Northwest Project ("RNP") and the NW Energy Coalition ("Coalition" or "NWEC") appreciate the opportunity to comment on Puget Sound Energy's ("PSE" or "Company") 2013 Integrated Resource Plan ("IRP") in response to the Commission's Notice dated June 20, 2013.

With this IRP, PSE has an opportunity to make strategic long-term decisions about its resource strategy without the pressure of near term capacity or energy shortfalls. We recommend the Commission encourage PSE to use this moment to its advantage and make portfolio decisions that lower risks to customers and emphasize clean, efficient resources.

Our comments focus on three areas of the IRP – the costs and risks associated with the Colstrip generating plant, the energy efficiency resource to meet capacity and energy growth, and finally some specific recommendations for the next IRP cycle.

I. COSTS AND RISKS ASSOCIATED WITH THE COLSTRIP GENERATING PLANT

PSE has time to plan for a new resource strategy

The proposed electric resource plan anticipates no supply side acquisitions until 2017 (p. 1-8). Demand side efficiency measures meet almost all of PSE's expected capacity and energy growth for the next ten years (Fig. 1-1 & 1-2).

While continuing to acquire all cost-effective demand side resources, PSE should use this period of slow net load growth to plan its future resource strategy with an emphasis on removing regulatory risks associated with continued operation of Colstrip. We recommend the Commission direct the Company to modify some of its inputs and assumptions and further refine its analysis regarding potential replacement of Colstrip, as discussed later in these comments.

PSE's plan must recognize the crossroad on federal energy policy

Since PSE started working on its 2013 IRP, federal climate policy has undergone a sea change. The Obama administration revealed that CO_2 emissions will be

regulated sooner and at a higher present value than PSE could have expected during its planning process. In June of this year, President Obama unveiled his administration's approach, ordering the Environmental Protection Agency (EPA) to develop regulations to limit carbon emissions from modified (i.e., upgraded) power plants within one year, and thereafter finalize greenhouse gas emission restrictions for existing power plants. The regulations will add costs to the operation of coal units, and may prevent these facilities from operating at today's level of output. Colstrip is one of the largest facilities in the western United States. Unfettered carbon emissions as assumed by the IRP's base case and the Company's action plan is at odds with the administration's recently proposed rulemaking.

Investments in coal do not make sense in today's environment

Stakeholders and PSE agree that the cost of complying with pollution control requirements is uncertain. The uncertainty associated with these investment costs is great enough that PSE modeled four Colstrip environmental cost compliance cases. (pp. 2-6, J-18:21). Even those may not capture the full range of additional compliance obligations raised by stakeholders in the IRP Advisory Group.

The economic challenges associated with compliance with current and expected environmental regulations have caused owners of coal units to retire facilities early and regional utilities to pivot away from traditional coal power. Portland General Electric negotiated an early retirement of its Boardman coal plant. NV Energy negotiated an agreement with state policy makers and stakeholders to close some of its largest coal units, as did the owners of Centralia. PPL Montana announced potential plans to mothball its 154-megawatt coal-fired power plant in Billings when new federal emission standards take effect in 2015. Just recently, the shared owners of the Navajo Generating Station, the largest coal-fired energy plant in the west, decided to substantially reduce or cease generation at one of its three units. There is action occurring outside of the western region as well – for example, Georgia Power announced earlier this year that it will retire 15 coal- and oil-fired generating units by April 2016.

Colstrip's other majority owner, PPL Montana, is trying to sell its share of units 1, 2 and 3 (PPL has no ownership interest in unit 4). However, PSE's IRP claims that Colstrip continues to reduce market costs and risks for PSE's customers. This might be true if compliance costs and risks are still downplayed, but if they are fully accounted for we do not believe PSE could make this statement. If PPL's shareholders cannot stomach the risk associated with an aging coal plant and the associated liabilities, then RNP and the Coalition wonder why the Commission should allow PSE to put that risk on ratepayers.

PSE's base case for investment decisions should include a cost of carbon that is greater than $0/ton.

PSE's IRP captured a broad range of possible CO_2 prices, resulting in estimates of $0 to $179 per ton in 2033. (p. 3-8) We commend PSE for accommodating stakeholder feedback, and including the societal cost of carbon as one benchmark on which to evaluate portfolio performance. This was a strong contribution to this year's IRP, which we believe is consistent with the requirement in WAC 480-100-238(2)(b) to include the costs of risks associated with environmental effects including emissions of carbon dioxide.

