EXH. JJJ-1T
DOCKETS UE-22___/UG-22___
2022 PSE GENERAL RATE CASE
WITNESS: JOSHUA J. JACOBS

BEFORE THE

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION, **Complainant,** **v.** **PUGET SOUND ENERGY,** **Respondent.**	**Docket UE-22____** **Docket UG-22____**

PREFILED DIRECT TESTIMONY (NONCONFIDENTIAL) OF

JOSHUA J. JACOBS

ON BEHALF OF PUGET SOUND ENERGY

JANUARY 31, 2022

PUGET SOUND ENERGY

PREFILED DIRECT TESTIMONY (NONCONFIDENTIAL) OF

JOSHUA J. JACOBS

CONTENTS

PUGET SOUND ENERGY

PREFILED DIRECT TESTIMONY (NONCONFIDENTIAL) OF

JOSHUA J. JACOBS

LIST OF EXHIBITS

PUGET SOUND ENERGY

PREFILED DIRECT TESTIMONY (NONCONFIDENTIAL) OF JOSHUA J. JACOBS

I. INTRODUCTION

Q. Please state your name, business address, and position with Puget Sound Energy.

A. My name is Joshua J. Jacobs. My business address is 355 110th Ave. NE, Bellevue, WA 98009-9734. I am the Vice President Clean Energy Strategy for Puget Sound Energy ("PSE" or "Company").

Q. Have you prepared an exhibit describing your education, relevant employment experience, and other professional qualifications?

A. Yes, I have. It is Exh. JJJ-2.

Q. What are your duties as Vice President, Clean Energy Strategy for PSE?

A. I lead PSE's long-term resource planning efforts related to the Company's gas and electric integrated resource plans, PSE's planning process tied to its compliance with the Clean Energy Transition Act, and the coordination and development of various PSE clean energy strategies.

Q. What topics are you covering in your testimony?

A. The purpose of my testimony is to describe efforts underway within PSE to drive decarbonization as it directly relates to the Company's Beyond Net Zero goals. My testimony will highlight the details of PSE's recently-filed 2021 Clean Energy Implementation Plan and discuss investments PSE is seeking to make that will be necessary to further decarbonize customer end use gas sales. My testimony also explains why the performance metrics discussed in the testimony of Mark Newton Lowry, Exh. MNL-1T, are appropriate measures for PSE to determine the Company's progress in achieving its clean energy transition goals.

II. CLEAN ENERGY TRANSITION OVERVIEW – BEYOND NET ZERO

Q. What is PSE's Clean Energy vision for the future?

A. As discussed in the testimony of Adrian J. Rodriguez, Exh. AJR-1T, PSE's vision for the future continues to be focused on providing safe, clean, reliable, and affordable energy service to its customers. PSE is committed to decarbonizing its footprint while meeting the needs of PSE's customers. PSE will play a critical role in leading many elements of the clean energy transition in the space of electric and gas utility service, yet its focus remains on meeting the needs of the communities PSE serves. This includes equitably implementing the changes that will be required to decarbonize the utility.

Q. What is PSE's commitment to clean energy?

A. PSE has a critical interest and important role in achieving a sustainable future and limiting widespread impacts of climate change. PSE must shift from what is practical, convenient, or easy, to climate action that is both grounded in the latest science and capable of moving to a more sustainable economy for PSE, its customers, and society. That is why in 2021 PSE announced its ambition to be a Beyond Net Zero Carbon company by 2045. As outlined in Rodriguez, Exh. AJR-1T, this goal underscores PSE's commitment to compliance with the Clean Energy Transformation Act ("CETA"), it sets an aspirational objective of getting to net zero carbon for PSE's end use customer natural gas sales and takes PSE beyond the traditional utility footprint by helping customers reduce their own carbon footprint in the region.

Q. What are some steps PSE is taking to advance clean energy?

A. There are multiple activities underway within the Company to support the advancement of clean energy. In April 2021 PSE filed its updated Integrated Resource Plan ("IRP"). The IRP, developed through a stakeholder process, establishes a plan and pathway for PSE to decarbonize its electric portfolio in a manner that complies with CETA and incorporated the Company's first ten-year Clean Energy Action Plan ("CEAP"). Building upon the IRP's 20-plus year plan and the CEAP, PSE recently filed its first Clean Energy Implementation Plan, ("CEIP").[1] The CEIP is a four-year roadmap laying out the types of specific investments the Company will make to support its clean energy transition. I will talk more about that plan later in my testimony.

In addition to the plans the Company has created, PSE has also put in motion multiple procurement processes to begin to acquire the types of clean energy resources that will be necessary to meet the needs of PSE's customers while complying with Washington's CETA. PSE is currently evaluating proposals in response to its All-Source RFP, which was filed with the Commission on June 30, 2021 in Docket UE-210220. PSE also filed a Draft Distributed Energy Resource ("DER") RFP on November 15, 2021 in Docket UE-210878, in which PSE will be soliciting bids for distributed resources within PSE's system consistent with the targets established in the CEIP.

Additionally, PSE is investing in several enablement projects to help support the integration of distributed resources on PSE's system. One such example is upgrades required on the electric distribution system to integrate new distributed energy resources called for in the CEIP. Catherine A. Koch describes these grid modernization enablement investments in her testimony, Exh. CAK-1T. Lastly, PSE is investing in new customer programs that enable it to partner with customers in a variety of ways. In his testimony, Exh. WTE-1CT, William T. Einstein describes many of the customer programs PSE has and is developing,

[1] *See* PSE's Final 2021 Clean Energy Implementation Plan, Docket UE-210795 (Dec. 17, 2021).

including a Transportation Electrification Plan, Green Direct program, and DER programs for customers.

III. PSE'S CLEAN ENERGY IMPLEMENTATION PLAN ("CEIP")

A. Overview

Q. Please briefly describe the various features of PSE's Clean Energy Implementation Plan.

A. After months of engagement with its advisory groups, customers, and other stakeholders, PSE filed its CEIP on December 17, 2021 in Docket UE-210795. A copy of the final CEIP, without appendices, is provided as Exh. JJJ-3. The full CEIP, including appendices, is available on the Commission's website at https://www.utc.wa.gov/casedocket/2021/210795/docsets. The CEIP identifies PSE's specific and interim targets for renewable and non-emitting energy over the four-year implementation period and the specific actions to achieve those targets, while also providing customer benefits and maintaining resource adequacy and affordability. These actions are necessary for PSE to achieve reasonable progress towards meeting CETA's ambitious clean energy transformation standards.[2] These standards include: 1) eliminating coal-fired resources for retail customers by 2025, 2) achieving carbon neutrality by 2030, and 3) using 100 percent clean electricity by 2045. Please see Rodriguez, Exh. AJR-1T, for more discussion of PSE's clean energy vision.

[2] The standards are identified in WAC 480-100-610.

B. CEIP Targets and Actions

Q. What interim target is identified in the CEIP?

A. To achieve the 2030 and 2045 CETA standards, each four-year CEIP must include targets for renewable and non-emitting energy, and specific targets for energy efficiency, demand response, and renewable energy. The CEIP also identifies specific actions to achieve these targets, provide customer benefits, and maintain resource adequacy and affordability.

The CEIP's interim target, measured as a percentage of forecasted retail electric sales supplied by renewable and non-emitting CETA-eligible energy, is 63 percent. This interim target puts PSE on a solid and aggressive path towards pursuing the important work of achieving CETA's 2030 and 2045 standards. This target is calculated based on PSE's load forecast, PSE's current power supply portfolio, and the forecast of impacts associated with the CEIP's specific actions. To meet this ambitious target, it is important that PSE attracts customers to participate in the CEIP's customer facing programs. The CEIP identifies the many important actions PSE must take to secure customer participation. These actions reflect a new scope and breadth of customer engagement, including a focus on equity to guaranty that all customers can participate in – and benefit from – the clean electricity transition.

Q. What specific targets are identified in the CEIP?

A. The CEIP specific targets include: 1,073,434 MWh of energy efficiency, 23.7 MW of incremental demand response capabilities, and a target of 63 percent for renewable resources. PSE also establishes sub-targets of the renewable target: 80 MW of distributed solar capacity, and 25 MW of distributed battery storage capacity. Finally, although not part of meeting the above-stated targets, PSE proposes acquiring 50 MW of utility-scale storage in the CEIP period.

Q. What are the CEIP's Energy Efficiency targets?

A. Reducing energy use reduces the need for renewable and non-emitting resources otherwise required by CETA. The CEIP establishes an energy efficiency specific target of just over 1 million MWh over the four-year implementation period consistent with the target identified in PSE's 2022-2023 Biennial Conservation Plan ("BCP"). This target is projected to be achieved through the implementation of a diverse portfolio of cost-effective residential, business, and regionally coordinated energy management initiatives. Several pilot initiatives are also proposed to test methods and technologies and improve program effectiveness.

