

Feedback report and meeting summary

Local and regional delivery infrastructure needs

Meeting details

- Thursday, May 09, 2024, 4:00 p.m. - 5:00 p.m.
- Virtual webinar hosted by PSE and facilitated by Triangle Associates
- Links to:
 - [Presentation](#)
 - [Meeting recording](#)
- Participants: 14 via Zoom (plus 11 panelists), 80 YouTube views as of May 30, 2024.

Meeting summary

Agenda Topic	Summary
<p>Equity in the IRP Kara Durbin, Director, Clean Energy Strategy, PSE</p>	<ul style="list-style-type: none"> • PSE provided an overview of upcoming discussions regarding equity in the IRP. These discussions will occur at two Equity Advisory Group (EAG) meetings, a Resource Planning Advisory Group (RPAG) meeting, and a public webinar. • Discussions about equity in the IRP will focus on evolving PSE’s scorecard approach for the electric IRP and considering a similar approach for the gas IRP. • Discussions will also focus on improving PSE’s electric analysis by including equity considerations in generic resource modeling.
<p>Delivery infrastructure in Clean Energy Transformation Act (CETA) context Brian Tyson, Manager, Clean Energy Planning and Implementation, PSE</p>	<ul style="list-style-type: none"> • PSE shared an overview of the 2022-2025 Clean Energy Implementation Plan (CEIP) targets and goals. • The CEIP was developed in 2021 to lay out foundational goals and targets that PSE aims to achieve during the 2022-2025 Clean Energy Transformation Act (CETA) compliance period. PSE aims to move towards 63% clean electricity by 2025, carbon neutrality by 2030, and 100% clean electricity by 2045. • To meet the 2025 target, PSE is focusing on utility-scale resources; distributed resources, including solar and storage; demand response; and energy efficiency.

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	<ul style="list-style-type: none"> To meet CETA targets, electric generating resources need to nearly double by 2030. PSE will need to make significant new resource additions and upgrades, including large-scale wind, large-scale storage, distributed storage, and community solar. A core tenant of CETA is ensuring that all customers receive benefits, so PSE is focusing on distributing benefits from clean energy advancements across all customers.
<p>Regional grid overview Eleanor Ewry, Manager, Transmission Strategy and Planning, PSE</p>	<ul style="list-style-type: none"> PSE provided an overview of how transmission constraints impact the acquisition of resources. One of PSE's considerations when acquiring resources is the location of those resources and the process of delivering power from the places it gets generated to the places it gets used by customers. An electric grid made up of wires connects resources to load centers. A key constraint in PSE's ability to deliver resources is the limitations on the amount of power carried by long-distance transmission lines. PSE has identified nine regions with high potential for renewable resource development. Some of these regions are in Washington, but others are as far away as Montana and Wyoming. PSE's service territory covers a small area compared to other utilities in the west. Most of the transmission lines that PSE currently owns and operates are located within its service territory. This means that to acquire resources from areas throughout the west, PSE must work with neighboring utilities and use a broader regional transmission system. One of the significant regional transmission providers that PSE partners with is the Bonneville Power Administration (BPA). BPA is a federal agency that owns and operates a regional transmission system that moves power from east to west over the Cascade Mountains. Ten high-capacity transmission lines cross the Cascades into the Puget Sound area; these lines are referred to as the West of Cascades North path. However, there is no remaining room on these lines to bring any additional resources from the east. Given the anticipated future demand on the West of Cascades North path, BPA is investigating opportunities to increase its capacity. This will require significant work that cannot be completed until 2038, but PSE needs additional transmission capacity on a much faster timeline. PSE is exploring several options for bringing new resources to its system: <ul style="list-style-type: none"> Co-location of resources: When planning resource procurement, PSE aims to match the resource to the amount of transmission capacity available. However, there will be times when one resource is not available, so the full transmission capacity will not be used. With co-location, PSE can procure multiple resources from the same region that might operate at different times of the day to make better use of the transmission capacity. Wait for BPA's upgrades: PSE could wait until BPA completes its transmission upgrades. However, this would affect PSE's ability to acquire the resource mix it needs. Self-build: PSE could build its own long-distance transmission lines that it owns and operates. This would be a different approach than PSE has taken in the past. Joint solution: PSE could partner with BPA for a joint solution to speed up BPA's timeline.

