Integrated Resource Plan (IRP) Stakeholder Meeting Summary

Meeting Information

- Tuesday, September 13 from 1 – 4 pm.
- Links to:
  - Meeting materials (e.g. hot sheet and presentations)
  - Meeting recording

Summary of September 13 IRP Electric Progress Report Meeting

- **Process Check-In**

This information can be found on slides 7-9 of the presentation

  - Phillip Popoff, PSE Director of Resource Planning Analytics, discussed the feedback results timeline from the August 24 Resource Adequacy webinar. Materials will be posted by September 22.
  - Phillip discussed the 2023 Electric Progress Report modeling process and next steps.

- **Inflation Reduction Act (IRA) Overview**

This information can be found on slides 10-17 of the presentation

  - Nate Davern, PSE Senior Government Affairs Representative, provided background information and key points of the IRA:
    - More certainty for renewable energy developers and battery deployment.
    - Provides lower-income customers with energy retrofit rebates.
  - Nate also reviewed the following:
    - Important tax changes and credits.
    - New renewable energy & storage tax credits.
    - EV purchases and charging infrastructure.
    - Customer tax credits and rebates.
    - Methane emission fee and emission reduction grants.

- **Inflation Reduction Act and Electric Progress Report Changes**

This information can be found on slides 18-21 of the presentation

  - Elizabeth Hossner, PSE Manager of Resource Planning and Analysis, explained how PSE will implement the new rules of the Production Tax Credit (PTC) and Investment Tax Credit (ITC).
  - Discussed what will be included in 2023 Electric Progress Report, including extensions and inclusions of the PTC and ITC.

- **2023 IRP: Conservation Planning Assessment**

This information can be found on slides 22-39 of the presentation

  - Gurvinder Singh, PSE Consulting Resource Planning Analyst, introduced Cadmus and how the Conservation Potential Assessment (CPA) contributes to PSE's portfolio analysis.

- Aquila Velonis, Cadmus Senior Associate, presented the results of the Electric Energy Efficiency Potential study and covered the following topics:
  - Comparison of 2021 CPA: 2023 Achievable Technical Potential, Demand Response Potential, Cumulative Potential as a function of the Net Levelized Cost, Rooftop Solar PV Potential.
  - Cumulative Achievable Technical Potential (aMW): Top Residential Measures/Achievable Technical Measures, Top Electric commercial and industrial measures, Combined Heat and Power.
- Gurvinder discussed Distribution Efficiency until 2050.

- **Resource Alternatives**

This information can be found on slides 40-44 of the presentation

- Elizabeth Hossner, PSE Manager of Resource Planning and Analysis, provided updates on generic resource alternatives and costs and assumptions based on feedback from the March 22 meeting and previous IRP cycles. She covered the following topics:
  - Hybrid configuration for Montana resources, capital costs, operating assumptions, battery cycling, and energy storage alternatives.

- **Achieving CETA Compliance: 100% Greenhouse Gas (GHG) Neutral by 2030**

This information can be found on slides 45-51 of the presentation

- Elizabeth Hossner, PSE Manager of Resource Planning and Analysis, outlined how PSE will achieve 100 percent GHG neutrality by 2030 and discussed options for meeting the remaining 20 percent of energy delivered.
- PSE will focus on unbundled Renewable Energy Credits (RECs) and carbon offsets.
- Elizabeth reviewed the modeling approach, including the base model, unbundled RECs, and Proposed Sensitivity.

- **Next steps:**
  - Sophie Glass closed the meeting and shared the next steps for the IRP stakeholder feedback process:
    - September 15: A recording and transcript of the chat will be available.
    - September 20: Feedback forms are due.
    - October 11: A feedback report of comments and summary will be posted to pse.com/irp.

Feedback Report

Purpose: The following table records the IRP stakeholder unanswered questions and PSE responses from the Conservation Potential Assessment (CPA) results and assumptions for the 2023 Electric Progress Report discussion with IRP stakeholders and the meeting's feedback form. Meeting materials are available on the project website.

