

**BEFORE THE WASHINGTON  
UTILITIES AND TRANSPORTATION COMMISSION**

**In the Matter of Puget Sound Energy 2023  
Integrated Resource Plan**

**DOCKET UG-220242**

**COMMISSION STAFF COMMENTS REGARDING  
PUGET SOUND ENERGY'S  
2023 NATURAL GAS INTEGRATED RESOURCE PLAN  
RCW 80.01.040 and RCW 80.04.160  
WAC 480-90-238**

**June 5, 2023**

**Table of Contents**

Executive Summary ..... 1

    Summary of the IRP..... 1

    New Policies and Regulatory Landscape..... 2

    Climate Change..... 2

    Equity ..... 3

    Summary of Recommendations ..... 3

Compliance with Commission Rules..... 6

Public Participation..... 6

Equity ..... 7

Changing Regulatory and Incentive Landscape ..... 8

    Inflation Reduction Act (IRA) ..... 9

    Climate Commitment Act (CCA)..... 9

Climate Change Impacts ..... 10

Load Forecasting..... 11

Conservation Potential Assessment ..... 13

    Electrification Measures ..... 14

    Equity-focused Segmentation ..... 14

    Transport Customers ..... 15

Data Disclosure / Transparency ..... 15

Upstream Emissions Estimates & SCGHG Calculations ..... 16

Alternative Fuels..... 17

Resource Shift..... 20

Electrification Analysis..... 20

Summary of Public Comments ..... 21

## **Executive Summary**

These comments from the Utilities and Transportation Commission (Commission) Staff (Staff) highlight the most important issues identified in our review of PSE's 2023 Gas Integrated Resource Plan (IRP). This document does not represent an exhaustive summary of Staff's analysis, but instead focuses on particularly salient topics and themes. Staff stresses that any planning document represents a snapshot in time. This IRP was developed over a period of time during which new policies were at various stages of implementation or passage. With this in mind, Staff provides recommendations that PSE should implement in its next IRP filing in 2025.

## **Summary of the IRP**

In this IRP, PSE describes a future that includes modest reductions in gas system sales achieved by assuming no new gas customers are added after 2026 and reducing load through conservation (both codes/standards and PSE programs). Fossil natural gas is still the dominant form of energy delivered to customers throughout the study period, but renewable natural gas and green hydrogen<sup>1, 2</sup> are blended into the distribution system starting in 2025 and 2028, respectively. Over the course of this IRP's study period (2024 to 2050), these factors contribute to a 25 percent decrease in the Company's annual emissions.<sup>3</sup> PSE allowed its portfolio model to choose between traditional year-round pipeline capacity and several storage options in this IRP. This dynamic, along with the overall reduction in sales, resulted in PSE's cost model allowing 195 MDth/day of year-round pipeline capacity contracts to expire by 2050. Adding storage resources and alternative fuel supplies allows PSE to meet peak demand in 2050 with a net reduction in capacity resources of 134 MDth/day.<sup>4</sup> The preferred gas portfolio has a net present value of approximately \$20.2 billion.

As required by rule, PSE outlines the actions it plans to take in the first two years of this IRP's study period. These actions include:

- Acquiring cost-effective conservation.<sup>5</sup>
- Exploring the feasibility and commercial viability of two storage resources.

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<sup>1</sup> PSE allowed hydrogen to be blended into its gas system fuel mix up to 15 percent by volume in 2032, or roughly 5 percent by energy (PSE 2023 Gas IRP, Appendix E, pg. E.13).

<sup>2</sup> Though PSE did not include a definition for "green hydrogen" in the IRP, Staff assumes the Company is using a definition compatible with the definition of "green electrolytic hydrogen" in statute (RCW 80.50.020(15)).

<sup>3</sup> PSE's preferred portfolio emits 5.5 million metric tons of CO<sub>2</sub>e in 2024, and 4.1 million metric tons of CO<sub>2</sub>e in 2050 (PSE 2023 Gas IRP, Appendix F: Gas IRP Results, "Summary of Emissions" tab).

<sup>4</sup> PSE 2023 Gas IRP, pg. 1.7, Table 1.1.

<sup>5</sup> This IRP's preferred portfolio shows slightly more cost-effective conservation in the first 10 years of the study period, but less in the out years, than the PSE's 2021 IRP (PSE 2023 Gas IRP, pg. 2.7, Figure 2.4).

- Acquiring cost-effective renewable natural gas (RNG) and green hydrogen as commercially available.<sup>6</sup>
- Determining which pipeline contracts to let expire.<sup>7</sup>
- Continuing to engage with interested parties to incorporate equity considerations in the 2025 IRP.
- Following and engaging with policy/regulatory proceedings including the Inflation Reduction Act (IRA) and the Climate Commitment Act (CCA).
- Implementing the 2021 general rate case settlement including decarbonization study, targeted electrification pilot, and targeted electrification strategy.<sup>8</sup>

### **New Policies and Regulatory Landscape**

New policies are at the heart of Staff comments. Implementation of the CCA has major implications for PSE's gas system. The Department of Ecology adopted CCA rules and conducted its first allowance auction during the development of this IRP; however, Staff is uncertain based on the information in the IRP regarding how this policy will be implemented including the costs to gas customers, the impact of allowance auction revenue, and the enforcement of state carbon emissions caps.

On the federal level, the Inflation Reduction Act was signed into law during the development of this IRP. While incentives for green hydrogen production (among other supply-side resources) are relatively well known, the impacts that this law will have on demand for gas are less clear.

Staff notes that PSE's general approach in this IRP regarding the uncertainties surrounding these policies was to include more certain impacts (which tended to bring down the relative costs of renewable supply-side resources), while omitting less-certain impacts (which often applied disproportionately to demand-side resources). The Company did respond to interested party feedback on its Draft 2023 Gas IRP by changing its preferred portfolio to one that includes zero customer growth after 2026. Though Staff appreciates this responsiveness to interested party engagement, we do not see this as a sufficient substitute for more rigorous analysis of the likely impacts of these new policies. Staff also notes that there are non-policy-related topics, such as voluntary electrification of customer end-uses and electrification from building attrition, which PSE does not fully account for in this IRP.

### **Climate Change**

PSE took a large step forward in this IRP by including the impacts of climate change in its load forecast for all scenarios and sensitivities. In both its energy and demand forecasts, PSE used a mix of recent historical temperatures and future temperatures from three different climate change

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<sup>6</sup> This IRP's preferred portfolio adds 900 MDth/year of RNG to PSE's system by 2050 (PSE 2023 Gas IRP, pg. 2.10, Table 2.2).

<sup>7</sup> PSE 2023 Gas IRP, pg. 1.7.

<sup>8</sup> See Final Order 24/10 including Appendix A – Revenue Requirement Settlement, Dockets UE-220066 and UG-220067.

models. The general warming trend tended to reduce the energy forecast as winters got milder on average. For peak demand, however, temperature volatility (especially in one of the three climate models PSE used) resulted in PSE's design day temperature<sup>9</sup> remaining at 13 degrees Fahrenheit, the same temperature used in the 2021 IRP.

