

Puget Sound Energy Resource Planning Advisory Group (RPAG) meeting

Meeting Summary

Friday, January 12, 2024 | 12:00 – 2:00 p.m.

Meeting purpose and topics

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

- Present updated demand forecast for gas and electric load
- Discuss next steps for demand forecast
- Present emerging technology assessment overview
- Discuss recommendations for technology assessment
- Recap next steps
- Public comment opportunity

Agenda

Time	Agenda Item	Presenter
12:00 p.m. – 12:05 p.m. <i>5 min</i>	Introduction and agenda review <ul style="list-style-type: none">• Safety moment• Introductions Agenda review and meeting purpose	Sophie Glass , Facilitator, Triangle Associates
12:05 p.m. – 12:10 p.m. <i>5 min</i>	Timeline update and public feedback summary <ul style="list-style-type: none">• Petition filing update• Public feedback summary	Phillip Popoff , Director, Resource Planning Analytics, PSE
12:10 p.m. – 1:05 p.m. <i>55 min</i>	Demand forecast <ul style="list-style-type: none">• Overview• Natural gas results• Electric results• Next steps	Lorin Molander , Manager, Load Forecasting and Analysis, PSE Allison Jacobs , Consulting Load Forecast Analyst (gas), PSE Stephanie Price , Consulting Load Forecast Analyst (electric), PSE
1:05 p.m. – 1:50 p.m. <i>45 min</i>	Emerging resource assessment overview <ul style="list-style-type: none">• Assessment scope• Storage	Elizabeth Hossner , Manager, Resource Planning and Analysis, PSE

Time	Agenda Item	Presenter
	<ul style="list-style-type: none"> • Technological feasibility • Storage configurations • Recommendations • Discussion 	
1:50 p.m. – 2:00 p.m. <i>10 min</i>	Next steps and public comment opportunity	Sophie Glass , Facilitator, Triangle Associates
2:00 p.m.	Adjourn	Sophie Glass , Facilitator, Triangle Associates

The full meeting materials, including [agenda](#), and [presentation](#) can be found online under the Jan. 12, 2024 meeting heading [on the IRP website](#).

Action items

Below is a summary of actions from the Jan. 12, 2024, RPAG meeting.

What	Who	When
Invite Guidehouse to provide a presentation to RPAG members	PSE	TBD (in progress)
Share Black and Veatch’s readiness assessment and summary with RPAG members	PSE	Complete

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).

Timeline update and public feedback summary

Philip Popoff, PSE, provided an overview of PSE’s timeline for the 2025 IRP and shared an update on their filed petition. The Washington Utilities and Transportation Commission (UTC) approved PSE’s petition to extend the 2025 gas and electric IRP filing date to March 31, 2025. Additionally, Philip shared participation statistics and a summary of public feedback from the December 7 hydrogen public webinar. During this past webinar, PSE heard concerns regarding blending hydrogen in the gas system, questions about the effectiveness of hydrogen and support for leveraging hydrogen for high value uses. PSE will continue to look at hydrogen in this IRP and agreed with the feedback that there are a lot of issues that need to be sorted out before PSE would be ready to blend hydrogen into the gas system.

Demand forecast

Lorin Molander, Allison Jacobs, and Stephanie Price, PSE, provided background information on the demand forecast. The forecast period for this IRP spans from 2026 to 2050 and represents PSE's entire service area.

PSE's analysis is calculated before the addition of demand side resources such as energy savings from PSE's energy efficiency programs or customer solar. The IRP analytics team will then produce a demand side resource forecast.

PSE went over its base case assumptions for the demand forecast. PSE also clarified that while these forecasts include policies that are currently in place that affect new gas growth and usage, it does not include potential future policies or programs incentivizing existing gas customers to switch to electric. These potential future policies will instead be addressed through scenarios. Additionally, these forecasts consider the anticipated economic slowdown in 2025 and assume patterns equivalent to 2022 behavior. PSE observed an increase in customers' energy uses during the pandemic and anticipates residential usage to decrease back to pre-pandemic levels, but they haven't fully reverted yet.

Similar to the 2023 IRP, temperature assumptions that reflect climate change are a major driver of the forecast. However, the electric forecast has increased compared to the last IRP primarily due to electrical vehicle charging. Furthermore, the gas IRP forecast is lower than in 2023.

Regarding natural gas results, the 2025 IRP assumes no new residential customer growth starting in 2024, modest commercial class growth, and a declining industrial class. These assumptions were influenced by two policies. The 2021 Washington building code update and PSE's gas line extension policy both made it harder to put natural gas in new construction.

The 2025 IRP's natural gas energy forecast declines over time because of the climate change assumptions and decreases in industrial uses and is expected to decrease even more once demand side resources are added. Ultimately, the 2025 IRP's forecast for 2050 is down 8% compared to 2023.