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<p>Local grid overview Reid Shibata, Manager, Grid Modernization Strategy & Enablement, PSE</p>	<ul style="list-style-type: none"> • PSE provided an overview of its delivery system and approach to prepare the grid for the future. • PSE serves over 1.2 million electric customers and 900,000 gas customers. The electric transmission system is 2,600 miles long and the electric distribution system is 23,700 miles long. <ul style="list-style-type: none"> ○ Power is generated and delivered to customers through a multi-step delivery system: ○ Power flows from the places it is generated into large, high-capacity transmission lines which bring that power into PSE's territory. ○ Power flows into transmission substations. ○ Power is converted from a higher voltage to a lower voltage to travel through a network of lower-voltage transmission systems. ○ Transmission lines carry the power to the next hub with distribution substations that serve customers within a five-to-10-mile radius. ○ Power goes to distribution overhead conductors. These conductors make up most of PSE's delivery system. ○ Power goes into a final set of transformers so it can be safely delivered to customers. • One of the challenges that PSE is now facing is the need to serve increasing loads for customers (due to increased electricity use from electric heat pumps, air conditioning, commercial building electrification, electric vehicle charging, data centers, etc.) and to accommodate power flow from small-scale solar and batteries pushing power back onto the grid. This means PSE must ensure the grid can accommodate both flow towards customers from the grid and flow in the opposite direction. • PSE keeps its grid safe, reliable, and efficient through grid modernization programs. These include identifying and proactively replacing aging infrastructure, replacing equipment within substations, investing in hardening the grid, and installing sectionalizing devices that automatically open and close to restore power quickly after small outages. PSE prioritizes these programs by targeting areas with poor system reliability or repeated outages. • In addition to using grid modernization programs to sustain the grid, PSE is working on advancing the grid's capabilities to ensure it can enable the two-way flow of clean energy using the following approaches: <ul style="list-style-type: none"> ○ Data and foundational technology: PSE is installing advanced metering infrastructure and line sensors to better understand where power is flowing. ○ Automation and optimization: PSE plans on providing self-healing grid capabilities that automatically reroute power to get customers back online after an outage. ○ Distributed energy resources (DER): PSE plans to create platforms to operate distributed energy resources, such as its virtual power plant. This enables customers to participate using voluntary in-home devices like thermostats and smart water heaters that can be controlled by PSE's virtual power plant.

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	<ul style="list-style-type: none"> PSE shared a roadmap describing its journey towards enabling grid DER technology between 2024 and 2028. PSE has begun developing projects at certain sites, including battery and solar projects that serve remote areas with frequent outages. These initial projects will help set PSE up for success in establishing future battery projects.
Next Steps and Public Comment Opportunity Sophie Glass, Facilitator, Triangle Associates	<ul style="list-style-type: none"> May 16, 2024: Feedback form closes May 14, 2024: Western Resource Adequacy Program (WRAP) overview RPAG meeting

Feedback report

The following table records participant questions and PSE responses from the public comment opportunity and comments submitted via online [feedback form](#) or irp@pse.com. Meeting materials are available on the IRP [website](#).

Note: PSE aims to provide clarity in responses but subsequent follow-up may be required at times. Please direct any follow-up clarifications to irp@pse.com.

No.	Date	Interested party	Submitted via	Question or comment	PSE response
1	5/9/2024	Adrian Falla	Q&A	No chat?	We are not utilizing the chat feature for our public webinars. Please feel free to submit your questions or comments using the Q&A feature.
2	5/9/2024	Adrian Falla	Q&A	OK. my interest is simply finding out if massive negative public response to the Ueland Tree Farm biodiesel peaker plant concept successfully killed it on the vine, (hopefully), or if the proposal is just in zombie suspense...	We are not able to provide any information on this project as it is not a PSE-owned project.
3	5/9/2024	Thomas Kraemer	Q&A	Does “almost doubling” by 2030 mean adding almost 6 GW to existing 6 GW ? Or more because some existing resources going away?	<i>Answered live at 14:22</i> Our current generation capacity is about 6,000 MW, so about 6 GW; yes we need to add 6 GW on top of our existing facility. You’re right in the aspect that we are going to have some resources go away as well. I think it’s