To account for the impacts of climate change, PSE also adjusted temperature-sensitive measures in its Conservation Potential Assessment.<sup>10</sup>

### Equity

Staff believes PSE made an effort to include equity in its analysis. This happened primarily through the Conservation Potential Assessment, where the Company segmented residential measures along vulnerable population lines and adjusted the cost-effectiveness threshold – similar to its treatment of low-income measures. Staff see this as a positive step, and we look forward to engaging with PSE as it expands these efforts for the 2025 IRP.

### Summary of Recommendations

Staff summarizes the following recommendations to PSE for its 2025 IRP.

Topic	No.	Recommendations
Public Participation	1	Allow more input on work plans to encourage the discussion of topics relevant to Named Communities.
	2	Build time into the workplan so that the risk of delays is not borne entirely by external interested parties.
	3	Make a concerted effort to solicit meaningful feedback throughout the IRP development process, especially from groups who have been poorly represented in this forum historically – and communicate these efforts transparently.
	4	Implement new avenues for engagement that foster a dialogue with interested parties and facilitate follow-up and resolution – and share the impacts of those discussions transparently with advisory groups and on the IRP website.
Equity	5	Thoroughly review the Cascade Natural Gas general rate case final order (Docket UG-210755), consider how the core tenets of energy justice apply to PSE, and prepare to implement the order's equity framework in its 2025 IRP, in part by dedicating time in the work plan for this topic.
Changing Regulatory	6	Include full accounting for the demand-side impacts of the IRA in PSE's 2025 IRP and provide sufficient time in the work plan for discussion within advisory group(s).

<sup>9</sup> The “design day temperature” represents the coldest average daily temperature across 50 years. This temperature is used to determine how much capacity PSE needs to meet its 1-in-50-year peak.

<sup>10</sup> PSE 2023 Gas IRP, Appendix C: Conservation Potential Assessment, pg. 59.

and Incentive Landscape	7	Work with the Department of Ecology Staff, and its advisory group, to discuss the implication of the statutory “cap” on carbon emissions and how it is likely to be achieved.
	8	Include full accounting for the downstream impacts of CCA investments in PSE’s 2025 IRP.
	9	Account for the dynamic customer response to increasing gas costs (from alternative fuel prices, and CCA allowances, for example) in its 2025 IRP and discuss the CCA within its advisory group early in the IRP development process.
Climate Change Impacts	10	In the presentation of climate change forecasts in its 2025 IRP, either (1) include in Figure 5.1 the climate change model data used or (2) include graphic error bars in Figure 5.1 that communicate the spread of values that were averaged to generate the new normal temperature forecast.
	11	Continue to engage with regional entities focused on how climate change is likely to impact PSE’s system and update the modeling in future IRP cycles as appropriate.
Load Forecasting	12	Incorporate RCW 19.27A.020(2)(a) into the 2025 IRP and refine its customer growth projection to accord closer with all known and anticipated code changes for its 2025 IRP. In the interim, work with the advisory group(s) to seek input on this topic.
	13	Further investigate and discuss with its advisory group the likely drivers of customer counts after 2031 including developing an evidence-based building attrition rate to inform forecasts in the 2025 IRP.
	14	Analyze the bill impacts of CCA compliance, and the bill impacts of declining customer counts. Dynamically model the response of customers to bill impacts and the changing price competitiveness of gas utility services relative to electric utility services. Analyze these risks to customers and the distributional effects through the lens of equity, energy justice, and access to energy efficiency resources.
Conservation Potential Assessment	15	Refine the electrification analysis in the 2025 IRP with input from interested persons.
	16	Continue to refine its methods and approach to achieving equitable outcomes (including in the Conservation Potential Assessment) using input from underserved groups, and other interested persons.
	17	Work with Staff, small transport customers, and other interested persons to determine how to approach this segment’s portion of this IRP’s cost-effective conservation.

Data Disclosure / Transparency	18	In the 2025 IRP: (1) share relevant data earlier in the process, (2) provide a table of contents for workpapers and a “readme” tab for workpapers with multiple tabs, (3) provide a visual comparison of the fuels PSE considered in the IRP, (4) provide a “workpapers workshop” to give any interested persons an overview of the contents of workpapers and data-dense appendices.
Upstream Emissions Estimates & SCGHG Calculations	19	Quantify all emissions occurring in the gathering, transmission, and distribution of natural gas for the 2025 IRP, and provide a narrative explaining how PSE considers and quantifies emissions on its distribution system.
Alternative Fuels	20	Resolve Staff's questions about green hydrogen's carbon impact, safety, viability in this industry, and impact on water use, or hedge the introduction of hydrogen-blended fuels in its 2025 IRP to account for the possibility that this resource will not be viable when the IRP calls for its introduction.
	21	Discuss openly the concerns that interested persons have, and resolve these concerns, before introducing green hydrogen into PSE's distribution system.
	22	Continue investigating RNG market pricing and update cost assumptions in the 2025 IRP.
Resource Shift	23	Ensure full accounting for the potential risks of PSE's proposed shift towards reliance on storage resources may present.
Electrification Analysis	24	Refine assumptions around electrifying loads, and run sensitivities that illuminate a range of possible costs of electrification depending on how loads electrify.

### **Compliance with Commission Rules**

In WAC 480-90-238, the Commission lays out the requirement of regulated gas utilities to file an integrated resource plan (IRP) every two years. The Subsections within Section (3) of these rules describes the contents of these plans, which includes:

- A range of forecasts for natural gas demand (a);
- An assessment of commercially available conservation (b);
- An assessment of resources including nonconventional gas supplies, storage, and pipeline transmission resources [(c)-(e)];
- A comparative assessment of these resources and their cost-effectiveness (f);
- A long-range integrated resource plan to meet current and future needs at the lowest reasonable cost to the utility and its ratepayers (g);
- A short-term plan of specific actions for the next two years (h);
- A report on progress towards implementing the recommendations in its previous plan (i).

Staff believes the contents of PSE's 2023 Gas IRP align with the required contents in Commission rule, but much of the below discussion centers around questions Staff has about the reasonableness of this 2023 Gas IRP's preferred portfolio.

As part of this IRP, PSE included its Conservation Potential Assessment (CPA). RCW 80.28.380 requires that gas company conservation targets be "based on a conservation potential assessment prepared by an independent third party and approved by the commission." Staff does not make a recommendation on the approval of this CPA in these comments; however, Staff plans to address gas company CPAs in a separate proceeding.

### **Public Participation**

Appropriate and sufficient public participation is critical to developing a robust and trusted integrated resource plan.

PSE filed an initial Work Plan<sup>11</sup> with the Commission on April 1, 2022 – twelve months before the Company's 2023 Gas IRP was due. Subsequent revisions were filed on October 21, 2022 and December 15, 2022. The Work Plan highlights the content and process of the IRP including the timing and extent of public participation. Utilities establish work plans for various filings. These work plans can dictate what is and is not discussed. **Staff would like to see more input on work plans to encourage the discussion of topics relevant to Named Communities.**<sup>12</sup>

Staff appreciates that, by and large, this Work Plan remained unchanged throughout the process which meant those who accessed this document early on had a good understanding of what to expect from the process, and from the IRP that would result from it. However, Staff notes one

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<sup>11</sup> Per WAC 480-90-238(4) and (5).

