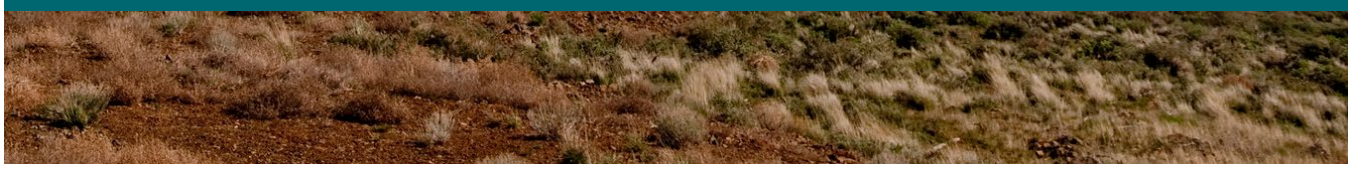
PUGET SOUND ENERGY

DRAFT

# 2021 PSE Clean Energy Implementation Plan

October 2021



# Table of Contents

# Table of Contents (Continued)

# Table of Contents (Continued)

# List of Figures and Tables

Figures



Tables

# List of Tables and Figures (Continued)

# List of Tables and Figures (Continued)

# List of Appendices

# Acronyms & Definitions

| Term | Definition |
|---|---|
| ACS | American Community Survey: helps local officials, community leaders, and businesses understand the changes taking place in their communities; created by the United States Census Bureau. |
| ADMS | Advanced Distribution Management System |
| AURORA | One of the software models PSE uses for integrated resource planning; the electric modeling forecasting and analysis software uses the western power market to produce hourly electricity price forecasts of potential future market conditions; identifies hypothetical portfolios of resources. |
| AMI | Advanced Metering Infrastructure: an integrated system of smart meters, communications networks, and data management systems that enables two-way communication between utilities and customers; industry standard technology. |
| AMI | Area Median Income Level: the midpoint of a region's income distribution—half of households in the region earn more than the median and half earn less than the median. |
| BESS | Battery energy storage system |
| BCP | Biennial Conservation Plan: on or before November 1 of every odd-numbered year, a utility must file a biennial conservation plan with the Washington Utilities and Transportation Commission (WUTC).<br><br>The plan must include, but is not limited to:<br>• A request that the WUTC approve its 10-year conservation potential and biennial conservation target.<br>• The extent of public participation in the development of the 10-year conservation potential and the biennial conservation target.<br>• The 10-year conservation potential, the biennial conservation target, biennial program details, biennial program budgets, and cost-effectiveness calculations.<br>• A description of the technologies, data collection, processes, procedures, and assumptions the utility used to develop the figures in (b)(iii) of this subsection.<br>• A description of and support for any changes from the assumptions or methodologies used in the utility's most recent conservation potential assessment.<br>• An evaluation, measurement, and verification plan for the biennium including, but not limited to:<br>(A) The evaluation, measurement, and verification framework;<br>(B) The evaluation, measurement, and verification budget; and<br>(C) Identification of programs that will be evaluated during the biennium.<br><br>For the purposes of this section, 10-year conservation potential is derived pursuant to Washington Administrative Code (WAC) 480-109-100 |
| burden reduction benefits | A customer benefit indicator category required by the WUTC for named communities. |

# Acronyms and Definitions (Continued)

| Term | Definition |
|---|---|
| beyond net zero carbon | PSE's aspirational goal to help reverse climate change by being beyond net zero carbon by 2045 |
| CEAP | Clean Energy Action Plan |
| CEIP | Clean Energy Implementation Plan |
| CETA | Clean Energy Transformation Act, a state law that sets requirements for PSE's electric energy supply; includes clean energy standards and ensures all customer benefit from the clean energy transformation. |
| C&I | Commercial and Industrial |
| clean energy | Under CETA, clean energy focuses on electric energy resources like renewable and non-emitting energy, and alternative resources, like demand resource and distributed energy resources. |
| conservation | Measures to improve efficiency of customer's electric loads to reduce energy use and peak demand. |
| CRAG | Puget Sound Energy's (PSE) Conservation Resource Advisory Group |
| consumption | The amount of electricity customers use over the course of a year, measured in kilowatt hours. |
| cost and risk reduction benefits | A customer benefit indicator category required by the WUTC; applied to all customers. |
| customer benefit indicators | A quantitative or qualitative attribute of resources or related distribution investments associated with customer benefits described in RCW 19.405.040 (8). |
| demand | The amount of power being required by customers at any given moment, measured in kilowatts. |
| DR | Demand response: flexible, price-responsive loads, which may be curtailed or interrupted during system emergencies or when wholesale market prices exceed the utility's supply cost. |
| demand-side resources | These resources reduce demand. They include energy efficiency, distribution efficiency, generation efficiency, distributed generation, and demand response. |
| DER | Distributed energy resources: small-scale electricity generators like rooftop solar panels located on the distribution system; the power lines seen in most neighborhoods. |
| distribution line | Medium-voltage line that carries 12.5–55 kilovolts of electricity from a substation to customers; reduced to service voltage at 110/240 V through smaller transformers located along distribution lines. |
| distribution system | Medium-voltage (12.5 kV-55 kV) infrastructure that carries electricity from a substation to customers; includes the substation transformer. |
| electric resource portfolio | A specific mix of electric resources to meet electric load. |
| energy assistance | A program undertaken by a utility to reduce customers' household energy burden. |
| energy assistance need | The amount of assistance necessary to achieve the level of household energy burden established by the WUTC. |

# Acronyms and Definitions (Continued)

| Term | Definition |
|---|---|
| energy benefits | A customer benefit indicator category required by the WUTC for highly impacted communities and vulnerable populations. |
| energy burden | The share of annual household income used to pay annual home energy bills. Set by the Washington Department of Commerce, the threshold to determine energy assistance need is 6 percent. |
| EE | Energy efficiency: tools or appliances that help customers save energy. |
| energy democracy | A condition in which all the members of an energy system have a voice in decision-making for that system. |
| energy equity | Equity in all aspects of the energy system, including benefits, burdens, costs, and participation. |
| energy justice | Defined by scholars as “a global system that fairly disseminates both the benefits and costs of energy services, and one that has representative and impartial energy decision-making.” |
| energy security and resiliency benefits | A customer benefit indicator category required by the WUTC; applied to all customers. |
| energy storage | A variety of technologies that allow energy to be stored for future use, like battery energy storage system (BESS) or pumped hydroelectric. |
| environmental benefits | A customer benefit indicator category required by the WUTC; applied to all customers. |
| EV | electric vehicle |
| FPL | federal poverty level |
| GHG | greenhouse gas |
| HCA | Hosting Capacity Analysis |
| HELP | Home Energy Lifeline Program: developed by PSE, provides bill payment assistance, supplementing Washington's Low-income Home Energy Assistance Program (LIHEAP). |
| HIC | Highly impacted communities: as defined by CETA, “a community designated by the department of health based on the cumulative impact analysis required by RCW 19.405.140 or a community-located in census tracts that are fully or partially on "Indian country," as defined in 18 U.S.C. Sec. 1151.” [WAC 480-100-605] |
| income-eligible | Income-eligible household: very-low or lower-income household, which is eligible to rent a particular affordable unit. Income-eligible household is a household of one or more persons whose maximum income does not exceed 80 percent of area median income. |
| intermittent resources | Resources that provide power where the time of generation can’t be controlled, such as wind and solar power. |
| IQDR | Income-qualified discount rate: a discount on customer bills. Rate design includes: program design, eligibility, operation, outreach, and funding |
| IRP | Integrated Resource Plan: required by law to be filed every 4 years, identifies PSE’s energy, capacity, and renewable and non-emitting energy needs over an established time horizon, and potential options to meet those needs. |
| kV | Kilovolt: equals 1,000 volts of electric energy. PSE uses kilovolts as a standard measurement when discussing things like distribution lines and the energy that reaches our customers. |
| kWh | Kilowatt hours: a measurement of energy, PSE uses kilowatt hours to measure customer energy use. |
| LIAC | PSE’s Low-income Advisory Committee |

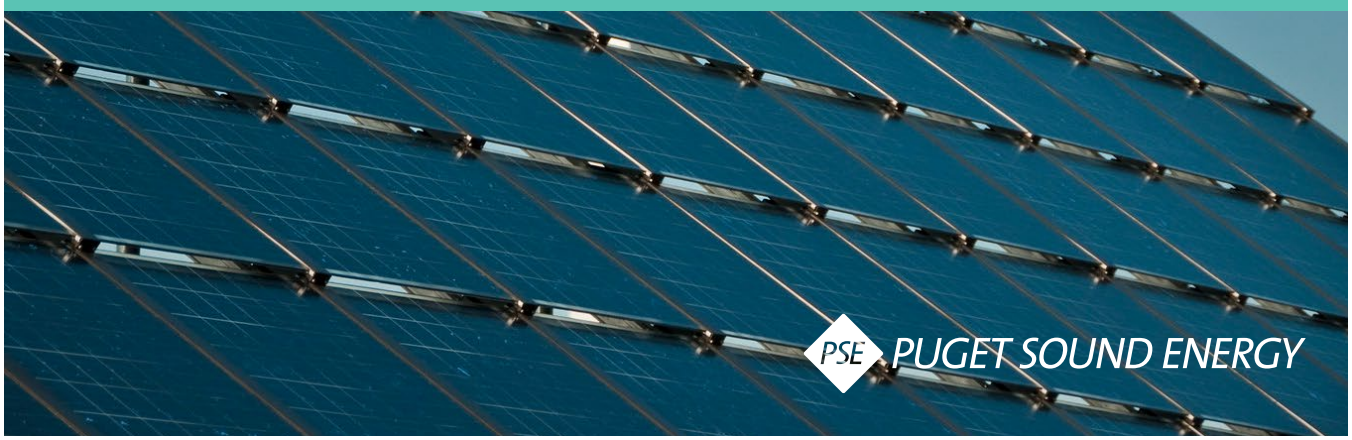
# Acronyms and Definitions (Continued)

| Term | Definition |
|---|---|
| LIHEAP | Low-income Home Energy Assistance Program |
| LINA | Low-income Needs Assessment: PSE conducted the study in 2019 to provide a better understanding of the needs related to energy affordability of low-income households in PSE's service territory, including data related to energy efficiency, specifically weatherization needs and opportunities. |
| load | The total of customer demand plus planning margins and operating reserve obligations. |
| low-income | Household incomes as defined by the WUTC, provided that the definition may not exceed the higher of 80 percent of area median household income or two hundred percent of the federal poverty level, adjusted for household size. |
| MW | Megawatt: unit of measurement of power. A megawatt equals 1,000,000 watts of electric energy. PSE uses megawatts as a standard measurement when discussing things like system load and peak demand. |
| named communities | Highly Impacted Communities and Vulnerable Populations. |
| nameplate | The intended full-load sustained output of an energy facility. Reflects the installed capacity typically in Megawatts |
| net metering | A program that enables customers who generate their own renewable energy to offset the electricity provided by PSE. |
| non-emitting energy | Electricity from a generating facility or a resource that provides electric energy, capacity, or ancillary services to an electric utility and does not emit greenhouse gases as a by-product of energy generation. Non-emitting energy does not include renewable energy. |
| non-energy benefits | A customer benefit indicator category required by the WUTC for named communities. |
| O&M | Operations and Maintenance |
| Peak demand | Customers' highest demand for electricity at any given time, measured in megawatts. |
| public health benefits | A customer benefit indicator category required by the WUTC for all customers. |
| pumped hydro | Facilities that store energy in the form of water, which is pumped to an upper reservoir from a second reservoir at a lower elevation. During periods of high electricity demand, the stored water is released through turbines to generate power in the same manner as a conventional hydropower station. |
| reliability | The continuity of electric service experienced by retail customers. Reliability is measured in the duration and frequency of outages to customers. |
| Renewable energy | As defined by CETA, renewable energy is "water; wind; solar energy; geothermal energy; renewable natural gas; renewable hydrogen; wave, ocean, or tidal power; biodiesel fuel that is not derived from crops raised on land cleared from old growth or first growth forests; or biomass energy."[ WAC 480-100-605] |
| resiliency | The ability of a power system and its components to withstand and adapt to disruptions and rapidly recover from them. Disruptions in this context are generally High-impact, low-frequency (HILF) events such as extreme weather events, natural disasters, and human made threats. |
| substation | A vital component of electricity distribution systems, containing utility circuit protection, voltage regulation and equipment that steps down higher voltage electricity to a lower voltage before reaching your home or business. |

# Acronyms and Definitions (Continued)

| Term | Definition |
|---|---|
| SCADA | Supervisory Control and Data Acquisition: a system of remote control and telemetry used to monitor and control the transmission and distribution system including substations, transformers, and other electrical assets. |
| supply-side resources | Resources that generate or supply electric power or supply natural gas to gas sales customers. These resources originate on the utility side of the meter, in contrast to demand-side resources. |
| TOU | Time-of-use: a method of measuring and charging a utility customer's energy consumption based on when the energy is used. Utility companies charge more during the time of day when electricity use is higher. TOU rates vary by region and utility. |
| transformer | A device that steps electricity voltage down from a higher voltage, or steps it up to a higher voltage, depending on use. Typically, it steps voltage down from a distribution voltage to 120 to 240 volts for customers' residential use. Transformers are the green boxes in some residences' front yard or the barrel-like canisters on utility poles. |
| transmission line | High-voltage lines that carry 55–5,000 kilovolts of electricity from generation plants to substations or from substation to substation. Transformers at the substation reduce voltage to distribution line voltage. |
| VPP | virtual power plant |
| VP | Vulnerable population: as defined by CETA, “communities that experience a disproportionate cumulative risk from environmental burdens due to: Adverse socioeconomic factors, including unemployment, high housing and transportation costs relative to income, access to food and health care, and linguistic isolation; and sensitivity factors, such as low birth weight and higher rates of hospitalization.” [WAC 480-100-605] |
| wholesale market purchases | Generally short-term purchases of electric power made on the wholesale market. |
| WUTC | Washington Utilities and Transportation Commission |

# 1 Executive Summary



# Chapter One: Executive Summary

In this, our first Clean Energy Implementation Plan (CEIP), Puget Sound Energy (PSE) moves further and faster to a carbon-neutral future than ever before. PSE recognizes the urgent nature of our climate crisis and seeks to be part of the solution to build an equitable clean energy future. We will achieve carbon neutrality in our electric supply portfolio by 2030, consistent with state law, and reach 100 percent renewable or non-emitting electric supply by 2045, if not sooner.

This 2021 Draft CEIP describes PSE's initial plan to implement the Clean Energy Transformation Act (CETA) for 2022–2025. It charts new directions in our electricity supply, includes new voices in the process, and seeks to achieve low cost, clean electricity, and an electric supply that benefits our customers and reduces burdens on our vulnerable customers. This first CEIP is an important milestone in PSE's efforts to address climate change and reach our aspirational goal to be a beyond net-zero carbon company by 2045.

## Targets to Achieve Our Clean Energy Goals

In this plan, we set an interim target of 59 percent of our electric supply from renewable or non-emitting resources in 2025, up from 35 percent in 2020. This 2025 interim target is a crucial stepping-stone on the way to our carbon-neutral future. We forecast our continued drive to supply at least 80 percent of electricity sales from renewable and non-emitting sources and taking advantage of other carbon-reducing opportunities will allow us to reach our carbon-neutral goal by 2030. This timeframe means we must keep up the pace of change from now to 2030.

As a part of achieving carbon neutrality by 2030, we also set specific targets for the 2022–2025 period for energy efficiency, demand response, renewable energy, and distributed energy resources (DER). This process builds on our foundation in energy efficiency and adds new energy supply resources and technologies that reduce risks and offer new benefits and opportunities to our customers.

**Energy Efficiency Specific Target: 505,448 MWh for 2022-2023, 505,448 MWh for 2024–2025**

PSE's energy efficiency programs have been the foundation of new resources for more than three decades, and this will continue. In the next decade, we must continue to stretch further and think creatively to hit higher and harder to achieve targets. PSE will also identify and incorporate a broader view of energy efficiency benefits to customers, from comfort to health. Finally, as with all our customer-facing programs, we will strive to ensure they are accessible, affordable, accountable, and benefit all customers. As required under Washington Administrative Code (WAC) 480-100-620, we will update our forecast of available, achievable, and cost-effective energy efficiency in 2023 and use this information to update the 2024–2025 specific target.

**Demand Response Specific Target: 23.7 MW**

In this CEIP, PSE sets a specific target for demand response programs for the first time. We create new programs to partner with customers on flexible ways to shift or reduce their electricity use during peak times. As we move to a cleaner portfolio in a region that will become short on generating capacity, we must aggressively pursue demand response programs to reduce peak energy needs in winter and summer.

Demand response also provides new methods and advantages that allow individual customers to save on their bills and benefit from reduced peak energy needs.