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					important that we recognize that yes, we want to get the 6 GW, but we may have to do more because we're also diminishing our existing set of resources as well.
4	5/9/2024	Adrian Falla	Q&A	Has PSE heard the clear criticism of the CEIP from interrogatories that it is far too unambitious in its targets especially for DER, EE?	<i>Answered live at 15:25</i> We've heard a number of critiques, criticism, and praise from both sides in terms of our targets in the CEIP. We're really focused on moving toward a cleaner portfolio and we know that's going to take a mix of resources. We know that it's a really big challenge ahead of us and so we're really trying to look at what's out there, what's feasibly, how can we get ahead, and start to bring in some of those resources. And more importantly, working with all of our customers and all of our external parties as we make some of these ambitious goal and targets.
5	5/9/2024	Thomas Kraemer	Q&A	Will all new resources be PSE-owned, within PSE's transmission/distribution area, or will some of these be PPAs from outside, requiring transmission over BPA or other transmission lines?	<i>Answered live at 16:23</i> It's a bit of a mix, because again we can't just really focus in on just one way to do this, so it's a mix of owning and building and BPAs and transmission lines. Now we know there are (going back to the previous question) going to be challenges with each of those, so we've got to be able to balance a number of different factors and variables as we make some of those decisions. At this point we're looking at all those various areas to be able to feasibly move towards those targets.
6	5/9/2024	James Adcock	Q&A	If Puget has this much work to do then why were not more of the previous round of RFP bids accepted?	<i>Answered live at 17:15</i> Because we are currently in the midst of evaluating bids, I don't know that we can talk much about that process right now. There will be an opportunity at the end of that bidding process when we will submit an evaluation report on what happened throughout that RFP process. Just because we're in the midst of that process right now we can't really talk too much about it.

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7	5/9/2024	Michael Blaz	Q&A	Is Biodiesel being considered as a renewable energy source, perhaps even as a Peaker Plant?	Biodiesel is generally considered a renewable resource under CETA and we are certainly considering it - along with other resources - as we work to meet our growing electricity needs. You can watch our public webinar on alternative fuels on our YouTube channel .
8	5/9/2024	Adrian Falla	Q&A	Is the evidence we're all now continually inundated by, of extreme weather disasters in the US & worldwide that are being accelerated, compounded and amplified by catastrophic anthropogenic global heating, that are already clearly outpacing IPCC's most pessimistic projections now sufficient to cause PSE to sharpen focus not only on *meeting* the CEIP's goals, but by how much and how quickly it can *exceed* them?	<i>Answered live at 31:45</i> We certainly share your concerns about the impacts of climate change and we are taking an "all of the above" approach in developing our clean energy goals and plans and doing what we can to make progress towards our ambitious goals that we have in our current plan as we move forward towards carbon neutrality in 2030. We are growing and we need to do this in a way that is reliable and affordable for our customers. To your question of "can we go faster?" I think that's going to be an ongoing conversation over the next several years as we figure out the pace that we can go; at the pace that our regulator the Commission (Washington Utilities and Transportation Commission) is comfortable with, and how we do this in a way that is safe and reliable and equitable. We will remain committed to moving as quickly as we reasonably can.
9	5/9/2024	Joel Nightingale	Q&A	Given the barriers to transmission development, what alternatives to new transmission builds is PSE exploring in the 2025 IRP (for example, grid-enhancing technologies or storage as a transmission asset)?	<i>Answered live at 28:44</i> As Eleanor mentioned we're definitely looking into the different alternatives for packing more renewable energy behind the same transmission lines. You don't get the same type of reliability benefits; for example, if we put 200 MW of resource behind a 100 MW transmission line that's not as good as a 200 MW power plants. But, if it's a wind or a solar farm we may be able to get more renewable energy, maybe not at peak, but during other periods. The ideas of reconductoring

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					existing transmission lines with different kinds of material are certainly ideas that we are considering the feasibility of.
10	5/9/2024	Thomas Kraemer	Q&A	Slide 18 lists transmission options PSE is exploring. Why is the Western Transmission Expansion Coalition – WestTEC – not listed? Will PSE be part of the Western Resource Adequacy Program (WRAP)? Rather than relying on BPA which won't add capacity until 2040 or self-building?	<i>Answered live at 30:45</i> PSE has been very engaged in the WestTEC effort. We were actually one of the original participants as that group was being stood up, and they are making great progress towards developing what the outcome of that committee is going to be. We've been continuing to be engaged and hope to help inform and drive some of the decisions and plan that come out of that. I can say we are also engaged with the WRAP.
11	5/9/2024	James Adcock	Q&A	When I look at BPA hourly reports of how much power they are transmitting on their various power lines, what I see is that most of the hours of the day, month, and year, those transmission lines are *not* at capacity. Can you please clarify why you cannot send renewable power over these lines on the vast majority of hours when those lines are *not* actually operating at capacity?	<i>Answered live at 33:08</i> This is a great question and I think what we're trying to accomplish is really being able to serve our load at all hours of the day, and there are certainly times when that path is constrained and the capacity is allocated, and we need to think about other ways we can meet our energy needs utilizing that system.
12	5/9/2024	James Adcock	Q&A	I was specifically asking about sending renewable power over these lines, not meeting "peak capacity requirements"	<i>Answered live at 34:38</i> We are looking in to whether we can pack the transmission system using non-firm transmission for non-firm energy. That's definitely something that we're looking into, so it's possible. The reason why the lines might be empty is because the wind isn't blowing. If we put more wind farms when the wind isn't blowing there won't be any more energy. Similarly, if we use solar, at night the transmission line is still going to be empty. Given BPA's position and how long it takes to build transmission that's something that we will be looking into in a lot of detail. I think it may be