Date	Stakeholder	Comment	PSE Response
9/13/22	Bradley Cebulko	Will someone at PSE please discuss any details about the proposed sale of Colstrip to Talen? I am particularly interested in the impacts of the sale to PSE's transmission and ability to access resources in Montana. Can't find reporting on transmission rights that PSE owns in Montana are a part of that sale or the sales impact on access to Montana's resource. Will there be Colstrip capacity in Montana? Would like to hear about impacts to transmission in the IRP.	The transfer of PSE's ownership interest in Colstrip does not change any of the assumptions in the IRP or affect transmission availability.
9/13/22	Bradley Cebulko	My groups are also interested in the transmission rights impacted by the proposed Talen sale.	Please see previous answer.
9/13/22	Don Marsh	Question on 15. Do you know whether the restriction that batteries need to be charged only through solar panels, is that restriction lifted through this?	Regarding the ITC for battery energy storage, as we read the law, if a standalone battery is placed in service after 12/31/2022 then there is no longer a charging-source requirement. The battery would not be required to be charged by an on-site renewable energy source, or even a renewable energy source at all.
9/13/22	Bradley Cebulko	I have a question on slide 16. It does not include the combustion or methane associated with gas, it is not a back door carbon tax? Does it impact Canadian producers as well if the costs are captured in this? Does it impact compressor stations?	It is not immediately clear to PSE if/how covered facilities downstream of an international producer might be impacted by the new methane fee program. The EPA may need to issue additional guidance or request public comment on this question to help covered operators better understand the program. As PSE

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			currently understands the law, only facilities that report emissions under EPA's Greenhouse Gas Emissions Reporting Program are covered under the law's "methane fee" program, and the emissions reported under that program are used as the basis for fee calculation. Canadian producers and operations in Canada are not bound to U.S. reporting requirements. U.S.-based operations of covered facilities would account for their emissions and pay a fee on those emissions reported to the EPA that exceeded the statutory thresholds listed below. (Source: CRS Reports, a services of the U.S. Congress) The methane emissions charge applies only to methane emissions from specific types of facilities that are required to report their greenhouse gas (GHG) emissions to the Environmental Protection Agency's (EPA's) Greenhouse Gas Emissions Reporting Program (GHGRP). The IRA methane charge applies to methane emissions from specific types of facilities in the petroleum and natural gas industry that, under current regulations, are required to report their GHG emissions, including methane, to EPA's GHGRP. Since 2011, EPA's

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			GHGRP has collected annual emissions data from nearly 8,000 large industrial facilities and other sources in the United States. The GHGRP requirements are codified in 40 C.F.R. Part 98. Subpart W includes the detailed requirements for petroleum and natural gas facilities. The IRA methane charge applies only to a subset of the petroleum and natural gas system facilities that are required to report GHG emissions in Part 98, Subpart W. The facilities subject to the charge include the following industry operations: • offshore petroleum and natural gas production; • onshore petroleum and natural gas production; • onshore natural gas processing; • onshore natural gas transmission compression; • underground natural gas storage; • liquefied natural gas storage; • liquefied natural gas import and export equipment; • onshore petroleum and natural gas gathering and boosting; and • onshore natural gas transmission pipelines. The reporting requirements in Subpart W apply to facilities that emit 25,000 metric tons of CO2

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			equivalent (mtCO2e) or more per year. In IRA, the scope of emissions subject to the charge is based on (1) the facility's reported emissions under EPA's GHGRP, as described above, and (2) an emissions threshold that varies by facility type. • For petroleum and natural gas production facilities, the charge applies only to the number of reported tons of methane that exceed 0.2 percent of the natural gas sent to sale from such a facility. • For nonproduction facilities, such as gathering and boosting facilities, the charge applies to methane emissions that exceed 0.05 percent of the natural gas sent to sale from the facility. • For natural gas transmission facilities, the charge applies to methane emissions that exceed 0.11 percent of the natural gas sent to sale from the facility.
9/13/22	James Adcock	Slide 16 -- is Canadian-side methane leakage of Canadian gas imported to USA taxed, or only USA based leakage?	Please see above answer.
9/13/22	Don Marsh	Is there anything in the IRA that might impact the analysis of Distribution Efficiency on slide 38? Just trying to understand all the impacts of the new legislation.	We do not believe so, but we will continue to examine the developing rules.

