Meeting Summary and Feedback Report

Energy Efficiency and Demand-side Resources public webinar

Meeting details

- Wednesday, November 15, 2023, 3:00 p.m. - 4:30 p.m.
- Virtual webinar hosted by PSE and facilitated by Triangle Associates
- Links to:
  - Presentation
  - Meeting recording
  - Draft Conservation Potential Assessment Measure Study List
- Participants: 45 via Zoom, 54 YouTube views as of December 11, 2023

Meeting summary

Agenda Topic	Summary

Customer Energy Management Overview
Mark Lenssen, Manager, Strategy, Planning and Evaluation, PSE
	• Demand-side (customer-side) resources consists of:
	  ○ Conservation and energy efficiency
	  ○ Distributed generation, such as rooftop solar panels
	  ○ Demand response, which entails customers reducing their loads during peak consumption
	• PSE's ability to deliver energy savings over time fluctuates due to impacts like changing codes and standards and COVID-19
	• PSE determines their energy resource targets based on energy efficiency potential:
	  ○ Achievable: an upgrade may be free, but not everyone will participate; feeds into the Conservation Potential Assessment (CPA)
	  ○ Technical: based on market-ready upgrades; feeds into the CPA
	  ○ Economic: what is cost effective; feeds into the IRP modeling

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Energy Efficiency
Leslie Wright, Manager, Business Energy Management, PSE
 	
Patrick Weaver, Manager, Residential Energy Management and Rebates, PSE
	• PSE's Business Energy Management team supports business, commercial, and industrial customers' energy saving choices through education and incentives
	  ○ Includes zero-cost upgrades, grants, rebates, site visits, and coaching
	  ○ Business products: pse.com/mybusiness
	• PSE's Residential Energy Efficiency team supports energy-saving behaviors and efficient products for residential customers
	  ○ Includes resources for renting customers, property managers, home builders, and homeowners
	  ○ Works closely with people in vulnerable populations highly impacted communities
	  ○ Access to energy efficiency products: pse.com/marketplace
	  ○ Residential rebates: pse.com/rebates

Demand Response Tom Smith, Product Development Manager, PSE	• Demand response (DR) is a measure for reducing energy load in response to supply constraints, generally during peak demand • Consumers can play a role by reducing or shifting energy usage during peak periods • PSE is rolling out new voluntary DR incentive programs for residential and business customers • Learn more at pse.com/rebates/pse-flex
Customer Generation Heather Mulligan, Manager, Customer Clean Energy Solutions, PSE	• PSE's Customer Clean Energy Solutions helps customers reach sustainability and renewable goals • Customer generation is continuing to grow by 3-4 megawatts (MW) per month with over 20,000 customers participating in PSE's net metering program (credits for energy returned to the grid from customer generation) • PSE is expanding Distributed Energy Resources (DER) through community solar, customer battery storage, net metering, or other small power producers
Next Steps and Public Comment Opportunity Sophie Glass, Facilitator, Triangle Associates	• PSE asked for feedback on the Draft Conservation Potential Assessment Measure Study List • PSE extended their feedback deadline to December 1 • There will be a future opportunity to dive deeper into demand-side resource planning during an upcoming RPAG discussion • PSE will host an Emerging Resources: Hydrogen public webinar on Dec. 7, 2023

Feedback report

The following table records participant questions and PSE responses from the webinar Q&A feature, public comment period, and comments submitted via online feedback form or irp@pse.com. Meeting materials are available on the IRP website.

No.	Date	Interested party	Submitted via	Question or comment	PSE response
1	11/15/23	Don Marsh, Washington Clean Energy Coalition (WCEC)	Q&A	I don't see how to change my affiliation. Happy to do it, but this platform is restrictive.	Thank you for the feedback. Webinar participants are not able to manually add their affiliation to their usernames in Zoom. If you are logged into Zoom (i.e., you have a Zoom account) it pulls this information from your default settings.
2	11/15/23	Virginia Lohr, WCEC	Q&A	When you ask a question, such as can you hear me, how do we answer?	Thanks Virginia - I was looking at my Triangle facilitation team colleagues to respond, not the general participants. I should have been more clear. I got thrown off when I got an "error" notice all of a sudden!
3	11/15/23	Don Marsh, WCEC	Q&A	How many people are online today?	We have 37 total participants and staff on the webinar and 13 streaming on YouTube.
4	11/15/23	Virginia Lohr	Q&A	Where do we find the list that Mark mentioned?	You can find it at this link on our website: Measure Study List draft.
5	11/15/23	Virginia Lohr	Q&A	That link doesn't seem to work for me.	If you go to our website using this link, you can find it under the November 15 header: https://www.pse.com/en/IRP/Get-involved
6	11/15/23	Don Marsh, WCEC	Q&A	When you are evaluating the cost of different Demand Response programs, are you also accounting for cost of avoided emissions?	*Answered live at 15:12.* For both the gas and electric side of the utility we have avoided costs that we value. So if we're not delivering a kilowatt hour or a therm to a customer because they did some kind of upgrade, there is a value provided. There are different components to that. It's not just the energy provided, it's the carbon emissions, the system upgrades we don't have to do, the generation we

