

Puget Sound Energy Resource Planning Advisory Group (RPAG) meeting

Meeting Summary

Tuesday, May 14, 2024 | 10:00 a.m. – 1:00 p.m.

Meeting purpose and topics

Below are the meeting topics of this Resource Planning Advisory Group (RPAG) meeting:

- Present delivery infrastructure in the Clean Energy Transformation Act (CETA) context
- Present an overview of the regional grid
- Present an overview of the local grid

Agenda

Time	Agenda Item	Presenter
10:00 a.m. – 10:05 a.m. <i>5 min</i>	Introduction and agenda review <ul style="list-style-type: none">• Safety moment• Introductions• Agenda	Sophie Glass , Facilitator, Triangle Associates
10:05 a.m. – 10:10 a.m. <i>5 min</i>	IRP process updates <ul style="list-style-type: none">• Equity in the IRP discussions• HB 1589 update	Kara Durbin , Director, Clean Energy Strategy
10:10 a.m. – 10:15 a.m. <i>5 min</i>	Feedback summary <ul style="list-style-type: none">• Feedback from March 25, 2024 RPAG meeting	Phillip Popoff , Director, Resource Planning Analytics, PSE
10:15 a.m. – 11:45 a.m. <i>90 min</i>	Western Resource Adequacy Program (WRAP) methodology overview <ul style="list-style-type: none">• Transmission constraints to meet CETA• Regional transmission challenges• Transmission options PSE is exploring	Phillip Popoff , Director, Resource Planning Analytics, PSE Michael O'Brien , Senior Engagement Manager, Western Power Pool Ryan Roy , Director of Operations and Technology, Western Power Pool
11:45 a.m. – 12:00 p.m. <i>15 min</i>	Break	All
12:00 p.m. – 12:30 p.m. <i>30 min</i>	Forecasting future WRAP resource adequacy requirements	Jennifer Coulson , Manager, Operations and Gas Analysis, PSE

Time	Agenda Item	Presenter
	<ul style="list-style-type: none"> Evaluating PSE’s metrics and WRAP metrics Approach for applying WRAP planning reserve margin (PRM) Overview of WRAP effective load carrying capabilities (ELCC) Comparing ELCCs from resource adequacy analysis and WRAP 	
12:30 p.m. – 12:50 p.m. <i>20 min</i>	Discussion and poll	Sophie Glass , Facilitator, Triangle Associates
12:50 p.m. - 1:00 p.m. <i>10 min</i>	Next steps and public comment opportunity	Sophie Glass , Facilitator, Triangle Associates
5:00 p.m.	Adjourn	Sophie Glass , Facilitator, Triangle Associates

The full meeting materials, including the [agenda](#), and [presentation](#) are available online under the May 14, 2024 meeting heading [on the IRP website](#).

Action items

Below is a summary of actions from the May 14, 2024, RPAG meeting.

What	Who	When
Research the following question and include a response in the feedback report: What kind of SMR is PSE considering modeling?	PSE	Complete – please see response #1 in the feedback report

Introduction and agenda review

Sophie Glass, facilitator, provided an overview of the agenda for the meeting and welcomed RPAG members (see “RPAG members in attendance” on the last page for a list of RPAG members who joined this meeting). Sophie introduced Stefan de Villiers who is replacing Stephanie Chase as the RPAG representative from the Public Counsel Unit of the Washington State Attorney General’s Office.

IRP process updates

Kara Durbin, PSE, provided updates on PSE’s approach to the Integrated Resource Plan (IRP). PSE has a series of upcoming meetings discussing the incorporation of equity into the IRP analysis. PSE is building off its approach from the 2023 Electric Progress Report (EPR) and adding an assessment of the distribution of benefits and burdens through the lens of the four energy justice tenants. This assessment is separate and complementary to the portfolio benefit

analysis from the last IRP cycle. PSE will discuss this new approach with the Equity Advisory Group (EAG) on Wednesday, May 21. This meeting will be followed by four equity-focused meetings in June including one public webinar, two RPAG meetings, and one EAG meeting.