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9/20/22	Kelly Hall, Climate Solutions Brad Cebulko, Stratagen Consulting	Climate Solutions appreciates the opportunity to comment on the September 13, 2022, Conservation Potential Assessment and Assumptions for the 2023 Electric Progress Report IRP Stakeholder presentation. Below, we address a number of areas of PSE's presentation that we believe need refinement prior to the Company issuing its draft Electric IRP Update. **1. The Conservation Potential Assessment must reflect the impacts of the Inflation Reduction Act to ensure that the Company is comparing demand-side and supply-side resources on an equal basis.** On August 16, 2022, President Joe Biden signed the Inflation Reduction Act into law[1]. The IRA is the single most comprehensive climate bill the country has ever passed and includes billions of dollars for clean energy. As PSE recognized in its September 13 presentation, the IRA provides new, or extends existing, renewable energy and storage tax credits[2]. The Company stated at the meeting that eligible supply-side resources will reflect the production and incentive tax credits in the 2023 Electric Progress Report. Unfortunately, PSE also stated in its meeting that it does not anticipate updating its Conservation Potential Assessment (CPA) to reflect the impact of IRA on energy efficiency and residential renewable energy generation. We disagree with	1. PSE will include the Inflation Reduction Act provisions for the distributed Solar ITCs in the 2023 Electric Progress Report (Report), as these are clear and have been used in the past. However, the bulk of the IRA with regards to energy efficiency still needs to go through a rulemaking process, and this is not expected to be completed till mid-2023. Revising the CPA would require waiting for this rulemaking and would result in a delay in the 2023 Report. The UTC has expressed that they will not endorse PSE delaying the filing of the 2023 Report. As Jennifer Snyder of the UTC commented at the September 22, 2022 Gas IRP stakeholder meeting, the incentives are a transfer cost, and do not enter into the total resource cost (TRC) test, so will not have a meaningful impact on the supply curve. PSE will stay informed about the IRA rulemaking processes and will incorporate the provisions in future CPA studies. 2. With regards to concerns about Colstrip, please see our answer to Mr. Cebulko's question at the top of this table. 3. We do not know how the IRA will impact methane emissions fee to the natural gas price forecast. Our price forecast is provided by Wood Mackenzie, and we will rely

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		PSE's position and strongly encourage the Company to modify its CPA to reflect the changes of the IRA to demand-side resources like energy efficiency measures and residential solar. A sample of the IRA provisions include[3]: • A 30 percent residential clean energy credit for residential solar, wind, geothermal, biomass, and battery storage for new projects between 2022 and 2032. • An increase and extension of energy efficiency home improvement credits, • Performance-based whole house rebates, • Thousands of dollars per household to install heat pumps, heat pump water heaters, electric stoves, and upgrades to electric panels. The significant source of funding for energy efficient appliances and rooftop solar will certainly impact the amount of each demand-side resources that is available during the IRP planning horizon. The Company stated intention to inequitably treat supply-side and demand-side resources in the IRP results will result in an IRP that has a bias towards supply-side resources. Consequently, we don't believe that the IRP could identify the lowest reasonable cost portfolio. Moreover, the Company's proposed energy efficiency targets for compliance with the Energy Independence Act, and possibly the CETA energy efficiency target, will be incorrect and artificially low. We strongly recommend that PSE	on them to update pricing based on impacts of the IRA when the rulemaking process is complete.