Q. What are the CEIP's Demand Response targets?

A. The CEIP establishes a specific target for cost-effective Demand Response ("DR") programs of 23.7MW of callable resources, mainly through "direct load control" ("DLC") measures. DR provides incentives for customers to shift their consumption away from peak periods, relieving strain and costs on the system and providing participants with direct financial benefits. DR is a key component of the resource stack, especially as the nature of energy supply and demand becomes more complex and more reliant on behind-the-meter DER. To achieve its DR specific target, the CEIP recognizes that PSE needs to build knowledge, systems, and processes to strengthen its delivery capabilities and maximize benefit potential. The DR component includes support for PSE's proposed Time-varying Rates Pilot Program, which is explained further in the testimony of Birud Jhavari, Exh. BDJ-1T.

Q. What are the CEIP's utility-scale renewable energy targets?

A. For it first CEIP, PSE is proposing that 63 percent of the energy used to serve retail sales will be delivered by CETA-eligible renewable or non-emitting resources by the end of 2025. In support of this target, the CEIP assumes the accelerated acquisition of CETA-compliant renewable resources, which will be identified through its All-Source RFP that is underway. Wind, solar, DR, DER, and other CETA-eligible resources qualify for consideration; however, PSE has not established resource-specific targets in the All-Source RFP. The exact glide path of resource additions is also not known at this time, but PSE expects some resources will be commercially available as early as 2024. PSE will acquire renewable resources that meet CETA requirements and consider customer benefits in the resource evaluation process.

Q. What are the CEIP's DER targets?

A. PSE has established a CEIP renewable energy sub-target of 80 MW of distributed solar energy and 25 MW of distributed battery storage. This sub-target is consistent with PSE's 2021 IRP and CEAP. The CEIP, however, goes further by updating the IRP's preferred portfolio of DER programs in ways that PSE believes will help spur adoption of clean energy resources from customers and third parties. PSE developed a scorecard to understand how each program may provide benefits to customers. As a result of this work, the CEIP's DER preferred portfolio now consists of three different distributed battery storage program concepts and eight different distribution solar program concepts.[3] Please see Chapter 2 of the CEIP and the testimony of William T. Einstein, Exh. WTE-1CT, for further discussion of the DER preferred portfolio.

Q. How did PSE balance the role and opportunities within the CEIP of utility-scale and DER investments?

A. Before CETA (and the advent of the CEIP), it was common that utility-scale resources would be selected in a planning context or in a given resource acquisition process because they would be the least cost resource, as compared to various forms of DER. CETA now requires the CEIP (and the IRP) to identify a lowest reasonable cost portfolio that takes into account other factors, and specifically those factors introduced through the identification of customer benefit

[3] Exh. JJJ-3, Table 2-8 at 28.

indicators ("CBI"). The CBIs, and their weights, serve to balance out the optimization by introducing other objectives, including the equitable distribution of clean energy transformation benefits, improved accessibility of clean energy, and the reduction in burdens to highly impacted and vulnerable communities. The importance of these other objectives justifies PSE pursuing a DER sub-target in this CEIP and aiming to secure those resources through subsequent resource acquisition processes even though these DER resources typically are less cost-effective than utility scale resources.

Q. How did PSE update its preferred portfolio to accommodate DER?

A. The CEIP remains consistent with its IRP and CEAP targets for distributed solar and battery storage concepts, but PSE performed additional, extensive analysis for the CEIP to refine and optimize DER opportunities, thereby advancing an updated preferred DER portfolio that promotes DER market development and maximizes customer benefit opportunities (including increased accessibility, lower barriers to investment, and higher levels of participation or adoption). PSE sought subject matter expert guidance from third-party consultants to develop a benchmark of potential DER programs and concepts. These concepts were evaluated based on program costs, customer benefits and market potential to better understand which potential programs could fulfill the DER solar and storage targets. A preferred DER portfolio was identified for the CEIP and provides guidance for which programs PSE could pursue. The update to the preferred DER portfolio was informed by additional guidance from PSE's Equity Advisory Group ("EAG") to put greater emphasis on highly impacted communities, renters, and multi-family customers.

Q. Why is clarity on the DER prudence relevant and important to the CEIP?

A. As noted above, CETA, and therefore CEIP, introduces countervailing considerations that move PSE beyond traditional least cost resource planning. In developing its CEIP, PSE found that applying initial CBIs in the IRP process influences resources selections in such a way that it creates more opportunities for DERS to contribute to the clean electricity transition. The proposed DER investments and DER program support activities are prudent considering the wider set of decision criteria reflected in CETA than those embodied in least cost planning. The decision criteria include the additional considerations embodied within CETA, particularly those addressing CBIs. Through the CEIP approval process, PSE is seeking approval from the Commission for the proposed level of distributed energy investments (as reflected in the renewable energy sub-target) and a finding that such investments are prudent considering PSE's equity considerations under CETA.

Q. What considerations must PSE balance in developing and implementing the CEIP?

A. Achieving CETA's clean energy transformation standards will not be easy. It will involve creativity, innovation, flexibility, and early action to optimally meet all necessary statutory requirements, including those that address traditional system operational and physical requirements. CEIP measures must be reasonable and feasible, and, as a portfolio, represent the lowest reasonable cost of specific actions.[4] PSE must maintain within its overall resource mix (including CEIP-identified resources), adequate resources to support safety, reliable operation, and a balanced electrical system.[5] The CEIP must also deliver an equitable transition to a clean energy future and look beyond PSE's standard measures to include quantifiable customer benefits as a means to inform program and investment choices.

This is a new way of approaching resource planning and acquisition, and it will take time for PSE's approach to mature in this space. For this CEIP, PSE focused on engaging new voices, in particular its EAG, in a) understanding the burdens and barriers facing customers and communities, b) identifying the factors that encompass vulnerable populations, c) identifying customer benefits, and d) developing customer benefit indicators and metrics. For example, PSE heard from the EAG and the Low-Income Advisory Committee that PSE's existing programs were uneven in how they benefit renters as compared to homeowners. In response to that feedback, PSE included proposed actions in the CEIP to better reach renters.

This is just one example of how EAG feedback shaped this first CEIP. In the next CEIP, PSE expects to have more robust tools in place to both measure existing

[4] WAC 480-100-640(6)(f)(i).
[5] WAC 480-100-610(4)(b).

disparities and track how PSE's proposed actions will address those disparities and provide benefits to vulnerable populations and highly impacted communities. These tools include updating any customer benefits based on additional customer outreach, and working with stakeholders to identify which, if any, benefits should be prioritized. PSE's plan to get to that future state is explained in more detail in Chapter 8 of its CEIP. entitled "Future Work and PSE Commitments."[6]

C. Stakeholder Process and EAG

Q. What role do customers, advisory groups, and stakeholders play in creating and implementing the CEIP?

A. PSE's customers, advisory groups, – including the EAG – and other stakeholders have been essential participants in the CEIP's development, shaping the direction of the Company's CETA-compliance plan. PSE engaged with the new EAG, the Low-Income Advisory Committee ("LIAC"), the Conservation Resource Advisory Group ("CRAG") and the IRP stakeholders throughout 2021 to seek their input and feedback on the development of the CEIP.

Through a total of 26 stakeholder meetings throughout the year, PSE engaged advisory groups and stakeholders as it assessed burdens, barriers and opportunities, developed customer benefit indicators, drafted programs and actions, and worked towards a draft CEIP. Their input helped PSE understand the benefits customers envision from the transition to clean electricity, which include

[6] *See* Exh. JJJ-3 at Chapter 8, "Future Work and PSE Commitments."

opportunities to improve PSE's communities through outcomes such as cleaner air, better public health, new jobs, or different ways for customers to get their electricity. PSE used this input to develop its CBIs. The CBIs guide PSE on the type and potential mix of DER programs to pursue, customer program designs, and in evaluating and selecting utility-scale and distributed resources through its resource acquisition processes.

In seeking input on the draft CEIP, PSE received more than 350 comments through the online open house website survey, sessions with community-based organizations and advisory groups, emails, website comment forms, and paper surveys. PSE looks forward to the continued participation of advisory groups and other stakeholders as the CEIP is reviewed and implemented, as well as in the development of the CEIP in future planning cycles.

Q. Please describe PSE's engagement activities.

A. PSE has prepared a multi-faceted Public Participation Plan, which outlines PSE's schedule, methods, and goals for public participation and education both during the development of its CEIP and throughout the implementation of the plan.[7] PSE's intentions throughout the CEIP development cycle has been to seek customer and community input so as to understand the kinds of customer benefits (and their weightings) these stakeholders seek from PSE's clean electricity transformation.

[7] *See* WAC 480-100-655(2).

The Public Participation Plan provides extensive details on the specific nature and purposes of various stakeholder input throughout the CEIP development and implementation cycle. PSE released the initial version of its Public Participation Plan on April 30, 2021 in Docket UE-210297, and PSE has subsequently updated the document to keep current with public participation activities as they have unfolded as part of the CEIP's development. The revised Public Participation Plan is provided as part of PSE's Final CEIP.[8]

Q. What members make up the new Equity Advisory Group?

A. In the spring of 2021, PSE convened an inaugural EAG to advise PSE on equity[9] and broaden PSE's engagement with frontline customers as PSE works to deliver a just and equitable clean electricity future and meet the objectives of CETA. After consulting with several key stakeholders on potential membership, PSE convened the EAG with the diverse members listed below. Also see Table 6-2 on page 191 of Exh. JJJ-3.