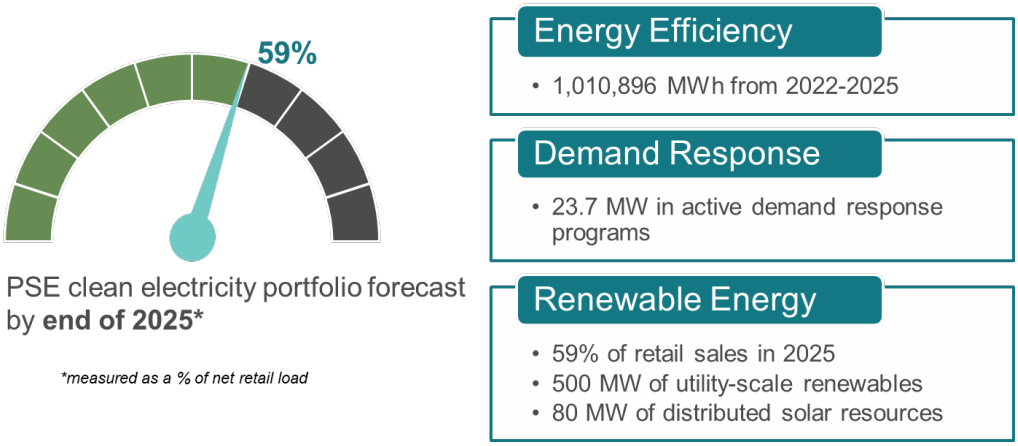
Although we have experience with residential and commercial pilot programs, we need to build the knowledge, systems, and processes to maximize the benefits of demand response. In this plan, we set the target based on our modeled mix of potential programs. When we complete the program acquisition request for proposal (RFP) process and develop program designs in 2022, we will learn much more about our region's true market potential, which will allow us to update our goals in 2023.

**Renewable Energy: 59 Percent of Retail Sales in 2025**

From our first hydroelectric generating facility in 1898, PSE has long received some of our electric supply from renewable energy. Over time, we added new renewable electric supply resources like our Wildhorse, Hopkins Ridge, Lower Snake River wind, and other hydroelectric facilities.

As we look to 2025, we must move faster than ever. We will bring recently acquired renewable energy contracts into our electric portfolio and seek to add 1,571,234 MWh annual generation, the equivalent of 500 MW of new wind facilities, by 2025. We also set specific sub-targets of 80 MW distributed solar and 25 MW of distributed battery storage programs. These distributed energy resources provide different customer benefits than traditional utility-scale generating facilities, such as local peak reduction and resiliency, and provide a future foundation for a flexible electric supply portfolio. Coordinated with our demand response efforts, we must also undertake the substantial work required to implement this 2022–2025 CEIP and build the knowledge, systems, and process foundations that will allow us to scale up distributed resources in the future.

Figure 1-1: Interim and Specific Targets




For a complete discussion of establishing targets, please read Chapter 2, Interim Targets, Specific Targets, CEIP Methodology.

## Customer Benefits Shape Our Plan

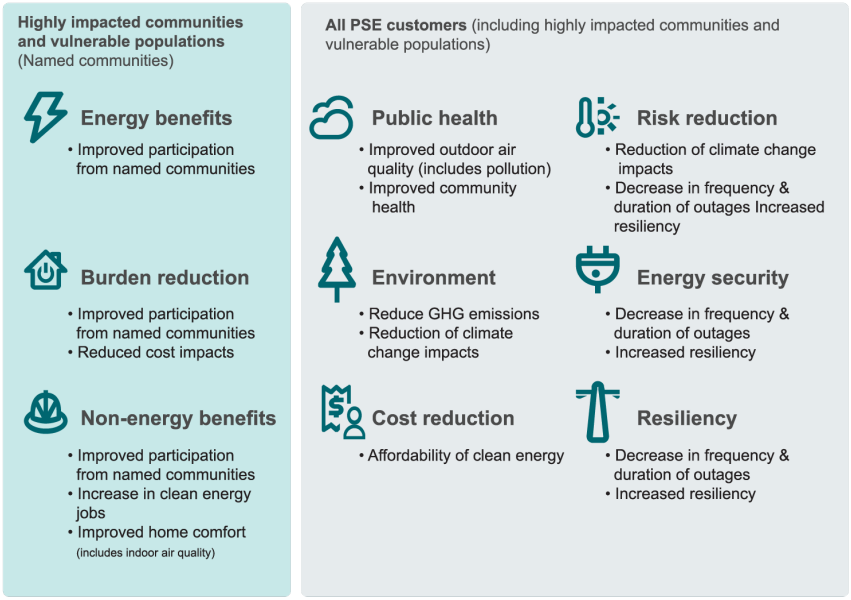
To achieve our energy goals, PSE must also ensure the transition to clean energy is equitable. CETA adjusted the traditional energy resource planning model to look beyond the lowest cost and reliability to include customer benefits to inform our program and investment decisions. Although PSE considered overarching customer benefits in past energy resource planning and acquisition processes, they did not reflect direct customer input nor include measured results.

In this first CEIP, PSE engaged customers, advisory groups, and stakeholders to develop customer benefit indicators. Benefits customers envision from the transition to clean electricity include opportunities to improve our communities through outcomes like cleaner air, better public health, new jobs, or different ways for customers to get their electricity.

The customer benefit indicators in this CEIP guide PSE on the type and mix of distributed energy programs to pursue, customer program designs, and in selecting utility-scale and distributed resources. PSE will achieve our customer benefit goals by delivering on the actions in this plan.

Customer benefits are iterative and will evolve. For this first CEIP, we are still developing baseline data for several customer benefit indicators so that PSE can measure change over time. Through the first implementation cycle, 2022 through 2025, we will estimate and measure the impacts of those benefits and communicate with customers to ensure we are focusing on the correct ones.

Figure 1-2: Customer Benefit Indicators




As we make this clean energy transition, we must consider the burdens our customers face, in addition to the benefits. We must determine how those benefits are distributed across all customers and ensure we reduce burdens for those who bear a disproportionate share of them.

This plan aims to make this transition more equitable by:

- Identifying highly impacted communities and vulnerable populations (Chapter 4, Specific Actions),
- Proactively engaging with customers in communities and partnering with community-based organizations (Chapter 6, Public Participation),
- Creating a channel for feedback and dialogue through program design and implementation, and
- Measuring and reporting progress.

For more discussion about customer benefits, please see Chapter 3, Customer Benefit Indicators, Highly Impacted Communities, and Vulnerable Populations.

## Acting Now

Achieving these targets requires action from PSE, our customers, and our suppliers. PSE must invest in energy efficiency, demand response, and utility-scale and distributed energy resources, along with the underlying systems, technology, and electricity grid to support this move.

Customers are a vital part of our carbon-neutral future—they must adopt energy efficiency and participate in demand response programs and distributed energy resources in order for these programs to be successful.

This customer involvement requires a new level of engagement and focus on equity to ensure all customers can participate in and benefit from the clean energy transition.

Figure 1-3: Summary of Draft Specific Actions 2022–2025

| | 2022 | 2023 | 2024 | 2025 |
|---|---|---|---|---|
| **Resource specific (projected)** | • Energy Efficiency Programs | • Energy Efficiency Programs | • Energy Efficiency Programs | • Energy Efficiency Programs |
| | • Complete targeted DER/ DR RFP | • Start Demand Response Programs | • Expand Demand Response programs | • Expand Demand Response programs |
| | • Complete targeted DER/ DR RFP<br>• 7 MW of DER solar in service | • 23 MW of DER solar in service<br>• 5 MW of storage in service | • 400 MW of wind in service<br>• 25 MW of DER solar in service<br>• 7 MW of storage in service | • 100 MW of wind in service<br>• 24 MW of DER solar in service<br>• 14 MW of storage in service |
| **Other Investments** | • Begin tariffs filing DER programs<br>• Customer-centered program design<br>• Baseline data collection for CBIs<br>• Enabling technologies planning | • Tariff filing DER programs<br>• Build and deploy new DER and DR programs<br>• Initial customer programs and education launch<br>• Begin installing enabling technologies<br>• Progress reporting and CEIP Update | • Utility-scale renewables and DERs in service<br>• Progress reporting<br>• Ongoing programs and education<br>• Ongoing installation of enabling technologies | • Utility-scale renewables and DERs in service<br>• Ongoing programs and education<br>• Ongoing installation of enabling technologies<br>• File 2026-2029 CEIP |

For detailed descriptions and a full list of actions, please see Chapter 4, Specific Actions.

## Engaging Customers

The development of this CEIP marked the first time PSE sought broad participation from our customers in energy planning considerations. PSE formed a new Equity Advisory Group (EAG) to bring voices to the energy planning process that have not traditionally participated and engaged with our other advisory groups. This process led directly to identifying customer benefit indicators, which influenced this CEIP and will be used to plan and evaluate resources in the future. The input from the EAG specifically helped expand consideration of vulnerable populations within PSE's service territory and informed valuable development of baseline information and guiding principles that PSE will use to include customers in program design. Feedback from the EAG will also help us ensure equal distribution of the benefits of clean energy.

For a complete description of public participation in developing this plan and for 2022– mid–2023, please see Chapter 6, Public participation and Appendix C, Public Participation Plan Current and future. For a complete description of vulnerable populations, please see Chapter 3, Customer Benefit Indicators, Highly Impacted Communities and Vulnerable Populations.

## Maintaining Reliability and Affordability

As we transition from an electric system that has historically operated with predictable, dispatchable generation sources to one increasingly dominated by intermittent wind and solar resources and more distributed, customer-controlled resources, reliability remains paramount. PSE must continue to meet our customers' energy needs at all hours of every day, especially during the winter cold snaps and summer heatwaves.

The resources in this plan make partial contributions to those peaks but do not cover the entire peaks in use. To maintain reliability, PSE must continue to use our existing fleet of resources and reduce reliance on short-term market transactions to meet peak needs.

PSE will continue studying and evolve reliability efforts as we implement this first CEIP, especially as regional resources change to eliminate coal and regional market structures adjust.

We do not know all the impacts or costs of these transitions at this time, but we will update future CEIPs as we learn more. Building a carbon-neutral direction for PSE's portfolio comes at a cost. The forecast cost of the actions in this plan are $445M more than they would have been without pursuing these plans. This amount equals an additional ~$6/month per residential customer in 2025 and barely exceeds the mark of a 2 percent average annual rate increase.

For more details on cost, please see Chapter 5, Cost.

### Alternative Compliance and Early Action Coal Credit

PSE is not using any alternative compliance mechanisms in this CEIP and does not propose an early action coal credit.

### Expanding the Use of Clean Energy

This CEIP is the first of many. It puts us on a path to cleaner electricity and sets a foundation for rapid advancement. With nearly 60 percent clean electricity we are well on our way to reaching our 2030 and 2045 clean electricity targets. We are excited to embark on this ambitious path with our customers and stakeholders and look forward to building an equitable, inclusive, and carbon-free future.

### Chapter highlights

Chapter 2: Interim and specific targets, and CEIP methodology

- By the end of 2025, nearly 60 percent of PSE's electric sales will be served by clean, CETA-eligible energy, like large-scale wind, solar, and distributed solar. This interim target puts PSE on the path to CETA's 2030 and 2045 goals.
- Energy efficiency saves 1,010,892 MWh through 2025 and we achieve 23.7 MW of demand response, lowering the overall CETA energy need. When customers use less energy, fewer carbon-emitting fossil fuels are mined and burned.
- This first CEIP is consistent with PSE's 2021 Integrated Resource Plan (IRP) and Clean Energy Action Plan (CEAP). It includes updates from the 2021 IRP for new clean energy supply contracts, refined resource costs for distributed energy resources, and updates the customer benefit indicators to reflect those developed with customer input during the CEIP process.
- For distributed energy resources, PSE developed a new portfolio approach to identify a preferred program concept mix for a future RFP. The approach included applying customer

benefit indicators, described more broadly in Chapter 3, Customer Benefit Indicators, Highly Impacted Communities and Vulnerable Populations.

Chapter 3: Customer Benefit Indicators, Highly Impacted Communities and Vulnerable Populations

- PSE developed 12 customer benefit indicators based on feedback from customers, advisory groups, and stakeholders for this first CEIP. We expect to make additional refinements during implementation. These CBIs include outcomes our customers desire, like reduced greenhouse gas emissions, cleaner air, better public health, new jobs, or different ways for customers to get their electricity
- PSE applied the customer-informed CBIs to evaluate and select the DER concept mix to include in our DER/Demand Response (DR) RFP. PSE will include CBIs as part of the evaluation process for demand response and large-scale renewables. Moving forward, PSE will apply these CBIs at the beginning of the resource planning cycle, beginning with the 2023 IRP work plan.
- The CBIs in this CEIP and the non-energy impacts (NEI) for energy efficiency in the Biennial Conservation Plan (BCP) overlap. The BCP used NEIs to help determine the conservation goal for 2022–2023.
- PSE identified highly impacted communities based on the Environmental Health Disparities map produced by the Washington Department of Health.
- PSE and our EAG developed vulnerable population factors to identify primary attributes that define vulnerable populations, which include sensitivity and socioeconomic factors.
- The CEIP uses the highly impacted communities designation and vulnerable populations factors (referenced as Named Communities) to identify disparities, track and measure progress over time, and include as a lens to develop and implement customer programs.

Chapter 4: Specific Actions

- PSE specific actions are the programs and investments needed to help us reach the CETA standards and provide customer benefits.
- PSE's energy efficiency effort envisions more than 13 different sets of programs for residential and business customers, and regional pilots and initiatives.
- Demand response actions include a DR/DER RFP to identify programs and implementing time-varying rates pilot programs.
- Renewable energy actions will include the results of the 2021 All-Source RFP, which will guide us in bringing more renewable and non-emitting energy to PSE's customers.

- For distributed energy resources, PSE will focus on distributed solar and battery storage that expand participation within our service area and in traditionally underserved populations. PSE will deploy our own resources for both, working with customers to partner on non-utility-owned assets, and launch targeted programs for income-eligible populations.
- Other specific actions include DER enablers, grid modernization, and other activities to support our drive to carbon neutral.

Chapter 5: Cost

- Transitioning to clean electricity comes at such a rapid pace it will increase customers' bills. PSE maintains that cost at just above an average of 2 percent per year, which amounts to an additional ~$6/month per residential customer in 2025.
- PSE's costs include calculation of the incremental costs associated with resource costs (e.g., energy efficiency, demand response, energy storage, large-scale renewables), and enabling tools and technologies that serve as a foundation for the transition—enabling systems, transmission rights, grid modernization, and customer education and engagement. We will also incur costs for monitoring and reporting.
- Although this path to a clean electricity future will increase the average bill over time, the CEIP includes opportunities for customers to reduce their energy bills through energy efficiency, new demand response and distributed energy resource programs.

Chapter 6: Public Participation

- PSE successfully convened and began engaging the new Equity Advisory Group, comprised of 13 members representing diverse organizations and geographies.
- Our public participation process broadened energy resource planning public participation efforts to customers, including targeted outreach to highly impacted communities and vulnerable populations, PSE's four advisory groups, and stakeholders.
- Public participation influenced the CEIP through the development of vulnerable populations' factors, customer benefit indicators, and programs and actions that reflect our customers' vision for an equitable clean energy future.

Chapter 7: Tracking and Reporting

- PSE will track and report progress on specific actions and energy metrics. Utilizing this tracking process to help determine adjustments and updates in future CEIP processes and updates.
- As part of ensuring the equitable distribution of benefits and burdens, PSE will track and measure each customer benefit indicator as it relates to the programs and actions developed in the CEIP.

- PSE will develop an annual CEIP progress report to include progress on planned actions and public participation.
- PSE will also track and report on renewable energy credits, greenhouse gas emissions, and other compliance actions.

Chapter 8: Future Work and PSE Commitments

- Although this first CEIP creates an initial roadmap for PSE, we must continue to make decisions at each step and update our path accordingly. The new energy resource planning process is continuous and iterative; it allows for these changes.
- PSE's commitments for this iterative process include:
  - Implementing a climate change analysis and updating resource-specific effective load-carrying capability (ELCCs) as part of the updated load forecast and resource adequacy analysis.
  - Incorporating the results of the 2021 All-Source RFP, 2021 Targeted DER/DR RFP, and 2023 IRP progress report in the 2023 CEIP update.
  - Engaging highly impacted communities and vulnerable populations on program design elements in 2022.
- Continuing to work with stakeholders on identifying and developing future customer benefit indicators and data sources for CBI metrics, and reporting on these sources and baseline data in 2022.
- PSE worked with the EAG to develop guiding principles for CEIP implementation, including building customer awareness and understanding of clean energy, intentionally engaging highly impacted communities and vulnerable populations to increase energy equity, and supporting the education and resource needs among partners and customers necessary to increase equity and meaningful engagement in clean energy programs and benefits.

# 2 Interim and Specific Targets

# Chapter Two: Interim and Specific Targets, Clean Energy Implementation Plan (CEIP) Methodology

## Introduction

To achieve the 2030 and 2045 Clean Energy Transformation Act (CETA) goals, each four-year CEIP sets interim targets for renewable and non-emitting energy, and specific targets for energy efficiency, demand response, and renewable energy. Each CEIP also identifies actions to achieve these targets, provide customer benefits, and maintain resource adequacy and affordability.

## Interim Targets

PSE's interim target, measured as a percentage of forecasted retail electric sales supplied by renewable and non-emitting sources is 59 percent. This means 59 percent of PSE's electric sales will be served by clean, CETA-eligible energy. This interim target is calculated based on PSE's load forecast, our current power supply portfolio, and the forecast of specific actions in this CEIP[1]. The interim target is also informed by PSE's historic performance under median water conditions[2]. Thirty-five percent[3] of PSE's retail sales of electricity was supplied by renewable and non-emitting resources in 2020. This calculation is based on the publicly available 10K filing[4].

To meet the interim target, PSE is pursuing all cost-effective, reliable, and feasible conservation and efficiency resources and demand response, while protecting the safety, reliable operation, and balance of the electric system[5]. PSE is also working to ensure all customers benefit from the transition to clean energy.

To calculate the interim target, PSE calculates the ratio between the CETA-eligible energy and CETA need:

1. CETA need: We start with PSE's forecasted retail sales and reduce by energy efficiency and load reducing resources like those from the Public Utility Regulatory Policies Act of 1978 (PURPA) and Green Direct.