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		incorporate the impacts of the IRA to its demand-side resources. 1. **PSE should include a discussion, with supporting quantitative analysis, of the impact of the proposed sale of PSE's share of Colstrip coal-fired power plant, including the value of PSE's transmission rights, for meeting its CETA requirements.** On September 12, 2022, Puget Sound Energy agreed to sell its 25 percent ownership of Colstrip Units 3 and 4 to Talen Energy Supply LLC on December 31, 2025[4]. The last time that PSE proposed to sell its stake in Colstrip, the sale included PSE's interest in the Montana transmission line that connects the coal units to Washington state. Initial news reports did not clarify if PSE is including its rights to the transmission line, nor was anyone at PSE able to state definitively if the sale includes PSE's transmission rights. Previous PSE IRPs have demonstrated that Montana is one of the most favorable sites for renewable energy generation in the Western interconnect. In its 2021 IRP, PSE wrote that, *"Wind resource in Montana are attractive because of their higher capacity factors and diverse seasonable output compared to the Washington wind current in PSE's energy portfolio. The retirement of Colstrip Units 1 and 2 provided for an opportunity to evaluate Montana wind resources*	

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		in PSE's 2028 RFP, allowing for the potential repurposing of Colstrip transmission to PSE's service territory[5]." PSE's transmission rights into Montana is a valuable asset that could help the Company comply with its CETA requirements. The draft and final Electric Progress Report should include a robust discussion on the impact of the sale for helping the utility identify the lowest reasonable cost of resources for meetings its resource adequacy and CETA requirements. 1. If the sale does not include the transmission rights, how PSE can best repurpose the transmission to maximize the delivery of cost-effective renewable energy for customers. What are the opportunities and risks of retaining the transmission rights into Montana? a. This explanation should be supported with quantitative analysis. 2. If the sale includes PSE's transmission rights, the Company should explain why the Company did not need the transmission rights for meetings its load requirements and compliance with CETA at the lowest reasonable cost. a. This explanation should be supported with quantitative analysis on the costs and benefits of the sale of the transmission rights.	

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		3. **PSE should incorporate the IRA methane emissions fee to the natural gas price forecast in the 2023 Gas IRP and 2023 Electric IRP Progress Report.** The IRA includes a new "upstream" emissions fee that will be administered by the EPA and is applied to production, processing, transmission, and storage facilities[6]. According to PSE's presentation, the fee begins at $900/MT in 2024, and increases to $1,500/MT in 2026. PSE employees at the meeting were uncertain how the methane fee will be applied to natural gas sourced from Canada and the potential impact to natural gas prices. Although PSE speculated that only one of its facilities (Jackson Prairie) will be directly impacted by the methane emissions fee, a PSE employee at the presentation conceded that the cost of the fee throughout the supply chain will likely be passed onto end users. PSE's draft and final Gas IRP and Electric IRP Progress Report should clarify if and how the methane emissions fee will be applied to Canadian-sourced gas, and modify its gas price forecast to include the expected impacts of the methane emissions fee. Thank you for the opportunity to comment. We look forward to continuing to work with PSE throughout the 2023 Gas IRP and 2023 Electric IRP Update. Best,	

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		Kelly Hall, Washington Director, Climate Solutions Brad Cebulko, Manager, Strategen Consulting Footnotes: [1] https://www.cnn.com/2022/08/16/politics/biden-inflation-reduction-act-signing/index.html [2] September 13, 2022 Presentation. Slide 13. [3] https://bipartisanpolicy.org/blog/inflation-reduction-act-summary-energy-climate-provisions/ [4] https://www.prnewswire.com/news-releases/talen-energy-supply-and-puget-sound-energy-announce-strategic-transaction-of-colstrip-montana-assets-301622447.html [5] PSE 2021 IRP Appendix J, p. J-11. [6] September 13, 2022 PSE IRP Presentation, slide 16.	
9/20/22	Sergio Duenas, Western Energy Storage Taskforce (WEST)	PSE should clarify if their capacity expansion model (CEM) is able to endogenously optimize tax credits (e.g., PTC and ITC). If the model is unable to do so, PSE should clarify at which step is the cost impact of the tax credits reflected. WEST favors representing these impacts prior to the optimization process of the CEM as it best aligns with ratepayer benefits and Tha cost-effective decarbonization strategy.	The portfolio capacity expansion model does not optimize between PTC and ITC. The calculation was done outside the model to determine the best option. PTC appears to be the better option for solar and wind projects. For storage projects PSE assumed the ITC. The impact for PTC is input as a variable cost reduction based on output. ITC is input as a reduction to fixed cost

