



2027 INTEGRATED SYSTEM PLAN

MODELING FEEDBACK MEMORANDUM

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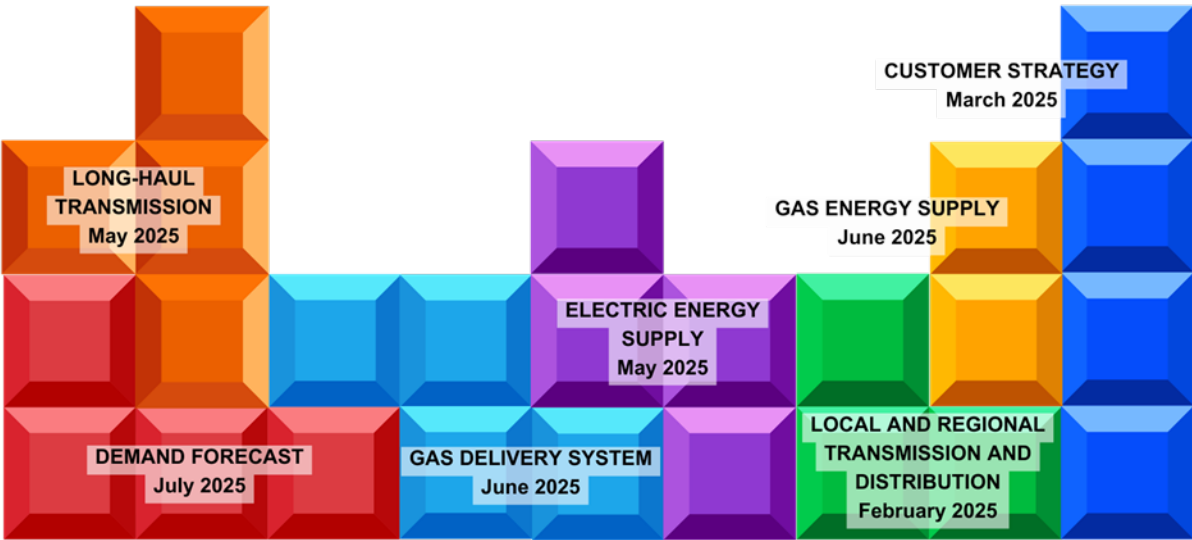
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Introduction

From July 2024 through July 2025 PSE hosted nine RPAG meetings and six public webinars to engage interested parties and customers in the 2027 Integrated System Plan (ISP) process. During this time, meetings focused on developing a range of scenarios and sensitivities and finalizing modeling inputs and assumptions (Figure 1). This document summarizes feedback themes during this period and how feedback was incorporated, consistent with WAC 480-96-050 (see below). Scenarios and sensitivities are still under development and will be shared when finalized.

Summary of public comments. A large combination utility must provide a summary of public comments received during the development of its integrated system plan and the large combination utility's responses, including whether issues raised in the comments were addressed and incorporated into the final integrated system plan as well as documentation of the reasons for rejecting any public input. The large combination utility may include the summary as an appendix to the final integrated system plan. Comments with similar content or input may be consolidated with a single large combination utility response.¹

Figure 1. RPAG modeling and assumptions meetings in 2025



Key terms

Term	Definition
Demand forecast	Estimate of future customer demand for electricity and natural gas; developed in 2025

¹ WAC 480-96-050 (12)

Term	Definition
Demand response (DR)	Demand response is a strategy to manage electricity consumption by encouraging customers to reduce or shift their energy usage during peak demand periods or when the electrical grid is under stress
Demand-side resources (DSR)	Resources that reduce customer demand; includes energy efficiency, distribution efficiency, generation efficiency, distributed generation, and demand response
Reference case	A set of assumptions used to set up the modeling and build the reference portfolio, against which we compare and test other assumptions from other scenarios and sensitivities

Feedback and responses

The tables below summarize feedback from members of the public and RPAG members for the 2027 ISP along with an explanation of how PSE is incorporating that feedback. Feedback carried over from the abbreviated 2025 Resource Planning Analysis cycle is denoted by an asterisk (*).