Regarding the natural gas peak forecast composition, the 2025's IRP peak forecast for 2050 is up 3% compared to 2023. This is expected to decrease once PSE adds demand side resources to the analysis. The nonresidential portion of the forecast assumes a slight increase because of the small growth of new commercial customers.

RPAG members had several questions and comments regarding the demand forecast.

- RPAG Member: Does PSE project some level of decline in gas customer count to reflect building turnover and replacement with all-electric construction?
 - PSE Response: We hold our gas customer count flat because even though we may see some customers turn over to electric, zero is pretty close to what we are expecting to see.
- RPAG Member: Does PSE have access to data or the rate of when buildings get torn down? This seems important to add to the projection.
 - PSE response: PSE will be doing building electrification scenarios. This could be a potential opportunity to consider this.
- RPAG Member: It is critically important that the load forecast is consistent across all scenarios to have a consistent understanding of all the effects. I noticed in the previous IRP, PSE moved to a zero-customer growth gas assumption but applied it only to preferred portfolio. In this IRP cycle I urge you to apply a consistent load forecast across all scenarios.
 - PSE response: Thank you for sharing, that is a good argument that you make. We need to discuss internally to see what we can do.
- RPAG Member: My understanding of slide 17 is that the forecast includes 2 years of new demand side resources, yet we see a lower volumetric load. What is the underlying cause of the decrease?
 - PSE response: With warmer winters we forecast a lower natural gas usage.
- RPAG member: I have some concerns with PSE's characterization of the base forecast as "business as usual". I think of the base forecast as what we expect to see given what we know or what we think is likeliest to happen. Slide 30 details early analysis PSE has done indicating PSE knows that electrification is happening. This should be incorporated into the load forecast.
 - PSE response: This is still a work in progress as PSE is wrestling with how electrification will affect the future. Slide 30 is an estimation based on what happened over 2 years. We don't know the slope of the line for customers switching over to electric, in other words we don't know how the transition trend will continue into the future. As we dig into historical trends and look into different systems to analyze that data we will have a better understanding.
- RPAG member: With the understanding that the IRP is an iterative process, how much additional research can we expect to make it into the load forecast? Additionally, has PSE included existing policies to its assumption on the rate of electrification such as the Inflation Reduction Act (IRA), which we know has contributed to electrification?
 - PSE response: PSE's additional research will impact the scenarios. Research specifically on the trend of electrification will not be able to be added to this cycle's IRP portfolio but PSE would like to be able to do an analysis that will inform and improve the next IRP cycle. Regarding the second question, policies like the IRA will affect demand side resources.

- RPAG member: I would like to see more data and analysis justifying the use of zero growth if it is used as the customer growth base assumption for the 2025 load forecast.
 - PSE response: That is a reasonable request. Currently the reference forecast is simply a starting point, it might not be our final number.

Electric results

Stephanie Price, PSE, provided an overview of its electric forecast. Starting with the customer growth forecast, PSE shared that the forecast is down from the last IRP due to the anticipated economic softening and results of the post pandemic shock. Usually, less customers are indicative of a lower load. The electric energy forecast composition does not include electric vehicles or new demand side resources. In terms of energy demand, about half is residential and half nonresidential. PSE developed an energy forecast in mid-2023 that included electric vehicles, however in late December PSE received an update from their external consultant that manages the analysis who shared a much lower forecast.

A major difference in the electric energy forecast as compared to the past cycle, is that the post pandemic usage of electric vehicles is up, and all new customers assume electric heating, ventilation, and air conditioning (HVAC) usage. Compared to the 2023 electric progress report, the 2025 electric energy forecast with electric vehicles results in an almost 24% growth forecasted for 2040.

Regarding energy demand, winter peaks are slightly lower compared to 2023 and summer peaks are slightly higher. Even if PSE had no demand side resources, it would still be a winter peaking utility, but the distance would be narrower. When you consider electric vehicles, the winter peak has been flat or declining for the past 5 years. The expected winter growth is primarily driven by electric vehicles along with new customers and the 2021 WA code update.

RPAG members had several questions and comments regarding the electric results.

- RPAG member: Is this analysis comparable to demand response in the sense that current policies are not reflected?
 - PSE response: Any ongoing programming and results not logged past 2022 are not reflected. PSE's analysis starts with the base consumption in 2022 and is then projected onwards.
- RPAG member: Is demand response baked into the initial forecast or is it forthcoming?
 - PSE response: This has been flagged for a feedback form response item.
- RPAG member: I noticed PSE does not have any managed charging.
 - PSE response: The electric vehicle management assumption is being analyzed through the conservation potential assessment (CPA). PSE will be hosting a CPA

webinar where PSE will share the impacts of demand response programs specifically for electric vehicles.