PSE explained that House Bill (HB) 1859, which passed in March of 2024 directly pertains to PSE's ongoing IRP work. HB 1859 streamlines the planning process into a single Integrated System Plan (ISP) due Jan. 1, 2027. This includes the IRP and the Clean Energy Implementation Plan (CEIP) and the opportunity to consolidate other plans such as the Biennial Conservation Plan. Additionally, the bill facilitates the development of critical energy infrastructure needed to meet clean energy goals. Lastly, HB 1859 accelerates the depreciation of natural gas infrastructure to ensure an equitable distribution of costs. HB 1859 does not ban new natural gas. The new law allows PSE to request the Commission bypass the 2025 planning processes for PSE to focus on the new ISP. If PSE moves forward with the request and the Commission approves it, the RPAG work plan for the 2025 IRP will likely change. However, PSE would still hope to engage with the RPAG and the public on topics relevant to scoping and developing the 2027 ISP. More details are available on PSE's website under the [HB 1859 Fact Sheet](#) page.

PSE responded to comments and questions from RPAG members:

- RPAG member: Could you confirm the date of Jan. 1, 2027, filing date? I see something different on the legislative website.
 - PSE response: Yes, we are certain of this date. You may be mistakenly looking at an out-of-date document. PSE shared [a link](#) to the bill in the chat with more information.

Feedback summary

Philip Popoff, PSE, summarized the public feedback from the March 25 RPAG meeting:

PSE heard concerns from the public regarding small modular reactors (SMRs) as a generating resource and a desire for PSE to provide additional details about overcoming transmission constraints. RPAG feedback included support for additional geothermal modeling, clarifying questions about specific modeled resources, and requesting that PSE do a full cost and emissions analysis that includes fuel cycle impacts.

PSE responded to comments and questions from RPAG members:

- RPAG member: Could you clarify what kind of SMR's PSE is considering modeling?
 - PSE response: Please see a response in the feedback report.

Western Resource Adequacy Program (WRAP) methodology overview

PSE introduced the WRAP as an important development in the region, setting the foundation of industry-standard resource adequacy requirements. The WRAP emphasizes the interconnected nature of the grid by enabling utilities in the industry to come together and agree to a certain set of resource adequacy standards.

Ryan Roy and Michael O'Brien, Western Power Pool, provided an overview of the WRAP. Western Power Pool (WPP) began operating over eighty years ago when groups of utilities came together to pool power for the war effort. The WPP aims to provide a suite of services that are more efficiently delivered through collaboration and coordination rather than what might be done on an individual basis. WPP provides a range of valuable grid integration and coordination services to its customer-members throughout the entire western interconnection. These services include a reserve sharing group, frequency response sharing group, training, transmission services, resource adequacy, and hydro modeling. The WPP is under independent governance with an independent board that does not have any links to its participants. WPP showed a map illustrating the geographic reach of WRAP participants. WPP serves as the Program Administrator of the WRAP, undertaking all actions necessary to implement and administer the program. Meanwhile, Southwest Power Pool (SPP) serves as the Program Operator of the WRAP, providing technical, analytical, and implementation support to the Program Administrator.

The WRAP's value proposition is binding forward showing. This requires participants to show they have secured their share of the regional capacity need for the upcoming season using common planning and capacity accreditation metrics. Additionally, WRAP has a binding operation program that obligates participants with surplus to assist participants with a deficit in the hours of highest need using bilateral trading mechanisms.

The first component of the forward showing program is determining the program capacity requirement. This is a monthly compliance obligation for each of the binding seasons (summer and winter). Participants must demonstrate they can meet a regional reliability metric of a seasonal one event-day in ten years loss of load expectation (LOLE). This means utilities can have one outage in ten years per winter and summer season due to the lack of available capacity to serve load. This is calculated by aggregating the load of all the participants and resources together and analyzing them through an LOLE study to determine the additional capacity needed beyond the load to meet the planning reserve. WPP considers the WRAP as two distinct load sub-regions: the Northwest and desert Southwest. These respective sub-regions have different and distinct planning reserve margins (PRM). In the future, WPP will be exploring potential transmission availability between the two. For each month of these forward-

showing seasons, a participant applies that PRM to their load forecast for those months and must demonstrate through their forward-showing submittal that they have dependable capacity to meet them.

Dependable capacity is the second component of the forward-showing program which refers to determining the capacity contribution of resources. Registered resources receive a qualifying capacity contribution (QCC) in advance of forward-showing deadlines. WPP utilizes a resource-agnostic, consistent methodology for assessing capacity contribution. The last component of the program is the compliance review of the portfolio. Non-compliance with forward showing requirements, whether capacity or transmission, results in a forward showing deficiency charge.