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			related to capital investment.
	Sergio Duenas, Western Energy Storage Taskforce (WEST)	PSE should incorporate incremental durations of li-ion batteries as candidate resources. PSE's consideration of li-ion as limited to 6 hours of duration is unduly restrictive. WEST is aware of load-serving entities in California that have contracted for li-ion resources with 8-hour durations, and the technology is only expected to improve and drop in cost following the enactment of the IRA. Thus, WEST requests PSE to consider incremental durations of li-ion as candidate resources.	PSE does not plan to incorporate an 8-hour battery resource as an option in the 2023 Electric Progress report because we are relying on the 2022 NREL ATB costs, which do not have cost information for an 8-hour battery. We will continue to refine our assumptions and resources studied for future IRPs.
	Sergio Duenas, Western Energy Storage Taskforce (WEST)	PSE should use PNNL data to include additional storage candidate resources in this cycle. PSE would lose an important learning opportunity in this cycle if no emerging technologies are included simply because there is no NREL ATB cost estimate at this time. To mitigate this concern and start understanding future needs in this cycle, WEST urges PSE to consider PNNL's Energy Storage Cost and Performance Database (https://www.pnnl.gov/ESGC-cost-performance) to include other storage candidate resources.	The IRP and Electric Progress Report look at generic resources. We are using the li-Ion battery technology as a stand in for generic battery energy storage to evaluate the need for energy storage. Once PSE issues the RFP, we will evaluate all resource alternatives submitted to us, even those not specifically studied in the IRP. See the Generic Resource Capital Cost and Operating Assumptions document for further detail.
9/20/22	Joel Nightingale, UTC	Good afternoon PSE IRP team, I have a few follow-up questions from the 9/13 IRP stakeholder meeting below. • In the CPA section, Slide 34 shows the achievable technical potential for distributed solar in terms of nameplate capacity (MW)	1. Thank you for bringing this to our attention. There was an error on the slide. The updated slide is below, the corrected value is highlighted: **Sector** | **Installed Capacity 2050 MW (Nameplate)** Residential | 617.0

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		and generation (aMW) expected from different customer groups. I would expect the energy generated from a residential solar installation to be at least roughly the same as that of a residential solar installation in a vulnerable population, but when I divide the aMW by the MW for those two groups (to get energy produced per nameplate capacity) it looks like the VP residential solar is only expected to produce about 1/10th of the energy as the non-VP residential solar per MW installed. Is that a typo? Am I reading this right? If so, please explain why it is that a VP residential solar should be expected to produce almost 90% less energy per installed MW than non-VP residential solar. • Also in the CPA section, Slide 31 shows the levelized cost of demand response programs in the 2023 CPA versus the 2021 CPA. Aquila (Cadmus) mentioned in the presentation that the main driver in this change was the change in T&D deferral costs. Why did these T&D deferral costs change so much from 2021 ($16/kW-yr) to 2023 ($75/kW-yr)? • Do the CPA results presented in the 9/13 meeting represent the final results, or are adjustments still being made to that	<table><tr><td>Residential Vulnerable Population</td><td>28.2</td><td>3.3</td></tr><tr><td>Commercial</td><td>777.51</td><td>92.64</td></tr><tr><td>Total</td><td>1,422.68</td><td>167.78</td></tr></table> 2. In the 2021 IRP PSE estimated its system T&D deferral costs based on historical data of projects implemented to add capacity on the T&D system. In the 2023 IRP, PSE pivoted to a forward-looking estimate of the T&D. We are looking at an environment where we expect more electrification both from EVs and fuel switching. In this environment more T&D will be needed. An estimate of T&D deferral cost for increased electrification was presented at the June Stakeholder meeting by the Delivery System Planning team. The increased T&D deferral costs of $75/kW-year reflect this new environment. This is also what was applied to energy efficiency and electrification scenarios in this IRP. 3. Costs aren't allocated for either summer or winter seasons. For this analysis PSE is looking at what is most cost-effective. 4. Please see PSE's response to Sergio Duenas in the previous question. Concerning a "threshold" to decide which resources are included in an IRP, PSE