- Greater Seattle Business Association and New Chapter Weddings and Events
- Sustainable Connections
- Tacoma Urban League
- El Centro de la Raza
- Vadis
- HopeSource

[8] *See* Exh. JJJ-3 at Appendix C-1, Public Participation Plan.
[9] See WAC 480-100-655(1)(b).

- Economic Development Alliance of Skagit County
- Washington Soldiers Home
- Lummi Indian Business Council's Office of Economic Policy
- Front and Centered
- Island Senior Resources
- Chinese Information and Service Center
- Community advocates

Q. How is the EAG helping shape PSE's clean energy future?

A. The EAG has advised PSE on equity issues for the Company's first CEIP. In convening the EAG, PSE sought diverse and constructive voices from individuals or organizations not actively engaged in PSE's other advisory groups. PSE specifically looked for people with experience in environmental justice, public health, Tribes, frontline communities, vulnerable populations, or social and economic development issues.

The primary objectives of the EAG are to advise PSE on how to equitably deliver the benefits of and reduce the burdens related to the planning and implementation of CETA. PSE consulted with the EAG on: (1) the definition of vulnerable populations; (2) customer benefit indicators, metrics, and methodology; (3) burden and barrier reduction; (4) equitable delivery of clean electricity benefits, and (5) public participation. For more discussion on the EAG, please see Chapter 6 of Exh. JJJ-3.

Q. What are PSE's desired outcomes from the CEIP customer engagement work?

A. PSE recognizes that the CEIP, IRP, CEAP, biennial and other compliance reporting obligations are recurring; therefore, PSE's engagement must be consistent and remain meaningful over time. PSE's long-term goals are to: (a) create an equitable and durable CEIP (throughout its many future iterations) in its advancement of the region's clean energy transformation, (b) reflect continuous process improvement related to the participation itself, (c) make sure input, listening, mutual learning and outcomes are themselves reflective of equitable inclusion, (d) build customer education and awareness of clean energy programs, and (e) foster improved relationships with community-based organizations. A critical output of the engagement process, and described elsewhere, is the formalization of CBIs, and their weightings, which are applied in the optimization process for selecting preferred resources.

Q. How does PSE identify vulnerable populations in the service territory?

A. PSE has been listening closely to the EAG to learn how to identify, recognize, and understand the needs of vulnerable populations. Through a series of meetings, PSE collaborated with the EAG to identify and describe factors of vulnerability, which bring the needs of its vulnerable populations into the energy resource portfolio analysis and decision-making process in an objective way. In turn, these factors contributed towards inclusion of CEIP resource choices that seek to reflect an equitable distribution of clean energy transformation benefits. The work resulted in the identification of a set of primary and expanded sensitive populations and socioeconomic indicators.[10] PSE and the EAG were then able to associate these factors with a variety of data sources (such as market surveys, or public health databases) and geographic data (county level, census block level, census tract level, customer level), which enabled the identification of energy resource burdens and opportunities (such as DER) to address vulnerable population needs.

Q. What are Customer Benefit Indicators ("CBI") and how have they been developed and applied within the CEIP?

A. CBIs are an essential feature of the CEIP. Implementation of CETA and the CEIP is intended to expand the meaning of benefit beyond traditional lowest cost resource and bring into the resource optimization decision-making and resource acquisition processes, as well program implementation, a broader set of customer benefits. To do this, one must first understand the existing barriers or burdens customers experience, then determine which set of customer benefits are of interest to PSE's customers, then determine their indicators and weightings to use within the resource optimization process, as well as the resource acquisition process and program implementation. This process is also mindful of customer burdens related to energy resource decision making. For example, program access and complexity were identified by advisory group members as burdens, including

[10] *See* Exh. JJJ-3, Tables 3-2 and 3-3 at 52-54.

language and cultural barriers. In response to this and other stakeholder feedback, PSE included a CBI to address language barrier and accessibility.

Other examples of CBIs in PSE's CEIP are "improved community health" and "improved outdoor air quality." By including these CBIs in the resource optimization process, the CEIP can begin to reflect these and other benefits in formal and structured ways, which might otherwise not be captured under traditional IRP optimization practices. Or they might not be weighted in a way that reflects community input and consideration of relevant tradeoffs. In its CEIP PSE did not prioritize or weight any customer benefit above another. Therefore, each customer benefit is treated equally in the resource optimization process. In future CEIP processes, PSE will again engage with the community to better understand which customer benefits are a priority for customers and develop a mechanism to reflect an appropriate weight for each benefit.

The PSE CEIP identifies 11 CBIs and paired each one with specific and unique metrics (such as tons reduced or number of jobs created) that will be used over time to measure progress. These CBIs were developed with input from PSE's advisory groups as well as input from a customer survey. Three of the performance metrics proposed in this case overlap with the CBIs developed in the CEIP: (1) affordability; (2) energy efficiency and (3) demand response/peak load reduction. Please see the testimony of Mark N. Lowry, Exh. MNL-1T, and Section D of my testimony for more details on these performance metrics.

Q. How did advisory groups and customers help PSE determine the CBIs for the CEIP?

A. PSE's advisory groups provided important input on CBIs during the development of the CEIP. The EAG's input in particular has been fundamental in the development of CBIs in two ways.: (a) First, the EAG brought awareness and insight to the table about how to identify the existing barriers and burdens faced by customers in highly impacted communications and vulnerable populations. Second, the EAG also provided key input on the identification of factors that are now applied within the CEIP analysis to help identify vulnerable population customer segments more effectively. The EAG, as well as PSE's other advisory groups, also; (c) the also provided input on PSE's draft customer benefit indicators and guidance on indicators specific to highly impacted communities and vulnerable populations. All this feedback and guidance from PSE's advisory groups has enabled PSE to design a preferred DER resource portfolio that designates potential programs and program concepts for these communities, with the aim to reduce energy burdens and create accessible, reliable, and affordable clean energy within these communities and customer segments.

D. Performance Metrics

Q. Is PSE proposing performance metrics as part of the multiyear rate plan in this case related to the Company's progress in achieving its clean energy transition goals?

A. Yes. PSE is proposing six performance metrics in this area and one performance incentive mechanism ("PIM"). The distinction between performance metrics and PIMs is discussed in Mark Lowry's testimony, Exh. MNL-1T. Collectively, I will refer to these generally as performance measures.

Q. What elements of the clean energy transition are covered by these performance measures?

A. The proposed performance measures quantify PSE performance on demand-side management with metrics that quantify electric and natural gas energy efficiency program gains. There are equity components of these programs, as well as a PIM and one associated metric to measure progress on newly implemented demand response programs. The proposal also includes a metric that measures greenhouse gas emissions from electric operations.

Q. What are the proposed demand-side management performance measures?

A. The demand-side management performance metrics include the following:

1) Energy Efficiency Savings Electric Programs.
2) Energy Efficiency Savings Gas Programs.

3) Number of Customers Participating in Energy Efficiency Programs from Highly Impacted and Vulnerable Communities Electric Programs.

4) Number of Customers Participating in Energy Efficiency Programs from Highly Impacted and Vulnerable Communities Gas Programs.

PSE is also proposing one PIM and one additional associated metric in demand-side management:

1) Peak Load Management Savings PIM.

2) Residential Peak Load Management Savings.

Q. What is the proposed greenhouse gas emissions metric?

A. PSE is proposing a metric to report all CO_2 emissions from Company-owned electric operations.

Q. Can you provide further details about how each of these performance measures are calculated?

A. The energy efficiency savings for electric and natural gas will report energy savings from all energy efficiency programs implemented by PSE, consistent with the methodology used and reported in PSE's Biennial Conservation Plans.

The number of customers participating in PSE electric and natural gas energy efficiency programs in highly impacted and vulnerable communities will be calculated using customer participation data and geographic databases that identify the areas of highly impacted and vulnerable communities in PSE's service territory (see Chapter 3 of Exh. JJJ-3). This calculation will include customer participation in all energy efficiency programs for which customer data is known, including low-income programs. More information regarding the calculation of these metrics can be found in Chapter 3 and Appendix H of the CEIP. PSE will utilize the same methodology to report natural gas program metrics, although those are not described in the CEIP.

The Peak Load Management Savings PIM will measure the total available energy reduction in PSE's winter coincident peak electric demand. Each demand response program implemented by PSE will have an estimated winter coincident peak demand value estimated based on pre-established measurement and verification techniques. These techniques are described in Chapter 7 of Exh. JJJ-3. The calculation for the PIM will include all demand response programs. In response to stakeholder suggestions, PSE is also proposing a metric that will separately track the residential class demand response program peak load savings contribution.

For greenhouse gas emissions, PSE is proposing to track the metric tons of Scope 1 emissions from Company-owned generation.[11] The CO_2 output is based on the fuel source claims reported under Chapter 19.29A RCW and is consistent with the methodology used to report Scope 1 emissions to the US Environmental Protection Agency.