2. Calculate the total energy from CETA-eligible energy. This includes existing wind, hydroelectric and solar, and new wind and solar.

Figure 2-1 illustrates this calculation. Table 2-1 breaks down the calculation for the forecasted energy in the years 2022 through 2025. Figure 2-2 shows the ramp up to the interim target over the four-year period.

[1] WAC 480-100-640(2)(a)(iii)
[2] WAC 480-100-640(2)(c)
[3] WAC 480-100-640(2)(b)
[4] https://www.sec.gov/ix?doc=/Archives/edgar/data/81100/000108539221000011/psd-20201231.htm
[5] WAC 480-100-640(2)(a)(ii)

Figure 2-1: Calculating the Interim Target

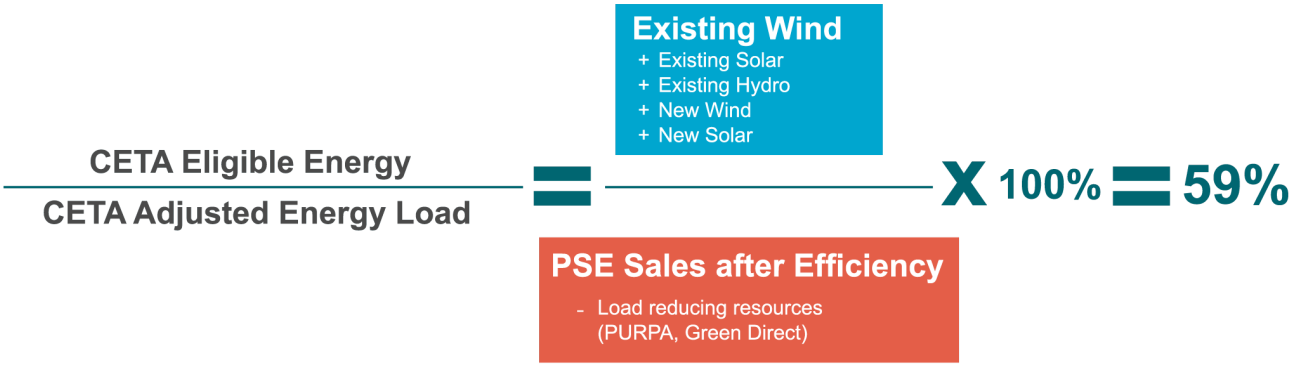



Table 2-1: 2022 - 2025 Interim Target Calculation[6]

| CETA Summary | 2022 | 2023 | 2024 | 2025 |
|---|---|---|---|---|
| Forecast Retail Sales (after existing DSM) | 20,236,296 | 20,378,670 | 20,604,482 | 20,722,203 |
| New Energy Efficiency[7] | 84,660 | 272,403 | 478,047 | 697,383 |
| PURPA Contracts | 581,349 | 580,831 | 624,011 | 580,333 |
| Green Direct | 656,726 | 656,726 | 659,726 | 970,973 |
| **CETA Target (100% by 2045)** | **18,913,561** | **18,868,710** | **18,842,699** | **18,473,514** |
| | | | | |
| New Wind | 0 | 0 | 1,264,673 | 1,256,988 |
| New DER/Non-Wires Solar | 9,973 | 45,558 | 84,062 | 116,791 |
| Existing Wind/Solar/Biomass (includes signed contracts) | 2,390,017 | 4,054,688 | 4,076,546 | 4,054,720 |
| Existing Hydro | 5,714,766 | 5,696,247 | 5,667,996 | 5,411,073 |
| **CETA-eligible Energy** | **8,114,756** | **9,796,493** | **11,093,278** | **10,839,572** |
| | | | | |
| **Interim Target** | **43%** | **52%** | **59%** | **59%** |

[6] Calculation consistent with WAC 480-100-640(2)(c)

[7] New Energy Efficiency does not include updated target from the 2022 – 2023 draft BCP

Figure 2-2: 2022-2030 Interim Targets

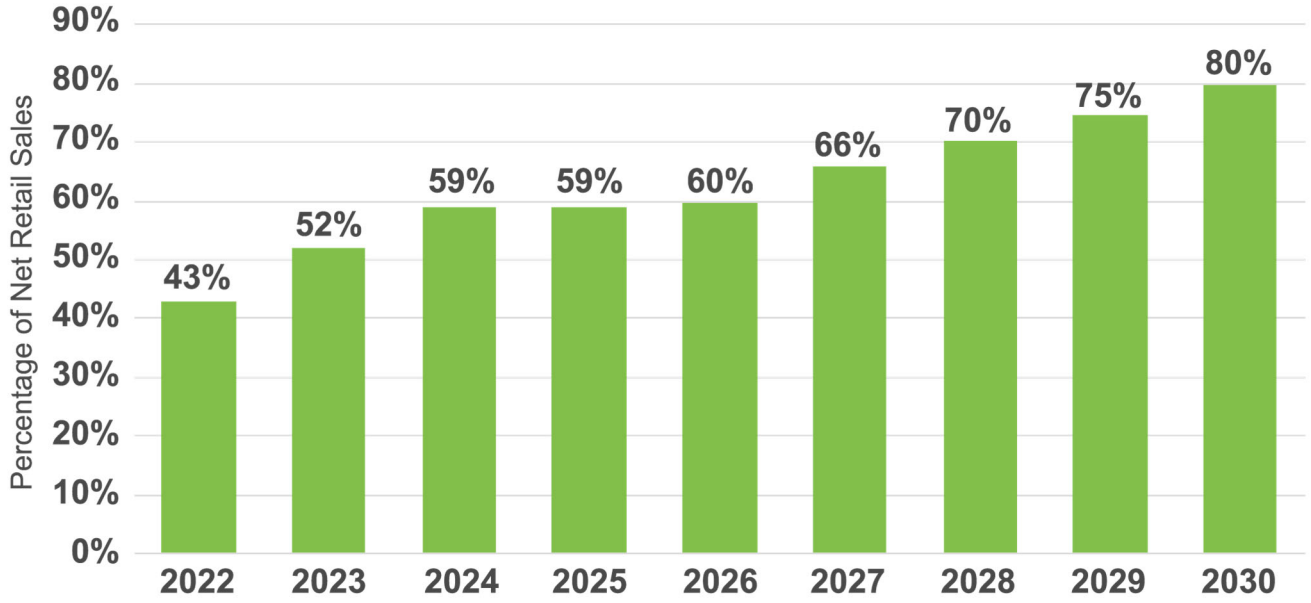
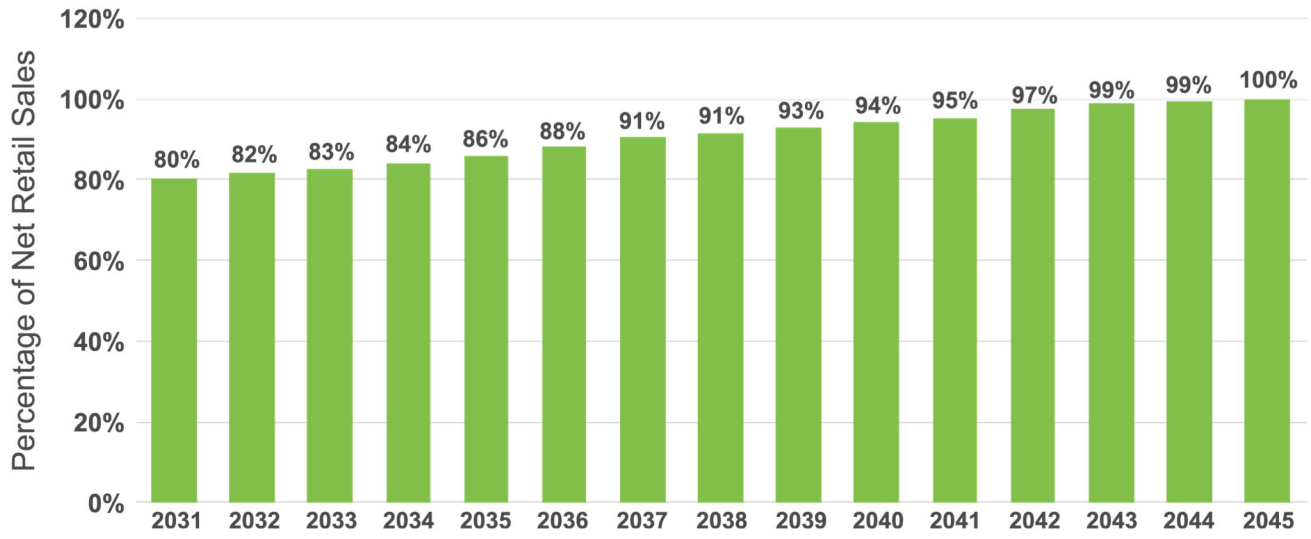



Figure 2-3: 2031–2045 Interim Targets



This same calculation is used to calculate the interim targets for 2030 through 2045, shown in Figure 2-3. The interim targets and specific targets are consistent with the 2021 Integrated Resource Plan (IRP) and CEAP based on the rule requirement because:

- The CEIP starts with the output of the 2021 IRP preferred portfolio. This includes the baseline assumptions for generic resources and costs. The CEIP maintains these inputs for all resources except the distributed solar and storage resources. For the distributed solar and storage, the CEIP uses more granular assumptions as described in Chapter 2 below.
- The resource mix need developed in the 2021 IRP and CEAP is carried over as targets to the 2021 CEIP. The CEIP is consistent in meeting the targets established for each resource group. For example, the CEIP targets 80 MW of distributed solar, which is the same amount capture in the IRP and CEAP.
- The CEIP utilizes customer benefit indicators to make resource planning decisions. The IRP and CEAP used initial customer benefit indicators to develop the preferred portfolio. We updated these customer benefit indicators and used them to determine the preferred CEIP portfolio.

## Specific Targets

### Energy Efficiency Target

PSE's energy efficiency targets for the 2022–2025 CETA implementation period is 1,010,896 MWh consistent with the draft Biennial Conservation Plan (BCP) published on October 1, 2021. Table 2-2 shows the calculated target for each biennium of the four-year period. The annual targets are detailed in PSE's BCP and include all energy efficiency and conservation targets and goals required by the Washington Utilities and Transportation Commission (WUTC).

Table 2-2: Energy Efficiency Targets

| | 2022–2023 | 2024–2025 | Total |
|---|---|---|---|
| Energy Efficiency Targets | 505,448 MWh | 505,448 MWh | 1,010,896 MWh |

### Energy Efficiency Methodology

Developing the energy efficiency targets for PSE's CEIP begins with a study that determines conservation potential—the amount of energy efficiency available in our service territory. We built the conservation potential with a bottom-up approach, using individual energy-efficient technologies applied to appropriate end uses and building types to determine the achievable technical potential, also known as the Conservation Potential Assessment (CPA).

We subsequently used the CPA outputs as inputs for the PSE IRP economic portfolio modeling. The models select the amount of annual energy efficiency that is cost-effective when compared to alternative resources. Variables that influence this selection process include load growth, additional

generation costs, and other factors. In conjunction with its Conservation Resource Advisory Group (CRAG), PSE then uses the achievable, technical, and economic potential to build up its biennial targets.

The targets are calculated for each biennium, consistent with the Energy Independence Act requirements in WAC 490-109-100(3). The calculation uses a pro-rata share of the 10-year conservation potential identified in the IRP, subtracts the anticipated NEEA savings[8], and then adds a 5 percent decoupling target. On top of this, additional firm savings (the Schedule 449 Program) and estimated pilot program savings are added to obtain the final two-year conservation goal. See Table 2-3 for a detailed explanation of this calculation.

PSE then works in consultation with our CRAG to utilize the information in the conservation potential assessment, along with other relevant information, to build up our portfolio of programs that it will use to achieve the targets. These programs fall in the areas of residential energy management, business energy management, pilots, and regional programs, which includes participation in the Northwest Energy Efficiency Alliance and system distribution efficiency activities. All this work to implement the biennial targets through programs constitutes specific actions under CETA. Further discussion on specific actions are in the next section.

[8] NEEA savings are savings achieved through participation in regional programs administered by the Northwest Energy Efficiency Alliance. The electric penalty structure is discussed in RCW 19.285.060 and WAC 480-109-070. The decoupling threshold is described in PSE's Amended Decoupling Accounting Petition in Docket UE-121697 Section III.G.31, page 17.

Table 2-3: Electric Portfolio Savings Target Calculation Summary

| Puget Sound Energy 2022–203 Electric Portfolio Savings | | | | | |
|---|---|---|---|---|---|
| Index | Description | MWh | aMW | Comment | Calculation |
| *Colored cells correspond to indicated lines in Exhibit 1: Savings and Budgets, 2-Year Portfolio View.* | | | | | |
| | **Calculate the EIA[9] Target** | | | | |
| a | CPA[10] Pro-Rata Share IRP & CPA Guidance | 467,784 | 53.4 | Represents all available conservation that is cost-effective, reliable, and feasible, as a 20% pro-rata share of PSE's 10-year conservation potential, per RCW 19.285.040(1). | Figure 3, Exhibit i |
| b | EIA Target | 467,784 | 53.4 | Meets RCW 18.285.040(1)(a) and (b) requirements | |
| | **Calculate the Penalty Thresholds** | | | | |
| c | Subtract NEEA[11] Savings | -28,382 | -3.24 | ("Option A" in savings calculation table from NEEA forecast--current method) | |
| d | EIA Penalty Threshold | 439,402 | 50.2 | $61 - 64/MWh shortfall penalty, based on 2020 inflation, per RCW 19.285.060. | = b - c |
| e | Decoupling Threshold | 23,389 | 2.7 | 5 percent of EIA Target | = b * .05 |
| | **Complete the Portfolio** | | | Use CPA Pro-Rata Share as foundation. | |
| f | Add Firm Savings Excluded from CPA | 9,550 | 1.1 | 2022/2023: 449s, special contracts | |
| g | Add Pilots with Uncertain Savings | 4,725 | 0.5 | | |
| h | Total 2022-2023 Utility Conservation Goal | 505,448 | 57.7 | This is the total Portfolio to which Energy Efficiency is managing. | = b + e + (f + g) |

PSE's current BCP only includes the 2022–2023 conservation targets. To obtain the total four-year energy efficiency savings target for the CEIP, PSE is applying the same numbers and methodology for years three and four, although this may be adjusted in the future to align with the target contained in the 2024–2025 BCP.

**Demand Response Target:**

PSE's demand response target for the 2022 through 2025 CETA implementation period is 23.7 MW of demand response through 2025.

[9] EIA: Energy Independence Act. A reference to the 2006 voter initiative, The Washington Clean Energy Initiative. The vote resulted in the creation of RCW 19.285 and WAC 480-109, which is now referred to as the Energy Independence Act. The EIA was also sometimes colloquially referred to as "I-937".

[10] CPA: Conservation Potential Assessment

[11] NEEA: Northwest Energy Efficiency Alliance

### Demand Response Target Methodology

PSE commissioned a conservation potential assessment that included an analysis of demand response opportunities in PSE's service territory. Because PSE is a winter peaking utility, this analysis focused on identifying programs aimed at reducing PSE's winter peak demand. We defined each program, and produced technical and achievable potential estimates for each product with a bottom-up method that used number of customers, equipment saturation rates, expected load impact, market conditions, and customer adoption estimates. We determined costs for each program based on a total resource cost perspective.

PSE used information from the conservation potential assessment in portfolio modeling to estimate the cost-effective demand response programs. The preferred portfolio from the 2021 IRP and the Clean Energy Action Plan (CEAP) each included a similar selection of demand response programs. We accelerated these programs for the 2021 draft CEIP model runs according to their cost-effectiveness, i.e., starting with the lowest cost programs and their market potential with the ability to increase over time.

We did not include critical peak pricing and time-of-use programs in the 2021 CEIP DR target calculation. PSE is actively developing a time-of-use pilot to identify these savings; we describe this action in Chapter 4, Specific Actions. As we learn more about the specific rate designs and customer response to those rate designs, we can adjust targets to incorporate the projections of including these rates.

**Renewable Energy Target**[12]**:** 59 percent of the energy used to serve retail sales will be delivered by CETA-eligible energy by the end of 2025

### Renewable Energy Target Methodology

#### The renewable energy target is informed by updated information

PSE added over 750 MW of renewable energy to its power supply between 2005 and 2020, with renewable energy making up 35 percent of PSE's energy supplied to customers as of 2020.

In establishing the renewable energy target for the 2022–2025 period, PSE sought to build from the work of the 2021 CEAP and incorporate new information as available and feasible. We describe this new information in detail in the Methodology section, below. The 2022–2025 renewable energy target incorporates the following information after the 2021 CEAP.

PSE has also accelerated the forecasted pace of renewable energy adoption from the CEAP. As we outlined in the 2021 IRP, the incremental cost of the preferred portfolio ran below a 2 percent average annual increase in rates. In this CEIP, we accelerate the acquisition of renewable energy relative to the 2021 IRP.

[12] The Renewable Energy target keeps PSE on track to meet the EIA target

Table 2-4: Increase in Renewable Energy from 2021 IRP to CEIP

| | | 2022 | 2023 | 2024 | 2025 |
|---|---|---|---|---|---|
| 2021 IRP | aMW of Renewable | 845 | 1,033 | 1,038 | 1,183 |
| | % of Retail Sales | 39% | 48% | 48% | 56% |
| 2021 Draft CEIP | aMW of Renewable Energy | **926** | **1,118** | **1,266** | **1,237** |
| | % of Retail Sales | 43% | 52% | 59% | 59% |

PSE is currently in compliance with Washington's Energy Independence Act. The forecasted resource additions of wind and solar are also compliant with Washington's Energy Independence Act. PSE anticipates these added resources will keep PSE in compliance with the Energy Independence Act renewable energy target.