The forward showing advanced assessment is used to determine monthly forward showing PRMs for summer and winter seasons along with advisory binding seasons. The assessment includes various data inputs including thermal resources, North American Reliability Corporations' (NERC) general availability data system (GADS) or equivalent outage data for the last six years for thermal resources, historical data load for the previous ten years, wind and solar variable energy resources (VERs), storage hydro, energy storage resources, run of river (RoR) resources, hourly generation profiles for VERs and RoR, nameplate of all resources, and storage hydro monthly QCC values.

The forward showing reliability metrics are calculated through an LOLE study using the load and resource zones (LRZs) to distinguish weather variability across the WRAP and within subregions. These subregions are used to determine monthly forward showing PRMs. Capacity, also known as QCC, is added to meet this variability reflected in the one in ten years reliability metric. WPP uses data from forty years of historical weather to model the impact on load and simulate a stack of qualified resources with thermal outages and variations in generation. The amount of capacity is converted to unforced (UCAP) values to calculate PRMs.

Forward showing capacity requirements are the amount of monthly capacity (portfolio QCC) a participant is required to demonstrate in a binding season. The monthly P50 peak load forecast for a binding season looks back over the months of a binding season for five years, attests to significant loads added or removed, and applies a load growth rate. The LOLE study assumes an average 6% peak load in its contingency reserve adjustment. This considers each individual participant's actual imports and exports and any contingency reserve contracts to ensure the correct amount of capacity is required.

To summarize, the WPP collects data from participants through the advance assessment which is then aggregated in the LOLE study to calculate PRM by sub-region by geography. The data is also used in a QCC study to determine the performance of all those resources when the region needs them most during critical hours. Then the forward sharing PRM is applied to each participant's specific P50 load forecast during those months to determine the forward sharing and capacity requirement that they must comply with.

Per the QCC methodology, qualified resources must be registered in the WRAP through the Advance Assessment before being used to meet the monthly forward showing capacity requirements in a forward showing submittal. Thermal, long-duration storage, and demand response resources must undergo additional capability testing every five years. All resources must undergo an operation test annually to demonstrate they can operate at a high percentage of generating capability. WPP provided a catalog of how they calculate the QCC of each type of resource.

The sharing requirement for participants is calculated by subtracting the operational reality from the forward showing expectations. The operational reality evaluates participants' operational situation relative to forward showing assumptions and obligates participants with a calculated surplus to assist participants with a calculated deficit on the hours of highest need. Surplus participants who fail to provide assigned energy deployment must pay an energy delivery failure charge.

WPP showed a timeline highlighting the distinction between the forward showing, operational, and after-the-fact time horizons. The operational time horizon begins seven days before the operating day with the rolling daily assessment and ends with the sharing event on the operating day. WPP shared their formula for calculating the current available capacity and current need.

WPP ended their presentation by presenting a timeline of 2023-2024 WRAP implementation and a preview of the implementation ahead from summer 2025 through winter 2027/2028. WPP highlighted that by 2028, all participants must be registered in a binding program without transition provisions. Participants have the option to opt into this program in 2026 or 2027.

WPP and PSE responded to comments and questions from RPAG members:

- RPAG member: Given that WRAP has a bilateral trading mechanism, how are trades enforced? Who is responsible if participants cannot reach a deal?
 - WPP response: The rules of the operations program mandate that if a participant is calculated to have a surplus and someone else needs help, the capacity is set aside. In this context, there is no reliance on the bilateral market because the entity with a surplus is obligated to contribute it to the program if another entity has a deficit. The matching of surplus and deficient entities occurs via the tariff. The tariff additionally dictates the terms of the transaction such as the price and timing.

Forecasting future WRAP resource adequacy requirements

Jennifer Coulson, PSE, provided an overview of forecasted future WRAP resource adequacy requirements. The 2025 IRP will run two sets of resource adequacy metrics. The first set is PSE metrics provided by E3. The second set is the forecasted future WRAP requirements. By evaluating both metrics, PSE takes into account the gap between operations and longer-term planning. Instead of these metrics being created via a formal WRAP group, PSE has produced a forecasted WRAP metric for longer-term projections.