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					don't have to acquire, the Climate Commitment Act (CCA) allowance cost that we bear in the auctions that we are participating in. So it doesn't just look at the unit of energy that we deliver, but all of the aspects behind the scenes as well.
7	11/15/23	Brian Grunkemeyer	Q&A	Do you have any way to account for a locational value of conservation measures? IE, DR at the end of a feeder?	*Answered live at 17:12.* We are working towards having more locational specific data. What's still fairly new to us is how we evaluate where the locational value is from a customer perspective. We're looking at different equity lenses now with our programs. You could look at that from an avoided cost perspective in what we would call a targeted area or constrained area where there are system constraints. There are specific locational benefits that we can tie to different programs or delivery of programs when there is one that we can quantify.
8	11/15/23	Joel Nightingale, Washington Utilities and Transportation Commission (UTC)	Q&A	For folks who are not familiar with cost-effectiveness, avoided cost, etc. could you speak a little more about the top of the pyramid (slide 11)? What goes into this economic evaluation? Whose perspective does it take?	*Answered live at 18:41.* When the measures are evaluated in the Conservation Potential Assessment (CPA) there are a bunch of data points tied to each measure. Those would include how much energy they save, what type of energy they save, or what different load types they are as well as the cost. That gets into the economic questions – if you have two different upgrades that deliver the same amount of energy, but one costs a dollar and the other costs 10 dollars, we're going to value those differently, assuming they last the same amount of time. In the model we stack up in groups or bundles, the different energy efficiency measures in like costs. The $1 example would be on the left end of the scale and the $10 savings would be at the right end of the spectrum. We have this series of bundles that get

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					more and more expensive from a societal and customer perspective to deploy as measures. What the IRP is doing is deciding how much of different resources are we going to select and how do we mix in energy efficiency or other types of demand-side resources. Going back to the stack of economic bundles, we will go from left to right, picking the most cost-effective things first and as we need more conservation or demand-side resources it goes further up the stack into the more expensive measures. Comparatively it's better than building a new generation plant. The avoided cost is tied into the cost or benefit of not delivering that kilowatt hour to the customer, from the generation point to the customer.
9	11/15/23	Rosemary Moore	Q&A	I have received an email about joining a Flex program but I can't find any information about this on the website.	https://www.pse.com/en/rebates/PSE-flex
10	11/15/23	Don Marsh, WCEC	Q&A	I have a lot of observations about residential programs, but it's difficult to type them here. I guess I will have to wait for the comments at the end. V2G, VPP, TVR, residential batteries, heat pump water heaters.	Thank you for sharing your feedback during the comment period; feel free to email us as well at irp@pse.com.
11	11/15/23	Rosemary Moore	Q&A	Why can't community solar investor customers be eligible for 100% rebates?	To clarify, PSE does not consider payments under community solar to be rebates, but there is a credit applied to a participant's bill for the value of the energy produced by their share(s) from a project in a given month. PSE's Community Solar projects allow customers to "subscribe" to a share(s) for a minimum of 12

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					months. The cost for general participants is $20 for each 1.46 kW share. In return, customers receive a credit on their bill for their share of the energy generated by the solar project to which they subscribed. The credit amount is calculated by multiplying the kilowatt hour generation of a share times $0.067130, as determined from value of distributed solar within PSE's 2023 Electric Progress Report. This value was recently increased from $0.044883/kWh in a tariff approved by the Washington Utilities and Transportation Commission in October 2023.
12	11/15/23	Thomas Kraemer, Third Act Puget Sound	Q&A	How can homeowners and business owners apply to participate in the trial electrification program?	*Answered live at 39:47.* We have a targeted electrification pilot going now as a result of the latest rate case and right now customers can apply online. There's a rebate to convert from a gas furnace to a heat pump or a rebate for folks that either put in a furnace recently and/or want to add a heat pump for heating and cooling. We also have some low-income programs we've included in the pilot, working with our low-income weatherization program. We're doing very little work on the commercial side in the pilot. We may look at a couple of multi-family buildings or small businesses that would need to be in some of the targeted areas we've identified in that pilot. The website is: https://www.pse.com/en/rebates/home-electrification-assessment.
13	11/15/23	Don Marsh, WCEC	Q&A	Can customers request to be included in your Time Varying Rates pilot program? I would love to participate in that.	We provided information about the TVR in our Feedback Report from the October 16 IRP meeting on page 6.