[11] Scope 1 emissions are direct greenhouse gas emissions that occur from sources controlled or owned by an organization (e.g., emissions associated with fuel combustion in boilers, furnaces, vehicles). Scope 2 emissions are indirect emissions associated with the purchase of electricity, steam, heat, or cooling.

Q. Is PSE proposing targets associated with these performance measurements?

A. Yes. In this case, PSE is proposing performance targets for the peak load management PIM. The proposed targets are consistent with the demand response targets outlined in PSE's CEIP. These targets are an annual peak load savings of 5 MW in 2023, 6 MW in 2024 and 12 MW in 2025.

Q. Are the performance measures consistent with the CEIP and the customer benefit indicators developed for the CEIP?

A. Yes. The proposed greenhouse gas emission metric is a customer benefit indicator identified in the CEIP. The demand-side management participation metrics mirror aspects of customer benefit indicators established in the CEIP and go further by also including the same measurements for natural gas energy efficiency programs and participation in these programs by customers in highly impacted and vulnerable communities.

Q. What is the purpose of utilizing performance measures that are linked to the CEIP customer benefit indicators in the multiyear rate plan?

A. PSE views the multiyear rate plan and the CEIP as two interrelated elements on the path to regulatory implementation of the clean energy transition. The CEIP is connected to the multiyear rate plan primarily through treatment of costs, and the performance measures associated with the rate plan establish a means of transparency and accountability for how PSE is executing its CEIP commitments, especially in areas that are of primary importance to public policy goals.

Furthermore, as previously discussed in my testimony, PSE conducted a robust public participation process including a broad customer survey, consultation with all existing advisory groups, and community-based organization outreach to develop the customer benefit indicators. It makes sense to rely on these measurements for the multiyear rate plan because they are representative of broad-based public input that represents the interests and priorities of PSE customers and stakeholders.

Q. Do some of the performance measures support demonstration of PSE's performance relative to CETA?

A. Yes. CETA requires utilities to pursue all cost-effective energy efficiency and demand response. These types of demand-side management efforts reduce the need for new generating resources, which in the short-term reduces the need for fossil generating resources and over the longer term reduces the need for more costly energy alternatives, lowering overall system costs of CETA compliance.

Q. Do some of the performance measures support progress toward PSE's broader Beyond Net Zero Carbon goals?

A. Yes. Natural gas energy efficiency programs are an important component of reducing greenhouse gas emissions on the natural gas system. These programs reduce customer greenhouse gas emissions by reducing the individual customer's demand for natural gas. Energy efficiency programs are central to PSE's efforts to reduce emissions from the natural gas system.

Q. Do some of the performance measures support demonstration of progress toward PSE's commitment to an equitable clean energy transition?

A. Yes. Metrics that measure participation in PSE energy efficiency programs among customers in highly impacted and vulnerable communities will help PSE improve participation rates in these communities, allowing that the benefits of energy efficiency such as lower energy bills, home comfort and health and others are provided equitably across PSE's customer population. CETA requires establishing these types of equity metrics for PSE's electric programs, however, PSE is committed to advancing equity holistically, and so PSE proposes to utilize the highly impacted and vulnerable population designations created for electric purposes and apply the same analysis to natural gas customer participation rates.

Q. Do these performance measures provide transparency and accountability on other public policy or stakeholder goals beyond decarbonization and equity?

A. Yes. As discussed in the testimony of Mark Lowry, SB 5295 itemized criteria for evaluating metrics pertaining to multiyear rate plans. In addition to the goal of attainment of state energy and emissions reduction policies and equity goals, the metrics I describe above provide performance evaluation related to customer satisfaction and engagement, conservation acquisition, demand-side management expansion, and affordability.

E. CEIP Costs

Q. What are the CEIP capital costs identified in this case?

A. Table 1 summarizes the cost of investments by category that are directly allocated to the CEIP that PSE is seeking recovery for in this case. In many cases, these are new investments to implement the CEIP, and in other cases, these are already planned investments that have been accelerated in order to implement the CEIP. Please see Appendix E for a more detailed breakdown of projects and their allocation. These projects are described in the direct testimony and exhibits of William Einstein, Catherine Koch, Carol Wallace, and Suzanne Tamayo. One set of smaller DER enablement investments not described by these witnesses is listed in the CEIP as “DER Innovation.” It consists of three projects described in the CEIP: (1) customer notification platform; (2) device marketplace; and (3) marketing platform. The total capital cost of these projects over the rate period is $2.25 million and is included in the DER Enablers total cost in Table 1. For more information on these projects, please see Appendix D-7 of the CEIP.

It is important to note that there are other costs associated with grid modernization and enablement not reflected in this chart that are necessary in order for PSE to successfully meet its clean energy targets and specific actions in the CEIP, and without those investments, the incremental cost of the CEIP would be much higher. For discussion of those investments, please see the testimonies of Catherine A. Koch, Suzanne Tamayo, and Carol Wallace.

Table 1. Summary of CEIP Capital Costs by Revenue Period

Capital Plan ($ millions)	Gap Year 2022	Rate Plan Year 1 2023	Rate Plan Year 2 2024	Rate Plan Year 3 2025	Total	Witness	Seeking Recovery in GRC?
Energy Efficiency (incremental in CEIP)	37.6	37.6	37.6	37.6	150.4	N/A	No – Conservation Rider (Schedule 120)
Demand Response	0	1	1	1	3	William Einstein	Yes
Projected Power Costs (overall, not specific to CEIP)		N/A	N/A	N/A		Paul Wetherbee	Yes[12]
DER Costs	0	17	33.5	60.1	110.6	William Einstein	Yes
Grid Modernization[13]	4.3	27.8	38.2	45.7	116	Catherine Koch	Yes
DER Enablers[14]	3.9	15.1	8.4	5.7	33.1	Catherine Koch, Carol Wallace, and Suzanne Tamayo	Yes

Q. What are the CEIP operating expenses identified in this case?

A. Table 2 summarizes the operation and maintenance (O&M) expenses by category over the rate period associated with implementation of the CEIP. An estimate of these costs was included in the PSE O&M forecast provided in the testimony of Josh A. Kensok, Exh. JAK-1T.

[12] The testimony of Paul Wetherbee, Exh. PKW-1CT, contains projections of PSE's power cost for the rate period of $902.4 million (2023), $913.4 million (2024), and $850.8 (2025). These are projections and do not necessarily reflect CETA-eligible renewable resources needed to meet PSE's specific and interim targets in the CEIP (Exh. JJJ-3). Additional new resources will be required to implement PSE's CEIP once approved, and the cost of those resources will depend on the outcome of PSE's All-Source and Distributed Energy Resource RFPs. PSE seeks to recover those costs when known through its requested annual power cost update as described in the testimony of Janet Phelps, Exh. JKP-1T.

[13] For Grid Modernization, this chart reflects capital costs according to their allocation to CETA, consistent with Appendix E of the CEIP.

[14] For DER enablers, this chart reflects capital costs according to their allocation to CETA, consistent with Appendix E of the CEIP.

Table 2. Summary of CEIP O&M Expenses by Revenue Period

Operating Expense ($ millions)	Gap Year 2022	Rate Plan Year 1 2023	Rate Plan Year 2 2024	Rate Plan Year 3 2025	**Total**
DER Resources	-	9.2	13.3	19.5	42
Grid Modernization[15]	-	.2	.5	.5	1.2
DER Enablers[16]	-	3.6	3.5	3.7	10.8
Customer Outreach	-	9.8	10.2	10.5	30.5
Administration	-	2.1	2.2	2.2	6.5
Total Opex	-	24.9	29.7	36.4	91

Q. What is the incremental cost of implementing the CEIP over its four-year term?

A. CETA requires PSE to determine the CEIP projected incremental cost.[17] The cost must be incremental to that PSE would incur except for the costs associated with meeting CETA's clean energy standards reflected in RCW 19.405.040 and RCW 19.405.050. To determine this cost, PSE has used a scenario and portfolio-based analysis methodology to identify a "baseline portfolio" for its resource needs, which assumes no CETA clean energy standard related activities, versus a "CEIP portfolio" that keeps PSE on track to meet CETA's clean energy transformation standards. Based on this methodology, PSE has calculated that CEIP implementation over the four-year period requires $450 million in new funding as compared to its baseline needs. These costs ramp in over the four-year period:

[15] For Grid modernization operating expenses, these are reflected according to their allocation to CETA, consistent with Appendix E of the CEIP.

[16] For DER Enabler operating expenses, these are reflected according to their allocation to CETA, consistent with Appendix E of the CEIP.

[17] WAC 480-100-640(7).

$45.3 million (2022), $72.1 million (2023), $142.6 million (2024), and $190.1 million (2025).

Q. What do these costs include?

A. These costs are PSE's budget to support the programs, supply sources, planning, compliance, administration, outreach, assets and technologies, and other resources required to implement the CEIP during the four-year period. By incurring these costs PSE will be able to carry out the CEIP actions, achieve the specific and interim targets, thus keeping on track to achieve the 2030 and 2045 CETA standards.