**Distributed energy resources: a sub-target of the renewable energy target**

The preferred portfolio in the 2021 IRP included distributed energy resources, specifically distributed solar programs and battery storage. The preferred portfolio identified amounts of distributed energy resources but did not fully consider feasibility or program design. In this CEIP, we incorporate feasibility, benefits, and risk mitigation of distributed solar and battery programs, in aggregate and for specific programs.

Distributed energy resources provide an important risk mitigation measure, and customer benefits. The 2021 IRP analyzed the impacts of a lack of regional transmission availability, which led to a unrealistic pace of development of distributed energy resources[13]. The systems to control distributed energy resources, supply chains, skilled workforce, and distributed system capacity will take many years to develop. By beginning now to incorporate distributed energy resources as part of PSE's supply portfolio, we can establish foundational technologies, operational systems, and experience to maximize the value of distributed resources.

For this initial CEIP, we adopt a sub-target of 80 MW of distributed solar capacity in 2025, which is based on the IRP preferred portfolio. There is no way to identify an optimal amount of distributed energy resources to adopt now, but the market potential evaluation indicates this sub-target is a feasible market adoption rate. This amount is higher than the current adoption rate in PSE's service territory, so it expands jobs there, a customer benefit, and that ramps up over time to allow for training. This rate of distributed solar capacity and calibrated work force expansion ensures the created jobs are sustainable. The information we receive in 2022 from both the All-Source and Targeted DER/DR Request for Proposal (RFP) will help PSE refine the data necessary to refine the forecasted distribution of energy and non-energy costs and benefits.

[13] PSE 2021 IRP, Sensitivity C constructed no distributed energy resources prior to 2035 and 3200 MW between 2040 and 2045.

## Methodology to develop targets: from Integrated Resource Plan (IRP) to Clean Energy Implementation Plan (CEIP)

The IRP/CEAP sets the stage for PSE to meet resource needs and provide customer benefits over a 10-year horizon. As PSE transitions to building the four-year roadmap in the CEIP, we refined the assumptions and inputs of the IRP/CEAP resource modeling based on available information. The 2021 CEIP modeling process optimized the battery storage and solar additions to better represent target programs over the 2022–2025 timeline using the AURORA long-term capacity expansion model, a benefit-cost analysis (BCA) model, and customer benefit indicators.

For the 2021 CEIP, PSE made several updates to the resource inputs from the 2021 IRP.

- New energy supply contracts: PSE entered two renewable energy supply contracts after the 2021 CEAP was completed. The first is a new contract for 5 percent of the output of Chelan Public Utility District's Rock Island and Rocky Reach hydropower contracts from 2022 through 2026. The second is an extension of a contract with the Colville Tribe for a 5.5 percent share of the output of the Wells dam in Douglas County.

- Specific distributed energy resource programs and costs: As described here and in Appendix D, Distributed Energy Resources (DER) Suite Selection and Evaluation, PSE commissioned a detailed evaluation of program costs and potential adoption rates for a range of distributed solar energy and energy storage programs.

- As we previously noted, PSE has adopted a more aggressive pace of renewable energy procurement than the 2021 IRP.

- PSE updated customer benefit indicators. We used initial customer benefit indicators in the 2021 IRP to identify the preferred portfolio, which in turn informed the CEAP. Since we filed the IRP in April 2021, PSE's public participation process provided extensive feedback, so we updated the indicators to better reflect the benefits customers want for the clean energy transition. Through this process, PSE collaborated with our advisory groups, including the newly formed Equity Advisory Group (EAG), community-based organizations, and customers to develop these updated indicators. PSE also consulted the EAG on how these indicators should be used to determine the program mix for the CEIP actions. Most of the initial customer benefit indicators included in the 2021 IRP were affirmed by feedback from customers, and we added additional customer benefit indicators. These updated customer benefit indicators are part of the factors we used to determine the mix of programs and concepts to satisfy the DER target in this CEIP, to evaluate resources in the RFP process, and will be incorporated in the 2023 IRP and CEIP updates. Further details on customer benefit indicators and how they were used are in Chapter 3, Customer Benefit indicators, Highly Impacted Communities and Vulnerable Populations.

Like the IRP modeling for the preferred portfolio, the CEIP will continue to meet resource adequacy and CETA energy needs.

Figure 2-4: IRP Portfolio to CEIP Portfolio


To provide additional detail on the distributed resources, PSE developed DER Suites to represent different ways to achieve a specified nameplate amount of distributed energy resources. We will deliver these DERs through a mix of customer-facing programs focused on distributed solar and battery storage. We did not include demand response in this modeling framework because we have already assessed its potential and produced a cost methodology by program, which we explain in further detail in Appendix J. We focused on a theme for each suite to identify and analyze various factors. We then compared the suites to help determine costs, and how the mix of concepts meet the resource needs and customer benefit goals.

## Distributed Solar and Distributed Battery Storage Updated Modeling

### Introduction

In addition to serving as an important pathway to achieving PSE's CEIP goals, DERs create opportunities to enhance benefits to customers and contribute meaningfully to grid operations. The 2021 IRP preferred portfolio included 80 MW of distributed solar (incremental to the 2021 IRP net metering forecast) and 25 MW of distributed battery storage but did not distinguish options to reach these goals. To select preferred methods to reach the distributed energy resource targets, PSE seeks to develop a portfolio of DER programs that help spur adoption of clean energy resources from customers and third parties. This section outlines PSE's approach to develop a draft DER preferred portfolio of distributed solar and battery storage programs for this CEIP.

#### DER Guiding Principles

To achieve the CETA compliance goals while effectively incorporating DERs, PSE is developing supporting systems and tools to use DERs effectively and offer them through a mix of customer products and services, third-party partnerships, and PSE-owned projects. Below are the principles we developed internally and with a third-party consultant, West Monroe. These principles will guide PSE's DER strategy:

- Ensure development and deployment are flexible as technologies change,

- Launch customer programs that expand participation in DERs to historically under-served customer groups and ensure the benefits are equitably distributed,
- Become the partner our customers rely on for these new DER programs, and
- Deploy DERs in areas where they provide maximum benefit to the grid.

**Concept Ideation**

As a first step to develop PSE's draft DER preferred portfolio for solar and battery storage programs, we partnered with West Monroe to study other utilities' DER programs and captured characteristics such as technology, ownership structure, and customer and utility benefits. We examined and used additional industry knowledge and experience to expand and encompass a broader range of program designs such as ownership, location, and customer segment. PSE then screened these concepts and prioritized based on scalability, feasibility, and accessibility to develop groupings of programs to evaluate for inclusion in the CEIP actions.

In the first cycle of the 2021 CEIP study, we focus on 25 MW of distributed battery storage and 80 MW of distributed solar, as shown in Table 2-5 and Table 2-6. These amounts were identified as part of the lowest reasonable cost preferred portfolio in the 2021 IRP and in the Clean Energy Action Plan.

Twelve different battery storage programs will encompass the distributed battery storage category.

Table 2-5: Distributed Battery Storage Programs

| # | Program Concept | Program Description |
|---|---|---|
| 1 | Third-party Customer-sited Distributed Battery Power Purchase Agreement (PPA) | Third-party installs/manages network of customer-sited batteries. Third-party will aggregate network of batteries to respond to dispatch signal from PSE. |
| 2 | Third-party Utility-scale Distributed Battery PPA | Third-party installs/manages single/network of batteries to respond to dispatch signal from PSE. |
| 3 | Commercial and Industrial (C&I) Bring your own (BYO) Battery | Tariff targeted to existing/new commercial battery owners that encourages optimal load behavior, charge/discharge, and/or PSE access that helps PSE to manage system/local peak. |
| 4 | C&I Battery Install Incentive | PSE offers upfront incentive to commercial customer to install their own battery storage system, with terms for operating modes that lead to optimal load behavior. |
| 5 | C&I Space Leasing for Batteries | PSE leases space from/at C&I customers to deploy battery storage system. |
| 6 | Multi-family Unit Battery Program | PSE partners with multi-family unit owner/developer to deploy battery program. |
| 7 | PSE Mobile Batteries | PSE deploys mobile batteries to support planned and (un-)planned outages. Batteries can serve at distribution level. |
| 8 | PSE Substation Batteries | PSE installs batteries at its substations. |
| 9 | PSE Utility-scale Distributed Battery Stations | PSE installs distributed batteries locally, communally, and/or in urban settings (i.e. outside of substations). |

| # | Program Concept | Program Description |
|---|---|---|
| 10 | Residential Battery Install Incentive | PSE offers upfront incentive to residential customers to install their own battery storage system, with terms for operating modes that lead to optimal load behavior. |
| 11 | Residential PSE Battery Leasing | PSE installs batteries in customer homes. Customers pay a monthly fee for backup power services; PSE uses battery to manage system/local peaks. |
| 11a | Residential PSE Battery Leasing; Income-eligible | PSE provides targeted deployment of batteries for low-income customers. Customers pay a monthly fee for backup power services; PSE uses battery to manage system/local peaks. |

Thirteen different solar programs will encompass the DER solar category.

Table 2-6: Distributed Solar Programs

| # | Program Concept | Program Description |
|---|---|---|
| 12 | Net Metering (Existing, referred to as Customer Connected Solar) | Voluntary customer program to install rooftop solar and state-regulated mandate for compensation on generated energy imported to grid. |
| 12a | Net Metering (Successor) | Next iteration of voluntary customer program to install rooftop solar and state-regulated mandate for compensation, at a reduced rate from prior, on generated energy imported to grid. |
| 13 | PSE Community Solar | PSE offers customers the ability to subscribe to the output of solar panels deployed throughout the service territory. Customers pay a monthly fee and receive a monthly credit for generation. |
| 13a | PSE Community Solar - Low Income | Provides community solar access to low income customers by discounting their monthly subscription fee. |
| 14 | Third-party Distributed Solar Power Purchase Agreement (PPA) (or Solar Lease) | Third-party installs/provides rooftop solar panels to customers throughout service territory. PSE off-takes renewable energy via PPA or net metering while the third-party is responsible for managing program and financing equipment. |
| 15 | Commercial & Industrial (C&I) Rooftop Solar Incentive | PSE offers upfront incentive to commercial customers, discounting their upfront cost to install and own distributed solar generation throughout service territory. |
| 16 | C&I Rooftop Solar Leasing | PSE offers to lease commercial customers' rooftop space to install solar PV. Customer receives a monthly lease payment from PSE; PSE generates renewable energy to supply grid. |
| 17 | Multi-family Solar Partnership | PSE facilitates installation of solar PV at multi-family unit buildings by connecting with technology providers and/or billing support to share production across units. |

| # | Program Concept | Program Description |
|---|---|---|
| 18 | Multi-family Rooftop Solar Incentive | PSE offers incentive to multi-family unit building owners, discounting their upfront cost to install and own solar in PSE's service territory. |
| 18 | PSE Customer-sited Solar+Storage | PSE enrolls customers through a monthly incentive program to host Solar+Storage systems with that can offset customers' load from the grid in response to operating settings or dispatch signals from PSE |
| 20 | Residential Rooftop Solar Leasing | PSE offers to lease residential customers' rooftop space to install solar PV. Customer receives a monthly lease payment from PSE; PSE generates renewable energy to supply grid. |
| 20a | Residential Rooftop Solar Leasing - Income-eligible | PSE offers to lease income-eligible residential customers rooftop space to install solar PV. Customer receives a monthly lease payment from PSE; PSE generates renewable energy to supply grid. |
| 21 | Low- or Moderate-Income (LMI) / Multi-family Community Solar | Provides community solar access to low-to-moderate income qualified customers or multi-family unit residences by discounting their monthly subscription fee. |

### Suite Development and Cost Test Methodology

PSE developed a suite selection process to create the draft DER preferred portfolio of distributed solar and battery storage programs. We analyzed groupings ("suites") of programs based on program designs and objectives. This approach provided sensitivity analysis methods and allowed us to evaluate how a portfolio is shaped when we optimize it for various criteria. We show the objectives and methodology for each suite selection in Table 2-7. PSE took these steps to create and analyze each suite:

- Organize concepts by suite
- Gather cost data for each concept
- Apply test to each suite

We constructed each suite from concepts that aligned with the individual suite objective. We included community solar and low-income community solar in all suites because those programs are already approved by the WUTC and are valuable as they increase solar accessibility. For details on which concepts we considered in each suite, see Appendix D, DER Suite Selection and Evaluation. PSE compared and contrasted portfolio options in the suite selection process to create a balanced DER preferred portfolio that promotes equity, diverse offerings, and minimizes costs.

PSE engaged a third-party consultant, Black & Veatch, to complete an independent cost and market potential assessment for each concept (see Appendix K, Black & Veatch Cost Report). We used the costs for each concept to inform the utility program and host customer costs. PSE used a DER benefit-

cost analysis (BCA) model to quantify potential grid, customer, and societal benefits. For further details on the DER BCA model, please see Appendix D, DER Suite Selection and Evaluation. We then mapped each of these costs and benefits to the societal and participant cost tests.

To evaluate the different suites of DERs, PSE followed guidance from the National Standard Practice Manual (NSPM) for Benefit-Cost Analysis of Distributed Energy Resources. [14] The NSPM recommends deploying a primary cost test and a secondary cost test where applicable. For a primary cost test, the NSPM recommends a jurisdiction-specific test to align with a jurisdiction's policy goals and objectives. CETA has a clear goal to achieve a 100 percent clean electricity supply and includes safeguards to protect consumers from excessive rates or unreliable service. Of the traditional cost tests, these objectives align with the Societal Cost Test (SCT), which includes electric utility systems, host customers, and societal impacts. As a secondary cost test, we used the Participant Cost Test (PCT) to prioritize concepts with favorable customer economics; that is, concepts customers will be more likely to adopt if the economics are sound. Once these tests were selected, PSE applied each test based on the suite methodology.

Table 2-7 Overview of DER Suite Selection Methodology

| Suite # | Name | Suite Objective | Methodology |
|---|---|---|---|
| 1 | Lowest Cost | Evaluate all concepts with selection that meet IRP DER targets with the lowest utility costs | Evaluated using AURORA. We detail the AURORA modeling in Chapter 2 below |
| 2 | General Rates | Comprised of concepts where all costs would go into general rates | Ordered concepts based on the Societal Cost Test from highest to lowest |
| 3 | Voluntary Cost Sharing | Comprised of concepts where participants share in the cost of deploying DERs | Ordered concepts based on the PCT from highest to lowest |
| 4 | Broadening Access | Comprised of concepts that help broaden access and remove barriers to DER adoption | Ordered concepts based on the Societal Cost Test from highest to lowest |
| 5 | Customer Benefit Indicators | Evaluation of all concepts based on customer benefit indicator scores | Evaluated based on customer benefit indicator (CBI) scores. We detail our use of CBIs in Chapter 3 – Customer benefit indicators, highly impacted communities and vulnerable populations |
| 6 | Preferred Portfolio | Balanced review of all criteria | Hybrid approach to balance lower costs, prioritized CBI scores, and diversity of program offerings |

### Draft DER Preferred Portfolio Selection

To develop a preferred portfolio, PSE used the following methodology to select a mix of DER programs that meet the MW targets for distributed solar and battery storage promoting equity, diversified

[14] Woolf, T., Lane, C., Whited, M., Neme, C., Alter, M., Fine, S., Rabago, K., Schiller, S., Strickland, K., and Chew, B. (2020, August). National Standard Practice Manual For Benefit-Cost Analysis of Distributed Energy Resources. https://www.nationalenergyscreeningproject.org/national-standard-practice-manual/.

offerings, and minimized costs. Figure 2-5 gives an illustration of how multiple suites were pulled together to form the draft DER preferred portfolio.

**Preferred Portfolio Selection Approach**

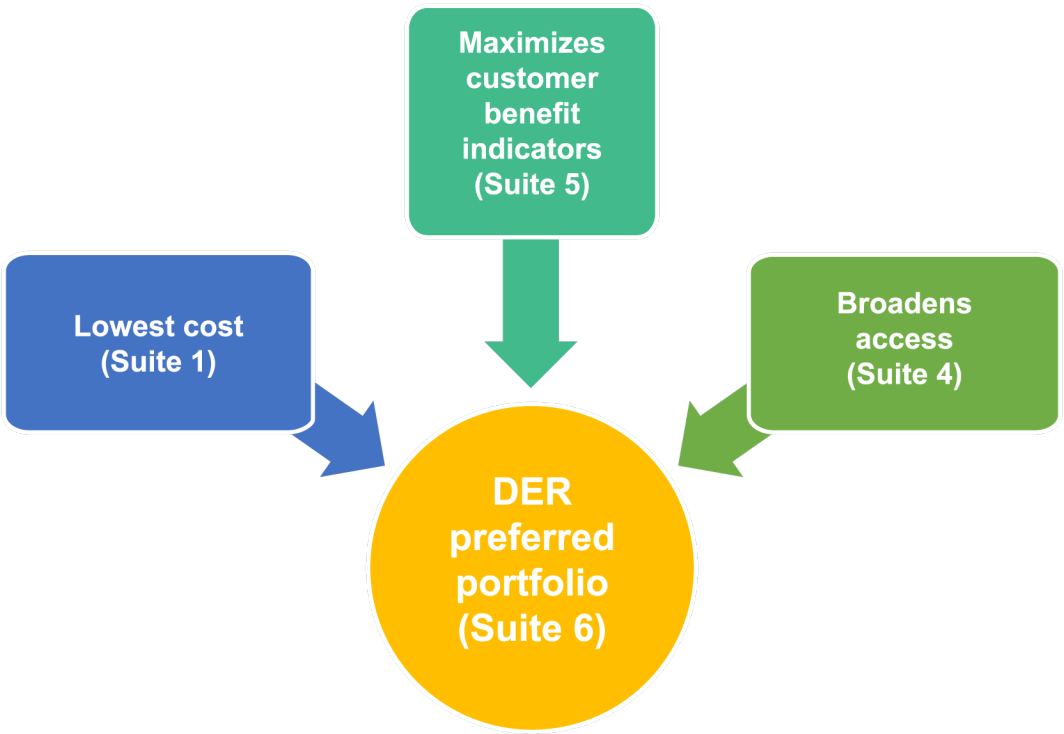
Phase 1: Develop a short list of concepts - distributed solar and battery storage

1. Rank all concepts by lowest capacity cost ($/Watt) as calculated by AURORA.
2. Filter by a total customer benefit indicator (CBI) score, using a threshold greater than or equal to the median CBI score. Find additional descriptions of CBI scoring in Appendix D, DER Suite Selection and Evaluation.