Scenarios and sensitivities

Level of engagement²: Collaborate

Feedback theme	Action taken	Response
Consider a scenario for ramping electrification sooner than 2030	Not incorporated	Any new electrification programs must be identified in the 2027 ISP and then approved through the regulatory process and funded before they could be implemented. Given the ramp time for new programs, it is neither feasible nor practical for new, large-scale programs to be operational prior to 2030.
Evaluate a worst case “death spiral” scenario with respect to the gas system	Incorporated	PSE is evaluating a scenario where electrification is modeled to occur regardless of burnout or available incentives which, absent significant policy changes, will represent a scenario that is far more aggressive than could otherwise be imagined.
Evaluate scenarios exploring the impact of different levels of fuel switching independent of other electric load growth	Partially incorporated	PSE is evaluating scenarios with different levels of load growth due to electrification; however, we are not modeling these scenarios independent of all other electric load growth. PSE is considering if a building electrification only scenario is necessary.
Model a maximum customer benefit scenario	To be determined	PSE continues to believe measuring and then maximizing “customer benefits” is extremely subjective, with some benefits increasing as others decrease. PSE will consider this feedback following rulemaking.
Model a scenario or sensitivity where very little new transmission build-out	Incorporated	PSE will model multiple transmission related sensitivities, including high and low transmission availability.

² PSE uses the International Association of Public Participation (IAP2) pillars to inform the level of participation in various phases of the public participation process. <https://www.iap2.org/page/pillars>

Feedback theme	Action taken	Response
comes online		
Model a scenario that explores a resource build-out without new gas-fired facilities, and possibly with relaxed build limits	To be determined	PSE explored a similar sensitivity in the 2021 Integrated Resource Plan and in the 2023 Electric Progress Report. As presented during the Dec. 19, 2024 ³ RPAG meeting, using the 2023 Electric Progress Report analysis, it would require more than 9,400 MW of 4-hr battery energy storage system (BESS) to replace 2,250 MW of nameplate peaker capacity. PSE will consider this feedback for a potential sensitivity after the reference portfolio is complete.
Provide transparency about the modeling approach, particularly its limitations	Incorporated	PSE held a series of RPAG meetings and public webinars in 2024-2025 in which we reviewed each modeling process and solicited feedback on key assumptions. This memorandum reflects the outcomes of that engagement.
Include a scenario in which the gas distribution system is progressively decommissioned by 2050*	Not incorporated	In the February 13, 2024 RPAG meeting to discuss decarbonization scenarios, RPAG members agreed that full retirement of the gas system by 2050 was unrealistic ⁴ . PSE will model progressively “higher” electrification scenarios in the ISP.
Model the social cost of greenhouse gas (SCGHG) costs in dispatch.	Incorporated	PSE intends to continue to model SCGHG in two ways, as an externality cost and in dispatch.
Model weekly hydroelectric variability rather than monthly*	Not incorporated	PSE does not anticipate modeling weekly variability in our hydroelectric resources in the 2027 ISP because our data sources do not provide this level of detail.
Include effective load carrying capacity (ELCC) variations of hybrid systems rather than provide ELCCs just for each individual resource*	Incorporated	PSE will model resources both independently and as hybrids for the 2027 ISP.
Portfolios should achieve PSE’s proportional share of direct greenhouse gas (GHG) reductions needed to meet the Climate Commitment Act (CCA)*	Incorporated	PSE will model at least one scenario that achieves PSE’s proportional share of the state’s greenhouse gas emissions reductions goals.
Model a mid-range electrification scenario to reflect PSE investing in electrification as a decarbonization resource*	Incorporated	PSE is modeling scenarios with different levels of electrification and resulting decarbonization levels.
Customer impacts should be considered across all PSE’s customer classes, not just residential customers; analysis should demonstrate	Already incorporated	The ISP scenarios will produce forecasted planning-level electric and gas revenue requirement impacts.

³ <https://www.cleanenergyplan.pse.com/rpag-meeting-dec-19-2024>

⁴ <https://www.cleanenergyplan.pse.com/rpag-meeting-feb>

Feedback theme	Action taken	Response
which customer segment is being considered		

Demand forecast

Level of engagement: Consult

Feedback theme	Action taken	Response
Include a thorough analysis of how new data center interconnections in PSE's service territory may affect the demand forecast	Partially incorporated	PSE is evaluating different levels of potential block loads (e.g., data centers and other large loads) through the ISP scenarios.
Apply the demand forecast consistently across all portfolios in the ISP*	Partially incorporated	Demand forecast will be applied consistently across the portfolios. PSE is still working through the differences at specific geographic locations and how to discuss the impact of transport customers on gas delivery system investments. Please note that transport demand forecast is not part of the resource analysis.

Electric vehicle forecast

Level of engagement: Consult

Feedback theme	Action taken	Response
Model aggressive electric vehicle adoption where vehicle miles traveled (VMT) assumptions decrease	Not incorporated	Guidehouse has modeled a scenario with aggressive vehicle adoption and increased VMT. A scenario of aggressive vehicle adoption with VMT decreased would result in lower energy and peak demand from electric vehicle charging than the high electric vehicle (EV) scenario.