<sup>12</sup> Named Communities is an umbrella term for Highly Impacted Communities and Vulnerable Populations as defined in RCW 19.405.020 and commission rule.

important exception. As mentioned above, PSE revised its Work Plan twice, both times pushing back deliverable dates towards the end of the 2023 Gas IRP development process. The timing of these delays had the effect of cutting two months out of interested parties' review of PSE's IRP draft portfolio results,<sup>13</sup> and cutting about three weeks out of interested parties' review of PSE's draft IRP.<sup>14</sup> While engagement throughout the IRP development process is important, this period at the end of the process was the first time when interested parties got a full view of the IRP and were able to react to its results. This is also a period when alternative options can be explored, but this review and exploration requires time. **Staff understands that unforeseen circumstances are sometimes inevitable, but if PSE cannot reliably predict the dates of key deliverables, Staff recommends the Company build time into its workplan so that the risk of delays is not borne entirely by external interested parties.**

Staff encourages PSE to evaluate and improve its outreach efforts during the 2025 IRP process. While PSE "encouraged attendees [in IRP meetings] to participate actively," Staff believes it is incumbent upon PSE to take an active role in growing the number and diversity of attendees. As we discuss in the Equity section of these comments, procedural justice is a core tenet of energy justice and involves inviting new (especially underrepresented) voices into processes like this one. Staff understands that IRP advisory group meetings can be a challenge to manage even at current participation levels, but **we expect PSE to make a concerted effort to solicit meaningful feedback throughout the IRP development process, especially from groups who have been poorly represented in this forum historically – and communicate these efforts transparently.** Staff recognizes that PSE has started to include its Equity Advisory Group in IRP discussions and encourages continued engagement with this group.

Staff appreciate PSE's efforts to respond to questions and comments of interested parties via "Feedback Reports" on its IRP website. These reports are a helpful way to organize all the feedback PSE received, but they lack any direction for how to follow up on questions or comments that may have been misunderstood or were not fully answered. **Staff encourages PSE to implement new avenues for engagement that foster a dialogue with interested parties and facilitate follow-up and resolution – and share the impacts of those discussions transparently with advisory groups and on the IRP website.**

### **Equity**

While many of the Staff's recommendations relate to equity, Staff would like to comment on equity more broadly here. PSE states "We expect to expand equity considerations in the 2025 Gas Utility IRP and beyond by applying lessons learned from equity work across PSE and

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<sup>13</sup> Originally scheduled for November 17, 2022, the draft IRP results were ultimately pushed back to January 17, 2023.

<sup>14</sup> Originally scheduled for January 3, 2023, the draft 2023 Gas IRP was ultimately posted to PSE's website on January 24, 2023.

identifying desired outcomes and goals.”<sup>15</sup> Staff commends PSE for this position and looks forward to working with PSE to incorporate and improve equity within the 2025 IRP process.

However, PSE also notes, “When considering equity in resource planning, it is important to note that no specific guidance exists today to inform how we should embed equity into our 2023 Gas Utility IRP.”<sup>16</sup> Staff agrees that no published and rigorous guidance on Gas Utility IRP equity exists. Staff highlights the recent Cascade Natural Gas GRC Final Order, Docket UG-210755. The order stresses the importance of addressing equity in all public interest considerations.<sup>17</sup> Staff believes that the order provides guiding equity principles.

The core tenets of energy justice are:

- **Distributional justice**, which refers to the distribution of benefits and burdens across populations. This objective aims to ensure that marginalized and vulnerable populations do not receive an inordinate share of the burdens or are denied access to benefits.
- **Procedural justice**, which focuses on inclusive decision-making processes and seeks to ensure that proceedings are fair, equitable, and inclusive for participants, recognizing that marginalized and vulnerable populations have been excluded from decision-making processes historically.
- **Recognition justice**, which requires an understanding of historic and ongoing inequalities and prescribes efforts that seek to reconcile these inequalities.
- **Restorative justice**, which is using regulatory government organizations or other interventions to disrupt and address distributional, recognition, or procedural injustices, and to correct them through laws, rules, policies, orders, and practices.<sup>18</sup>

**Staff recommends that PSE thoroughly review the Cascade Natural Gas general rate case final order (Docket UG-210755), consider how the core tenets of energy justice apply to PSE, and prepare to implement the order's equity framework in its 2025 IRP, in part by dedicating time in the work plan for this topic.** Staff look forward to collaborating with and assisting PSE in this endeavor and learning process.

### **Changing Regulatory and Incentive Landscape**

This IRP includes discussion and analysis of several pieces of new legislation and policy changes that impact PSE's gas system in some way. In this section, Staff discusses the federal Inflation Reduction Act (IRA) and Washington's Climate Commitment Act (CCA).<sup>19</sup> In general, Staff observed when PSE saw uncertainty around the impacts of these new policies, the Company

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<sup>15</sup> PSE 2023 IRP, pg. 1.4.

<sup>16</sup> PSE 2023 IRP, pg. 1.4.

<sup>17</sup> Final Order 09, UG-210755, pg. 19, ¶58.

<sup>18</sup> Final Order 09, UG-210755 (Aug. 23, 2022), pg. 18.

<sup>19</sup> Building and energy code changes are discussed briefly in the Load Forecasting section of these comments.

appeared to exclude the uncertain impact rather than include a rough or approximated impact. Several examples of this are described below.

### **Inflation Reduction Act (IRA)**

The IRA was signed into law several months into PSE's IRP development process, which made including the full suite of its impacts a difficult, if not impossible, task. Because they were more certain, PSE included the IRA's incentives for green hydrogen in its IRP, but it did not include the new law's impacts on the demand side (e.g., customer rebates for high-efficiency and electric appliances). In informal comments on PSE's Draft 2023 Gas IRP, Staff requested that PSE include a narrative describing how PSE accounted for – or did not account for – the various impacts of the IRA. While Staff understands that PSE could not have known the demand-side impact of the IRA early in the IRP process, we are disappointed at the level of detail and narrative in the IRP.<sup>20</sup> Staff agrees with PSE that the demand-side impacts of the IRA are not fully known. However, Staff believes it is safe to assume that they are non-zero and we expected PSE to do more to at least include them qualitatively. **Staff expects PSE to include full accounting for the demand-side impacts of the IRA in PSE's 2025 IRP and provide sufficient time in the work plan for discussion within advisory group(s).**