Phase 2: Select preferred portfolio for distributed solar and battery storage

3. Rank remaining concepts by SCT, from highest to lowest.
4. Select concepts ranked by high CBI score, high SCT, and low-cost.
5. Ensure offerings are available for all customer classes, with a mix of utility- and customer-sited/owned DER concepts included.

Figure 2-5: CEIP Suite 6 Draft DER Preferred Portfolio Selection




We selected concepts to fulfill the nameplate capacity amounts of distributed solar and battery storage with this process. Between steps four and five, it was essential to assess whether the initial portfolio

represented diversity in utility- and customer-sited/owned DER concepts with offers available for all customer classes, such as single-family residential, multi-family residential, commercial, and industrial. After reviewing a draft DER preferred portfolio with internal and external stakeholders like the EAG and IRP stakeholder group, additional community solar was added to include a greater MW emphasis on highly impacted communities and multi-family customers (see Chapter 4; Specific Actions). The draft DER preferred portfolio consists of the following DER programs:

**Distributed Solar:**

- Community solar, including low-income and multi-family community solar
- Commercial and industrial (C&I) Rooftop Solar Incentive
- Commercial and Industrial (C&I) Rooftop Solar leasing
- Third-party Distributed Solar PPA (or Solar Lease)
- Customer-sited Solar+Storage Offering
- Residential Rooftop Solar Leasing (including income-eligible portion)
- Multi-family Solar Partnership
- Multi-family Rooftop Solar Incentive

**Distributed Battery Storage:**

- Customer-sited Solar+Storage Offering
- C&I Space Leasing for Batteries
- Residential PSE Battery Leasing (including income-eligible portion)

The output of the draft DER preferred portfolio is in Table 2-8.

Table 2-8 Installed Capacity of Suite 6 (2022–2025)[15]

| DER programs | Incremental Installed Capacity (MW) | | | | Cumulative (MW) |
|---|---|---|---|---|---|
| | 2022 | 2023 | 2024 | 2025 | Total |
| C&I Space for Batteries - Leasing | 0.00 | 0.00 | 1.80 | 7.20 | 9.00 |
| Residential PSE Battery Leasing | 0.00 | 1.20 | 1.30 | 1.30 | 3.80 |
| Residential PSE Battery (Income-eligible) Leasing | 0.00 | 0.10 | 0.10 | 0.10 | 0.30 |
| PSE Community Solar | 5.60 | 4.80 | 5.60 | 0.00 | 16.00 |
| PSE Community Solar - Low Income | 1.40 | 1.20 | 1.40 | 0.00 | 4.00 |
| Third-party Distributed Solar PPA or Solar Lease | 0.00 | 3.73 | 3.73 | 3.73 | 11.20 |
| C&I Rooftop Solar Incentive | 0.00 | 6.96 | 6.96 | 6.96 | 20.80 |
| Multi-family Solar Partnership | 0.00 | 0.11 | 0.11 | 0.11 | 0.33 |
| Multi-family Unit Rooftop Solar Incentive | 0.00 | 0.55 | 0.55 | 0.55 | 1.66 |
| PSE Customer-sited Solar+Storage (solar) | 0.00 | 4.41 | 5.07 | 5.80 | 15.28 |
| PSE Customer-sited Solar+Storage (storage) | 0.00 | 3.68 | 4.23 | 4.83 | 12.74 |
| Residential Rooftop Solar Leasing | 0.00 | 1.19 | 1.60 | 2.00 | 4.79 |

[15] See Appendix D – DER benefit-cost analysis (BCA) model overview and inputs for full table of Suites

| DER programs | Incremental Installed Capacity (MW) | | | | Cumulative (MW) |
|---|---|---|---|---|---|
| | 2022 | 2023 | 2024 | 2025 | Total |
| Residential Rooftop Solar (Income-eligible) Leasing | 0.00 | 0.17 | 0.23 | 0.28 | 0.68 |
| Low- or Moderate –income (LMI)/Multi-family Community Solar | 0.00 | 0.00 | 0.00 | 5.40 | 5.40 |

PSE's draft DER preferred portfolio is an initial path to meet CEIP targets with a diverse set of distributed energy resource programs. The All-Source and Targeted DER/Demand Response Request for Proposals (RFP) will provide important data on resource and program availability. Customer research and program design will provide additional insight on potential customer adoption rates. During the program design and implementation phase, we will also be able to better understand how we can expand the scope of programs beyond what is listed in the draft DER preferred portfolio. Options for hybrid or other programs may be available for businesses or income-eligible customers. You can find details on the role of these programs and preliminary budget estimates in Chapter 4, Specific Actions and Appendix E, Incremental Costs.

## CEIP Methodology

For the CEIP, we also used the AURORA model used in the 2021 IRP to measure the contribution of the CEIP targets and actions to PSE's energy and capacity needs, as well as to model portfolio costs.

### Assumptions and Limitations

The 2021 CEIP is based on the preferred portfolio identified in the 2021 IRP. We also propagated the assumptions made in the 2021 IRP to the 2021 CEIP, with the following updates:

#### CEIP Adjusted CETA Needs

PSE recently signed two new hydroelectric contracts that were not included in the 2021 IRP. The first contract is a three-year extension of PSE's existing portion of the Colville Tribe's share of the Douglas Public Utility District's Wells Hydro Project from October 1, 2021, through September 30, 2024, providing approximately 26 aMW of energy. The second hydroelectric contract is a five-year contract with Chelan PUD from January 1, 2022, through December 31, 2026, providing approximately 49 aMW of energy. With the acquisition of these hydroelectric contracts, PSE will adjust its CETA need in the near term.

PSE also adjusted the ramp rate of resources over the four-year period given the impacts of the additional hydroelectric contracts and two percent cost guidance. The 2021 IRP preferred

portfolio was below an average annual rate increase of 2 percent. With room to continue to make these investments toward CETA, PSE analyzed how to best align with the two percent incremental cost curve. PSE accelerated the ramp rate from the 2021 IRP, and instead of a linear ramp to meet the CETA requirements by 2030, the CEIP adds additional renewable resources earlier. PSE added an estimated 314,247 MWh annual contribution from wind in years 2024 and 2025. PSE used the AURORA model to determine the new resource builds associated with the CETA needs adjustment.

Table 2-9: 2021 IRP vs. Draft CEIP resource additions in MW (2022–2025)

| Scenario | Resource Type | 2022 | 2023 | 2024 | 2025 | Total |
|---|---|---|---|---|---|---|
| 2021 IRP Preferred Portfolio | Battery Storage | - | - | - | 25 | 25 |
| | Wind | - | - | - | 400 | 400 |
| 2021 Draft CEIP | Battery Storage | - | 50 | 50 | 25 | 125 |
| | Wind | - | - | 400 | 100 | 500 |

Table 2-9 highlights the changes in the resource additions from the 2021 IRP preferred portfolio to the 2021 draft CEIP. After the CETA needs adjustment, there is an increase of 100 MW in wind resources and a shift in the wind forecast to 2024. There is also an additional 100 MW of battery storage starting in 2023. Over the four-year period, there is no change in other resources. The portfolio optimization model is nonlinear and has multiple possible solutions. The adjusted CETA needs and new hydroelectric contracts we triggered with a different optimization path resulted in a different portfolio. This portfolio satisfies the peak needs, energy needs, and CETA requirements. The preferred portfolio with updated CETA needs and hydroelectric contracts is a baseline for PSE's 2021 CEIP study.

### Updated Distributed Solar and Distributed Battery Storage Costs

In the 2021 IRP preferred portfolio, the 80 MW distributed solar and 25 MW distributed battery storage projections were based on generic resources. As discussed previously in this chapter, PSE refined resource costs for distributed solar and distributed battery storage were developed and incorporated into AURORA for modeling energy and capacity contributions, and the overall cost of the CEIP portfolio. Instead of the generic resource costs used in the 2021 IRP for these distributed resources, PSE used the granular cost information provided by Black & Veatch, seen

in Appendix K. This cost information provided not just the resource cost, but also the cost of each DER program.

**Constraints**

To allow the AURORA model to optimize across the various distributed solar and battery storage concepts in Suite 1, we held the other resources in the model constant. This allowed for optimization of the DER programs based on their refined cost information. The composition of the mix was dictated by 80 MW of distributed solar and 25 MW of distributed battery storage, the CEAP targets adopted after considering initial customer benefits.

**Effective Load Carrying Capability**

In the CEIP, there are four programs, (i) the multi-family unit battery, (ii) residential battery install incentive, (iii) residential PSE battery leasing, and (iv) the residential PSE battery leasing–low income, that use three-hour lithium-ion battery with 90 percent round-trip efficiency. The three-hour Li-Ion battery was not modeled in the 2021 IRP. To update for this resource, we calculated the three-hour Li-Ion battery capacity and its effective load-carrying capability (ELCC) using the resource adequacy model (RAM) to model 90 percent round-trip efficiency. In moving from generic resources to specific resources in our modeling, we used this three-hour battery. The methodology to determine this ELCC is consistent with the 2021 IRP, Chapter 7. The ELCC value is 18.66 percent.

In the PSE customer-sited Solar+Storage program, the distributed battery storage is charged in a different way from that in the IRP hybrid system model assumptions. The distributed battery in this CEIP program can be charged by any other generation resources and market purchases, not just on-site solar. This flexible charging resource provides higher ELCC from the hybrid system. For the 2021 CEIP, we treat the distributed solar and the distributed battery storage in the hybrid system as an independent resource for ELCC calculation purpose. The ELCC value is also 18.66 percent for this resource.

**Resource Adequacy/Peak Capacity Need**

PSE studied its peak hour capacity needs with a resource adequacy analysis in the 2021 IRP. This analysis evaluated existing PSE resources compared to the projected peak need over the planning horizon. Due to the retirement of existing coal resources, PSE's AURORA modeling forecasts a peak capacity shortfall beginning in 2026. PSE currently uses a loss of load probability (LOLP) consistent with the Northwest Power and Conservation Council to determine the peak capacity need for its service territory. Using the LOLP methodology and before any new demand-side resources, the 2021 IRP ascertained we would need 907 MW of capacity by 2027 and 1,381 MW by 2031. We provide complete discussion of the peak capacity need in the 2021 IRP, Chapter 7, Resource Adequacy Analysis[16].

[16] 2021 IRP Chapter 7, Resource Adequacy Analysis: https://oohpseirp.blob.core.windows.net/media/Default/Reports/2021/Final/07.IRP21_Ch7_032921.pdf

The resource adequacy analysis is complex and ensures the resource system has enough flexibility to handle balancing needs and unexpected events, such as variations in temperature, hydro, wind, and solar generation, equipment failure and forced plant outages, transmission interruption, potential curtailment of wholesale power supplies, or any other sudden departure from forecasts. Resource adequacy requires that PSE meet the full range of possible demand conditions, even if the potential of experiencing those conditions is relatively low.

We adopted the peak capacity analysis and resource capacity contribution methodology in the 2021 IRP for this draft Clean Energy Implementation Plan. Since the 2021 IRP was published, PSE has started on additional analysis of its load forecast to incorporate a view of climate change impacts, and an analysis of the impacts of resource assumptions. These analyses, taken together, may change the peak capacity need and the capacity contribution of different resources. We will complete the study of these factors in 2022 and incorporate them into the 2023 CEIP update.

In addition to firm resources, PSE currently relies on market purchases from the Mid-Columbia (Mid-C) trading hub to meet capacity needs. Based on PSE's evaluation of the existing wholesale electric market, the 2021 IRP recommended using a portion of the available Mid-C transmission for firm resource adequacy (RA) qualifying capacity contracts or a reliable firm capacity resource in place of short-term energy purchases, with a reduction in the amount of short-term capacity over time.

PSE is also considering the appropriateness of relying on the short-term market in our 2021 All-Source RFP process. The resources secured to meet the targets in this CEIP will help reduce PSE's short-term market reliance but will not provide significant peak capacity. PSE may require additional resources over time to reduce our dependence on the Mid-C market to meet capacity needs. However, we are seeking only CETA-compliant capacity resources in the 2021 All-Source RFP. PSE will provide an update on our reliance on short-term market purchases in the 2023 IRP and 2023 CEIP updates.

To stay consistent with the 2021 IRP and due to time constraints in the development of the 2021 CEIP, many conventions were carried from the 2021 IRP to the 2021 CEIP. The most important of these are:

**Power Demand and Energy Demand**

PSE employs time series econometric methods to forecast monthly energy demand and peaks for our electric and gas service territories. PSE observes and gathers sales, customer counts, demand, weather, economic, and demographic variables to estimate use models per customer (UPC), customer counts, and peaks.

In the 2021 IRP base demand forecast, energy demand, before additional demand-side resources (DSR), is expected to grow at an average rate of 1.2 percent annually from 2022 to 2045. This growth increases energy demand from 2,500 aMW in 2022 to 3,316 aMW in 2045. The 2021 IRP high demand forecast projects an average annual growth rate of 1.6 percent; the low demand forecast projects 0.9 percent.

To model normal electric summer peak hour demand, 93 degrees Fahrenheit is used as the design temperature. Summer peaks typically occur in July or August. The 2021 IRP base summer peak demand forecast has an average annual growth rate of 1.7 percent. This rate increases the summer peak demand from 3,515 MW in 2022 to 5,183 MW in 2045.

There are no changes to the demand forecast for the CEIP.

**Transmission Constraints and Costs**[17]

Transmission constraints impact the availability of resources to serve load and significantly constrains the clean and renewable resources necessary to meet clean energy transformation targets.

We modeled the PSE service territory as a two-zone system in the 2021 IRP, with a transmission limit between the PSE service territory and the Mid-C market.

Consistent with the 2021 IRP, PSE modeled a potentially available 750 MW of transmission to Montana and 400 MW to Wyoming.

There are no changes to the transmission constraints and costs for the CEIP.

**Resource Assumptions and Costs**

Except for the distributed solar and distributed battery storage programs discussed earlier in this chapter, generic resource characteristics and costs from the 2021 IRP were used in the CEIP. To be consistent with the IRP resource plan modeling process and leverage the assumptions and best practices of the IRP, the AURORA modeling for CEIP follows the same load forecast, cost model, plant operating characteristics, system constraints, and AURORA setting as we documented in Appendix G, Electric Analysis Models[18] of the 2021 IRP.

[17] Transmission constraints are discussed further on pages 5 through 35 in the 2021 IRP Chapter 5, Key Analytical assumptions: https://oohpseirp.blob.core.windows.net/media/Default/Reports/2021/Final/05.%20IRP21_Ch5_032921.pdf

[18] 2021 IRP Appendix G, Electric Analysis Models: https://oohpseirp.blob.core.windows.net/media/Default/Reports/2021/Final/Appendix/18.%20IRP21_AppG_033021.pdf


# 3 Customer Benefit Indicators

PSE PUGET SOUND ENERGY

# Chapter Three: Customer Benefit Indicators (CBI), Highly Impacted Communities and Vulnerable Populations

## Customer benefit indicators

The Clean Energy Transformation Act (CETA) creates an inclusive approach to clean energy. It also requires that all customers benefit from the transition to the 2030 carbon-neutral standard and the 2045 requirement for non-emitting and renewable electric resources. Identifying, measuring, and applying customer benefits is a new part of the electric resource planning and resource acquisition process beginning in 2021. By including customer benefits, CETA ensures that while PSE pursues the energy supply targets to be carbon-neutral by 2030 and carbon-free in 2045, we do so in a way that benefits customers and reduces burdens. CETA's overall goal is to meet the targets at the lowest cost while maximizing customer benefits.

The 2021 Clean Energy Implementation Plan includes customer benefit indicators, shown on Table 3-1, based on our collected public participation data.