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		analysis? I ask in part because I think there was ongoing discussion around whether it was appropriate to split DR product costs between summer and winter or not, and I did not see that methodology change in these slides (i.e., it appears, based on slide 30, that DR product costs are still being split between summer and winter seasons in the current CPA). • On generic resources, it looks like PSE has largely defaulted to using NREL's ATB numbers where possible (I think this generally makes sense). I am wondering what "threshold" or other logic PSE uses to decide whether to include other sources (internal or external) to inform its generic resource assumptions. For example, PSE did decide to include reciprocal combustion engines, but decided not to use an outside source to inform resource assumptions for certain emerging technologies. I believe Sergio (from WEST) touched on this, but I was hoping to get a little more clarity if you can provide some.	reviews current generation technology trends and seeks feedback from internal and external stakeholders.

Feedback Addressed from September 13 Electric Progress Report IRP Meeting

What PSE heard	What PSE did
Provide details about the proposed sale of Colstrip to Talen, Colstrip capacity to Montana, and the impacts to transmission in the IRP.	The transfer of PSE's interest in Colstrip does not change any of the assumptions in the IRP or affect transmission availability.
Interest in the Inflation Reduction Act and how it impacts the IRP process, particularly for the 2023 Electric Progress Report and Gas Utility IRP.	PSE will include the Inflation Reduction Act provisions for the distributed Solar ITCs in the 2023 Electric Progress Report, as these are clear and have been used in the past. However, the bulk of the IRA with regards to energy efficiency still needs to go through a rulemaking process, and this is not expected to be completed till mid-2023.

Attendees (alphabetical by first name)

1. Amy Wheeless
2. Andrew Wood
3. Bill Will
4. Blake Bjornson
5. Bradley Cebulko
6. Brian Duncan
7. Brian Grunkemeyer
8. Court Olson
9. Don Marsh
10. Gamze Gungor Demirci
11. James Adcock
12. Jeffrey Larsen
13. Jennifer Snyder
14. Jesse Durst
15. Jessica Neely
16. Jim Schretter
17. Joel Nightingale
18. Jon Sdao
19. Jonathan Budner
20. Kelly Hall
21. Marcus Sellers-Vaughn
22. Michael Forman
23. Nancy Shimeall
24. Natasha Bryan
25. Nelli Doroshkin
26. Phil Ritter
27. Rachel Clark
28. Sammie Roeun
29. Sashwat Roy
30. Scott Spettel
31. Sergio Dueñas
32. Stephanie Chase
33. Steve Edburg
34. Tanner Gillespie
35. Virginia Lohr
36. Willard Westre

Puget Sound Energy Staff Observers (alphabetical by first name)

1. Alexandra Karpoff
2. Allison Jacobs
3. Bob Williams
4. Brian Tyson
5. Cindy Vu
6. Corey Corbett
7. Douglass Hart
8. Elizabeth Hossner
9. Gurvinder Singh
10. Hannah Wahl
11. Jennifer Coulson
12. Jennifer Magat
13. Jesse Durst
14. Jessica Zahnow
15. Jisong Wu
16. Kara Durbin
17. Kasey Curtis
18. Kelly Xu
19. Lorin Molander
20. Marc Alberts
21. Mark Lenssen
22. Meredith Mathis
23. Michelle W.
24. Nate Davern
25. Nathan Critchfield
26. Nick Gemperle
27. Phillip Popoff
28. Ray Outlaw
29. Renchang Dai
30. Tyler Tobin
31. Wendy Gerlitz

Consultant Staff (alphabetical by first name)

1. Aquila Velonis (Cadmus)
2. Kim Zamora Delgado
3. Lucila Gambino
4. Seth Baker
5. Sophie Glass
6. Will Henderson