PSE modeled four sets of CO_2 prices: base cost ($0/ton), low cost ($6/ton in 2014 to $20/ton in 2033), high cost ($25/ton in 2017 to $80/ton in 2033), and very high cost ($75/ton in 2014 to $179/ton in 2033). The high CO_2 cost estimate used EPA's analysis of the Kerry-Lieberman cap and trade proposal, and was expected to be most consistent with potential federal policy. As described above, action is now occurring at the federal level and carbon regulations will be more restrictive than foreseen by the Company at the start of this IRP process. RNP and the Coalition recommend that the Commission review the IRP and action plan with an eye toward the reasonableness of the preferred portfolio and action plan investment decisions under the high CO_2 price, rather than the base CO_2 cost assumption on which many of the planning rationale is based. It is clear that the future cost of carbon regulation will be more than $0/ton, and future IRPs should reflect that reality in the base case

Investments in Colstrip Units 1 & 2 appear uneconomic

PSE's IRP shows that making expensive pollution control investments at Colstrip units 1 & 2 is generally not cost-effective if CO_2 is regulated. We strongly recommend the Commission review Figure 5-23. Even with base case gas prices ($6.50/Dth levelized), Units 1 and 2 are not cost-effective at a CO_2 cost of $30/ton under the low, medium and high compliance cost cases, and are not cost-effective with CO_2 at $0/ton under Case 4 ("very high cost"). In 25 percent of scenarios including some price on carbon, investments at all four units are not cost effective.

We recommend that the Commission request the ratepayer impact analysis for replacing Colstrip Units 1 and 2 be separate from Units 3 & 4. For the purpose of examining the impact of different gas and CO2 prices on cost-effectiveness, Figure 5-23 groups Units 1 and 2 separately from Units 3 and 4, reflecting the fact that Units 1 and 2 are older and subject to a different ownership agreement than 3 and 4. Unfortunately, the IRP calculates the cost to ratepayers of replacing all four units rather than breaking those down into Units 1 and 2 versus Units 3 and 4. (pp. 5-48:50) Even with all four units lumped together, the analysis shows an estimated rate impact of 5 percent using the Base Scenario and Case 2 (medium) compliance costs. While five percent is not insignificant, and has several associated caveats, it is within the range of reason for further examination. And we infer from this result that the rate impact of replacing just Units 1 and 2 could be substantially lower than five percent.

Replacement power for Colstrip may be less expensive than modeled

Montana wind is cheap

We appreciate the effort PSE has made to model Montana wind resources as a replacement for Colstrip. Figure 5-32 demonstrates that by 2025 a wind replacement portfolio is cheaper than market replacement portfolios. (p. 5-57) However, the analysis mischaracterizes the Montana wind resource, making the replacement portfolio that includes Montana wind seem more costly than it would be in reality.

In recognition that Montana has a stronger wind resource than Eastern Washington, PSE assumed that Montana wind could generate at a 31 or 40 percent capacity factor (p. 5-56); the Montana wind resource is actually much stronger. Built in 2005 in Wheatland County, the Judith Gap wind farm has generated at an average 40% capacity factor. Since that installation, wind turbine efficiency has made impressive strides. The Spion Kop wind farm, energized in Montana earlier this year, performs even better with a 48% capacity factor and, despite its small size, is expected to deliver energy to its customers for $54/MWh for twenty years or longer.

Montana wind can serve as an important piece of a Colstrip replacement portfolio. If PSE's analysis reflected updated values for turbine technologies, then a wind replacement portfolio may be a very competitive candidate portfolio for the replacement of Colstrip. Typically this lowest cost energy resource is limited by transmission restrictions. Should PSE retire the Colstrip facilities, it would have the good fortune of having transmission assets capable of delivering low cost wind energy to PSE's customers.

Natural gas conversion at Colstrip was unduly dismissed

RNP encouraged PSE to model converting Colstrip units to natural gas fired boilers as a potential lowest reasonable cost replacement strategy. Such a conversion could provide a low cost capacity resource for PSE's customers, and may allow lower capacity value wind facilities to fulfill PSE's remaining replacement energy requirement.