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					PSE's pilot design intended to include customers with solar and/or battery storage systems, but due to billing system constraints and regulatory hurdles we are unable to offer time-of-use (TOU) rate options to existing and prospective net energy metering (NEM) customers at this time. Our goal is to develop the necessary capabilities in order to extend TOU rate options to existing net metering customers by 2025 upon completion of the 2-year pilot. Residential customers will be incentivized to utilize energy storage by charging during off-peak hours when the cost of electricity is lower and utilizing their lower-cost stored energy during on-peak hours to avoid higher on-peak energy costs. This incentive for battery owners could shorten the amount of time before they are able to recoup their investment in energy storage. At the same time, their load shifting serves to reduce system costs for everyone in the long term
14	11/15/23	Don Marsh, WCEC	Q&A	On slide 24, is one of those "Flex" programs a new name for Time Varying Rates? I need a translator. :)	*Answered live at 49:15.* It is not. Time Varying Rates (TVR) is another name for Time of Use (TOU). The TOU pilot that we have right now breaks into two different types; it's a standard TOU where you'll have different rates and different times, and then there's another one called peak time rebates. Anybody who participates in peak time rebates could participate in our demand response programs if they wanted to, but because of the parameters of the pilot that's underway you can either participate in peak time rebates or in demand response. It's your choice what you want to participate in; you can even participate in TOU and demand response as long as it's not

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					specifically peak time rebates. We're really trying to make sure customer choice is at the forefront of how we're rolling these programs out.
15	11/15/23	Joel Nightingale, UTC	Q&A	How do customer-sited batteries fit into the rollout timeline on slide 24? Are those part of the "Flex Smart" program?	*Answered live at 50:20.* We have an updated timeline for residential batteries and it's looking like April right now. It is going to integrate with the virtual power plant (VPP) and be a part of the overall portfolio. We're in the process of defining exactly how the customer journey looks for that and we're really looking forward to giving more information on that. Right now we know when it's targeted to happen and we definitely know that we're going to be leveraging the VPP and the overall demand response infrastructure that we've developed over the past year and a half to utilize batteries as a resource at the residential level.
16	11/15/23	Rosemary Moore	Q&A	Can we over-ride PSE's temperature reduction (or increase) if one signs up to a program where PSE changes one's temperature from afar?	*Answered live at 51:08.* Yes, 100%. Temperature set points for demand response can vary depending on the manufacturer. For example, Nest has a very specific set point and Ecobee lets the customer choose their set point, Sinope and Mysa also let customers choose set points; it can really vary based off of the OEM. Most of the time you get to choose exactly what the temperatures are when there isn't a demand response event happening and when there is a demand response event happening. Beyond that you also have the ability to say "it needs to be warmer in here and I'm going to change the temperature", and that's ok.
17	11/15/23	Brian Grunkemeyer	Q&A	If I have residential batteries & solar, can I also do V2G?	*Answered live at 52:19.* We're planning on exploring our vehicle to grid integrated options for multiple DERs in that space in 2024. Right now I can't

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					answer that question, but what I can say is we're taking a "no customer left behind" approach to this. We are designing these programs with the thought in mind that in a future state there's going to be a lot of customers out there that have multiple types of DERs that need to work with each other in order to achieve our goals.
18	11/15/23	Don Marsh, WCEC	Q&A	Polestar just announced that all their new EV models will include Vehicle To Grid capability. They will even roll out their own VPP software. Is PSE anticipating any V2G support?	*Answered live at 53:12.* Yes, absolutely. 2024 is going to be a big year for us looking into our options for vehicle to grid. We definitely have plans. How Polestar and all of the EV original equipment manufacturers (OEM) that claim vehicle to grid capabilities are going to be analyzed thoroughly to see what their feasibility is for plugging in to a more developed virtual power plant than we have in this service territory.
19	11/15/23	Don Marsh, WCEC	Q&A	That could be the biggest collective battery in our region, so good to think about.	Thank you for your feedback.
20	11/15/23	Brian Grunkemeyer	Q&A	Have you considered Demand Flexibility above & beyond DR to also reduce carbon emissions?	*Answered live at 56:26.* Something that's at the core of all conservation measures is an end result of a reduction of carbon emissions. I think one of the end results of demand response that's unavoidable is because we're using less energy it will equal lower carbon emissions. However, there are a lot of measures to analyze what carbon reduction looks like from a demand response standpoint. There isn't a silo for demand response when it comes to how energy efficiency as a whole is analyzed by the reduction of carbon emissions. Yes, we are looking at it, but we are under the same sort of analysis