Customer strategy: conservation, demand response, solar and storage

Level of engagement: Involve

Feedback theme	Action taken	Response
Explore thermal energy networks as a means to transition neighborhoods off of natural gas*	Not incorporated	Thermal energy networks are an emerging technology in our region, and more information is needed to be able to model it in the ISP.
Customer strategies should not be examined independently of all other costs and feasibility concerns	Partially incorporated	The ISP scenarios attempt to quantify the costs and impacts of all aspects of the scenario (programs, infrastructure, etc.). The portfolio of conservation programs within PSE's Biennial Conservation Plan

Feedback theme	Action taken	Response
		needs to demonstrate that the Total Resource Cost Test is > 1.0.
Review the impacts of the assumed levels on the gas and electric systems and evaluate whether those levels are consistent with the system's cost results	Incorporated	This is the foundation for the ISP analysis and will be modeled through scenarios. Since this is a 20-year model, the assumptions and costs will be directional. Assumptions on how each scenario was represented and calculated will be provided in the final analysis.

Resource adequacy methodology

Level of engagement: Consult

Feedback theme	Action taken	Response
Model more than two types of demand response programs in the resource adequacy analysis*	Incorporated	PSE is evaluating several demand response programs including time of use (TOU), EV managed charging, and flex events that include thermostat and water heater programs.

Long-haul transmission planning, local electric transmission and distribution system planning

Level of engagement: Involve

Feedback theme	Action taken	Response
Include a scenario or sensitivity in which no or very little transmission build comes online	Incorporated	PSE plans to model a low transmission availability sensitivity. This sensitivity assumes that not all planned transmission investments will move forward, and not all transmission service requests will become executed Transmission Service Agreements.
Assume battery storage can be modeled in all the transmission zones within the region	Incorporated	PSE plans to model storage in all transmission zones.
Evaluate if distributed energy resources (DER) can reduce transmission expansion needs	Incorporated	The ISP will evaluate different levels of DERs and the impact to the overall system, including transmission.

Gas modeling and assumptions, gas delivery system, non-pipe alternatives

Level of engagement: Involve

Feedback theme	Action taken	Response
Create a detailed gas reduction plan to pursue full electrification	Partially incorporated	PSE will model at least one scenario that achieves PSE's proportional share of the state's greenhouse gas emissions reductions goals. This scenario will examine the level of building electrification needed to achieve that level of emission reduction over time. This will be informative to assessing the technical feasibility in appliance markets and to assess technical feasibility of building the additional infrastructure required for PSE's electric system over time to meet that load. Results of this scenario will also estimate the cost impacts to PSE's gas and electric customers.
Model a sensitivity exploring the impact of high natural gas commodity prices relative to wholesale power costs	Not incorporated	Natural gas prices are an input into our electric price model, so when a high or low electric price is identified that is inclusive of the natural gas price. The variability in prices is captured in the stochastic analysis; a specific sensitivity is not necessary.
Consider using a lower commodity price to reflect a broader global market view rather than a PSE-specific analysis.	Not incorporated	PSE purchases our gas prices from Wood Mackenzie; they develop wholesale customer pricing models that incorporate local, regional and federal impacts to gas prices.

Electric modeling and assumptions

Level of engagement: Involve

Feedback theme	Action taken	Response
Acknowledge potential delays and cost uncertainties for new technologies (like nuclear SMRs, alternative fuels, geothermal, storage, offshore wind)	Incorporated	The ISP will include several sensitivities around emerging technologies along with a portfolio that does not include any emerging technologies to see if the portfolio builds change and if it would change any decisions in the next 10-years.
Include backup plans if proposed technologies face implementation challenges	Incorporated	The ISP analysis is technology agnostic and will not prescribe new resources or technologies to be acquired beyond those resources that are already under negotiation. Future procurement processes will determine which resources to acquire when needed.
Consider both ratepayer costs and legal compliance	Incorporated	PSE will include cost to customers in the analysis while ensuring the ISP is compliant with state law.
Be conservative with uncertainty percentages and costs for capital project modeling	Incorporated	The ISP is using conservative cost curves for the electric resource alternatives.
Conduct a thorough analysis on battery location	Partially incorporated	The ISP will evaluate several transmission zones and the availability of resources within those zones including batteries.
Reflect risk in a variety of ways through sensitivities	Incorporated	The ISP will include several sensitivities to incorporate different risks around the availability of resources, transmission availability, carbon costs, etc.