Without performing any engineering analysis, PSE rejected this idea as too expensive. While we recognize that natural gas conversion may not be the lowest reasonable cost replacement resource for Colstrip, it is certainly deserving of more consideration and analysis than it received. PacifiCorp's 2013 IRP (Docket No. UE-120416) indicates it will convert its 330 MW Naughton 3 coal unit to burn natural gas. In addition, PacifiCorp performed engineering studies to determine the costs of converting to natural gas boilers the rest of its coal fleet still requiring pollution upgrades. We strongly encourage the Commission to review PacifiCorp's Confidential Volume III coal study submitted with its IRP; that document includes

the utility's analysis regarding natural gas conversion as a replacement resource available for its coal fleet. Natural gas conversion is worth analyzing at Colstrip, and we recommend the Commission encourage the Company to consider this alternative seriously

II. THE COMMISSION SHOULD INITIATE A PROCESS FOR CONFIDENTIAL EXCHANGE OF INFORMATION REGARDING COLSTRIP

In recommending the Commission direct PSE to conduct more detailed analysis related to potential replacement of Colstrip, we recognize that PSE has raised legitimate concerns regarding sharing of proprietary information that could compromise its future market position. In the Commission's current procedural rulemaking (Docket No. A-130355), we advocate for expanded use of the Commission's standard protective orders in non-adjudicative cases.[1] Allowing stakeholders to sign confidentiality agreements would enable a freer exchange of information that would ultimately yield a more robust and detailed analysis.

The Commission and PSE could continue to delve into Colstrip issues in the next IRP and include the opportunity for access to confidential information in that process. Alternatively, the Commission could open an investigation into potential replacement of Colstrip and enable parties to intervene, sign confidentiality agreements, and focus their efforts.

ENERGY EFFICIENCY IS CRITICAL TO MEETING PSE'S ENERGY AND CAPACITY NEEDS

<u>Energy efficiency continues to shine as a low cost, low risk resource</u>

PSE's IRP reaffirms the importance of energy efficiency as a resource in meeting future needs. Despite low current market power prices and significant changes in avoided cost, accelerated acquisition of efficiency continues to be in PSE's best interests as a least cost, least risk strategy. (pp. 1-8, 5-37, 5-66:68) For example, PSE's optimal Base Scenario portfolio includes 1007 MW of electric demand side resources (DSR) by 2033, reducing PSE's revenue requirement by $1.42 billion compared with a portfolio with no DSR. Similarly, the risk associated with an electric portfolio lacking DSR equates to a cost of $1.43 billion. (pp. 5-67:68)

PSE's analysis supports accelerated acquisition of both electric and gas efficiency. On the electric side, the IRP continues to apply a 10-year ramp rate for retrofit opportunities. (p. 5-66) Given current low gas prices and ongoing policy discussions regarding the cost-effectiveness of utility gas conservation programs, PSE wisely examined three possible ramp rates for its gas conservation programs: accelerated 10-year rate, 10-year rate with a two-year delay in acquisition of discretionary

[1] Docket No. A-130355, Joint Comments of Renewable Northwest Project and NW Energy Coalition, May 17, 2013, pp. 4-7.

measures (during this period of low gas prices), and a 20-year rate. The 10-year ramp rate continues to be the most cost-effective, resulting in the lowest net present value portfolio cost in all scenarios and deferring the need to acquire some supply-side resources. (pp. 1-14, 2-23, 6-29, 6-36, 6-38)

It is important to note that the overall level of electric and gas DSR in this IRP is less than in the 2011 IRP, due to a combination of factors including low natural gas prices, slow economic recovery, past program achievements, updated model assumptions, the elimination of federal tax incentives, and the introduction of new codes and standards. (pp. 3-6, 6-36, 6-39) We were not surprised by those results given the current landscape, and believe that PSE's efficiency programs going forward will continue to be robust. As the economy recovers and new technologies become available in the market, the pendulum may swing in the other direction. That said, it is important to always take a critical look at the gap between what the conservation potential assessment identifies as cost effective and what is identified as achievable. As stated earlier, the assumptions and factors PSE considers when determining what is achievable are appropriate at this point in time but should receive close scrutiny by the Commission in the next IRP.

<u>The IRP includes a limited analysis for generation efficiency potential</u>

The Energy Independence Act (RCW 19.285, "I-937") requires qualifying electric utilities to "pursue all available conservation that is cost-effective, reliable and feasible," where conservation is defined as "any reduction in electric power consumption resulting from increases in the efficiency of energy use, production, or distribution." PSE's IRP notes that the Company has assessed potential energy conservation measures at its owned and operated production facilities in Washington, including lighting, compressor, cooling tower, pump, and motor upgrades. PSE already has implemented full or partial lighting upgrades at nine generation facilities, and installed a variable frequency drive air compressor at one facility. Together these measures are estimated to save .045 aMW, though further documentation and verification is necessary before that number can be solidified. (p. 5-20) The IRP estimates an additional 3.1 aMW of savings from generation efficiency mostly from measures other than lighting, though development of the measure costs is still underway. (p. 5-34)

The IRP lists projects pending or completed at three hydropower facilities (Upper Baker, Lower Baker, Electron) and eight gas plants (Encogen, Goldendale, Mint Farm, Sumas, Fredrickson, Fredonia, Whitehorn, and Tenaska). (pp. 5-21, 5-34) While we did not see a discussion in the IRP regarding any potential for efficiency upgrades at PSE's three wind projects, we assume that is because those were built recently. Similarly, we did not see any discussion of PSE's Snoqualmie Falls hydropower project, even though that has been under renovation to increase the efficiency of its output.