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					a very important component of our ability to meet CETA targets.
13	5/9/2024	Thomas Kraemer	Q&A	Are the 2,600 mi. of transmission in PSE's delivery system all owned by PSE, or are some of these BPA lines?	These are PSE-owned transmission lines.
14	5/9/2024	Thomas Kraemer	Q&A	How much of the required resource doubling by 2030, or 15 GW required by 2045 (per slide 12) can be achieved by the technologies discussed in the local grid overview?	Please see our answer to #20 below.
15	5/9/2024	Adrian Falla	Q&A	<p>why are we not hearing MUCH MORE about work with third parties to boost microgrid development? 2 measly sites!</p> <p>and why are you talking about "our" virtual power plant, when 3rd parties (e.g. Tesla) are far ahead of you on realizing such concepts?"</p>	<i>Answered live at 53:14</i> PSE has been working a lot on developing our own capabilities around microgrid development. We also have a few other projects where we have partnered with other third parties for microgrids. These two sites are specifically for one project, but we have other projects in the queue as well around microgrids; it's not just these two. For PSE's virtual power plant (VPP) we are working with multiple third party entities and multiple original equipment manufacturers (OEM) to work directly with the customers to trigger these different events.
16	5/9/2024	Thomas Kraemer	Q&A	The local grid planning schedule (slide 25) seems to peter out with two small microgrids and enabling of a DER management system. Where is the planning, design and construction of transmission capacity within PSE's delivery system?"	While the focus of Reid's presentation was on the short-term implementation of grid enhancing technologies, PSE continues to focus on long-term local transmission system planning. Details of PSE's transmission system plans are publicly posted on OASIS on an annual basis (https://www.oasis.oati.com/woa/docs/PSEI/PSEIdocs/PSE_Plan_2023_Final.pdf). This PSE Plan details the new transmission facilities and facility replacements or upgrades planned by PSE over a ten-year timeframe.
17	5/9/2024	James Adcock	Q&A	https://transmission.bpa.gov/Business/Operations/Paths/	Thank you.

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18	5/9/2024	Kathy Leigh-Godfrey	Q&A	Really well done! Thank you.	Thank you for your feedback.
19	5/9/2024	Meghan Anderson	Feedback form	Why not consider reconductoring with BPA? This can at least double transmission capacity with a 1-3 year timeframe.	PSE recognizes the value of maximizing existing transmission corridors and evaluates reconductoring when identifying potential solutions to address system capacity needs. BPA has also committed to moving forward with their Evolving Grid projects, which include measures to increase capacity on the West of Cascades North path. This portfolio of projects includes reconductoring two lines on this path in addition to other measures to increase path capacity. These reconductors were identified in 2022 with an estimated in-service date of 2030. It is important to note that there are many types of constraints the system can experience, including thermal limits for lines, or voltage or stability limits for load areas. Reconductoring may increase thermal capacity while not fully addressing other types of constraints, resulting in a reduced capacity benefit.
20	5/14/2024	Thomas Kraemer on behalf of Third Act Washington	irp@pse.com	<p>Thank you for focusing on transmission as one of the necessary resources for meeting our region's clean energy needs. The Pacific Northwest Utilities Conference Committee recently said that "permitting new transmission lines is the biggest hurdle to expanding the electric transmission system."</p> <p>The IRP process is necessarily vague about transmission planning, identifying possibilities but deferring specific plans to the future when generation sources are better determined. However, more concrete actions can be taken to begin the process of upgrading and adding to the</p>	<p>1. PSE has been actively engaged in WestTEC efforts, holding positions on the Steering Committee and the WestTEC Assessment Technical Team. We look forward to the continued efforts of WestTEC to develop an actionable transmission plan for the Western Interconnection. Likewise, PSE is a participant in the Western Resource Adequacy Program and we recognize the importance of resource adequacy and the benefits of a region-wide approach as we transition to a fully renewable resource mix. PSE is encouraged by the considerable work of the Pathways Initiative and the preliminary identification of legal risks around a long-term governance transition for California and</p>