Table 3-1: Customer Benefit Indicators and Metrics

| CETA Category | Customer benefit indicator | Metric |
|---|---|---|
| Energy benefits<br>Non-energy benefits<br>Burden reduction | Improved participation from named communities | Count and percentage of participation by PSE customers within named communities |
| Non-energy benefits | Increase in clean energy jobs | Number of jobs created by PSE programs by residents of named communities |
| Non-energy benefits | Improved home comfort | Dollar per kilowatt-hour in benefits for program calculated using indoor air temperature, indoor air quality, and lighting quality |
| Burden reduction | Reduced cost impacts | Percentage of income spent on electricity bills for PSE customers in highly impacted communities and vulnerable populations |
| Cost reduction | Affordability of clean energy | Percentage of income spent on electricity bills for PSE customers |
| Environment | Reduced greenhouse gas emissions | Metric tons of annual CO2 emissions form PSE resources |
| Environment, risk reduction | Reduction of climate change impacts | Reduced peak demand |
| Public health | Improved outdoor air quality | Regulated pollutant emissions (Sox, NOx, PM2.5) from PSE resources<br>Reduction of particulates from resources in non-attainment areas |
| Public health | Improved community health | Health factors like mortality, hospital admittance, work loss days |

| CETA Category | Customer benefit indicator | Metric |
|---|---|---|
| Energy security<br>Resiliency | Decrease frequency and duration of outages | Number of outages, total hours of outages and total backup load served during outages |
| Risk reduction<br>Energy security<br>Resiliency | Increased resiliency | Number of customers who have access to emergency power in home or at community center |

The 2021 Integrated Resource Plan (IRP) used an initial set of customer benefit indicators developed with only limited feedback from the IRP stakeholders group.[19] Updates to the customer benefit indicators in this Clean Energy Implementation Plan (CEIP) benefit from the public participation processes and input as required by CETA to create this Clean Energy Implementation Plan. This public participation information will also inform future IRPs and 10-year Clean Energy Action Plans (CEAP). PSE is including customer benefits in the electric resource planning and resource acquisition decisions made after the filing of the 2021 IRP on April 1, 2021, through the following mechanisms:

**Applying customer benefit indicators to energy efficiency**

The calculations used to establish the cost-effectiveness of different energy efficiency programs include non-energy impacts, which are benefits not included as energy or cost benefits but can be estimated as financial impacts and included in the cost-effectiveness calculation. Non-energy impacts (NEIs) are the value to the participant (or the utility) of benefits we did not include in our avoided energy or capacity costs. We are considering an expanded list of non-energy impacts for future conservation goals (see Table 3-2). Many of these also align with the customer benefit indicators used across the actions in the CEIP. As more NEIs can be measured and used in the cost-effectiveness calculation, we will add to the cost-effectiveness evaluations of different programs.

Energy efficiency measures naturally overlap with many of PSE's customer benefit indicators (CBIs) found in this CEIP. When customers use less energy, fewer carbon-emitting fossil fuels are mined and burned. Air sealing and insulation, used to reduce heating and cooling needs, also improves home comfort by blocking noise and drafts. Efficient upgrades to homes, offices, and infrastructure create clean energy jobs for the workforce. And of course, the less energy a customer uses, the less they pay in utility charges. Many of these benefits are already quantified and accounted for in PSE's resource planning, such as adding the social costs of greenhouse gas to our avoided cost calculations.

In the 2022–23 Biennial Conservation Plan (BCP), PSE is taking steps to further quantify and include the monetary benefits of energy efficiency by adding to our list of NEIs. Before this, PSE typically used a narrow range of NEIs, including water and sewer savings, air pollution avoided using supplemental fuels, and NEIs developed by the Regional Technical Forum. This narrow list was used as part of the determination of the conservation goal. In 2020, PSE and other Washington State investor-owned

[19] Timing of UTC rules and Draft IRP: The WUTC rules for the CEIP were completed in January 2021 in the midst of the ongoing 2021 IRP process. The 2021 IRP was filed in April 2021. Because of the short time period between these two products, stakeholder engagement on customer benefit indicators was limited

utilities commissioned the creation of a database of NEIs from across the nation and a methodology that transferred a benefit from one utility jurisdiction to another; this enabled the expanded use of NEIs into different categories of benefits.

The result of this work to expand the use of NEIs will begin to show up in our 2024–2025 BCP. Categories of NEIs that PSE adopted from this project include operations and maintenance savings, health and safety impacts, indoor and outdoor air quality, financial impacts from payment assistance or arrearages, health care costs, and fire risk reduction. Table 3-2 shows a list of draft CBIs we propose for PSE's CEIP, along with a list of new NEI categories we will use to account for the value of energy efficiency projects in future BCPs.

Table 3-2 Mapping NEIs to CBIs

| Draft CEIP customer benefit indicators | Potential 2022-23 NEIs |
|---|---|
| Reduction of climate change impacts | Quantified indoor air quality values |
| Improved outdoor air quality | Reduced PM 2.5 particulates |
| Improved community health | Reduced health care costs |
| Affordability of clean energy | Quantified HVAC and insulation costs for income-eligible customers |
| Reduced cost impacts | Debt/arrearages reductions |
| Improved home comfort | Thermal comfort/lighting quality |
| Increased resiliency | Reduced fire risk/insurance costs |
| Greenhouse gas reduction<br>Increase in clean energy jobs<br>Decrease in outages<br>Increased accessibility | These draft CBIs are not explicitly addressed in new NEIs but are accounted for in avoided costs of capacity and the social cost of GHG or include areas of future work. |

Many of these expanded NEIs fall within the customer benefit categories outlined in CETA, and within the customer benefit indicators PSE has identified in this 2021 CEIP. Not all these new NEIs can be quantified at this point. As a result, we expect we will continue to evaluate and adopt these new NEIs in the coming years. PSE will provide a separate report to describe the monetary value received as we integrate these NEIs into our cost-effectiveness calculations in future BCPs and annual reports. PSE will continue to develop quantified NEIs and incorporate them into the cost-effectiveness calculations and align them with customer benefit indicators.

**Apply customer benefit indicators to demand response**

PSE will issue a Targeted DER/DR RFP in early 2022 to meet the target for demand response. This Targeted RFP will include a section for bidders to describe and illustrate how their bid best

meets the customer benefit indicator categories, like the 2021 All-Source RFP, as described in Chapter 4, Specific Actions. We will evaluate the responses based on the bids received and will consider them to create a short list and contracts.

**Apply customer benefit indicators to renewable energy**

**Utility-scale resources through the 2021 All-Source RFP**

On June 30, 2021, PSE issued an All-Source RFP seeking any resource that could meet the CETA or capacity need. The All-Source RFP requires all responses include an equity plan that explains how the proposal will affect each of the customer benefit indicator categories: distribution of energy and non-energy benefits in highly impacted communities and vulnerable populations, reduction of burdens to highly impacted communities and vulnerable populations, long- and short-term public health and environmental impacts, and energy security and resiliency. Proposals to the All-Source RFP must also note whether respondents are located in a highly impacted community and whether they or any of their suppliers for the project are women -, minority-, disabled-, or veteran-owned businesses. RFP responses shall also include any written diversity commitments, plans, or policies.[20]

In Phase 1 of the All-Source RFP evaluation, which starts with the bid deadline on September 1, 2021, and continues into Q1 2022, responses will include a qualitative assessment based on the number of customer benefit indicator categories each proposal improves.[21] Respondents will have the opportunity to update their equity plans in January 2022 to address the customer benefit indicators in the CEIP more specifically.[22]

In Phase 2 of the All-Source RFP evaluation, PSE will perform a more in-depth qualitative assessment of the customer benefit indicators. In this additional due diligence, PSE will seek more information, including the extent to which the proposals may provide benefits or burdens and plans to create benefits or mitigate burdens.

**Distributed energy resource through the 2021 CEIP and Targeted RFP:**

In the first CEIP, PSE is using the customer benefit indicators to evaluate and select the distributed energy resource programs and concepts that maximized benefits to customers. PSE developed a scorecard to understand how each program reflected each customer benefit indicator. For this 2021 draft CEIP, PSE does not have the baseline data established to reflect the impact of each program on the indicators. Therefore, the evaluation was qualitative and based on the degree of influence. In this exercise, PSE assessed each DER program or concept and determined where the customer benefit has none or minimal impact, some impact, or a direct impact on each customer benefit indicator.

[20] PSE All-Source RFP, Exhibit B
[21] PSE All-Source RFP, Exhibit A
[22] PSE All-Source RFP, Section 3

For this draft CEIP, the scorecard solely focused on distributed energy resources modeled, solar and battery storage, and therefore the results showed similar impacts based on the resource type. Table 3-3 shows how specific concepts were scored across all the indicators. For each concept, we gave a score of 0, 1, or 2 to each indicator. We calculated the total score for each concept and ranked the concepts according to the score.

**Table 3-15. Scorecard for customer benefit indicators for select DER programs/concepts**

| CBI | Reduced greenhouse gas emissions | Reduction of climate change impacts | Improved outdoor air quality | Improved community health | Affordability of clean energy | Reduced cost impacts | Increase in clean energy jobs | Improved participation from named communities | Decrease in time and duration of outages | Increased resiliency | Improved home comfort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Rubric | 0 - May produce more annual metric tons of CO2 | 0 - Increases impacts of climate change | 0 - May produce more annual metric tons of NOx, SOx, and PMP2.5 | 0 - % increase | 0 - non-measurable % decrease | 0 - measurable risk of % increase | 0 - No to minimal impact to local jobs or training | 0 - No removal of barriers to enable more participation | 0 - no discernable impact or decrease | 0 - no to minimal impact | 0 - no impact |
| [1, 2, 3] | 1 - Not likely to reduce annual metric tons of CO2 | 1 - Does not mitigate | 1 - Not likely to reduce annual metric tons of NOx, SOx, and PMP2.5 | 1 - no discernable % increase/ decrease | 1 - measurable % decrease, but only for targeted or participating customers | 1 - non-measurable % increase/ decrease | 1 - low impact to local jobs (f/t) or training OR only creates short term jobs | 1 - Some removal/mitigation of barriers across all/any customer types, but minimal for most impacted | 1 - May help to mitigate risk or lessen impact of potential number and/or duration of outages | 1 - provides resources to support future resiliency or educates customers about resiliency | 1 - minimal impact |
| | 2 - Reduces annual metric tons of CO2 | 2 - Can measurably mitigate | 2 - Reduces annual metric tons of NOx, SOx, and PMP2.5 | 2 - % decrease | 2 - measurable % decrease for all customers | 2 - measurable % decrease | 2 - Measurable impact to local f/t job and training | 2 - Removal/ mitigation of barriers for any/all and named communities | 2 - Directly decreases number and/or duration of outages | 2 - provides direct resiliency | 2 - significant impact |
| 3rd Party Customer-Sited Distributed Battery PPA | 2 | 2 | 2 | 2 | 1 | 1 | 0 | 1 | 2 | 2 | 0 |
| 3rd Party Utility-scale Distributed Battery PPA | 2 | 2 | 2 | 2 | 0 | 0 | 0 | 0 | 2 | 2 | 0 |
| C&I Battery Install Incentive | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 0 |
| C&I Space Leasing for Batteries | 2 | 2 | 2 | 2 | 1 | 2 | 1 | 1 | 2 | 2 | 0 |
| Multi-Family Unit Battery Program | 2 | 2 | 2 | 2 | 0 | 1 | 1 | 2 | 2 | 2 | 0 |
| PSE Mobile Batteries | 2 | 2 | 2 | 2 | 0 | 0 | 0 | 0 | 1 | 2 | 0 |
| PSE Substation Batteries | 2 | 2 | 2 | 2 | 0 | 0 | 0 | 0 | 1 | 2 | 0 |
| PSE Utility-Scale Distributed Battery Stations | 2 | 2 | 2 | 2 | 0 | 0 | 0 | 0 | 2 | 2 | 0 |
| Residential Battery Install Incentive | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 2 | 1 |
| Residential PSE Battery Leasing | 2 | 2 | 2 | 2 | 1 | 1 | 2 | 1 | 2 | 2 | 1 |
| Residential PSE Battery Leasing - Low Income | 2 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 1 |
| PSE Community Solar | 2 | 2 | 2 | 2 | 0 | 1 | 1 | 1 | 1 | 1 | 0 |
| PSE Community Solar - Low Income | 2 | 2 | 2 | 2 | 1 | 2 | 1 | 2 | 1 | 1 | 0 |
| 3rd Party Distributed Solar PPA (or Solar Lease) | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 0 |
| C&I Roof-top Solar Incentive | 2 | 2 | 2 | 2 | 1 | 1 | 2 | 1 | 1 | 1 | 0 |
| C&I Roof-top Solar Leasing | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 1 | 1 | 0 |
| Multi-Family Solar Partnership | 2 | 2 | 2 | 2 | 1 | 2 | 1 | 2 | 1 | 1 | 0 |
| Multi-Family Roof-top Solar Incentive | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 0 |
| PSE Customer-Sited Solar+Storage Offering | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 2 | 2 | 1 |
| Residential Roof-top Solar Leasing | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 1 | 1 | 0 |
| Residential Roof-top Solar Leasing - Low Income | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 1 | 1 | 0 |
| C&I Battery BYO | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 2 | 0 |

Conversations and feedback from stakeholders guided how we prioritized specific indicators above others. PSE initially prioritized the indicators based on the synthesis shown in Figure 3-4. With this prioritization, we weighted the indicators twice the value for their indicator score. For example, reducing greenhouse gas emissions was a prioritized customer benefit indicator; therefore, the scoring impact reflects a 0, 2, or 4 instead of 0, 1, 2, and is reflected on the scorecard.

Table 3-4: Customer Benefit Indicators and Priority

| Draft customer benefit indicator | Prioritized |
|---|---|
| Reduced greenhouse gas emissions | X |
| Improved outdoor air quality | X |
| Affordability of clean energy | X |
| Reduced cost impacts | X |
| Increased clean energy jobs | X |
| Decreased frequency and duration of outages | |
| Improved participation from named communities | |
| Improved home comfort | |
| Improved community health | |
| Reduced of climate change impacts | |
| Improved fish and wildlife habitat | |
| Increased resiliency | |

PSE continued to listen, contemplate, and integrate feedback from stakeholders. From this feedback, we learned prioritization was one point of interest and heard a range of feedback on the subject. Some stakeholders expressed concern about emphasizing specific indicators and how that may diminish the importance of the non-prioritized indicators. Stakeholders also suggested PSE should prioritize an indicator in each category, as opposed to across all indicators. By taking this advice, we captured a priority of indicators without losing the impact of each category.

To develop the DER programs and actions, PSE used stakeholder feedback to create an additional Suite five. This new Suite five allowed us to compare weighted (prioritized) and unweighted customer benefit indicators. Our purpose was to understand the impact of weighted and unweighted customer benefit indicators on the DER programs and concepts. By using unweighted customer benefit indicators, the results of this comparison showed the addition of two programs as highlighted in Table 3-5, a multi-family unit battery program and a C&I rooftop solar leasing program. Table 3-5 shows the weighted versus unweighted comparison and which programs we selected for the CEIP portfolio.

Table 3-5: DER Concept Score and Selection Using Weighted vs. Unweighted[23]

| DER Concept | Unweighted CBI Score | Weighted CBI Score | CEIP portfolio w/ Unweighted CBI | CEIP portfolio w/ Weighted CBI |
|---|---|---|---|---|
| Residential PSE Battery Leasing - Income-eligible | 25 | 35 | X | X |
| PSE Customer-Sited Solar+Storage | 25 | 36 | X | X |
| Residential PSE Battery Leasing | 24 | 34 | X | X |
| Multi-Family Unit Battery Program | 22 | 30 | X | X |
| C&I Space Leasing for Batteries | 21 | 31 | X | X |
| Multi-Family Solar Partnership | 21 | 30 | X | X |
| Residential Rooftop Solar Leasing - Income-eligible | 21 | 31 | X | X |
| Third-party Customer-sited Distributed Battery PPA | 20 | 28 | X | X |
| Residential Battery Install Incentive | 20 | 28 | X | X |
| PSE Community Solar - Low Income | 20 | 29 | X | X |
| C&I Rooftop Solar Incentive | 20 | 29 | X | X |
| Residential Rooftop Solar Leasing | 20 | 30 | X | X |
| C&I Rooftop Solar Leasing | 19 | 29 | | X |
| C&I Battery Install Incentive | 18 | 25 | X | X |
| Third-party Distributed Solar PPA (or Solar Lease) | 18 | 26 | | X |
| Multi-family Rooftop Solar Incentive | 18 | 26 | | X |
| C&I Battery BYO | 18 | 26 | | X |
| PSE Community Solar | 17 | 24 | | |
| Third-party Utility-scale Distributed Battery PPA | 13 | 19 | | |
| PSE Utility-scale Distributed Battery Stations | 13 | 19 | | |
| PSE Mobile Batteries | 12 | 17 | | |
| PSE Substation Batteries | 11 | 16 | X | X |

The CEIP specific actions related to distributed energy programs and concepts guide PSE on the types of programs to request in the Targeted DER/DR RFP. PSE will issue a Targeted DER/DR RFP in early 2022 to meet the target for distributed energy resources. This Targeted RFP will include a section for bidders to describe and illustrate how their bid best meets the customer benefit indicator categories, like the 2021 All-Source RFP. We will consider and evaluate the responses from bidders to create the shortlist and contracts. In this case, we use customer benefit indicators in both the CEIP modeling and the resource acquisition process.

### Baseline data development for customer benefit indicators

PSE will address baseline data in the 2021 Final CEIP. This information will be used to describe the forecasted distribution of energy and non-energy costs and benefits.[24] PSE will continue to understand

[23] Concepts with a red "X" denote they were not selected in the DER preferred portfolio
[24] WAC 480-100-640(3)(a)(i), 3(a)(ii) and 3(a)(III)

the data currently available and data that requires additional sources. These additional data sources may require working with a third-party consultant.

### Stakeholder input on customer benefit indicators

This section explains the process PSE staff conducted to collect and synthesize input from each audience to develop the customer benefit indicators. See Chapter 6, Public Participation for more information about the public participation we undertook to create the 2021 draft CEIP.