Of greater concern is PSE's focus on its owned facilities in Washington. It is unclear whether the lighting upgrade for Frederickson in Figure 5-14 refers to PSE's wholly owned simple cycle turbines (SCT) or the combined cycle combustion turbine (CCCT) it co-owns with Atlantic Power Company,[2] but our assumption based on the level of savings is that line item refers to one or both SCTs. And of course, a focus on wholly-owned facilities and on those located in Washington omits Colstrip in Montana from any savings potential assessment even though PSE owns 50% each of Units 1 and 2, and 25% each of Units 3 and 4. PSE should assess the potential for efficiency improvements at Colstrip, and the associated cost should be factored into its analysis of regulatory liabilities associated with continued operation of the plant.

The Coalition raised this same concern in its comments on PSE's proposed 2012-2013 biennial conservation target under I-937.[3] Neither the law[4] nor the rules[5] suggest that conservation in a qualifying utility's production facilities is limited solely to those located in Washington, or to those wholly owned by a qualifying utility. Ultimately, the Commission approved PSE's biennial target for 2012-2013 subject to conditions, including the following:

> NWEC and PSE have also agreed that PSE will review and consider the feasibility of pursuing cost-effective conservation in the form of reduction in electric power consumption resulting from increases in the efficiency of energy use at electric power production facilities it owns in whole or in part outside the boundaries of Washington State. No one has objected to this commitment.[6]

Further,

> Puget Sound Energy shall work with the CRAG to identify options for overcoming obstacles to the feasibility of pursuing cost-effective conservation in the form of reduction in electric power consumption resulting from increases in the efficiency of energy use at electric power production facilities that Puget Sound Energy owns in whole or in part outside the boundaries of Washington State, prior to filing its 2014-2015 biennial conservation target.[7]

Given the focus on Colstrip in this IRP, it is unfortunate that the analysis does not include generation efficiency potential at the coal plant as well as challenges to achieving that potential. And the cost of efficiency improvements should be added to the list of regulatory liabilities faced by PSE if it continues to operate Colstrip. As we

[2] PSE owns 49.85% of the facility.
[3] Docket No. UE-111881, comments of NW Energy Coalition submitted Dec. 7, 2011, at p. 2.
[4] RCW 19.285
[5] WAC 480-109
[6] Docket No. UE-111881, Order 01, para 16.
[7] Id, para 41.

work with the CRAG over the next few months to provide advice regarding PSE's 2014-2015 conservation target, we will raise this issue again. We recommend the Commission also direct PSE to include a more comprehensive analysis of generation efficiency potential in its next IRP that includes conservation potential in its partially owned facilities and in any facilities outside of Washington State.

III. RECOMMENDED IMPROVEMENTS FOR THE NEXT IRP

Delivery infrastructure planning should be a core component of the next IRP

According to the IRP, over the next 10 years, PSE anticipates the need to build more than 200 miles of new transmission lines and eight new distribution substations, upgrade more than 300 miles of existing transmission lines and three existing substations, and replace 500-1000 miles of underground cable and thousands of transmission and distribution poles. (pp. 7-15:16) On the gas side, PSE expects to build or upgrade seven gate or limit stations, add 27.5 miles of high pressure main and 28 miles of intermediate pressure main, and replace 200-300 miles of gas main. (p. 7-17) The IRP notes some "emerging alternatives" that may impact some of these needs, including distributed generation, demand response, and smart grid options. (pp. 7-19:21) For example, in 2012 alone, PSE added 414 new net-metered customers (an almost 40% increase!), bringing its total to 1476 customers producing more than 7.8 MW of nameplate capacity. (p. D-20:21) The next IRP presents a timely opportunity to delve in-depth into these alternative options and assess the extent to which PSE can delay or eliminate the need for new construction and upgrades.

New wind turbine technologies should be considered

Like previous IRPs, PSE assumed that Washington wind generates at a 30 percent capacity factor. (p 4-22) That assumption does not account for new wind turbine technology allowing wind projects to generate at higher capacity factors. PSE recently sold the development rights of Lower Snake River Phase 2 to Portland General Electric. The new project, using new Siemens turbines, will have a 37 percent capacity factor, greatly improving the economics of Washington wind resources. PSE retains the development rights for future phases at the same wind site. Future IRPs need to recognize the improved economies made available by modern turbine technology.