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					options for that as the rest of customer energy management.
21	11/15/23	Chris Goelz, Third Act Puget Sound	Q&A	Do your programs favor big users and not reward people who have been saving all along?	*Answered live at 57:50.* People who have been conservation champions will still benefit from participating in demand response, whether it's a behavioral or automated demand response program. When you look at a large commercial complex versus a residential household there is a very large difference in the amount of energy you're using. Anybody who participates in these programs has something to gain. At the base level there is going to be financial reward and then after that we get the other benefits - conservation, reduced carbon emissions, and grid resiliency. Nobody gets left behind. Regardless of who is participating, or how or where, there is a way for people to benefit.
22	11/15/23	Joel Nightingale, UTC	Q&A	Are there any limits on number of participants in any of these DR programs?	We do not limit the number of participants in Flex Smart and Flex Rewards. Our Opt-Out Behavioral DR program, Flex Events, has a cap of ~200,000 and ~500,000 customers in the winter and summer respectively.
23	11/15/23	Don Marsh, WCEC	Q&A	The chart on slide 28 is encouraging, but I expect solar will get an even bigger bump due to incentives in the Inflation Reduction Act. Is PSE anticipating that? How much more solar generation do you expect in the next few years? Also I would expect our own Clean Energy Transformation Act would also encourage more solar.	*Answered live at 1:13:06.* We are going to see a lot more solar. Currently the federal government is offering a 30% tax credit for the installation of solar. We know that lots of customers are interested in taking advantage of those benefits. In terms of growth we are expecting to see roughly 30 megawatts (MW) of new solar added each year for the next couple of years at least. By the end of 2025, somewhere in the range of roughly 60 MW of new solar will be added if we continue on current trends. We're adding 3-4 MW each month right now.

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24	11/15/23	Rosemary Moore	Q&A	Don't digesters produce methane which is susceptible to large methane leaks?	*Answered live a 1:14:10.* The nice thing about dairy digesters is that they actually capture the methane and convert it into carbon, which generates energy. We're actually destroying the methane before it can be put into the atmosphere and then creating energy out of it. Otherwise, that manure tends to sit in a manure pond releasing that methane into the air, whereas if it's in a digestor it is actually running through a generator. I won't say there aren't any emissions with a dairy digester – there are some, certainly – but there are far fewer emissions when you have a dairy digester than when you just allow that manure to produce methane, as it will.
25	11/15/2	Rosemary Moore	Q&A	Why does PSE expect customers to invest in community solar rather than PSE simply provide the solar energy as part of its electricity provision?	*Answered live at 1:15:26.* PSE is investing in all types of renewable energy, both wind and solar and of course hydroelectric to meet our goals. Community solar is something we heard from customers that they want; they want the ability to invest in solar in the communities and see the benefits in solar on their bill. This is really designed to make that possible and also share the benefits with our income-eligible customers where they can see bill reductions passed along to them.
26	11/15/23	Brian Grunkemeyer	Q&A	Have you considered expanding the single-family battery storage program to V2G? Or is that two years too early?	*Answered live at 1:18:01.* Vehicle to grid is definitely on our road map and something that we are paying very close attention to. We just aren't there yet; we're learning a lot about this space and about how our customers feel about enrolling their vehicle in a product like this. This will definitely be something we work to launch and partner with our customers on in the future.

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27	11/15/23	Virginia Lohr, WCEC	Q&A	PSE is approaching the amount of energy they are legally required to support from home-owners installing solar panels on their properties. I've heard that PSE plans to voluntarily accept participation above the minimum legal level requirement and maintain net metering, which I am glad to hear. I understand that HB 1427 was proposed last session and will be reintroduced in 2024 to ensure that this happens. Does PSE support this legislation? What is PSE doing to expand net metering of solar?	PSE will answer this question in the feedback report. *Post-meeting follow-up:* PSE expects to fulfill the requirement for offering Net Metering as described in RCW 80.60.030 in January 2024. We are committed to continue offering net metering in its current form (PSE Schedule 150) until we have a successor tariff in place for new solar adoption. PSE will provide a minimum of 6 months notice prior to closing applications to Schedule 150. PSE can propose a successor tariff without the enactment of legislation such as HB 1427. While we don't yet know what compensation will be for solar energy exported to the grid under a successor tariff, we do know that PSE will continue to offer behind the meter interconnection that utilizes bi-directional metering and allows self-consumption of solar generation. Residential solar is a critical component of PSE's clean energy goals.
28	11/15/2	Don Marsh, WCEC	Q&A	Would it make any sense for a solar panel owner to also enroll in Community Solar? Or is it limited?	A customer who owns solar on their property can also choose to enroll in a PSE's Community Solar project. However, the number of shares they are eligible to purchase might be fewer than a customer without solar. This is due to the fact that participating customers may not subscribe to greater than 120% of their monthly average consumption, as determined over a one-year time period. For a customer with solar at their property, this would be calculated using the customer's net consumption after accounting for generation from their solar system.