The 2021 CEIP includes customer benefit indicators informed by the broad participation required under CETA. As indicated in the Public Participation Plan (see Appendix C), PSE collected input from the following audiences to develop the draft CBIs:

- Community-based organizations that serve vulnerable populations among PSE customers
- PSE residential customers
- PSE business customers
- PSE's inaugural Equity Advisory Group (EAG)
- PSE's other advisory groups, including IRP stakeholders, Low-income Advisory Committee (LIAC), and Conservation Resource Advisory Group (CRAG)

Project staff collected input from different audiences using similar questions in different formats suitable for each audience. This data is shown in Table 3-6.

Table 3-6: Overview of Outreach for Customer Benefit Indicators

| Audience | Input Format | Quantity |
|---|---|---|
| Residential customers | Residential customer survey submissions | 921 |
| Business customers | Business customer survey submissions | 194 |
| Vulnerable populations | CBO meetings | 7 |
| Equity Advisory Group | EAG meetings | 9 |
| Integrated Resource Plan Stakeholders | IRP meetings | 5 |
| Low Income Advisory Committee | LIAC meetings | 3 |
| Conservation Resource Advisory Group | CRAG meetings | 3 |

The goal of public participation in CBI development is to understand the challenges that utility customers face regularly and the benefits that could address those challenges. The resulting CBIs represent a synthesis of stakeholder input and opportunities to address challenges via electric system planning and implementation.

PSE staff noted the following themes across different stakeholder audiences and used this input to develop customer benefit indicators.

- **Environment:** Reduce greenhouse gas emissions and the effects of climate change

- **Public health:** Increase air quality and improve community wellness
- **Affordability:** Decrease the amount of income spent on electricity and empower low-income populations to participate in clean electricity programs
- **Economic:** Increase the number of local clean energy jobs and make them accessible to vulnerable populations
- **Accessibility:** Empower customers to participate in clean electricity programs regardless of income level or homeownership status
- **Clean electricity participation**: Make the benefits of solar energy available to named communities
- **Resiliency:** Ensure a resilient clean electricity system
- **Comfort and satisfaction:** Build a clean electricity system that customers know they can depend on and reflects their environmental stewardship

**Advisory group process: Meetings**

**Collect input**

Project staff met with PSE's four advisory groups in May and June 2021. We asked each advisory group to suggest potential benefits they would like to see in the clean energy transition based on their experience and subject matter expertise. We also asked them to indicate the priority of the potential benefit. The EAG and IRP provided a low, medium, high, and highest priority scale for their benefits. The CRAG and LIAC simply indicated if the benefit was a priority or not.

**Code and summarize input**

Project staff reviewed the suggested benefits and organized them into different codes to compare similar ideas from other advisory groups and get a sense of the frequency of common themes.

**Develop and apply CBIs**

Project staff developed CBIs that could be used to monitor progress toward achieving the benefits described by the input. We applied one CBI to each suggested benefit.

**Prioritize CBIs among advisory group sources**

Project staff counted the number of times a CBI occurred in each advisory group's input with a priority indicator. We considered CBIs that were high priorities and common among multiple advisory groups higher on the priority list. The comprehensive look at the input received from advisory groups on customer benefit indicators is in Table 3-7.

Table 3-7: Advisory Groups—Input for CBIs

| Proposed Customer Benefit Indicator | Advisory Group Source |
|---|---|
| Non–energy—Decreased income spent on electricity | EAG<br>LIAC<br>CRAG |
| Reduction of cost—Reduced energy bills | IRP<br>CRAG |
| Public Health—Improved air quality | EAG<br>LIAC<br>IRP<br>CRAG |
| Public Health—Improved community wellness | EAG<br>CRAG |
| Security and resiliency—Decreased time and duration of outages | EAG<br>IRP<br>CRAG |
| Economic—Increased clean energy jobs | EAG<br>LIAC |
| Economic—Lower unemployment | EAG<br>IRP |
| Non-energy—Improved sense of self–sufficiency | EAG |
| Non-energy—Increased sense of provide and shared values | EAG<br>IRP |
| Accessibility—Improved awareness and education | IRP<br>CRAG |
| Environment—Reduced greenhouse gas emissions | LIAC<br>IRP |
| Accessibility—Renters | IRP |
| Accessibility—Vulnerable Populations | IRP |
| Environment—Decreased wildfires | IRP<br>CRAG |
| Environment—Improved siting | IRP |
| Public Health—Decreased rates of asthma | IRP |
| Public Health—Improved water quality | IRP |
| Non-energy—Improved home comfort | CRAG |

### Residential customer process: Online survey

### Collect input

Project staff distributed an online community survey to PSE customers in May 2021. See Chapter 7, Tracking and Reporting, for more information about survey distribution methods and respondent demographics.

The survey asked respondents to do the following:

- Indicate the importance of eight benefit categories
- Suggest benefits customers would like to see in the clean energy transition for each category.

We also asked customers to provide demographic information. For details on distribution and response rates, review Chapter 6, Public Participation.

**Code and summarize input**

Project staff reviewed the suggested benefits and organized them into different codes to compare similar ideas from other survey respondents and get a sense of the frequency of common themes.

**Develop and apply CBIs**

Project staff developed CBIs that could potentially be used to monitor progress toward achieving the benefits described by the input themes. We applied one CBI to each suggested benefit theme.

**Prioritize benefit categories based on input from vulnerable populations and all customers**

Project staff analyzed the responses that indicated the importance of the eight benefit categories. We compared the responses from demographics in the working definition for vulnerable populations to all survey responses.

The responses from vulnerable population groups were predominantly aligned with the responses from all customers. All demographic segments held the same categories in their top-three most important, but they were in a different order in some cases. The remaining five categories were all aligned in the same order.

Project staff determined that the total results of the survey represented a good synthesis of the priorities of all analyzed segments.

**Prioritize CBIs**

Project staff counted the frequency of each comment code applied to the benefits suggested in survey responses. We considered the codes in the highest third of frequencies a higher priority.

Since each code was associated with a benefit category, project staff ordered the codes according to the category’s priority determined in the previous step and then ordered them by code frequency. This process gave staff an idea of the most common ideas in each category in the context of the category's relative importance. The team then identified the CBIs associated with the higher priority benefits for each category; this is shown in Table 3-8.

Table 3-8: Residential Customers—Input for CBIs

| Proposed draft customer benefit indicator |
|---|
| Environment – Reduced greenhouse gas emissions |
| Environment – Decreased fossil fuel extraction |
| Public Health – Improved air quality |
| Public Health – Decreased rates of asthma |
| Public Health – Improved community wellness |
| Non–energy – Decreased income spent on electricity |
| Accessibility – Improved participation from named communities |
| Reduction of cost – reduced barrier to participation |
| Economic – Increased clean energy jobs |
| Non–energy – Decreased income spent on electricity |
| Non–energy – Improved sense of self–sufficiency |
| Reduction of cost – reduced barrier to participation |
| Security and resiliency – Decreased time and duration of outages |
| Non–energy – Increased sense of pride and shared values |

### Business customer process: Online survey

#### Collect input

Project staff distributed a survey in May 2021 to PSE small and medium business customers and major accounts customers. See Chapter 6, Public Participation, for more information about survey distribution methods and respondent demographics.

The survey asked respondents to do the following:

- Indicate the importance of eight benefit categories
- Suggest benefits business customers would like to see result in the clean energy transition for each category.

We also asked customers to provide information about their business. For details on distribution and response rates, review Chapter 6 on public participation.

#### Code and summarize input

Project staff reviewed the suggested benefits and organized them into different codes to be able to compare similar ideas from different survey respondents and get a sense of the frequency of common themes.

#### Develop and apply CBIs

Project staff developed CBIs that could potentially be used to monitor progress toward achieving the benefits described by the input themes. We applied one CBI to each suggested benefit theme.

### Prioritize benefit categories based on input from small and medium business customers and major accounts customers

Project staff analyzed the responses that indicated the importance of the eight benefit categories. The project team compared the responses of small and medium businesses to major accounts customers.

The responses from small and medium businesses were more focused on affordability and economic benefits than major accounts customers, but both held affordability and environment in their top three categories.

Project staff determined that the total results of the survey represented a good synthesis of the priorities of both small and medium businesses and major accounts customers.

### Prioritize CBIs

Project staff counted the frequency of each comment code applied to the benefits suggested in survey responses. We considered the codes in the highest third of frequencies higher priority.

Since each code was associated with a benefit category, Project staff ordered the codes according to the category's priority determined in the previous step and then ordered them by code frequency. This process gave staff an idea of the most common ideas in each category in the context of the category's relative importance. Staff then identified the CBIs associated with the higher priority benefits for each category, and the results are shown in Table 3-9.

Table 3-9: Business Customers—Input for CBIs

| Proposed draft customer benefit indicator |
|---|
| Reduction of cost—Reduced energy bills |
| Environment—Reduced greenhouse gas emissions |
| Environment—Decreased fossil fuel extraction |
| Economic—Increased clean energy jobs |
| Economic—Lower unemployment |
| Public Health—Improved community wellness |
| Public Health—Improved air quality |
| Security and resiliency—Increased resiliency |
| Security and resiliency—Decreased time and duration of outages |
| Accessibility—Improved participation from named communities |
| Non-energy —Decreased income spent on electricity |
| Reduction of cost—Reduced barrier to participation |
| Non-energy—Improved sense of self–sufficiency |
| Non-energy—Increased sense of pride and shared values |

### Community-based organization process: Go-to-you meetings

#### Collect input

Project staff attended standing meetings with seven community-based organizations (CBO) between May and July 2021.[25] The locations of and communities served by the organizations are listed below in Table 3-10.

Figure 3-10: Community-Based Organizations

| CBO Name | County | Population Served |
|---|---|---|
| The Rainbow Center | Pierce | LGBTQIA+ |
| Provail | King | People with disabilities |
| NAACP Bremerton | Kitsap | Black/African American |
| Boys and Girls Club Skagit County | Skagit | Youth |
| WWU's Institute for Energy Studies | Whatcom | Students, low-income |
| Opportunity Council of Island County | Island County | Low-income, seniors |
| Island Senior Resources | Island County | Low-income, seniors |

The project team asked meeting participants to suggest potential resulting benefits they would like to see in the clean energy transition based on their experience. Due to time constraints, these participants did not indicate a priority for their benefits.

#### Code and summarize input

Project staff reviewed the suggested benefits and organized them into different codes to be able to compare similar ideas from different advisory groups and get a sense of the frequency of common themes.

#### Develop and apply CBIs

Project staff developed CBIs that could be used to monitor progress toward achieving the benefits described by the input. We applied one CBI to each suggested benefit and the results are shown in Table 3-11.

Table 3-11: Community Based Organization—Input for CBIs

| Proposed draft customer benefit indicator |
|---|
| Non–energy – Decreased income spent on electricity |
| Economic – Increased clean energy jobs |
| Non–energy – Improved sense of self–sufficiency |
| Environment – Decreased fossil fuel extraction |
| Public Health – Improved community wellness |

[25] PSE acknowledges that this does not represent all perspectives, but consistent with CETA, an attempt to engage groups that do not normally participate in the typical electric resource planning process.

| Proposed draft customer benefit indicator |
|---|
| Security and resiliency – Increased resiliency |
| Economic – Reduced Energy burden |
| Non–energy – Improved home comfort |
| Accessibility – Improved awareness and education |
| General – Addressed by collective CBIs |
| Public Health – Improved air quality |
| Reduction of cost – Reduced energy bills |
| Accessibility – Improved participation from named communities |
| Accountability – Customers and Investors |
| Economic – Lower unemployment |
| Environment – Addressed by collective CBIs |
| Environment – Improved siting and mitigation |
| Non–energy – Increased sense of pride and shared values |
| Security and resiliency – Decreased time and duration of outages |

### CBI alignment among sources

Project staff took the CBI input identified from the advisory groups, the residential survey, and the business survey and divided them into top-third, middle-third, and bottom-third based on the previous prioritization process. Project staff highlighted CBIs that occurred more than once among the top-third areas. Then, Project staff compared this to the list of CBIs developed from meetings with CBOs. Table 3-12 shows the results of this comparison.

Table 3-12: Customer Benefit Indicator by Source

| Customer Benefit Indicator | Sources |
|---|---|
| Non-energy—Decrease in income spent on electricity | Advisory Groups<br>General Survey<br>CBOs |
| Reduction of cost—reduce energy bills | Advisory Groups<br>Business Survey<br>CBOs |
| Public Health—Improved air quality | Advisory Groups<br>General Survey<br>CBOs |
| Public Health—Improved community wellness | Advisory Groups<br>General Survey<br>CBOs |
| Economic—Increase in clean energy jobs | Advisory Groups<br>Business Survey<br>CBOs |
| Environment—Reduced greenhouse gas emissions | General Survey<br>Business Survey |

| Customer Benefit Indicator | Sources |
|---|---|
| Environment—Decrease in fossil fuel extraction | General Survey<br>Business Survey<br>CBOs |
| Security and resiliency—Decrease in time and duration of outages | Advisory Groups |
| Public Health—Decreased rates of asthma | General Survey |
| Economic—Lower unemployment | Business Survey |
| Non-energy—Improved sense of self-sufficiency | CBOs |
| Security and resiliency—Increased resiliency | CBOs |

To determine the customer benefit indicators for this draft CEIP, this table was circulated to all the advisory groups, including the EAG, for feedback on whether the list represented the benefits customers wanted to see in this transition and if there were any gaps in the list. PSE also received proposed customer benefit indicators from a joint stakeholder group for our consideration. PSE recognizes the customer benefit indicators will continue to evolve as we consider the list from the joint stakeholder group and feedback from other stakeholders between the draft and final CEIP.

### Highly Impacted communities and vulnerable populations

CETA requires utility resource plans to ensure that all customers benefit from the transition to clean energy. CETA specifically identifies vulnerable populations and highly impacted communities as groups that should benefit from the equitable distribution of energy and nonenergy benefits and reduction of burdens. PSE has invested considerable effort in understanding and identifying customers who may belong to these named communities through customer outreach, collaboration with the EAG, and demographic analysis of the service territory.

This section discusses how we characterize vulnerable populations and highly impacted communities in the 2021 CEIP. The work in this section builds on our initial investigations into defining vulnerable populations and highly impacted communities documented in the 2021 IRP Appendix K, Customer Benefits Assessment[26]. Since the publication of the 2021 IRP, PSE has had numerous opportunities to engage with the EAG, the Washington State Department of Health, the WUTC, customers, and other internal and external stakeholders. This effort provided valuable insight into the identification of vulnerable populations and highly impacted communities. Therefore, the characterization of vulnerable populations, and to a lesser degree, highly impacted communities, has changed from the 2021 IRP to the 2021 draft CEIP, and PSE expects the characterization to continue to evolve as more data, new perspectives, and industry best practices continue to emerge.

[26] 2021 IRP Appendix K, Economic, Health and Environmental Benefits Assessment of Current Conditions: https://pse-irp.participate.online/2021-irp/reports https://pse-irp.participate.online/2021-irp/reports https://pse-irp.participate.online/2021-irp/reports https://pse-irp.participate.online/2021-irp/reports

### Definitions

Named populations include vulnerable populations and highly impacted communities, each with a specific definition from the CETA rulemaking:

**HIGHLY IMPACTED COMMUNITIES.** A community designated by the Department of Health based on the cumulative impact analysis required by RCW 19.405.140 or a community located in census tracts that are fully or partially on "Indian country," as defined in 18 U.S.C. Sec. 1151.

**VULNERABLE POPULATIONS.** Communities that experience a disproportionate cumulative risk from environmental burdens due to: Adverse socioeconomic factors, including unemployment, high housing and transportation costs relative to income, access to food and health care, linguistic isolation, and sensitivity factors such as low birth weight and higher rates of hospitalization.

### Vulnerable Populations

Vulnerable populations' attributes describe disproportionate cumulative risk from burdens due to:

- Adverse socioeconomic factors including unemployment, high housing and transportation costs relative to income, access to food and health care, linguistic isolation; and
- sensitivity factors, such as low birth weight and higher rates of hospitalization.

PSE held a series of meetings with our Equity Advisory Group (EAG) to develop a more comprehensive understanding of vulnerable populations. The collaboration with the EAG informs and directs PSE's work to define, locate, and measure engagement and support for customers to ensure equitable implementation of the CEIP.

The CETA provides a list of primary attributes to define vulnerable populations divided into two classifications: sensitivity factors and socioeconomic factors. Sensitivity factors represent impacts to populations from adverse conditions and have some overlap with highly impacted community factors. Two examples cited in the legislation are low birth weight and increased rates of hospitalization. Socioeconomic factors are attributed mainly to a lack of resources to meet basic needs such as access to food and health care, and high transportation costs. Table 3-13 gives a list of primary factors identified by PSE.

Table 3-13: Factors by Sensitive Populations/Socioeconomic

| Factors | Sensitive Populations (SP) Socioeconomic (SE) |
|---|---|
| Cardiovascular Disease | SP |
| Low Birth Weight | SP |
| Housing Burden | SE |
| Linguistic Isolation | SE |
| Poverty | SE |
| Transportation Expense | SE |
| Unemployment | SE |

The EAG expanded the primary list adding factors derived from their collective experience and interactive sessions with PSE. The expanded list is in the Table 3-14 below:

Table 3-14: Expanded Factors by Sensitive Populations/Socioeconomic

| Factors | Sensitive Populations (SP) Socioeconomic (SE) |
|---|---|
| Disability | SP |
| Cardiovascular Disease | SP |
| Low Birth Weight Rates | SP |
| Higher rates of Hospitalization | SP |
| Heat Islands | SP |
| Home Care | SP |
| Mental Health/Illness | SP |
| Arrearage/Disconnections | SE |
| Access to Digital/Internet Resources | SE |
| Access to Food | SE |
| Access to Health Care | SE |
| Educational Attainment Level | SE |
| Estimated Energy Burden | SE |
| Historical Red Line Influence | SE |
| Housing Burden | SE |
| Linguistic Isolation | SE |
| Poverty | SE |
| Race (People of Color/Black, Indigenous, and People of Color) | SE |
| Renter vs. Owner | SE |
| Seniors with fixed income | SE |
| Transportation Expense | SE |
| Unemployment | SE |

The gray-shaded factors in the table reflect that PSE is either still pursing data resources that will provide metrics to apply to its customer base; or, in the case of historical red line influence, determine how to apply the available information to the present distribution of vulnerable populations within our service area.