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				<p>regional transmission system, within and outside PSE's service area, to provide capacity for connecting remote and local generating resources which will soon be needed.</p> <p>1. PSE can support and provide leadership in regional transmission planning initiatives for the western interconnection. It's clear that PSE cannot simply rely on BPA to provide regional transmission, as slide 17 in the May 9 presentation says. PSE can provide leadership in the Western Transmission Expansion Coalition (WestTEC) and the Western Resource Adequacy Program (WRAP), as well recently proposed Pathways Initiative sponsored by the Western Power Pool, and endorsed by utilities commissioners in Washington and other western states, which could lead to a regional transmission organization that integrates transmission planning and energy markets.</p> <p>2. PSE can accelerate within-PSE renewable energy resources and grid upgrade planning to evaluate how much (and what kinds of) additional generation will be needed from remote sources, to assist in regional planning. Many zero emission resources will be zero cost (demand response) or low cost (EV to grid, customer-owned solar), especially those that don't require transmission capacity increases (many DERs) because they can be built within existing distribution systems. These can be planned and cost-estimated, and possibly even placed in service, before regional</p>	<p>the west, and continues to thoughtfully monitor Pathways.</p> <p>2. You can read more about PSE's resource evaluation in our 2023 Electric Progress Report Conservation Potential Assessment or watch our March 25, 2024 RPAG meeting.</p> <p>The distributed resources such as solar can cost twice as much or more than the larger utility scale resources. For example, in the 2022 NREL ATB that was used in the 2023 Electric Progress Report, the utility scale resources were around \$1200/kw, whereas the distributed solar is around \$2000/kw with a lower net energy output of about 17% and utility scale solar in Eastern Washington is around a 27% net energy output. This can be found in the 2023 report, Appendix D: Generic Resource Alternatives</p>

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				<p>agreements are fully in place, for which the timelines are still uncertain.</p> <p>The local grid overview in the May 9 presentation does not provide even a rough estimate of how much power can be delivered by the planned local grid upgrades presented, in order to offset the need for regional transmission from outside PSE. How much of the required resource doubling by 2030, or 15 GW required by 2045 (per slide 12) can be achieved by the technologies discussed in the local grid overview? The local grid planning schedule (slide 25) seems to peter out with two small microgrids and enabling of a DER management system. What are the next steps for maximizing these low-cost resources?</p> <p>PSE shouldn't wait for WRAP to plan for all the renewable resources it can tuck into its existing distribution and transmission system. A concerted effort to maximize distributed resources within PSE may reveal a surprising amount at reasonable costs.</p>	
21	5/21/2024	Joel Nightingale on behalf of Washington Utilities and Transportation Commission staff	irp@pse.com	<p>1. Slide 18 shows the options for overcoming transmission constraints that PSE is exploring in the 2025 IRP. Staff would appreciate more information about each of these options including:</p> <ul style="list-style-type: none"> a. How PSE is exploring making the most of the existing transmission network using grid enhancing technologies (GET) and how they fit into each of the proposed transmission-related sensitivities. 	<p>PSE is closely following developments in grid enhancing technologies. While they show promise for maximizing existing corridors, these technologies are not well suited to address the size and scale of the transmission capacity need that PSE has identified. The use of grid enhancing technologies to increase flows on existing corridors must also be balanced against reliability needs of the system. As existing facilities carry more power, loss of these facilities will have greater impact on</p>

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				b. What assumptions these sensitivities include about types of solutions available and the costs of those solutions.	the surrounding system, potentially resulting in reduced reliability for customers.

Attendees (alphabetical by first name)

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|------------------------|---------------------|--------------------|
| 1. Adrian Falla | 6. Kate Brouns | 11. Patrick Leslie |
| 2. Brandon Green | 7. Leslie Almond | 12. Quinn Weber |
| 3. James Adcock | 8. Michael Blaz | 13. Stuart Coles |
| 4. Joel Nightingale | 9. Mona Davis | 14. Thomas Kraemer |
| 5. Kathy Leigh-Godfrey | 10. Meghan Anderson | |

PSE staff

- | | | |
|------------------|----------------------|------------------|
| 1. Brett Rendina | 5. Elizabeth Hossner | 9. Ray Outlaw |
| 2. Brian Tyson | 6. Kara Durbin | 10. Reid Shibata |
| 3. David Landers | 7. Meredith Mathis | 11. Ryan Lambert |
| 4. Eleanor Ewry | 8. Phillip Popoff | |

Facilitation staff

- | | |
|---|--------------------------------------|
| 1. Emilie Pilchowski, Triangle Associates | 4. Sophie Glass, Triangle Associates |
| 2. Jack Donahue, Maul Foster & Alongi (MFA) | 5. Will Henderson, MFA |
| 3. Pauline Mogilevsky, Triangle Associates | |