PSE led a discussion on how to incorporate new electric vehicle forecasts. Seven RPAG members shared their interest in meeting with Guidehouse to learn more about the analysis. RPAG members also shared comments regarding the peak need. They recommended adding this topic to the risk scenarios and expressed concern with overburdening customers with the cost for peak need.

Emerging resource assessment overview

Elizabeth Hossner, PSE, provided an overview of emerging technologies. PSE has hired Black and Veach, an external consulting firm, to do an initial technology assessment to help PSE determine which technologies they should move forward with and model in the 2025 IRP. While this is still a work in progress, the emerging technologies PSE is considering include offshore wind, advanced nuclear small modular reactors (SMRs), geothermal, combustion turbine with carbon capture and sequestration, and storage.

Regarding advanced nuclear SMRs, PSE has committed a \$10 million investment in Energy Northwest's small modular nuclear reactor development to help them receive a Department of Energy (DOE) loan. As PSE becomes more capacity constrained in the region, PSE is open to filling this gap with nuclear energy. Geothermal and combustion turbine with carbon capture and sequestration are among the emerging technologies along with offshore wind which was modeled in the 2021 IRP and 2023 Progress Report.

Previously PSE modeled short and medium duration storage options technologies including lithium-ion and pumped hydro in the 2023 Progress Report. In the 2025 IRP PSE plans to model additional technologies and duration ranges in the 2025 IRP including metal air batteries, sodium ion batteries, compressed air energy storage (CAEs), flow batteries, pumped hydro and lithium-ion batteries.

To support technological feasibility, Black and Veach has compiled a technological readiness level (TRL) list that ranks emerging technologies on maturity through their conceptualization, development, and application stages. PSE shared a comparison of storage technologies highlighting their advantages and disadvantages and their configurations.

PSE asked RPAG members for feedback on what energy storage technology they should evaluate for three different categories: short, medium, and long duration. RPAG members shared a preference for mature technologies that are dominant in the market and that PSE is already familiar with. PSE members also questioned if this had to be a binary decision between options. Lastly, RPAG members requested more information on the emerging technologies and

PSE committed to sharing Black and Veach's readiness assessment and summary once it is available.

Next steps

- Jan. 17, 2024: RPAG Meeting
- Jan. 19, 2024: feedback form closes for Jan. 12 meeting
- Jan. 24, 2024, feedback form closes for the Jan. 17 meeting

Public comment

The public comments shared during this meeting can be viewed online in the feedback report posted under the Jan. 12, 2024, heading on the [PSE website](#).

Adjourn

The meeting was adjourned at 2 p.m.

Attendees¹ (alphabetical by first name)

- | | | |
|---------------------|--------------------|-------------------|
| 1. Austin Nnoli | 12. Jesse Scharf | 23. Ross Tyler |
| 2. Brandon Green | 13. John Deese | 24. Sachi Begur |
| 3. Brent Rendina | 14. Kathi Scanlan | 25. Sally Jackson |
| 4. Brian Dombeck | 15. Mathew Shapiro | 26. Sarah Buck |
| 5. Chirs Beasley | 16. Megan Lacy | 27. Taylor Nickel |
| 6. Chris Goelz | 17. Mike Hopkins | 28. Tyler Tobin |
| 7. Danielle Szigeti | 18. Orijit Ghoshal | 29. Virginia Lohr |
| 8. David Tomlinson | 19. Patrick Leslie | 30. Weber Quinn |
| 9. Diana Aguilar | 20. Rachel Clark | 31. Wesley Franks |
| 10. James Adcock | 21. Randy Hardy | |
| 11. Jesse Durst | 22. Robin Park | |

RPAG members in attendance

- | | | |
|----------------------|---------------------|---------------------|
| 1. Aliza Seelig | 5. Jim Dennison | 10. Lauren McCloy |
| 2. Dan Kirschner | 6. Joel Nightingale | 11. Megan Larkin |
| 3. Ezra Hausman | 7. John Ollis | 12. Sommer Moser |
| 4. Froylan Sifuentes | 8. Kate Brouns | 13. Stephanie Chase |
| | 9. Katie Chamberlin | |

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

Presenters

1. Allison Jacobs, PSE
2. Elizabeth Hossner, PSE
3. Jennifer Coulson, PSE
4. Kara Durbin, PSE
5. Lorin Molander, PSE
6. Meredith Mathis, PSE
7. Phillip Popoff, PSE
8. Stephanie Price, PSE

Other PSE staff

1. Alexandra Karpoff
2. Jisong Wu
3. John Mannetti
4. Kelly Xu
5. Megan Slater
6. Nick Gemperle
7. Ray Outlaw

Facilitation staff

1. Emilie Pilchowski
2. Kim Zamora Delgado
3. Sophie Glass
4. Will Henderson