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29	11/15/23	Virginia Lohr, WCEC	Q&A	I applaud your projections to "host" local Community Solar projects. Communities, such as Vashon or Bainbridge, want to create local Community Solar projects that are run through PSE, but I understand this is currently not a readily available legal option. Community Solar is one puzzle piece that can help reduce global warming and help under-served populations, including low-income households. Is what PSE is proposing currently consistent with State regulations or are modifications needed? HB 1509, a bill to facilitate Community Solar, was introduced in the State legislature last year and a version of it will be introduced in 2024. I have 2 questions about this. 1. Does what PSE currently proposes need such legislation to pass? Please explain. 2. Is PSE likely to support legislation that is being considered by the legislature in 2024 that could, as I understand it, allow more Community Solar to be implemented? Please explain.	PSE will answer this question in the feedback report. *Post-meeting follow-up:* Community solar is available for Puget Sound Energy customers. PSE's Community Solar Program is large and growing! We currently have 16 MW of Community Solar serving 3,050 customers. Of that total, 1,124 shares of the program are providing benefits to low-income customers. Additionally, PSE's Clean Energy Implementation Plan includes building the program to 50 MW by the end of 2025, serving up to 34,000 customers. 20% of this program is reserved for income-eligible customers who receive the energy benefits without paying a subscription fee. Our current Community Solar projects are consistent with current state regulations and utility tariffs in place with the WA State Utilities and Transportation Commission. Additionally, in 2022 PSE supported the passage of HB 1814 which created the WA State Community Solar Expansion Program and provides $100M of simple, accessible funding for up to 100% of a community solar project's development costs that are designated to benefit low-income subscribers. This program began this past summer (2023). PSE does not need HB 1509 to pass in order to meet our current 2025 target goal of 50 MW of community solar.

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					PSE is supportive of Washington policy that will continue to encourage the growth of Community Solar. We believe this is best done by establishing targets, and granting utilities flexibility in how they acquire, provide access to, and distribute the benefits of solar energy to customers who do not have access to traditional, single-family, customer-owned and sited solar energy.
30	11/15/23	Katie Chamberlain, Renewable Northwest	Q&A	What does the outreach for community solar projects look like, particularly for income eligible folks? How do people enroll in community solar?	*Answered live at 1:16:38.* There are a number of things happening: first of all, we do try to go to events when a new project has been launched where new shares are available. We have a new project that we are starting enrollment in right now, one of the eastside projects. One of the things we've done is try to translate our materials into Spanish so that we can reach a higher number of our Spanish-speaking customers and inform them of the availability of this product. We also send emails and we have sent flyers through the mail as we recognize that not everybody has access to email. Again, we try to show up at events where we think our customers who would be eligible for this program might be to reach them where they're at.
31	11/15/23	Joel Nightingale, UTC	Q&A	could we go back to heather for that response to Virginia's question?	PSE will answer Virginia's questions in the feedback report. *Please see our answer to question #27 and #29.*
32	11/15/23	Don Marsh, WCEC	Public comment	Some of the things I wanted to say were actually covered but I still have a whole bunch that I want to say. I was a little disappointed that we didn't hear a little bit more about the time of	Thank you for your feedback.

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				use pilot program and hopefully that will become a real program. The reason is that is probably one of the biggest demand response programs that PSE will have and it would be nice to hear a little bit more about that. People are interested in what the rate structure is on time of use and how it all works. It seems like that was a missed opportunity to talk about a very meaningful program for demand response. As far as residential batteries go, I want to heartily endorse what Heather Mulligan said about residential batteries. I installed two Tesla power walls in August of last year and it has prevented my family from experiencing 14 power outages since they were installed. Even though that's really cool, the rest of the time the batteries are not really doing much to contribute to the grid, and they really could. I'm very excited to be able to contribute this capacity to the grid and I'm looking forward to that happening soon. Finally, I just wanted to say something about heat pump hot water heaters. I've just had one installed. This is really an amazing technology; super quiet, you can't hear it at all inside the house. Outside, there's a very quiet fan that runs. The size of the tank is smaller than a normal water heater, and this is going to be super efficient. I feel like PSE could help educate and incentivize people switching to heat pump hot water heaters. Really cool stuff.	