Q. What are the principal cost categories that PSE has identified in the CEIP?

A. The CEIP is a diverse plan that builds on PSE's existing initiatives and programs, addresses certain gaps in PSE's resource mix that emerge starting in 2025 (per PSE's IRP and CEAP), and meets aggressive interim targets that PSE is proposing for the 2022-2025 timeframe. Reflecting this diversity, 34 percent of CEIP incremental costs are for energy efficiency and demand response programs, which reduce the need to supply load, 45 percent are for energy supply, 12 percent are for DER and grid technology enablement, and 9 percent are for CEIP customer education, administration, and reporting. The incremental cost projections are based on the recovery of capital and current period costs through the revenue requirements process and are built on PSE's capital and operating budgeting and cost estimation. Table 3 below represents those costs and a more detailed version of this table can be found in PSE's CEIP as Table 5-3.

Table 3: Incremental Cost Summary

Estimated Incremental Cost Calculation ($000)	2022	2023	2024	2025	2022–25 Incremental Cost
Energy Efficiency	$37,570	$37,570	$37,570	$37,596	$150,279
Demand Response	$242	$722	$888	$2,228	$4,080
Energy Supply Portfolio	$412	$11,165	$74,806	$114,458	$200,840
DER Technology and Enabling Costs	$4,075	$10,785	$16,969	$23,321	$55,150
Customer Education and Outreach	$960	$9,830	$10,215	$10,406	$31,410
Administration and Reporting	$2,058	$2,110	$2,162	$2,162	$8,547
Total Incremental Cost	**$45,317**	**$72,182**	**$142,611**	**$190,198**	$450,307

It is important to emphasize that incremental cost is a hypothetical construct under CETA for the purpose of calculating the incremental cost of compliance – i.e. what costs are "directly attributable" to meeting the clean energy standards in RCW 19.405.040 and 19.405.050. It compares the hypothetical "no-CETA" portfolio (referred to in WAC 480-100-660 as the "alternative lowest reasonable cost and reasonably available portfolio") to the "CETA portfolio." This calculation is required by rule irrespective of whether the utility intends to rely on the incremental cost for purposes of alternative compliance.

Q. What are the principal cost drivers influencing the CEIP?

A. The CEIP includes specific actions to support and advance key grid modernization and DER enablement capabilities, systems, technologies, and customer-facing programs. The CEIP-identified resources – both in their nature and their timing, place additional demands on PSE and the grid to meet the Company's resource adequacy and system balancing obligations. Therefore, PSE has had to carefully inspect its current programs and budgets in these areas and determine what is fairly and reasonably allocatable to the CEIP, due to the nature of the resources proposed in the CEIP. In large part, it achieved a level of rigor in its allocation task due to the development of a good roadmap for its grid modernization and DER enablement IT and OT investments. Please see Exh. CAK-1T for more information on the necessary grid modernization efforts to implement CETA.

Q. What is the incremental cost of energy efficiency programs in the CEIP?

A. The CEIP estimates a four-year incremental cost for energy efficiency of $150.3 million for a range of energy efficiency programs encompassing residential energy management ($56.5 million), commercial energy management ($85.5 million), energy management pilots ($1.2 million), and regional energy efficiency initiatives ($7.1 million). To calculate the incremental cost of energy efficiency programs, PSE used the average cost of savings in the 2022-2023 Biennial Conservation Plan and multiplied by the increased amount of energy efficiency in the CEIP portfolio as compared to the baseline (no CETA) portfolio.

Q. What incremental costs are budgeted as part of the CEIP for acquiring new supply resources?

A. The CEIP calls for actions to secure a resource supply portfolio that meets resource adequacy requirements, and that provides energy "that is clean, affordable, reliable and equitably distributed."[18] The largest cost component in the CEIP is for new clean sources of supply. In fact, over $200 million is budgeted to meet the incremental energy, capacity and other resource adequacy needs in support of the CETA-compliant portfolio (as compared to the baseline portfolio). Actual costs of these resources will depend on the outcome of PSE's All-Source and Distributed Energy Resources RFPs. Incremental costs are also included for several unique distributed solar programs, and battery storage projects. Projects may include both utility-owned and non-utility owned assets. These programs will include an essential focus on ensuring access to clean, reliable energy for PSE's vulnerable populations.

Q. What incremental costs does the CEIP include for grid modernization?

A. The CEIP includes $55.1 million in incremental cost for grid modernization programs and investments, which are guided by PSE's practical, customer focused, and unified grid modernization strategy.[19] For context, PSE's CEAP – based on the 2021 IRP preferred portfolio – identified a significant number of DERs needed (634 MW) by 2030. To accommodate this level of DER integration,

[18] WAC 480-100-620(1).
[19] Appendix G: Grid Modernization Strategy, PSE CEIP.

PSE must upgrade the transmission and distribution grids earlier than planned. The grid modernization CEIP component therefore includes investing in a number of tools and processes that interface with DERs, broadly facilitating evaluation, interconnection, visibility, dispatch and operation. These investments are captured in the CEIP as “DER Enablers” or “Enablement from Grid Modernization” and include forecasting tools, hosting capacity analysis capabilities, locational pricing analysis tools, distribution control systems (“ADMS”), interconnection tools, and a distributed energy management system (“DERMS”). They also include tools and capabilities to manage power flows, supporting grid reliability, resiliency, and safety; funding is also proposed to support grid visibility and control by expanding PSE’s Supervisory Control and Data Acquisition (“SCADA”) and to improve the grid’s capacity to integrate DER through circuit-level improvements in microgrids and resiliency-enhancing upgrades.

Q. How are the grid modernization incremental costs calculated?

A. PSE has many grid modernization efforts underway, and it would be unreasonable to assign these costs to the CEIP without careful attention to a proper allocation of those costs directly attributable to the clean energy standard provisions in CETA. Accordingly, PSE developed a detailed budget for its CEIP-related grid modernization efforts that explicitly recognizes the expansion and acceleration of its current grid modernization efforts that are uniquely due to supporting and sustaining its CETA-compliant portfolio resources. Only those incremental grid modernization costs reasonably attributable to the CEIP are allocated to the CEIP.

Please see Appendix E of the CEIP, to review the allocation of grid modernization costs specifically to support the CEIP, as well as Exh. CAK-5.

Q. Why does the CEIP include "enablement" costs?

A. DER enablement costs are needed in order to identify, integrate, track, manage and control DER resources identified as part of the CEIP's specific targets. Budget costs are identified to support vendor contracting and management, marketing, benchmarking research, stakeholder engagement, customer care (for portfolio owners), customer relationship management, and customer education. PSE will also build a virtual power plant ("VPP") and develop an integrated DER information technology/operation technology strategy. PSE's enablement-related specific actions provide the essential 'backbone' of capabilities and tools to position PSE in its need to lead, drive, facilitate and encourage DER adoption throughout the PSE service territory, across all dimensions of DER growth. Please see Exh. CAK-1T for more on the enablement-related costs for this CEIP.

Q. What are the administrative, compliance and customer education costs included within the CEIP budget?

A. The CEIP includes $40.0 million over the CEIP period to support administrative and compliance responsibilities ($8.6 million) and customer education ($31.4 million). CETA creates significant new requirements for customer education and engagement to support customer benefit indicators, in the development of the CEIP, implementation of the plan, and through customer notices. CETA also requires ongoing customer engagement with all customers and members of highly impacted communities and vulnerable populations through education about clean energy. Furthermore, implementing CETA includes several critical administrative activities, including tracking progress towards clean energy goals, monitoring the performance of customer benefit indicators, tracking actual costs, and multiple forms of reporting. These costs are necessary for PSE to meet its CEIP compliance obligations and secure the customer participation and engagement necessary to equitably achieve the interim targets.

Q. What costs are not included in the CEIP budget?

A. PSE's CEIP includes a small contribution towards PSE's overall grid modernization investments and initiatives that are current known and identified. PSE has recognized the imperatives of improving its transmission and distribution grids prior to the enactment of CETA, and it would not be appropriate to burden the PSE CEIP with certain portions of its costs identified with upgrades that PSE perceives are required to maintain the grid in satisfaction of its reliability, system balancing, resource adequacy, and resiliency requirements that exist regardless of the CETA-driven mandates. PSE also acknowledges that the CEIP does not include some costs (and related benefits) of future grid- and energy market impacts, which are likely to impinge on meeting the 2030 and 2045 CETA standards. PSE observes, however, that it would not be prudent or feasible to try to include costs related to these impacts at this time because the impacts are uncertain (and hence subject to speculation) in terms of their timing, nature, and extent in specific relation to achieving CETA standards. The impact areas include: (a) integration costs for high levels of renewable energy, (b) changes to reliability standards, (c) changes in wholesale market design and regulation, and (d) changes to federal and state tax structures.

IV. DECARBONIZATION OF PSE'S NATURAL GAS SALES

A. Need for Decarbonization

Q. Why is PSE addressing carbon reduction tied to gas customer end use?

A. In 2021 PSE established a Beyond Net Zero Carbon initiative to drive carbon emission reductions across the Company. A subset of that initiative includes an aspirational goal of net zero carbon emissions for PSE's gas customer end use sales by 2045, with an interim target of 30 percent reduction by 2030. PSE is focusing on this issue to address two primary needs: 1) to adequately plan and prepare for legal and regulatory changes occurring in Washington State within various jurisdictions aimed at mitigating climate change, and 2) to address the concerns for carbon emission reduction expressed by customers and the communities PSE serves.