### **Climate Commitment Act (CCA)**

While the CCA was signed into law in 2021, the Department of Ecology (Ecology) adopted CCA rules in late September 2022 and the first auction for carbon allowances occurred in February 2023. Staff appreciates that PSE was able to include the floor and ceiling allowance prices from these rules in its modeling even at this late stage of the IRP development process. Allowances for carbon emissions are one aspect of the CCA, but Staff believes PSE's approach fails to reckon with two important aspects of this law: the emissions cap, and the investment of carbon allowance auction revenues. Ecology describes the CCA as a “cap-and-invest” program, meaning that the law “caps” (or limits) Washington's greenhouse gas emissions and then “invests” the proceeds from its allowance auctions into “critical climate projects throughout the state.”<sup>21</sup>

- The “cap” portion of the “cap-and-invest” program is an acknowledgement of the statute which requires statewide greenhouse gas emissions be limited to five million metric tons by 2050.<sup>22</sup> To put that in context, PSE's 2023 Gas IRP preferred portfolio – representing the operations of just *one* company in just *one* of the many industries covered by the CCA – would emit 83 percent of the total emissions allowed by the entire state in 2050 (over 4 million metric tons). Staff is very skeptical that a portfolio resulting in this level of emissions represents a reasonable future given the statewide emissions limit required by law. **Staff encourages PSE to work with the Department of Ecology, Staff, and its**

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<sup>20</sup> PSE 2023 Gas IRP, pg. 3.4-3.5.

<sup>21</sup> See Department of Ecology's [Climate Commitment Act website](#).

<sup>22</sup> [RCW 70A.45.020](#)(1)(a)(iv).

**advisory group, to discuss the implication of this “cap” and how it is likely to be achieved.**

- The “invest” portion of the “cap-and-invest” program refers to the way revenue from CCA allowance auctions will be used. Though Staff does not expect all investments funded through the CCA to go towards projects that will impact the gas system, the Climate Commitment Account is described on Ecology’s website as projects “that support Washington's transition to a low-carbon economy, improve air quality, and increase access to clean energy for Washington residents.”<sup>23</sup> One could argue that a low-carbon economy *could* include continued use of the gas system with alternative fuels like green hydrogen or renewable natural gas, but PSE’s preferred portfolio envisions continued use of fossil natural gas for the bulk of its delivered product throughout the study period. Staff understands that the specific investments that CCA revenue will enable are unknown, but PSE must grapple with the fact that these investments are not likely to include further investment in a gas industry that envisions continuing to deliver mostly fossil-derived fuels to customers for the foreseeable future. Rather, the investments on the table include those that explicitly transition away from fossil fuels. **Staff expects to see accounting for the downstream impacts of CCA investments in PSE’s 2025 IRP.**

Staff also finds it important to note that PSE’s purchase of CCA allowances, offsets, and/or zero- or lower-emission fuels will likely drive gas customer bills up. Even without any specific programs for electrification, this price impact alone may well have the effect of incenting customers to voluntarily electrify. PSE does not account for this effect in this IRP. **Staff expects PSE to account for this dynamic in its 2025 IRP and discuss the CCA within its advisory group early in the IRP development process.** Staff understands this may entail an iterative modeling process, but we believe it is important that this effect be captured to accurately reflect likely market dynamics and account for the potential risks to customers.

### **Climate Change Impacts**

The 2023 Gas IRP improves on previous IRPs by introducing climate change models as a source for weather data in PSE’s forecasting and modeling. Staff lauds PSE for beginning this work. PSE chose to model climate change impacts using the representative concentration pathway (RCP) of 8.5.<sup>24</sup> Staff supports this choice since it matches the Northwest Power and Conservation Council and other Utility filings.

PSE has updated its normal temperature model to include climate change.<sup>25</sup> The model is no longer an average of the last 30 years. Now, the model uses weather data 15 years prior to and 15 years after each study year. Visually, Staff can see the past data that the previous normal

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<sup>23</sup> <https://ecology.wa.gov/Air-Climate/Climate-Commitment-Act/Auction-proceeds>.

<sup>24</sup> PSE 2023 IRP, pg. 5.3.

<sup>25</sup> PSE 2023 IRP, pg. 5.5.

temperature was derived from, however, Staff cannot see the climate change model data that the forecast is based on.<sup>26</sup> **Staff recommends in the presentation of climate change forecasts in its 2025 IRP, that PSE either (1) include in Figure 5.1 the climate change model data used or (2) include graphic error bars in Figure 5.1 that communicate the spread of values that were averaged to generate the new normal temperature forecast.**

To determine its gas peak capacity need, PSE uses a 1-in-50 year daily average temperature using a mix of recent historical data and future temperature data from three climate change models. Staff largely agrees with PSE's approach to its peak design day temperature.

Staff notes that climate science is a constantly developing field. While Staff sees the models that PSE used in this IRP as a reasonable choice, **we expect PSE to continue to engage with regional entities focused on how climate change is likely to impact its system and update the modeling in future IRP cycles as appropriate.**

PSE also included climate change impacts in quantifying savings for conservation measures that are weather-dependent. This had the effect of reducing gas energy savings for heating and weatherization measures due to winters becoming milder on average in climate change forecasts.

### **Load Forecasting**

PSE provides two perspectives on its load forecast in this IRP: a reference scenario based on historical data, and a zero-customer growth model. Staff appreciate PSE's investigation of a zero-customer growth model, and believe the use of this model in PSE's preferred portfolio likely represents a more realistic assumption for future demand than the base forecast. However, for the 2025 IRP, Staff makes the following recommendations to bring PSE's forecasts in line with the rapidly changing regulatory landscape.

First, Staff highlights the 2031 goals and mandates contained in RCW 19.27A.020(2)(a) and RCW 19.27A.160. The Washington State Building Code Council is tasked with a 70 percent reduction in net annual energy consumption in newly constructed residential and nonresidential buildings by 2031. PSE appears to have accounted for this statute via its Conservation Potential Assessment.<sup>27</sup> PSE also included the impact of local gas bans on its demand.<sup>28</sup> However, RCW 19.27A.020(2)(a) states that the Washington state energy code shall be designed to "construct increasingly energy efficient homes and buildings that help achieve the broader goal of building zero fossil-fuel greenhouse gas emission homes and buildings by 2031."<sup>29</sup> It is unclear if this zero emissions-based goal is included in PSE's IRP analysis. **Staff recommends that PSE incorporate RCW 19.27A.020(2)(a) into its 2025 IRP and to refine its customer growth**

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<sup>26</sup> PSE 2023 IRP, figure 5.1, pg. 5.6.

<sup>27</sup> PSE 2023 IRP, Appendix C: Conservation Potential Assessment, pg. 6.

<sup>28</sup> PSE 2023 IRP, Appendix C: Conservation Potential Assessment, pg. 55.

<sup>29</sup> Diane Glenn, State Building Code Council Chair, WASHINGTON STATE ENERGY CODE Progress toward 2030, 2018 Report to the Legislature, November 25, 2020. Available at [https://sbcc.wa.gov/sites/default/files/2020-12/Final 2018 Report.pdf](https://sbcc.wa.gov/sites/default/files/2020-12/Final%202018%20Report.pdf).