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33	11/15/23	Thomas Kraemer, Third Act Puget Sound	Public comment	*Thomas experienced audio issues during his portion of the public comment opportunity. His comments below reflect what he presented in the meeting and were submitted post-meeting via irp@pse.com.* Electrification is the most effective way to reduce gas demand. The 2023 Gas Utility IRP evaluated electrification as a demand side-resource, but it was not included in the preferred portfolio, because it was deemed not cost-effective. This result was surprising, since several studies have shown conversion from fossil gas to renewable electricity to be highly cost-effective. Also, the cost effectiveness calculation included some flawed assumptions, particularly about the social costs of greenhouse gases. The cost-effectiveness of electrification should be re-evaluated for the 2025 Gas IRP, which should be closely integrated with other electrical system upgrades for handling additional EVs and distributed energy, etc. There are a number of drivers for upgrading the electrical system, and the upgrade costs should be allocated accordingly. Largely because electrification was not included, the preferred portfolio of gas resources could not meet the Climate Commitment Act targets of 45% GHG emission	Thank you for your comments. PSE is updating assumptions regarding electrification in the 2025 IRP.

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				reduction by 2030 and net zero by 2050. For this reason, the Gas IRP shows PSE purchasing large and increasing amounts of allowances through 2050, amounting to over 70% of its base emissions by 2050. However, the intent of the CCA is to issue a diminishing number of allowances each year, going to zero in 2050. PSE's plan is in conflict with the intent of the CCA.	
34		Thomas Kraemer, Third Act Puget Sound	irp@pse.com	Electrification is considered in the Puget Sound Energy Gas Utility IRP to be a demand side resource, and it deserves significant discussion as it is the only resource capable of replacing the majority of PSE's gas supply. In the 2023 Gas Utility IRP, PSE does not include electrification to reduce fossil gas consumption in the preferred portfolio, because a cost effectiveness calculation showed electrification to be not cost-effective. The cost-effectiveness approach was based on some questionable assumptions as outlined below, and should be re-evaluated for the 2025 IRP. PSE's cost effectiveness calculations include a levelized cost, $6.57 per MMBtu of gas, for the social costs of greenhouse gas emissions (SCGHG). Both the dollar amount and the way it is used in the calculation are questionable. The cost factor source document[1] cited in the IRP notes that there are great uncertainties in the projected economic damage values. The authors of the document state that, because of	See response to #33.

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				this uncertainty, the 95th percentile unit cost estimate should be considered when estimating the social costs of carbon. But PSE instead uses the average value, which is approximately half of the 95th percentile value. Also, the source document, dated August 2016, is out of date. It relies on the AR4 assessment report of climate effects by the Intergovernmental Panel on Climate Change (IPCC), published in 2007, sixteen years ago. The updated AR6 assessment was completed earlier this year, with much more detailed modeling and greater damage expectations than previous assessment reports. The estimates in the source document for SCGHG have been criticized by leading economists. Joseph Stiglitz, a Nobel Prize winner in economics, has called the cost estimates in the source document "wildly wrong" and "inadequate to capture deep uncertainty and extreme risk."[2] The way that PSE uses the SCGHG costs is also questionable. The costs of climate damage will be borne by society at large. PSE cannot presume to appropriate them, call them acceptable, and trade them for costs that are borne only by PSE. Although RCW 80.28.395 specifies that SCGHG should be used to determine societal cost effectiveness for conservation resources, that rule only	

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				establishes a minimum requirement to add all resources that meet the economic cost-effectiveness guideline. It does not constrain utilities from using additional conservation resources, which may not be as cost-effective, to meet other regulatory requirements such as the CCA. PSE's approach is the reverse. It uses the cost-effectiveness criterion ab initio to remove a resource that would allow it to meet the intent of the Climate Commitment Act (CCA), which is inappropriate. Most importantly, the SCGHG as calculated represents only the economic costs of climate damage. The effects of climate damage include widespread suffering and death from unsurvivable heat waves, crop failures, greatly intensified storms and worse floods. These also must also be weighed in the balance. But there is no simple formula by which this can be done. Indeed the United Nations and the consortium of climate scientists of the Intergovernmental Panel on Climate Change advise that we must, whatever the cost, cut back GHG emissions to roughly half of 1990 levels by 2030, and to net zero by 2050, in order to avoid the worst effects of climate change. These targets are essentially the same as Washington's Climate Commitment Act targets. The intent of the CCA is to eliminate GHG emissions to a minimal 5% of 1990 levels by 2050, achieving net zero emissions in that	