Q. What do customers want with respect to their natural gas service and decarbonization?

A. As a provider of natural gas service, PSE hears diverse customer perspectives regarding their expectations for decarbonization of the gas system.

Foremost, customers want access to safe, reliable, and affordable service. In recent PSE customer surveys, as shown in Exh. JJJ-4, the top concerns expressed by customers are reliability and affordability with 82 percent of customers overall saying reliability is extremely important and 69 percent of customers saying affordability is extremely important.

Next, many customers, policy makers, and stakeholders are deeply concerned about climate change and the effect the fossil fuels have on the environment. When surveyed, 66 percent of PSE customers rate their level of concern about climate change between 8 and 10 on a 1-10 scale, indicating that a large portion of the customer base is very concerned about climate change. Of the 66 percent of customers who are very concerned about climate change, they place almost equal importance on reliability and access to renewable or clean energy. Of these same customers, 81 percent say reliability is extremely important and 85 percent say access to renewable or clean energy is extremely important.

Finally, PSE natural gas customers see immense value from the energy service PSE provides them and are concerned future policies will limit their ability to connect or to stay connected to the gas system. Survey data also shows that the majority of natural gas customers do not support natural gas bans with 60 percent opposing them. Customers want an <u>informed and well-reasoned approach</u> to decarbonizing the natural gas system; one that allows them the ability to maintain their service, but at a lower overall carbon intensity. This customer desire for affordability, reliability and decarbonization helps to inform the path forward for PSE.

Q. What else is adding to the urgency for PSE to act in reducing carbon emissions from gas customer end use?

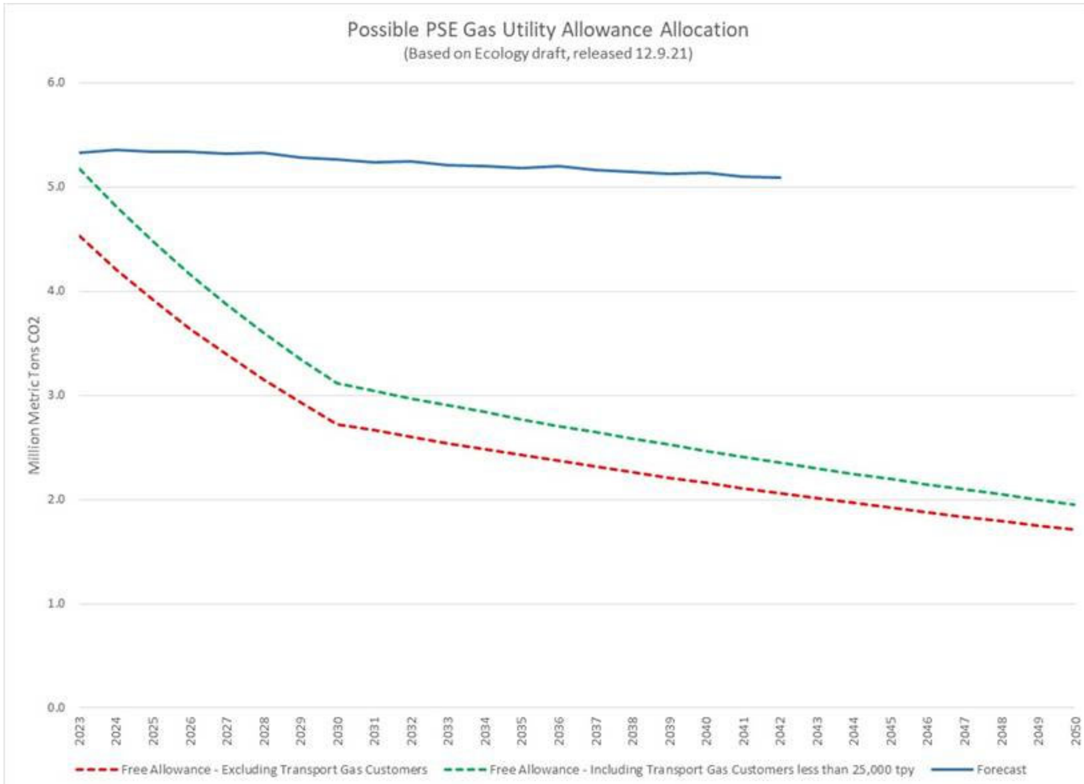
A. The Washington Climate Commitment Act ("CCA"), which was signed into law by Governor Jay Inslee in May 2021, solidifies Washington State as a national climate leader with the most ambitious limit on emissions of any state in the nation. The CCA offers a tremendous opportunity for Washington State to lead the way on decarbonization of end use gas sales. By introducing carbon pricing and a cap on carbon emissions it mandates decarbonization of PSE's energy systems, including natural gas.

PSE must move quickly to implement known carbon reducing measures related to natural gas end use. PSE must also thoughtfully develop implementation plans as requirements are clarified through ongoing rulemakings that prioritize safety and equity, while maintaining reliable service.

Q. How will the new CCA legislation likely impact the carbon emissions associated with PSE's end use gas sales?

A. The CCA provides for carbon pricing and sets the most aggressive targets in the nation for carbon reduction of the natural gas sector through steep annual reduction of a cap. Under the CCA, gas utilities are given sharply declining free allowances for natural gas sales and by 2045 have zero free allowances and the statewide budget for allowances for purchase will be extremely small. Rulemaking is underway at the Department of Ecology, and the draft rule related to allowance allocation issued on December 9, 2021 proposes that for the first year of the program in 2023 only 93 percent of the total carbon emissions from the baseline years (2015-2019) will be put into the state-wide allowance budget and this will be reduced 7 percent per year until 2030. Specifically, under the proposed rules natural gas utilities would only receive 93 percent free carbon allowances per year starting in 2023 and this budget would be reduced 7 percent each year until 2030 and then an average of 2.3 percent each year from 2031-2050. See Figure 1 below for a graphical representation of Ecology's proposed free carbon allowances versus carbon emissions associated PSE's gas sales 2021 IRP forecast. Without proactive utility planning and strategic decarbonization investment in anticipation of the allowance decline, there is significant risk of both affordability and reliability issues, particularly for those more vulnerable to gas and electricity rate increases. Although the proposed rule requires PSE to prioritize free allowances to eliminate the cost burden to low income customers, the free allowances will decrease to zero, eventually necessitating the decarbonization of the gas system.

Figure 1



B. PSE's Decarbonization Measures

Q. What decarbonization measures will PSE leverage to decarbonize customer end use gas sales to comply with the CCA?

A. Between 2020 and 2021 the Company contracted with Energy + Environmental Economics ("E3") to complete two related studies to evaluate viable decarbonization pathways for gas customer end use. The first study from October of 2020 can be found as Exh. JJJ-5 and the second study from September of 2021 can be found as Exh. JJJ-6. While work on this issue will be ongoing as the analysis is refined, technologies evolve and new public policies are enacted, thus far the Company has identified four complimentary pathways as critical to the equitable and cost-effective decarbonization of the gas system that PSE will leverage to comply with the CCA. Those pathways include: 1) methane emission reduction; 2) conservation and demand-side resources; 3) targeted electrification; and 4) alternative fuels such as renewable natural gas ("RNG") and green hydrogen.

Q. How will PSE address methane emissions within the gas system?

A. PSE is targeting net zero methane emissions on its local gas distribution system through a series of leak reduction and offset investments by the end of 2022. Investments in methane reduction efforts help to make PSE's gas distribution system safer and cleaner by limiting the release of methane. PSE investments to improve the hardening and tightening of the gas system infrastructure in order to reduce the amount of methane that is leaked into the environment are described the testimony of Cathy A. Koch, Exh. CAK-1T.