It's time to take solar seriously

Similar to past IRPs, PSE's analysis does not seriously consider the potential for utility scale solar in its portfolio. (p. 5-26) Yet as noted on page D-6, parts of PSE's territory have solar resources comparable with that of Texas. Furthermore, because PSE's resource strategy favors capacity resources, the capacity value of solar resources would be advantageous to the utility's system. Page D-44 acknowledges that solar resources will provide PSE with a capacity value as high as 18% or

roughly 4.5 times the capacity value of PSE's estimated wind capacity value. PSE assumes that utility scale PV systems will cost $4,755/kW. The best available surveys of current PV system prices present dramatically different figures. Bloomberg New Energy Finance's "PV Markey Outlook, Q3 2012" quotes utility scale PV projects contracted today with a total engineering, procurement and construction cost of $2.32/W (alternating current). That's 50% less than the IRP assumed. However this IRP assumes solar is not cost competitive and is not beneficial from a capacity perspective. This contradiction should be rectified in the Company's next IRP by including utility and distributed scale solar resources as a possible supply side resource option.

Energy Storage Is Readily Available

Energy storage projects have bid into PSE's most recent RFP, and we expect they will continue to do so. Clearly these bidders believe that energy storage resources will play an important and cost effective role in PSE's future operations. Acknowledging the future promise of these resources in the IRP is not enough. These projects are readily available, and deserve the same analytical treatment in the planning process afforded to traditional resources.

Storage provides a myriad of services; this is the resource's strength. The technology acts as a capacity resource available for peak demand. The resource suffers no partial load efficiency penalties, no limits on total operating hours, and no limits on the number of starts per year. It provides spinning and non-spinning reserves without running at a minimum run rate. It provides flexible operating reserves that may allow for more cost effective system dispatch. It provides arbitrage opportunities. Of these separate value streams, PSE has only measured the capacity value, and the capacity value methodology stands to benefit considerably.

PSE chose not to model energy storage in candidate portfolios. Many of energy storage resources' unique benefits are only captured with robust production cost modeling. As a result PSE cannot claim that energy storage resources are not cost effective.

The energy storage analysis the company did perform only measured the resource's capacity value, but a flawed assumption significantly compromises the results. Using the incremental capacity equivalent methodology, PSE assumes that when a battery system delivers capacity to the system, it must do so by fully discharging in four hours. The method then requires the battery to charge at the maximum rate for the following four hours. (p. K-52) For peak capacity requirements lasting for more than four hours this dispatch assumption has the effect of actually worsening the capacity problem for the last four hours. This behavior would obviously be avoided operationally, but for a modeling result has the effect of lowering the capacity value of the energy storage resource.

We recommend that the Commission guide PSE to work with stakeholders and the energy storage community to improve its tools for measuring the value of energy storage and to include this resource in future IRP portfolios. Energy storage will become increasingly valuable for PSE's ratepayers as its capacity needs grow, its existing resources are replaced, and once FERC finalizes Bal-002-WECC-1 which will require PSE to carry many more reserves. (p 5-6)

IV. CONCLUSION

RNP and NWEC have appreciated the opportunity to participate in PSE's IRP stakeholder process and the opportunity to present our findings to the Commission. PSE's IRP has made significant improvements, especially with respect to the new analysis at Colstrip. However, before PSE makes expensive pollution control investments at Colstrip, we recommend the following:

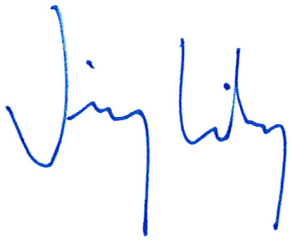
- **Update federal policy assumptions to be consistent with the administration's proposed federal emission regulation**
- **Break out the portfolio replacement costs of Colstrip Units 1 & 2 from Units 3 & 4**
- **Evaluate the costs of converting some Colstrip units to natural gas**
- **Consider the costs associated with making energy efficiency upgrades at Colstrip as required by I-937**
- **Include higher capacity factor wind resources, solar resources, and energy storage resources as portfolio options**
- **Create a process for sharing confidential information with interested stakeholders**

In addition, we recommend PSE's next IRP:

- Include a cost of carbon in the base case that is greater than $0/ton and consistent with new federal emissions regulations
- Conduct an in-depth examination of alternatives to delivery infrastructure planning
- Assess the potential for energy efficiency improvements at in-state generation facilities partially owned by PSE (e.g., Frederickson CCCT)

Thank you for the opportunity to comment.

Sincerely,



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