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				year. There can be no allowances under the CCA after that date – if successful, there will be no more emissions to abate. Meeting these emission reduction targets must be the starting point of any analysis – they cannot be traded away for reduced costs. **ALLOWANCES CANNOT BE USED TO MEET A LARGE FRACTION OF PSE'S CCA-REQUIRED EMISSION REDUCTIONS THROUGH 2050** The 2023 Gas Utility IRP shows PSE relying on an increasing number of purchased emission allowances, rather than cutbacks in its own emissions, over time, through 2050. Yet the Department of Ecology's website says the intent of the CCA is "to ensure Washington achieves its 2030, 2040, and 2050 emissions-reduction commitments, which means we'll issue fewer emissions allowances each year."[3] When the emissions cap reduces to zero, in 2050, there will be no more allowances. Figure 2.11 in the 2023 Gas IRP shows that PSE's own emissions over time in its preferred portfolio reduced by only 27% from the 2015-2019 baseline by 2050, when our state's emissions must be reduced by 100% to net zero. The Figure shows an increasing number of allowances over time, through 2050, purchased by PSE to meet its requirements. By	

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				2050, the figure shows over 4 million allowances purchased by PSE in that year, over 70% of its baseline emissions, at the year in which allowances available will go to zero. How can this be the preferred portfolio? To its credit, PSE's 2023 Gas IRP also includes in its closing chapter an analysis in which electrification and other conservation measures are able to reduce fossil gas emissions to very small amounts. The results are shown in Figure 6.11, which shows that using full electrification to replace gas consumption could eliminate the great majority of PSE's greenhouse gas emissions. PSE's own emissions in this figure are reduced by nearly 90% compared to baseline, by 2050. This should be the starting point for the analysis, and the most cost-effective methods to achieve these necessary results should be adopted, rather than dismissing electrification as not cost-effective based on a flawed initial analysis. For the 2025 IRP, PSE should change its approach to the preferred portfolio. The CCA reduction targets should also be PSE's targets, rather than relying primarily on allowances; only the means to achieve the targets should be subject to cost comparisons. For the 2025 IRP, PSE might suggest state policy changes that could reduce these costs and ameliorate them for PSE ratepayers and investors. This would	

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				put PSE in a leadership position in advocating for policies to address climate change. **INTEGRATED GAS AND ELECTRICITY PLANNING** While regulations may require different planning specifics for gas vs. electricity, this should not inhibit PSE from closely integrating the planning efforts for the two utilities. This is especially important in the transition planning that must be done to stop using fossil fuel completely by 2050. The most cost-effective way to do this will depend on careful integration of upgrading electricity supply as the natural gas supply is gradually eliminated. Expansion and modification of the electricity system must accommodate not only heating and other current gas uses, but also increasing EV loads and distributed renewable generation, among others. Carefully integrating these efforts will reduce the costs attributable to each of them. The information provided in the 2023 Gas Utility IRP is not sufficiently detailed to understand why electrification to replace gas heating is deemed not cost-effective, even when a rough estimate of the social costs of greenhouse gases is considered. It is surprising that electrification is deemed not cost-effective. Several comprehensive studies in recent years of overall regional generation-transmission-distribution systems have concluded that, not	

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				even considering the costs of climate damage, the transition to renewable power can be done at little to zero cost.[4] [5] [6] [7] PSE's 2023 Gas Utility IRP mentions that upgrades required to the electricity systems are one of the important costs that make electrification not cost-effective, but there are no details on the cost calculations for these upgrades in the report or its appendices. These costs will be shared with costs to increase EV and other increased loads, and may be reduced by careful planning for distributed electrical generation. [1]Technical Support Document: Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866 - Interagency Working Group on Social Cost of Greenhouse Gases, United States Government, August 2016 [2]Stiglitz, Joseph, et al., The Economics of Immense Risk, Urgent Action and Radical Change: Towards New Approaches to the Economics of Climate Change, Journal of Economic Methodology Volume 29, 2022 - Issue 3, (https://doi.org/10.1080/1350178X.2022.2040740) [3]https://ecology.wa.gov/air-climate/climate-commitment-act/cap-and-invest	