Feedback theme	Action taken	Response
Planning should reflect cost uncertainty adders for emerging technologies	Partially incorporated through sensitivity analysis	Instead of including risk adders into the reference database, we will be looking at sensitivities around emerging technologies
Delay locking electric inputs until 6 months prior to ISP filing	Not incorporated	Stale data is a constant concern and a difficult issue to mitigate. Unfortunately, different aspects of the analysis can take as much as a year to complete making it infeasible to update inputs 6 months prior to filing. The ISP timeframe has been established to ensure we are producing a draft ISP portfolio approximately 6 months before the final 2027 ISP is filed with the Commission. As this is our first ISP, we feel it is of great importance to have a draft earlier in the timeline, leaving more time for discussion, input and portfolio refinements.
Provide generic resource data and costs for all resources	Incorporated	PSE will provide generic resource cost assumptions as appendices and, where appropriate, confidential filings with the 2027 ISP consistent with past resource planning processes.
Account for the full range of costs and benefits associated with different resources*	Incorporated	PSE will include the full range of costs associated with resources for the life of the facility.
Use a lower uncertainty risk adder between 10 and 20%	Not incorporated	PSE will not include an uncertainty adder in the reference assumptions and we will test sensitivities around the availability of emerging technologies.
Use a higher uncertainty risk adder between 20 and 100%	Not incorporated	PSE will not include an uncertainty adder in the reference assumptions and we will test sensitivities around the availability of emerging technologies.
Model the renewal/availability of investment tax credit (ITC) and production tax credit (PTC) for the ISP time horizon	Incorporated	PSE will include a sensitivity that includes the PTC/ITC.
Do not model the renewal/availability of ITC and PTC for the ISP time horizon	Incorporated	PSE will reflect updates from the One Big Beautiful Bill Act (OBBBA) in the reference portfolio.
Emerging technologies should be available in the portfolio model	Not incorporated but included in sensitivities	PSE will not include this in the reference case but will test it via sensitivities.
Emerging technologies should not be available in the portfolio model	Incorporated	PSE will not include emerging technologies in the reference portfolio and will run sensitivities to test the availability.

Public participation

Level of engagement: Consult

Feedback theme	Action taken	Response
Provide more robust opportunities for members of	Incorporated	PSE evolved participation opportunities during this period including extending the length of public

Feedback theme	Action taken	Response
the public to engage in RPAG meetings*		comment opportunities during RPAG meetings and providing substantive updates to our public webinar process. We have also endeavored to improve clarity and transparency around feedback timelines and how feedback is used.
Make feedback windows longer and provide quicker responses from PSE	Not incorporated	PSE does not anticipate adjusting our current feedback timelines because it would limit our ability to finalize feedback reports before the subsequent RPAG meeting. Responding to 100% of public and RPAG member feedback is a significant undertaking and shortening PSE's response time is not conducive to this process.
Clearly state IAP2 levels for each meeting	Partially incorporated	The International Association of Public Participation (IAP2) is currently revising their spectrum of public participation based on interested party and practitioner feedback and we adjusted the RPAG charter to reflect that. IAP2 is developing a set of proposed changes including potentially "repositioning Inform to underpin all levels, recognizing its foundational role." While this important work is ongoing, PSE has generally focused on the feedback needed in each meeting rather than specify, and potentially debate, the "level" of engagement that may apply at a given moment in a meeting. Levels of engagement are included in this memorandum for reference purposes only.
Increase transparency in RPAG meeting for members of the public	Incorporated	PSE has taken steps to increase transparency to members of the public participating in RPAG meetings. These include: • Encouraging RPAG members to make their written questions and comments visible to all participants • Reading RPAG member questions and comments aloud • Providing screenshots and written results of in-meeting surveys, polls, and collaborative activities (e.g. Mural boards) in post-meeting summaries and feedback reports • Providing increased clarity around feedback timelines and how PSE uses feedback
Allow members of the public to utilize the Q&A feature in RPAG meetings	Not incorporated	PSE developed and continues to refine a robust public participation process in both the public webinar track and RPAG track. We chose to keep the Q&A feature off during RPAG webinars in order to promote equitable engagement for RPAG members during meetings. We encourage members of the public to provide questions and comments to PSE using the feedback form, public comment opportunity, or by participating in public webinars.
Hold hybrid meetings to increase participation	Not incorporated	PSE believes that the current online meeting format provides the best opportunity for maximum interested party engagement while reducing barriers to participation. Holding hybrid meetings creates a greater strain on resources and staff and does not

Feedback theme	Action taken	Response
		appear to hold much advantage over our current online-only platform.