PSE provided an overview of its approach to applying the WRAP PRM. The WRAP uses a five-year average historical normal peak load which PSE is emulating by using the five-year rolling average of forecast peaks from the 2025 IRP demand forecast. Additionally, PSE is applying a monthly WRAP PRM developed by Southwest Power Pool (SPP). SPP completed the analytics and modeling for the WRAP and their participants for the forward showing metrics. PSE takes into account the months selected with the highest total need to represent respective seasons.

PSE provided an overview of its approach to applying the WRAP effective load-carrying capabilities (ELCCs). To determine the regional build-out and ensure PSE is reflecting saturation effects, it leveraged two different sources. The first source, applicable through 2034, is the Pacific Northwest Utilities Conference Committee's (PNUCC) 2024 Northwest Regional Forecast. PNUCC's Forecast aggregates Northwest utility reported plans for future resources (backing out PSE's reported resources). To extend out to 2045, PSE is using its Power Price AURORA model regional build-out. Additionally, PSE is mapping the regional build-out to WRAP zones by location and technology and using saturation curves and ELCCs from material provided by WRAP.

Discussion and poll

PSE invited RPAG members to provide feedback on how supportive they are of PSE using PSE's WRAP forecast approach moving forward. Additionally, PSE asked RPAG members about any concerns they have moving forward with either methodology.

PSE responded to comments and questions from RPAG members:

- RPAG member: Could you clarify the question?
 - PSE response: Should PSE be transitioning to the WRAP methodology for resource acquisitions, or should we stick with our own? What are the pros and cons of each option?
- RPAG member: Is PSE leaning one way already?

- PSE response: We are open. We are leaning towards WRAP metrics but are open to feedback.
- RPAG member: I think everyone should pool resources together and support using WRAP. I have some long-term concerns about how WRAP coincides with PSE's CETA requirements.
- RPAG member: I believe WRAP is premature and do not think WRAP is ready yet and it does not represent time-shifting resources like storage. I also disagree with the note in the WRAP that excludes one of the six historical years for the QCC of thermal resources. This gives an unwarranted advantage to thermal resources.
- RPAG member: I strongly support using WRAP metrics. This model gives us a sense of how we should be preparing for the future. I think the proposal of joining forces with our neighbors is the way to go forward to create a more renewable-rich grid. This distributes the cost. One of the critiques of renewables is that they are so expensive, but this methodology allows utilities to distribute the responsibilities and costs across a wider regional footprint. This allows for diminishing costs and faster deployment.

Conclusion: Approximately half of RPAG members that participated were supportive of moving to the forecast of WRAP metrics. Phillip shared his conclusion that based on these results, it does not appear the RPAG is very supportive of making the change at this point. He suggested it would make sense for PSE to do the analysis both ways, then share the results with the RPAG, and revisit the topic, with this additional information. Therefore, PSE will run the analysis with both sets of RA metrics. PSE plans to bring those results back to the RPAG and revisit the topic.

Next steps

- May. 21, 2024: Feedback form for this meeting closes
- May. 31, 2024: RPAG meeting on the electric modeling process

Public comment

The public comments shared during this meeting can be viewed online in the feedback report posted under the May 14, 2024 heading on the PSE website.

Attendees¹ (alphabetical by first name)

1. Bill Westre
2. Brian Tyson
3. Diana Aguilar
4. Eric Schwartz
5. Jeff Ewing
6. Jesse Scharf
7. Lori Hermanson
8. Michaela Levine

9. Phil Ritter
10. Seth Baker

11. Stuart Coles
12. Thomas Kraemer

RPAG members in attendance

1. Dan Kirschner
2. Fred Heutte
3. Kate Brouns
4. Ezra Hausman
5. Jim Dennison
6. Katie Chamberlain

7. Stefan de Villier
8. Quinn, Weber
9. Megan Larkin
10. Sommer Moser
11. Froylan Sifuentes
12. Aliza Seelig

Presenters

1. Jennifer Coulson, PSE
2. Kara Durbin, PSE
3. Michael O'Brien, WPP
4. Phillip Popoff, PSE
5. Ryan Roy, WPP

Other PSE staff

1. Brett Rendina
2. Douglass Hart
3. Eleanor Ewry
4. Meredith Mathis
5. Ray Outlaw
6. Sachi Begur
7. Sandeap Reddy

Facilitation staff

1. Emilie Pilchowski
2. Pauline Mogilevsky
3. Sophie Glass
4. Jack Donahue

^[1] These numbers do not include viewers on [PSE's YouTube livestream](#)