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				[4]William, J.H. et. al., *Carbon-Neutral Pathways for the United States*, AGU Advances 2(1), January 14, 2021. (https://agupubs.onlinelibrary.wiley.com/doi/10.1029/2020AV000284) [5]The International Energy Agency, *Net Zero by 2050 - Flagship Report*, May 2021 (https://www.iea.org/reports/net-zero-by-2050) [6]Jacobsen, M.Z. et al, *100% Clean and Renewable Wind, Water, and Sunlight All-Sector Energy Roadmaps for 139 Countries of the World*, Joule, August 23, 2017 (https://doi.org/10.1016/j.joule.2017.07.005) [7]Jacobsen, M.Z. et al, *Zero air pollution and zero carbon from all energy at low cost and without blackouts in variable weather throughout the U.S. with 100% wind-water-solar and storage,* Renewable Energy 184: 430-442, January 2022. https://www.sciencedirect.com/science/article/abs/pii/S0960148121016499?via%3Dihub	
35	11/27/23	Don Marsh, WCEC	irp@pse.com	Dear IRP Team and RPAG members, As a dedicated attendee of IRP Advisory Group meetings for the past eight years and a regular participant in recent public Zoom webinars, I	Thank you for your comments. We agree that public participation is essential to the IRP process. Our goal with the 2025 IRP is to create more and diverse opportunities for public participation. Consistent with previous IRPs, all

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				have observed opportunities to meaningfully enhance public participation in the IRP process. The current structure attempts to address different levels of stakeholder engagement through a combination of short public webinars and longer technical meetings of the Resource Planning Advisory Group (RPAG). This system limits participation of stakeholders who have pertinent, detailed knowledge or interest, but are not RPAG members, allowing only a 2-minute oral comment at the end of each meeting. There is no opportunity for immediate, live responses to questions, comments, or concerns. While written feedback is permitted, this does not allow meaningful communication between members of the public attending the meeting and PSE staff and RPAG members. There is no way to know who is reading one's written submission, who is answering it, or who is reading the answer. A written communication followed by a few sentences of response does not accommodate people with differing abilities. To bridge this gap, I propose a straightforward solution: Allocate specific periods for public questions and comments at the beginning, middle, and end of each RPAG meeting. These public feedback periods, perhaps capped at 10 minutes each, would enable two-way interactions without significantly extending meeting durations. This approach recognizes	feedback and questions will be catalogued and addressed in a timely manner. There will also be a public comment period on the draft IRP. As a reminder, during this cycle all members of the public may submit comments or questions in writing as well as ask questions during webinars. The public may also provide comments during designated periods of both public webinars and RPAG meetings. Consistent with previous IRPs, all feedback and questions will be catalogued and addressed in a timely manner and shared with the RPAG as well as PSE's resource planning team. There will also be a public comment period on the draft IRP. The RPAG is not intended to be the only forum for feedback on resource planning.

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				the value of robust public participation in IRP development as stated in the Washington Administrative Code. The efficiency of public comments can be further enhanced by requiring participants to put their questions in the chat feature before they speak. This would enable PSE staff to prepare responsive information, ensuring a focused and informed discussion. To maintain meeting decorum and relevance, a participant who strays from the topic they had posted in the chat could be muted by the moderator. Reactivating the chat feature in the conference software, despite rare instances of misuse, will further streamline the process by reducing duplicate questions and fostering more transparent and interactive engagement. I believe these changes will significantly improve the effectiveness and transparency of public participation in future IRP meetings.	

Attendees (alphabetical by first name)

1. Adrian Falla
2. Anthony Gianella
3. Bill Will
4. Bonnie Bowers
5. Brian Grunkemeyer
6. Chris Goelz
7. Chris Searcy
8. Diana Aguilar
9. Don Marsh
10. Eugene Takahashi
11. Jason Wu
12. Jesse Durst
13. Joel Nightingale
14. Kasey Curtis
15. Kate Brouns
16. Katie Chamberlain
17. Liam Keyek
18. Marcus Sellers-Vaughn
19. Mark Klein
20. Mark Sincell

21. Megan Larkin
22. Mike Hopkins
23. Robert Healy
24. Rosemary Moore
25. Stephanie Chase
26. Susan Christensen
27. Taylor Nickel
28. Thomas Kraemer
29. Virginia Lohr

PSE presenters

1. Heather Mulligan, PSE
2. Leslie Wright, PSE
3. Mark Lenssen, PSE
4. Meredith Mathis, PSE
5. Nick Gemperle, PSE
6. Patrick Weaver, PSE
7. Phillip Popoff, PSE
8. Ray Outlaw, PSE
9. Tom Smith, PSE

Other PSE staff

1. Allison Jacobs
2. Jack Wellman
3. Jeff Tripp
4. Kara Durbin
5. Kelima Yakupova
6. Kelly Xu
7. Kristine Rompa
8. Lance Rottger
9. Leslie Almond
10. Lorin Molander
11. Michelle Wildie
12. Matt Larson
13. Megan Slater

Facilitation staff

1. Claire Moerder, Maul, Foster, and Alongi (MFA)
2. Emilie Pilchowski, Triangle Associates
3. Jack Donahue, MFA
4. Pauline Mogilevsky, Triangle Associates
5. Sophie Glass, Triangle Associates
6. Will Henderson, MFA