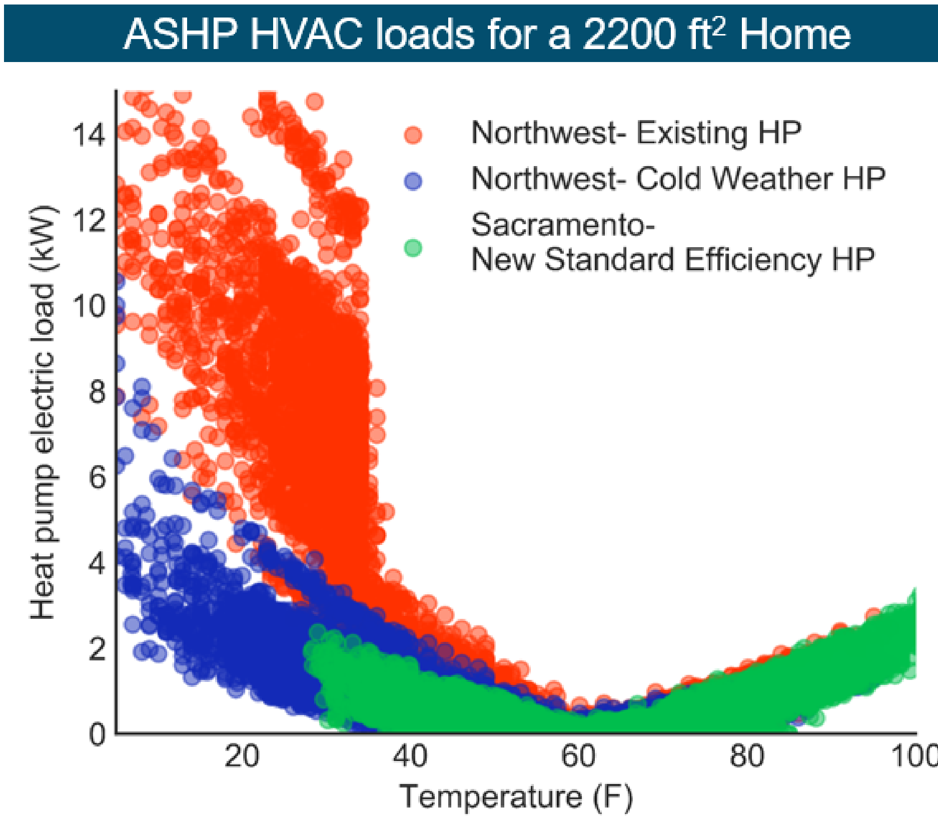
Q. How will PSE utilize conservation and demand-side resources to reduce carbon emissions within the gas system?

A. Cost effective conservation measures are a foundational component of any carbon reduction plan and are not a new element for PSE. PSE has provided demand-side resources to PSE's gas customers since 1993 and will continue to deliver (at increasing levels) energy efficiency incentives as detailed in the 2021 Biennial Conservation Plan recently filed with the Commission in Dockets UE-210822 and UG-210823.

Q. What is targeted electrification, and how does PSE anticipate it playing a part in decarbonizing the gas system?

A. For PSE, "targeted electrification" describes components of PSE gas load that can be transitioned over time to electric load, using electric appliances, without further constraining the electric system infrastructure during winter peak delivery periods. Hybrid heating solutions, or the adoption of electric heat pumps with complementary use of gas furnace appliances to support the cold weather needs of customers, will play an important role in decarbonizing customer end use gas sales. Based on PSE's preliminary analyses, heat pumps alone can be valuable in certain climates, but they are less effective in PSE's service territory because of cold winter temperatures. Figure 2 below, from Exh. JJJ-6, illustrates the constraints of air-source heat pumps in Washington's climate.

Figure 2



The analysis demonstrates that standard electric heat pump efficiency drops when temperatures fall, which can lead to large impacts on electric peak demand when resistance heat kicks in.

Using hybrid heating solutions, as the study referenced in Exh. JJJ-5 concludes, PSE could achieve greater carbon reduction at a lower overall cost and without further straining the reliability of electric grid during peak winter events. Conceptually, the supplementation of an electric heat-pump to an existing gas customer home would increase electric load and decrease gas usage in off-peak periods but preserve the ability to use gas during peak demand periods such as severe or long duration cold weather events like in December 2021. This would drastically reduce the electric infrastructure buildout that would otherwise be needed to serve peak periods and shrink the gas supply footprint such that PSE can transition to a 100 percent decarbonized gas supply within the next few decades.

PSE is piloting hybrid-heating solutions within its energy efficiency programs to understand how to both develop programs and drive customer adoption of hybrid heating solutions.

Q. Has PSE analyzed full electrification as an alternative to targeted electrification?

A. Yes, and PSE has determined that full electrification is not an appropriate solution at this time. Electrification is an important element of the clean energy transition but cannot be solely relied upon as the only energy solution to address climate change. Utilities must leverage multiple pathways to achieve meaningful reduction in order to combat climate change.

Today, PSE's electric distribution and transmission infrastructure and fuel supplies for dispatchable electric capacity are sized to meet current demand for electricity. In the near term, PSE is focused on simultaneously serving increased demand from electrified transportation and transitioning its diverse generation mix to a 100 percent carbon free generation supply in accordance with CETA.

Q. What are the challenges to full electrification that PSE has identified?

A. The push to electrify everything, however well intended, misses the mark when it comes to application and implementation. In a winter peaking area such as PSE's service territory, the pipeline infrastructure fuel delivery system serves a significant and vital role in meeting peak energy demand. PSE's existing electric infrastructure system was not built to meet this entire peak energy demand but rather assumed the availability of complementary energy systems during cold periods of the year.

Furthermore, the intermittency of projected incremental renewables in the Northwest do not align with the load shape of a winter peaking utility. Unlike in California, where the capacity shortage during peak load lasts only for hours and is usually during periods of moderate to high renewable production, PSE must solve for capacity shortage scenarios that last continuously over multiple days during which renewable production is intermittent and low.

Put another way, there is significant uncertainty regarding the availability of incremental, CETA-compliant, dispatchable power generation necessary for reliable system operation and the integration of renewables under peak conditions to cover the region's heating load. As a result, full electrification would require a major, expedient, and unprecedented expansion of electric generation, transmission, and distribution infrastructure. This type of rapid shift would have significant resiliency and cost impacts. In addition to cost and resiliency issues associated with a full electrified energy system there is no clear path under current federal and state siting laws on how such facilities could be permitted and sited in time to meet the Washington State carbon emission reduction goals. Full electrification also has potential to disproportionally affect low income and vulnerable communities due to the residential appliance conversion that would be required.

Q. What did PSE's gas decarbonization study conclude with respect to PSE gas loads under the high electrification scenario?

A. The studies PSE has completed thus far underscore the value of the gas system in serving the needs of PSE's customers on the coldest of winter days. The study performed by E3 in 2021, shown in Exh. JJJ-6, concluded that PSE's natural gas system is designed to deliver approximately 17 GW of energy during the system hourly winter peak. By comparison, PSE's 2021 IRP referenced a 4.7 GW hourly load in 2022 for electric peak demand. The energy delivery capability during winter peak system events through the gas system is significantly more than the equivalent electric peak delivery capability. As such, the electric infrastructure investments that would be required in Washington State to replace the peaking capacity of the gas system under a high electrification scenario would be extensive.

Q. Is PSE the only utility to draw these conclusions about the need for complementary energy systems?

A. No. Several utilities have produced plans that forecast similar paths to decarbonize end use natural gas sales. FortisBC, with support from Guidehouse, recently produced a report that concluded that leveraging diversified pathways that make use of gas infrastructure could save customers in excess of $100 billion by 2050. That report is attached as attachment Exh. JJJ-7. Also, attached as attachment Exh JJJ-8 is a plan developed by Xcel Energy that states, "As we determine the best mix of these strategies for emissions reductions purposes, our primary guideposts are affordability and reliability. While the magnitude and scale of each individual measure is unknown, we do plan to include a mix of both electrification and low-carbon gas alternatives." Plans produced by National Grid USA also show pathways to decarbonize the gas network that make use of RNG and green hydrogen while exploring the use of hybrid heating solutions. That plan is attached as attachment Exh. JJJ-9.

Q. How will alternative fuels such as RNG and green hydrogen play a part in decarbonizing the gas system?

A. Alternative fuels, such as RNG and green hydrogen, will be critical to decarbonizing the gas system. The study work performed by E3 confirms a hybrid approach that utilizes both targeted electrification and alternative fuels as a more cost-effective approach to reducing carbon emissions for PSE customers that electrification alone. As such, new investments will be necessary to drive the development of renewable natural gas facilities in the Pacific Northwest and across the country. Landfills, dairy digesters, wastewater treatment plants, food processing, forestry waste, and other new sources of renewable natural gas will be critically important to reducing the carbon content of the gas delivered by PSE's pipelines. Use of RNG in PSE's pipelines also would catalyze and facilitate reductions in methane emissions occurring outside the cap and invest system, supporting Washington's overall decarbonization goals. Further, development of increased supplies of alternative fuels such as RNG and green hydrogen will allow more cost-effective decarbonization of the electricity generating sector as well. These alternative fuels can also supply clean firm power (i.e., dispatchable power) to avoid the need to overbuild renewable electricity generating and battery storage facilities, resulting in lower overall system costs for energy decarbonization.

Additionally, more must be done to understand the range of potential benefits PSE customers and the State of Washington can achieve through the development of green hydrogen blending. PSE has begun the process of testing the blending of hydrogen on its equipment and gas appliances, but additional demonstration projects are necessary to fully understand the range of benefits and operational characteristics of blending hydrogen within the gas system infrastructure.

C. Decarbonization Investments

Q. What investments is PSE seeking to recover in this case associated with decarbonizing customer end use gas sales consistent with the CCA?

A. Currently PSE is seeking recovery of $102 million for the implementation of investments necessary to begin compliance with the initial four-year CCA compliance period. PSE recognizes that the CCA rulemaking is currently in process, and its projected investments may need to be augmented to guaranty CCA compliance. The investments fall into the following categories:

Pipeline system infrastructure (gas delivery) improvements: These investments include $15 million to conduct alternative fuel delivery demonstrations within the gas distribution system and to perform additional methane leak reduction on the gas distribution system. These alternative fuel delivery demonstrations are important for the utility to maximize opportunities to blend alternative fuels within the existing gas system infrastructure. These investments are detailed in Cathy Koch's testimony, Exh. CAK-1T.