**projection to accord closer with all known and anticipated code changes for its 2025 IRP.<sup>30</sup> In the interim, Staff recommends PSE work with its advisory group(s) to seek input on this topic.**

After 2031, Staff believes that the background rate of building stock attrition and the changing price-competitiveness of gas versus electric utility service will likely be significant drivers of customer forecasts. Rather than gas customer counts simply holding steady after 2031, there is reason to believe that this number will decrease over time regardless of market forces. Due to recent building code updates,<sup>31</sup> Staff believes that buildings in PSE's service territory are more likely than not to disconnect from gas service when affected by non-market forces such as fires, demolition, abandonment, condemnation, substantial remodels, or when incompatible use cases require it.

Staff acknowledges that PSE's zero-customer growth forecast includes a negative energy demand growth rate. "Before additional DSR, the 2023 IRP zero-customer growth forecast projects a -0.3 percent average annual growth rate (Table 5.4)."<sup>32</sup> However, this decrease is driven by declining gas use per customer, not declining customer counts.<sup>33</sup> **Therefore, Staff recommends that PSE further investigate and discuss with its advisory group the likely drivers of customer counts after 2031 including developing an evidence-based building attrition rate to inform its forecasts in the 2025 IRP.<sup>34</sup>**

Staff also anticipate costs to customers impacting demand in the future. As described in the Changing Regulatory and Incentive Landscape section, the CCA presents various compliance costs for utilities that are likely to increase customer bills. This could very well shift the calculus for customers weighing electrification on purely a customer-cost basis. With this potential for voluntary electrification, remaining gas customers would be impacted by fixed costs.<sup>35</sup> Other utilities have reported in their IRPs that as customer counts decline, fixed costs are spread out over the remaining customers resulting in exponentially increasing bills.<sup>36, 37</sup> There is a clear possibility that a declining customer base could result in increased customer costs that further

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<sup>30</sup> WAC 480-90-238(2)(b) "...At a minimum, this analysis must consider ... public policies regarding resource preference adopted by Washington state ..."

<sup>31</sup> See WAC 51-11C-50300 C503.4.6 and C503.5 (2022).

<sup>32</sup> PSE 2023 IRP, figure 5.1, pg. 5.8.

<sup>33</sup> PSE IRP Appendix, pg. D10.

<sup>34</sup> WAC 480-90-238(3)(a) "(3) Content. At a minimum, integrated resource plans must include: (a) A range of forecasts of future natural gas demand in firm and interruptible markets for each customer class that examine the effect of economic forces on the consumption of natural gas and that address changes in the number, type, and efficiency of natural gas end-uses."

<sup>35</sup> Fixed costs include infrastructure such as transmission lines, storage, distribution lines, compressors, as well as less variable elements of utility staff and administration.

<sup>36</sup> Docket UG-210094, "2022 NW Natural Integrated Resource Plan," pg. 322.

<sup>37</sup> Docket UG-220131, Cascade Natural Gas Integrated Resource Plan, Appendix K, Bill Impacts Analysis, 2023 IRP, pg. 12, 13.

incent customers to switch to electric service, resulting in a feedback loop of declining customers and increasing customer costs. Staff notes the potential risk of these feedback dynamics becoming unstable and accelerating beyond the control of PSE and harming customers with sharply increased bills. Staff acknowledges that changes to customer rates are determined in rate cases, separately from resource planning. However, estimating potential impacts of different scenarios or portfolios in an IRP can help regulators, customers, and consumer advocates interpret how planning decisions might affect energy affordability.<sup>38</sup> **Staff recommends that PSE analyze the bill impacts of CCA compliance, and the bill impacts of declining customer counts.**<sup>39</sup> **Staff recommends that PSE dynamically model the response of customers to bill impacts and the changing price competitiveness of gas utility services relative to electric utility services.**<sup>40</sup> **Further, Staff recommends that PSE analyze these risks to customers and the distributional effects through the lens of equity, energy justice, and access to energy efficiency resources.**<sup>41,42</sup>

Staff acknowledges that PSE must engage in certain aspects of this work as required by the Commission's final order in the Company's latest general rate case.<sup>43</sup> To the extent that these recommendations will be addressed in the Company's Comprehensive Decarbonization Study, Targeted Electrification Pilot, and Targeted Electrification Study, Staff defers to those processes and the language in the Settlement Agreement, and looks forward to discussing these terms within the advisory group process.

### **Conservation Potential Assessment**

Between the 2021 IRP and this 2023 Gas IRP, PSE made some important changes in its conservation potential assessment. Staff appreciates PSE including more non-energy impacts

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<sup>38</sup> Reimagining Resource Planning Report (January 2023) Rocky Mountain Institute at p. 62.

<sup>39</sup> WAC 480-90-238(3)(a)" (3) Content. At a minimum, integrated resource plans must include: (a) A range of forecasts of future natural gas demand in firm and interruptible markets for each customer class that examine the effect of economic forces on the consumption of natural gas and that address changes in the number, type, and efficiency of natural gas end-uses."

WAC 480-90-238(2)(b) "At a minimum, this analysis must consider ... the risks imposed on ratepayers, ..."

<sup>40</sup> See WAC 480-90-238(3)(a) and WAC 480-90-238(2)(b)

<sup>41</sup> WAC 480-90-238 (2)(b) "At a minimum, this analysis must consider resource costs, market-volatility risks, demand-side resource uncertainties, the risks imposed on ratepayers, resource effect on system operations, public policies regarding resource preference adopted by Washington state or the federal government, the cost of risks associated with environmental effects including emissions of carbon dioxide, and the need for security of supply." WAC 480-90-238(3)(g) "The integration of the demand forecasts and resource evaluations into a long-range (e.g., at least ten years; longer if appropriate to the life of the resources considered) integrated resource plan describing the mix of resources that is designated to meet current and future needs at the lowest reasonable cost to the utility and its ratepayers." [emphasis added by Staff]

<sup>42</sup> Docket UG-210755, "Final Order 09, Approving and Adopting Settlement Agreement Subject to Conditions" (GRC), at pg. 19 para 58, & pg. 18 para 56.

<sup>43</sup> Final Order Appendix A - Revenue Requirement Settlement, Docket UE-220066.

(NEIs) in this CPA to better capture the full value of conservation measures. Staff also commends PSE's effort to incorporate the impacts of climate change on measure level savings assumptions. Below Staff discusses three other changes that PSE made in this 2023 Gas IRP's CPA: development of new gas-to-electric measures, addition of equity-focused segmentation, and estimating gas transport customer conservation potential.

### **Electrification Measures**

In order to add new electrification measures, PSE's CPA consultant conducted a survey of customers to determine the appetite for shifting heating loads from gas furnaces to electric air-source heat pumps and hybrid heat pumps.<sup>44</sup>

Staff appreciate PSE's attempt to provide a first look at possible electric and gas system impacts of electrification of end-use loads. This is a complicated exercise that requires more coordination between PSE's gas and electric teams than previous cycles and iterative modeling. **Staff encourages PSE to refine this electrification analysis in the 2025 IRP with input from interested persons.**

PSE's preferred portfolio demand forecast projects residential and commercial customer counts will hold steady (i.e., zero growth) after 2030.<sup>45</sup> However, customer survey results show a significant appetite to electrify heating systems *even with no utility incentives*.<sup>46</sup> Staff acknowledges that this may not translate to customers disconnecting from PSE gas service altogether – for example, a customer could electrify space heating loads while continuing to use gas for cooking. Nonetheless, Staff point to customer survey results as another data point supporting our recommendation in the Load Forecasting section to incorporate customer attrition and voluntary electrification in PSE's 2025 IRP.

### **Equity-focused Segmentation**

In this IRP, PSE has taken equity criteria into account when assigning conservation measures to cost bundles. The CPA accomplishes this by creating a new sub-segment for “vulnerable populations” and using an adjustment factor when calculating the levelized cost of applicable measures.

Staff sees this as an important first step towards achieving equitable outcomes in PSE's conservation programs. **Staff encourages PSE to continue to refine its methods and approach to achieving equitable outcomes using input from underserved groups, and other interested persons.** Areas for potential refinement may include:

- Expanding equity-based segmentation outside of just the residential sector

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<sup>44</sup> “Hybrid heat pumps” in this IRP represent an HVAC system that includes both an electric air-source heat pump for all cooling and most heating needs *and* a gas furnace that supplies auxiliary heating when outside temperatures are below 35 degrees Fahrenheit.

<sup>45</sup> 2023 Gas IRP, pg. D.9, Table D.6,

<sup>46</sup> 2023 Gas IRP, Appendix C, pg. A-9 to A-10, Slides 18 and 19.

- Exploring the feasibility of a gradient of vulnerability rather than using a simple binary identification.

### **Small Transport Customers**

PSE's 2023 CPA analyzed the amount of achievable technical conservation potential in the small transport customer segment as these entities' emissions are PSE's obligation under the Climate Commitment Act (CCA).<sup>47</sup> PSE included these customers as a separate customer class and estimated their conservation potential by assigning each an appropriate subsegment (e.g., "large office," "supermarket," "foundries," "mechanical pulp," etc.). The methodology used to estimate small transport customers' conservation potential largely matches that used for PSE's other commercial and industrial customers. The CPA found that 26 MMtherms of conservation were technically achievable by 2050.

Staff believes the approach that PSE used in its estimation of transport customer conservation potential is reasonable, but it is not clear to Staff what PSE plans to do with this information given these customers secure their own supplies of natural gas. **Staff encourages PSE to work with Staff, small transport customers, and other interested persons to determine how to approach this segment's portion of this IRP's cost-effective conservation.**

### **Data Disclosure / Transparency**

Gas IRPs are getting more complicated and data disclosure and transparency is even more important today than compared with IRPs in the past. Utilities must consider new factors including: CCA allowance costs and investments, alternative fuel types, and the possibility of widespread electrification. With each of these factors comes a host of assumptions and data. In its 2023 IRP filing and accompanying workpapers, PSE provided a similar set of worksheets to those filed with its 2021 IRP, but with some additional data related to these new factors. The worksheets disclosed included:

- SENDOUT portfolio model results
- SENDOUT portfolio model demand inputs
- Conservation Potential Assessment "Market Analyzer"
- Fuel and carbon inputs
- Supply resource alternatives
- Green hydrogen prices

Staff appreciates that the above list represents substantially more data – reflecting the more complicated filing – than the 2021 IRP. Staff has the following recommendations for data disclosure and transparency in the 2025 IRP:

- **When possible, share relevant data earlier in the process.** PSE presented CPA results in a September 22, 2022, meeting, but the CPA Market Analyzer was not provided until

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<sup>47</sup> RCW 70A.65.080(1)(e)(i),

the final filing on March 31, 2023. The foundation for the green hydrogen resource cost stems from a report from E3 published in 2020, but the workpaper containing this green hydrogen analysis was not provided until the final filing on March 31, 2023. Staff believes PSE should be sharing as much as it can as early as it can to make the most of the early engagement with interested parties when there is an opportunity for those parties to influence the IRP at key steps in the process.

- **Provide a table of contents for workpapers and a “readme” tab for workpapers with multiple tabs.** This is an area where PSE appears to have backslid a bit on transparency, as the 2021 Gas IRP did include a table of contents for workpapers, and “readme” tabs in at least some of the larger workbooks. These orientation additions go a long way in supporting interested parties’ understanding of the data at the foundation of the IRP, and are especially important as new people and organizations join the process.
- **Provide a visual comparison of the fuels PSE considered in the IRP.** With PSE considering the relative cost-effectiveness of relying on new fuel types in this IRP, Staff encourages PSE to improve on its presentation of these alternatives by creating a side-by-side visual of the levelized cost of each fuel type. PSE should also include in this comparison the expected price variability/volatility of each fuel. Staff understands that some of PSE’s fuel price forecast information is necessarily confidential, but we believe PSE can do a better job illustrating its evaluation of these different fuels for the 2025 IRP.<sup>48</sup>
- **Provide a “workpapers workshop” to give any interested persons an overview of the contents of workpapers and data-dense appendices.** Even with an effective “readme” tab and table of contents, the data informing an IRP is a lot to digest. To make this data more accessible, Staff believes that a workshop – akin to one that NW Natural held after filing its final 2023 IRP – would help orient interested persons to this data.

### **Upstream Emissions Estimates & SCGHG Calculations**

As of 2019, gas companies must account for “emissions occurring in the gathering, transmission, and distribution of natural gas.”<sup>49</sup> PSE’s 2023 Gas IRP document quantifies upstream and end-use emissions.<sup>50</sup> However, it is unclear whether PSE considers and quantifies emissions on the distribution system. **Staff recommends that PSE quantify all its emissions occurring in the gathering, transmission, and distribution of natural gas for the 2025 IRP, and provide a narrative explaining how it considers and quantifies emissions on its distribution system.**<sup>51</sup>

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<sup>48</sup> For an example of how different fuels can be presented to show their relative costs, see “2022 NW Natural Integrated Resource Plan,” Docket UG-210094, pg. 48, 216, 223, 225.

<sup>49</sup> See RCW 80.28.395,

<sup>50</sup> PSE 2023 IRP, table 4.1, pg. 4.9.

<sup>51</sup> RCW 80.28.395 “For the purposes of RCW 80.28.380, the cost of greenhouse gas emissions resulting from the use of natural gas, including the effect of emissions occurring in the gathering, transmission, and distribution of natural gas to the end user....”

### **Alternative Fuels**

PSE plans to add Hydrogen into its fuel mix on a relatively short timeline. PSE's preferred portfolio includes green hydrogen blending starting in 2028, only five years away.<sup>52</sup> While green hydrogen may be a promising resource for decarbonization certain parts of our economy, Staff remains skeptical of the technology, and its promise as a lowest-reasonable cost solution on the gas distribution system. Further, WAC 480-90-238(2)(b) defines "lowest reasonable cost" as determined through a detailed and consistent analysis of a wide range of commercially available sources. Staff questions some of the Company's assumptions about green hydrogen regarding emission reductions, safety, reliability, and future availability.