Alternative fuel supply: PSE is seeking recovery of $87 million to begin an alternative fuels development program. The two elements of this program include: 1) expanded development of RNG supplies; and 2) the green hydrogen development for gas system blending via demonstration projects. The intent with this program is to drive the necessary development of RNG to supports compliance with the CCA. Additionally, the goal of this program is to innovate with emerging technologies exploring the potential for green hydrogen in PSE's future compliance with the CCA.

Q. Please describe how PSE plans to acquire and incorporate alternative fuels into is gas supply.

A. PSE is planning to build its portfolio of RNG supplies with a goal of serving 8-10 percent of its gas system sales with RNG by 2030. Conservatively this RNG supply would reduce the carbon footprint of PSE's gas system by at least 8-10 percent and would also reduce emissions from other sectors that would have other emitted methane straight into the atmosphere. RNG supply can be acquired in two ways. First, PSE can execute a long-term contract for purchases from an already developed project or from a planned project that has or can obtain funding based on a long-term off-take agreement. This method is referred to as "contract purchased RNG".

Second, PSE can (on its own or in partnership with others) acquire development rights and RNG feedstock supply and then design, build, own and operate the RNG project. This method is referred to as "RNG project funding." Like PSE's renewable electric generation supply, a combination of these approaches will be necessary to fully realize all the potential RNG supplies in Washington and the greater region, because for some projects, especially large or at more remote locations, a gas pipeline infrastructure operator can facility more rapid effective development and buildout.

Q. How will PSE contract for RNG purchases?

A. In 2020 PSE acquired a long-term supply of RNG from the Klickitat PUD's Roosevelt Landfill for delivery to customers on the gas system. By 2024 this contract will supply approximately 2 Bcf/yr and represent two percent of gas sales. In addition, PSE is working with developers and aggregators, some of whom have responded to the two RNG RFPs issued by PSE in the last 24 months, to evaluate contract RNG opportunities in the regional and national markets to acquire another 2 to 4 Bcf/yr of cost-effective contract purchased RNG supply by 2030. Most RNG contracted supply agreements will have a term of 15 to 20 years.

Some of the contract-purchased RNG will be transported directly to PSE's system. But in other cases, the gas molecules will be sold into local gas markets, displacing conventional natural gas, while the attributes will be retained by PSE and then applied to supplies of conventional gas. The displacement approach is recognized throughout the energy industry on other products such as carbon offsets or green power, and displacement is a cornerstone concept to many carbon reduction strategies. This methodology reduces cost and greatly expands the potential RNG supply market. Whether delivered directly or otherwise, PSE will reduce emissions and seek recovery of the cost of contract purchased RNG though its PGA mechanism and the Voluntary RNG tariff as appropriate.

Q. How will PSE acquire RNG through RNG project funding?

A. PSE has identified four local RNG projects and has been in discussions with the sponsoring developers or feedstock owners who are in need of capital funding to bring the projects to completion. PSE analyzed the projected costs of various projects and found these four to be within the range of RNG contract prices quoted or bid into PSE's recent RNG RFP. PSE will continue to analyze and monitor costs to develop the RNG supply to confirm that the resulting RNG will be cost-competitive. PSE will establish or acquire operating feedstock contracts to ensure the viability of each project. PSE will be working with qualified engineering and construction contractors to complete the RNG facilities and connecting pipelines and plans to contract with experienced third-party operators for on-going operations.

Q. What costs related to RNG Project Funding is PSE seeking in this case?

A. PSE is seeking recovery of $87 million of the necessary capital investments to be made during the three-year rate period to further develop the four target projects. The projects will provide an additional 4 Bcf/yr, or four percent of sales, by 2030. PSE would own and operate RNG feedstock gathering, digester and processing equipment, metering, monitoring, and delivery infrastructure necessary to bring Washington-sited RNG from landfill, wastewater treatment, and dairy-waste digesters to PSE's gas system. Based on the four project timelines, PSE expects that of the 4 Bcf per year of supply projected to flow from the projects, PSE would see incremental RNG volumes of 20 percent in 2023, 41 percent in 2024, 55 percent in 2025, 75 percent in 2026, 90 percent in 2027 and 100 percent in 2028 and beyond. The expected productive life of each project is at least 20 years.

PSE proposes to recover the capital related costs (depreciation, return and taxes) of these investments in base rates for PSE gas sales. PSE would propose to recover any operating costs, including the cost of the RNG feedstock supplies through the PGA mechanism.

Q. Is there legislative support for the development of RNG resources?

A. Yes. In section 12 of HB 1257, the legislature stated that the development of renewable natural gas resources should be encouraged to support a smooth transition to a low carbon energy economy in Washington.[20]

Q. Did the legislature put limitations on this development of RNG resources by natural gas utilities?

A. Yes. In the same statute, and as codified in RCW 80.28.385(1), the legislature limited the impact of RNG development to five percent of the amount charged to retail customers for natural gas.

Q. How will PSE comply with the legislated RNG limitation of a five percent impact on customer costs?

A. PSE believes that to achieve the carbon reduction requirements of Washington State, including compliance with the CCA, it will be necessary for PSE and other

[20] *See* Legislative notes to RCW 80.28.380.

gas utilities to replace a significant portion of conventional gas supply with alternative fuels in the form of RNG and hydrogen. PSE believes that it will eventually be necessary to remove the five percent limitation to allow greater volumes of RNG to be incorporated. However, in the meantime, PSE will continuously forecast and monitor all of the unitized costs of RNG supply included in the PGA -as RNG contract purchases or the operating costs of RNG projects, along with the capital related costs in base rates, to the current average cost of conventional gas supplies to determine the incremental cost of RNG supply. If, after excluding the costs of RNG allocated to Voluntary RNG programs, the incremental costs of RNG supply exceed five percent of PSE's gas revenue requirement, PSE will utilize existing and on-going opportunities to resell the necessary volumes of its RNG to the valuable vehicle fuel markets in California and use 100 percent of the proceeds to reduce PSE's RNG costs in the PGA mechanism.

Q. Why does PSE need to begin making these investments now?

A. PSE is seeking approval of these investments at this time for two primary reasons. First, PSE anticipates that RNG will be a critical and prudent resource for compliance with the CCA, and current supplies within the state are limited. As described in the 2018 study from the Washington State University Energy Program and the Washington Department of Commerce,[21] "Promoting Renewable

[21] https://www.commerce.wa.gov/wp-content/uploads/2019/01/Energy-Promoting-RNG-in-Washington-State.pdf.

Natural Gas in Washington State," roughly three to five percent of the current natural gas consumption in Washington State could be sourced locally from known RNG feedstocks. Secondly, PSE anticipates that the investments that will need to be made to comply with the CCA will need to be made within the timeline of the proposed multi-year rate plan period. As such, PSE is seeking recovery of these investments within this proceeding.

Q. What does PSE need for decarbonization in the first compliance period of the CCA to best protect customers and plan for future compliance?

A. PSE recognizes that uncertainties still exist given the ongoing rulemaking process that is currently underway at the Department of Ecology for the CCA's implementation. However, PSE believes that alternative fuels and methane reduction investments are key to decarbonizing the PSE gas pipeline infrastructure, and those investments should not be delayed. PSE needs certainty surrounding cost recovery in order to make the proper investments to comply with the CCA while maintaining affordability and reliability for gas customers.

PSE is seeking approval of these initial investments not only to comply with the CCA, but to begin to take the prudent steps to transform the way in which PSE utilizes the gas pipeline infrastructure to meet customer needs. At the completion of the Department of Ecology rulemaking process, PSE will be better positioned to understand the compliance requirements of the CCA. But PSE is already seeing the need to decarbonize the gas system seven percent per year beginning in 2023 based on the two sets of draft rules recently issued by Ecology in December 2021 and January 2022. PSE will be able to frame and analyze a range of investments or activities that will be needed to comply with the law so that the Company can make the necessary investments while keeping PSE's most vulnerable and disproportionately impacted customers from being left behind. At that time, PSE will also have the insight necessary to scope the process and timeline required to develop a robust plan for compliance.

Q. What other rate mechanisms would the Company consider for investments necessary to comply with the CCA?

A. Although the details surrounding the final CCA regulations are still pending, the CCA itself—with a January 1, 2023 implementation date—necessitates that PSE begin making decarbonization investments immediately. Accordingly, the Commission should allow recovery of $102 million in this proceeding for the implementation of investments necessary to begin compliance with the CCA. In the event the Commission declines PSE's request for recovery in rates of the CCA expenses, PSE proposes to defer such expenses for recovery in a CCA tracker mechanism that provides for recovery of and on the investment, associated operating costs, potential other costs necessary to comply with the CCA and, potentially, an incentive mechanism for achievements beyond the CCA requirements.

V. CONCLUSION

Q. Does that conclude your prefiled direct testimony?

A. Yes, it does.