- **Staff questions if hydrogen-blended fuels will result in emissions reductions.** It is unclear whether PSE conducted an assessment of the possibility of fugitive hydrogen gas (H<sub>2</sub>) emissions. H<sub>2</sub> is a GHG with a carbon dioxide equivalent (CO<sub>2</sub>e) of 11. This means that when released into the atmosphere, H<sub>2</sub> has warming impact 11 times more potent than a similar mass of CO<sub>2</sub>.<sup>53</sup> Some studies suggest that hydrogen tends to leak more aggressively than Methane, the primary constituent of natural gas.<sup>54</sup>
- **Staff also note outstanding questions about the safety and reliability of hydrogen-blended fuels.** A review of relevant literature suggests that there are substantial safety and reliability concerns that have not been resolved.<sup>55</sup> These concerns include:
  - Hydrogen-blended fuels have a wider window of flammability and a lower ignition energy.<sup>56</sup> Industry leader, Air Liquide, referring to 100 percent H<sub>2</sub> pipelines, notes "H<sub>2</sub> pipeline ruptures always catch fire."<sup>57</sup>

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<sup>52</sup> PSE 2023 IRP, Appendix F – Gas IRP Results, "L&R Bal – Preferred Portfolio," cell AI12.

<sup>53</sup> Nicola Warwick et al, "Atmospheric implications of increased Hydrogen use," April 22, 2022. Available at <https://www.gov.uk/government/publications/atmospheric-implications-of-increased-hydrogen-use>.

<sup>54</sup> "Hydrogen volumetric leak rates were observed to be 1.1 to 2.2 greater than leak rates for methane" Topolski, Kevin, Evan P. Reznicek, Burcin Cakir Erdener, Chris W. San Marchi, Joseph A. Ronevich, Lisa Fring, Kevin Simmons, Omar Jose Guerra Fernandez, Bri-Mathias Hodge, and Mark Chung. 2022. *Hydrogen Blending into Natural Gas Pipeline Infrastructure: Review of the State of Technology*. Golden, CO: National Renewable Energy Laboratory. NREL/TP-5400-81704. <https://www.nrel.gov/docs/fy23osti/81704.pdf>. pg. 40.

<sup>55</sup> Topolski, Kevin, Evan P. Reznicek, Burcin Cakir Erdener, Chris W. San Marchi, Joseph A. Ronevich, Lisa Fring, Kevin Simmons, Omar Jose Guerra Fernandez, Bri-Mathias Hodge, and Mark Chung. 2022. *Hydrogen Blending into Natural Gas Pipeline Infrastructure: Review of the State of Technology*. Golden, CO: National Renewable Energy Laboratory. NREL/TP-5400-81704. <https://www.nrel.gov/docs/fy23osti/81704.pdf>.

<sup>56</sup> Topolski et al. pg. 8,

<sup>57</sup> Air Liquide, Questions and Issues on Hydrogen Pipelines, Doe Hydrogen Pipeline Working Group Meeting, August 31, 2005, slide 23, available at [https://www.eere.energy.gov/hydrogenandfuelcells/pdfs/hpwgw\\_questissues\\_campbell.pdf](https://www.eere.energy.gov/hydrogenandfuelcells/pdfs/hpwgw_questissues_campbell.pdf).

- Hydrogen gas embrittles steel making it more prone to leaks and fractures.<sup>58</sup>
- Line pack greatly diminishes as an ad hoc storage resource with hydrogen-blended fuels.<sup>59</sup>
- Due to the lower pressure of hydrogen-blended fuels, line pressures will need to be increased to maintain the previous energy flow. This presents increased energy costs.<sup>60</sup>
- Due to embrittlement, pipelines will likely need to operate at reduced pressure.<sup>61</sup> Notably a crude oil pipeline carrying hydrogen ruptured after six months of use due to hydrogen corrosion at a pressure of only 700 PSI.<sup>62, 63</sup>
- Changing fuel mixtures can lead to customer meter inaccuracies.<sup>64</sup>
- The maximum blending ratio will be likely be determined by the weakest link in a utility's system.<sup>65</sup> Older vintage pipe steels contain more latent defects and warrant greater evaluation for fatigue and fracture behavior.<sup>66</sup>
- Hydrogen also reduces the strength of elastic materials commonly used for seals, diaphragms, gaskets, flanges etc.<sup>67</sup>
- PSE does not discuss hydrogen storage and whether the Company plans to store fuels separately or as a blended fuel.
- Hydrogen-oxidizing bacteria and archaea exist underground and can result in 2-4 percent losses in hydrogen stored underground.<sup>68</sup> PSE relies on underground storage for natural gas.<sup>69</sup> Hydrogen stored in aquifers can be lost by dissolving in brine.<sup>70</sup> PSE relies on aquifer storage for natural gas.<sup>71</sup>
- The Pacific Northwest National Laboratory maintains a database, "H2 Tools," of hydrogen industry incidents.<sup>72</sup> Numerous reports list pressure-related component failure, and fatalities.

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<sup>58</sup> Topolski et al. pg. 12,16, 19.

<sup>59</sup> Topolski et al. pg. 14.

<sup>60</sup> Topolski et al. pg. 14.

<sup>61</sup> Topolski et al. pg. 14.

<sup>62</sup> Air Liquide, Questions and Issues on Hydrogen Pipelines, DOE Hydrogen Pipeline Working Group Meeting, August 31, 2005, slide 10, available at [https://www.eere.energy.gov/hydrogenandfuelcells/pdfs/hpwgw\\_questissues\\_campbell.pdf](https://www.eere.energy.gov/hydrogenandfuelcells/pdfs/hpwgw_questissues_campbell.pdf)

<sup>63</sup> It is unclear to staff whether this incident or pressure is representative. However, the firm operating the line thereafter ran it at about half the original pressure.

<sup>64</sup> Topolski et al. pg. 19.

<sup>65</sup> Topolski et al. pg. 35.

<sup>66</sup> Topolski et al. pg. 13.

<sup>67</sup> Topolski et al. pg. 22.

<sup>68</sup> Topolski et al. pg. 24.

<sup>69</sup> PSE 2023 IRP, pg. 6.1.

<sup>70</sup> Topolski et al. pg. 25.

<sup>71</sup> PSE 2023 Gas IRP, pg. 6.1.

<sup>72</sup> Pacific Northwest National Laboratory, "Lessons Learned," April 18, 2023. Available at [Lessons Learned | Hydrogen Tools \(h2tools.org\)](https://www.pnnl.gov/energy/hydrogen/learned-lessons).

- Staff also highlights its own concerns around indoor air quality related to partial combustion of fuel mixes resulting from the lower combustion heat.<sup>73</sup>
- **Staff are skeptical that blending on the gas distribution system will represent a viable use case for green hydrogen if supplies are limited or demand is high.** Washington policy is pushing towards economy-wide decarbonization. This means that many industries are looking at ways to wean off fossil fuels. While much of the gas distribution system has a relatively straightforward path to decarbonize via electrification, other industries (e.g., steel production, transportation, fertilizer production, etc.) do not.<sup>74</sup>
- **Staff also notes that green hydrogen's primary feedstock is fresh water, a resource that climate change has put more uncertainty around even in the historically wet western Washington.** Green hydrogen's other feedstock is electricity. As noted above, electrification is one promising path towards decarbonization of many customers end uses. It is unclear whether producing and storing green hydrogen and then delivering it to customers presents sufficient benefits to promote this approach over electrifying end use loads and delivering electricity directly.

Staff notes that these unanswered questions are not unique to PSE. Rather, they relate more to the nascence of the technology rather than any particular oversight by PSE. Regardless, the need to answer these questions is fast approaching as PSE plans to start using hydrogen in about five years.<sup>75</sup> **Staff recommends that PSE resolve Staff's above questions about green hydrogen's carbon impact, safety, viability in this industry, and impact on water use, or hedge the introduction of hydrogen-blended fuels in its 2025 IRP to account for the possibility that this resource will not be viable when the IRP calls for its introduction. Staff expects PSE to discuss openly the concerns that interested persons have, and resolve these concerns, before introducing green hydrogen into its distribution system.**

PSE's preferred portfolio includes some Renewable Natural Gas (RNG). PSE anticipates adding 400 MDth/year by 2030 and ramping up to 900 MDth/year by 2050.<sup>76, 77</sup> PSE modeled RNG fuel costs between \$19.01-21.71/Dth.<sup>78</sup> This is considerably higher than the estimates provided

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<sup>73</sup> The New York Times, "Gas Piped into Homes Contains Benzene and Other Risky Chemical, Study Finds," April 10, 2023. Available at [Gas Piped Into Homes Contains Benzene and Other Risky Chemicals, Study Finds - The New York Times \(nytimes.com\)](https://www.nytimes.com/2023/04/10/us/gas-piped-into-homes-contains-benzene-and-other-risky-chemicals-study-finds.html).

<sup>74</sup> Smart Electric Power Alliance, An Introduction to Hydrogen: Applications, Technological Challenges, and Long-Term Potential, 2023, slide 25.

<sup>75</sup> PSE 2023 IRP, pg. 6.17.

<sup>76</sup> PSE 2032 IRP, table 2.2, pg. 2.10.

<sup>77</sup> MDTH/year means million dekatherms per year. One Dekatherm is 10 therms.

One Therm is 100,000 BTUs.

<sup>78</sup> Appendix E. 27.

by Northwest Natural in their 2022 IRP.<sup>79,80</sup> This difference in price ranges impacts the amounts of RNG that the respective companies plan to add to their preferred portfolios. As RNG enters greater usage in the coming years and methodologies improve, Staff anticipates that these pricing discrepancies will become less pronounced. **Staff recommends that PSE continue investigating RNG market pricing and update its cost assumptions in the 2025 IRP.**

### **Resource Shift**

PSE's preferred portfolio proposes a shift in its resources used to meet customer demand in this IRP. This entails letting year-round pipeline capacity contracts expire, while relying more heavily on peaking resources that can dispatch gas to PSE's system on high demand days. This shift in PSE's preferred portfolio is a result of PSE allowing its long-term capacity expansion model to choose between peaking resources and pipeline contracts. The model ultimately found peaking resources to be more cost-effective at meeting expected customer demand than year-round pipeline contracts. This resource shift is a phenomenon that varies little between the different scenarios and sensitivities in this IRP.

Staff commends PSE for exploring the lowest reasonable cost portfolio in new ways in this IRP, and largely agrees that this resource shift appears reasonable and likely represents a lower cost option than year-round pipeline capacity contracts for meeting the modeled demand. **However, Staff encourages PSE to ensure it is fully accounting for the potential risks this reliance on storage resources may present.**

### **Electrification Analysis**

PSE introduced two electrification scenarios in this IRP: one based on fully electrifying residential end-use loads (and many commercial and industrial) in line with the State Energy Strategy, and one based on fully electrifying *most* residential end-use loads but only partially electrifying heating loads (i.e., replacing existing gas furnaces with hybrid heat pumps at the end of their useful lives). This analysis involved significant coordination between the gas and electric IRP teams at PSE and Staff commends the Company for this important first look at the impacts that electrification may entail. Staff encourages PSE to continue to explore this potential future and refine this analysis.

Staff encourages PSE to refine its assumptions about *how* loads are electrified, and run sensitivities exploring the implications of a "smart" transition versus a "business as usual" transition.<sup>81</sup> PSE did not have any system-wide demand response programs running prior to

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<sup>79</sup> NWN 2022 IRP, pg. 217.

<sup>80</sup> NWN modeled RNG in two price tranches. The first tranche was priced at \$14/MMBtu (+/- \$3/MMBtu in stochastic simulation). The second tranche was priced at \$19/MMBtu (+/- \$5/MMBtu in stochastic simulation). NWN 2022 IRP, pg. 217.

<sup>81</sup> Staff uses "smart" transition to mean an electrification process that uses available mitigation strategies to limit the negative impacts of such a transition. Mitigation techniques may include incentivizing

developing this IRP, but plans to later this year. Staff expects PSE to use its real-world experience with demand response to inform its understanding of the impacts of electrifying certain loads. For example, higher than anticipated participation rates in a direct load control HVAC program would likely reduce the emissions and costs associated with electrifying heating loads. The choice of a cold-climate heat pump rather than a standard air-source heat pump would have implications for the peaking electric resources – and transmission/distribution investment – required to meet newly electrified loads. Staff agrees with PSE that full electrification will result in capacity needs on the electric system, but we believe that the magnitude of this need will vary significantly depending on how this transition occurs. **Staff recommends that in its 2025 IRP PSE refine its assumptions around electrifying loads, and run sensitivities that illuminate a range of possible costs of electrification depending on how loads electrify.**

### **Summary of Public Comments**

As of writing, 25 comments had been filed to this docket.<sup>82</sup>

- Two of the comments were from the Washington Clean Energy Coalition (WCEC) – one on the draft, and one on the final IRP. WCEC highlighted the impacts of climate change and raised concerns about the reasonableness of PSE's preferred portfolio and risks of reliance on green hydrogen. WCEC also highlighted the intent of the CCA and cost of allowances in this plan. WCEC recommended the Commission reject this IRP.
- 22 of the comments were from customers,<sup>83</sup> who all expressed opposition to the filing – all but three explicitly recommended that the Commission reject it. Many of these customers expressed support for WCEC's comments.
- One of the comments was from the Tacoma Chapter of Citizens' Climate Lobby. This group also recommended the Commission reject PSE's 2023 Gas IRP, and expressed support for WCEC's comments.

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appliances with lower peak hour demand, increasing enrollment of newly electrified loads in demand response and time-of-use programs, etc. Staff uses "business as usual" transition to mean an electrification process that allows loads to electrify in an unmitigated way.

<sup>82</sup> As of 6/1/2023.

<sup>83</sup> This includes commenters who did not provide their affiliation in their comments, though they may not have explicitly self-identified as a PSE customer.