PSE will integrate data from several different types of resources. We list most in Table 3-15 except those resources we are still pursuing. We report the data at varied scales ranging in size from county to individual customer. Census block groups provide one helpful scale for PSE to consider vulnerable populations within our service area. Census block groups range between 600 to 3,000 people and serve as a good proxy for neighborhoods. Some data is available at the census tract level, while other data may be available at the customer level. PSE will aggregate our individual customer data to this scale and characterize neighborhoods within our service area across the breadth of factors identified in collaboration with the EAG. Ideally, all data would be available at the neighborhood or individual scale. For those factors where data is not yet available at that scale, PSE will generalize from larger scales until we can locate or develop a better unit of measure. A definition of each expanded factor is listed in Table 3-16.

Table 3-15: Expanded Factors by Data Resource/Scale

| Factors | Data Resource | Data Scale |
|---|---|---|
| Disability | American Community Survey 2019 | Census Block Group |
| Cardiovascular Disease | Washington State Department of Health | Census Tract |
| Low Birth Weight Rates | Washington State Department of Health | Census Tract |
| Higher rates of Hospitalization | Washington State Department of Health | County |
| Heat Islands | TBD | TBD |
| Arrearage/Disconnections | PSE Customer Information System | Customer Level |
| Access to Digital/Internet Resources | PSE Customer Information System | Customer Level |
| Access to Food | USDA Food Access Research Atlas | Census Tract |
| Access to Health Care | Washington State Department of Health | County |
| Educational Attainment Level | Purchased Market Research Data | Customer Level |
| Estimated Energy Burden | Multiple Resources/Customer Level | Customer Level |
| Historical Red Line Influence | Seattle Civil Rights and Labor Project UW | Varied Scales |
| Home Care | TBD | |
| Housing Burden | American Community Survey 2019 | Census Tract |
| Linguistic Isolation | American Community Survey 2019 | Census Block Group |
| Mental Health/Illness | TBD | |
| Poverty | American Community Survey 2019 | Census Block Group |
| Race (People of Color/ Black, Indigenous, and People of Color)) | American Community Survey 2019 | Census Block Group |
| Renter vs. Owner | Purchased Market Research Data | Customer Level |
| Seniors with fixed income | Purchased Market Research Data | Customer Level |
| Transportation Expense | American Community Survey 2019 | Census Block Group |
| Unemployment | American Community Survey 2019 | Census Block Group |

The data for vulnerable population factors are distributed at various numeric scales across PSE's service area block groups. As the Department of Health does with its highly impacted communities

metrics[27], PSE rescaled the distributions of values across the metrics to a standard scale such as 1–5, where one represents the lowest frequency of the factor and five represents the highest frequency of the factor. This method makes the factors easier to interpret for a variety of users. Thus, for a given block group within PSE's electric service area, each factor will receive a score of 1–5. Some metrics such as access to food and historical red line influence may be qualitative. We will flag these metrics with 0 or 1, where 0 indicates an absence of the condition and one indicates the condition is present.

Table 3-16: Expanded Factors Definition

| Factors | Definition |
|---|---|
| Disability | Percentage of HHs reporting a member with disability |
| Cardiovascular Disease | Rate of death from cardiovascular disease |
| Low Birth Weight Rates | Rate of low birth weight |
| Higher rates of Hospitalization | Rate of hospitalization |
| Heat Islands | TBD |
| Arrearage/Disconnections | Percentage of customers in arrearage/disconnected per block group |
| Access to Digital/Internet Resources | Percentage of low digital engagement customers |
| Access to Food | Low income and low access food flag |
| Access to Health Care | Percentage of population with primary care provider |
| Educational Attainment Level | Percentage of customers with less than or high school education |
| Estimated Energy Burden | Percentage of energy burdened customers |
| Historical Red Line Influence | TBD |
| Home Care | TBD |
| Housing Burden | Percentage of population paying more than 30% income for housing |
| Linguistic Isolation | Percentage of households with limited English proficiency |
| Mental Health/Illness | TBD |
| Poverty | Percentage of households in Poverty |
| Race (People of Color/BIPOC) | Percentage of households identifying as BIPOC |
| Renter vs. Owner | Estimated percentage of customers renting |
| Seniors with fixed income | Estimated percentage of customers over 65 at 80% or lower AMI |
| Transportation Expense | Percentage of households with greater than 35-minute commute |
| Unemployment | Percentage of households experiencing unemployment |

Table 3-17 below reports the distribution of vulnerable populations, or scale of vulnerability, across PSE's electric service area. Census block groups within this geography identified with a four or five represent the highest frequency of the metric, while those with a one or a two represent lower frequencies of the metric.

[27] Washington State Department of Health - Washington Tracking Network, A source for Environmental Public Health data: https://fortress.wa.gov/doh/wtn/WTNIBL

Table 3-17: Scale of Vulnerability Across PSE's Electric Service Area[28]

| Factors | Scale of Vulnerability by Quintile Across PSE's Electric Service Area | | | | | Distribution of Flagged Factors | |
|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 0 | 1 |
| Disability** | 19% | 42% | 33% | 5% | 1% | | |
| Cardiovascular Disease** | 20% | 20% | 19% | 22% | 19% | | |
| Low Birth Weight Rates** | 82% | 0% | 2% | 6% | 9% | | |
| Higher rates of Hospitalization*** | | | | | | | |
| Heat Islands*** | | | | | | | |
| Arrearage | 66% | 24% | 6% | 2% | 1% | | |
| Disconnections | 82% | 15% | 3% | 0.5% | 0.1% | | |
| Access to Digital/Internet Resources | 70% | 27% | 2% | 0.8% | 0.1% | | |
| Access to Food (lack of vehicle) | — | — | — | — | — | 84% | 16% |
| Access to Food (half mile urban) | — | — | — | — | — | 76% | 24% |
| Access to Health Care* | — | — | — | — | — | | |
| Educational Attainment Level | 48% | 42% | 8% | 2% | 1% | | |
| Estimated Energy Burden | 89% | 10% | 0.7% | 0% | 0.1% | | |
| Historical Red Line Influence*** | | | | | | | |
| Home Care*** | | | | | | | |
| Housing Burden Owner** | 4% | 46% | 42% | 7% | 1% | | |
| Housing Burden Renter** | 4% | 23% | 52% | 19% | 1% | | |
| Linguistic Isolation** | 71% | 20% | 6% | 1% | 1% | | |
| Mental Health/Illness | | | | | | | |
| Poverty** | 71% | 24% | 4.4% | 0.3% | 0.5% | | |
| Race (People of Color/BIPOC) | 43% | 31% | 17% | 7% | 1% | | |
| Percent Renters | 85% | 12% | 2% | 0.7% | 0.1% | | |
| Seniors with fixed income | 71% | 25% | 3% | 0.8% | 0.1% | | |
| Transportation Expense | 18% | 39% | 30% | 11% | 1% | | |
| Unemployment** | 29% | 52% | 15% | 2% | 1% | | |

PSE will locate higher concentrations of vulnerable populations for those census block groups with a four or five for a given metric. In some cases, we may identify multiple factors at this level indicating a vulnerable geography. From the preliminary results noted in Table 3-17, it appears most census blocks within PSE's electric service area have lower levels of vulnerability. For these census block groups identified with a one or a 2, there may be other indicators available at the individual customer level,

[28] ** The data set referenced from the Washington Department of Health reported results from 2016 at the county level. Across the eight counties where PSE provides electric service, an average of 73 percent of the population reported having access to health care with about a 6 percent variance across the eight 8 counties. PSE will continue to pursue finer scale and more recent data that will provide a more rigorous measure of this metric.*
***Census tract level data*
****PSE is pursing data resources that will provide metrics for these factors*

such as energy burden, that are an indicator to identify customers who may also be experiencing stressors from additional vulnerability factors.

### Highly Impacted Communities

Highly impacted communities (HICs) are defined by the Washington Department of Health Cumulative Impact Analysis (CIA) and identified as census tracts with an overall score on the Environmental Health Disparities (EHD)[29] map of nine or ten, or any census tract with tribal lands.[30] The EHD map ranks communities based on the risks they face, from environmental burdens and vulnerabilities to the impacts of climate change. The criteria used to determine these risks are displayed in Figure 3-1. The risks are calculated using the various criteria shown which creates a final composite score for each census tract. Census tracts with a score of nine or ten are identified as highly impacted.

[29] / *https://fortress.wa.gov/doh/wtn/WTNIBL*
[4] / *https://www.doh.wa.gov/DataandStatisticalReports/WashingtonTrackingNetworkWTN/ClimateProjections/CleanEnergyTransformationAct*

Figure 3-1: Environmental Health Disparities Map: Technical Report Prepared by Washington State Department of Health. Seattle; 2019.

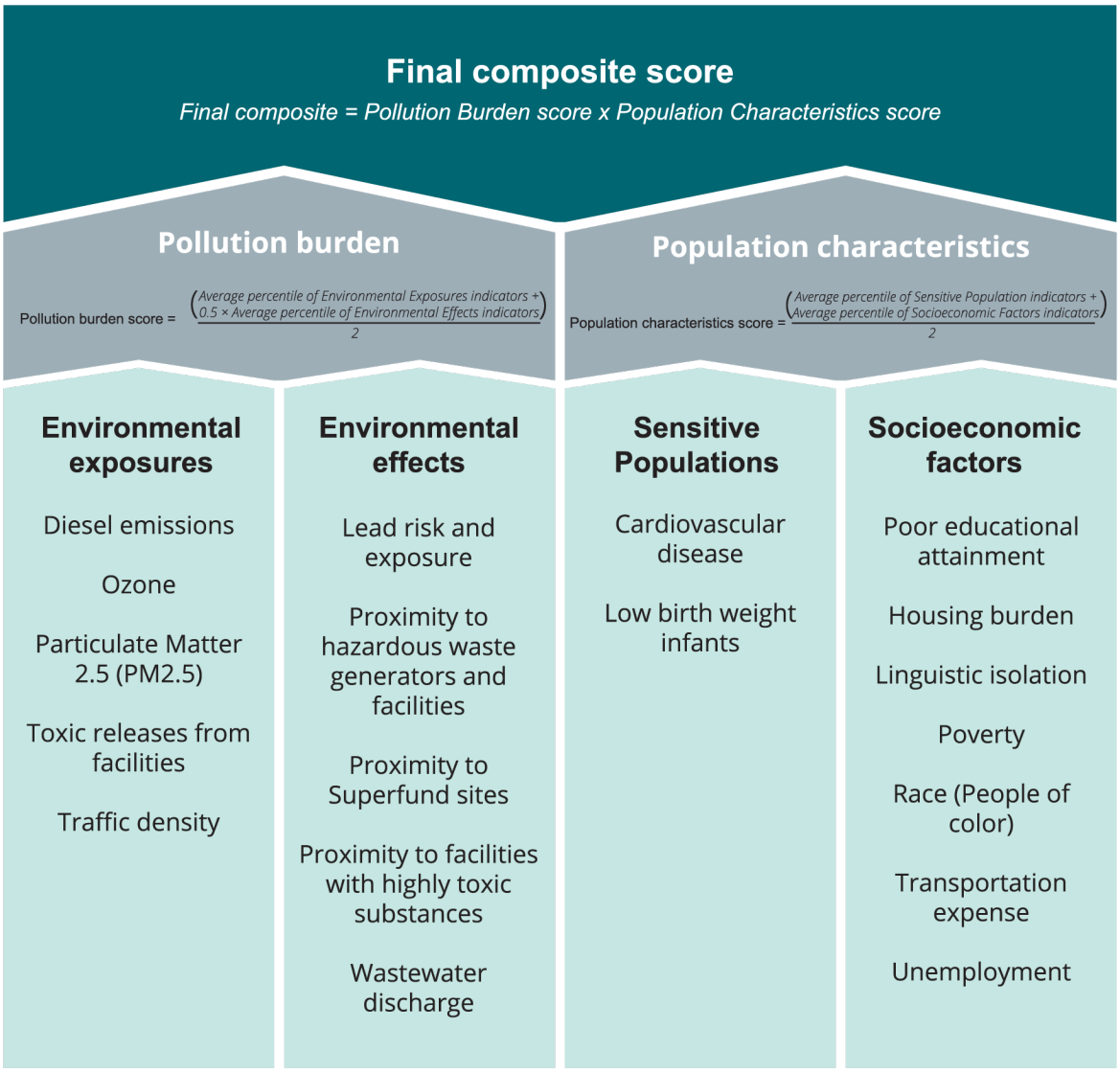
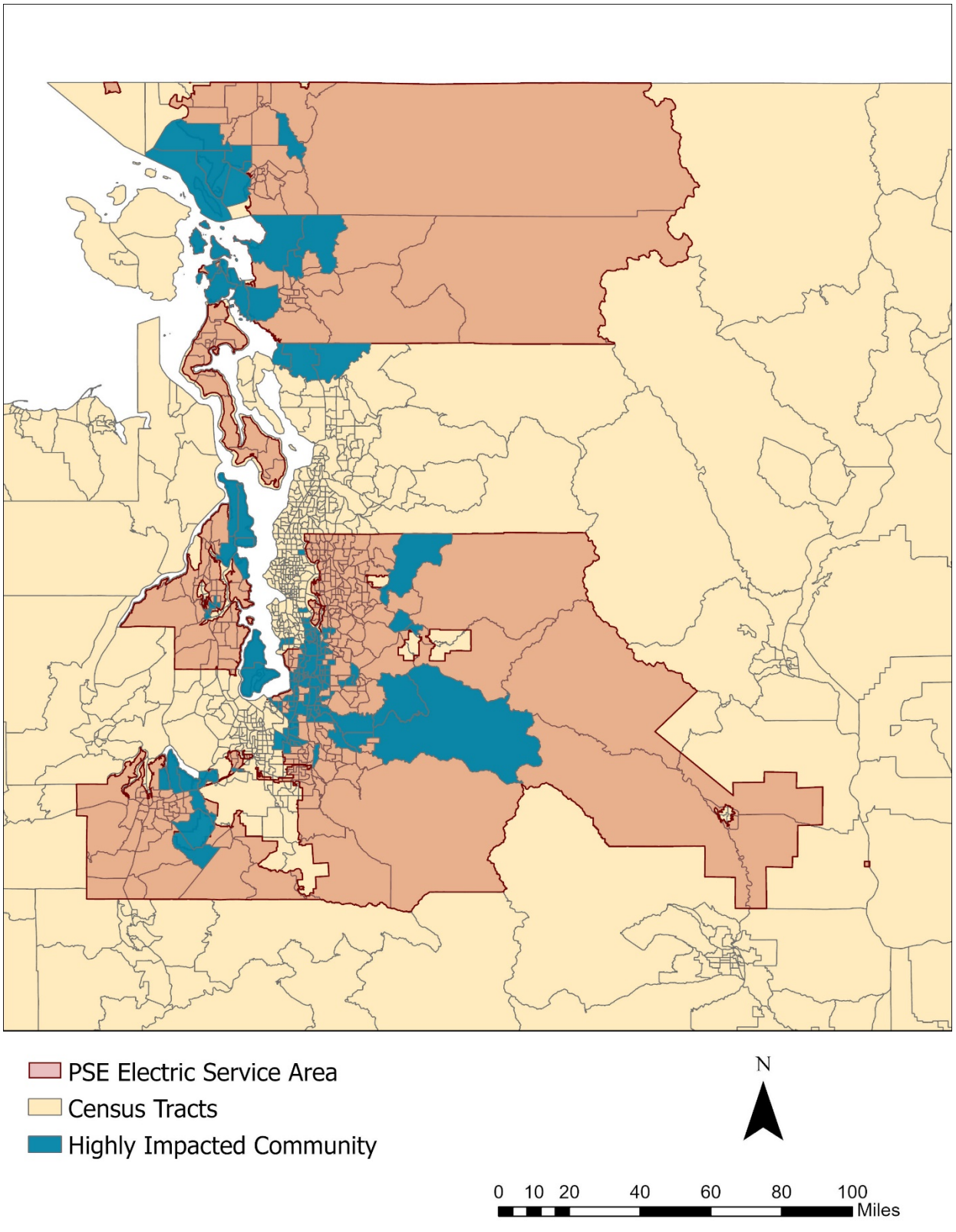



*Figure credit: University of Washington Department of Environmental & Occupational Health Sciences. Washington.*

Using the EHD map as the basis for identifying HICs results in a geographic representation of where the communities exist within PSE's service area. Figure 3-2 shows the highly impacted communities in PSE's electric service area. The CIA has identified 164 census tracts in PSE's service area as highly impacted communities. PSE notes that some census tracts identified as highly impacted communities identified by the CIA are adjacent to and not within PSE's electric service area. PSE has notified the Department of Health of this inconsistency, and we await further refinement of the CIA by the Department.

Figure 3-2: Highly Impacted Communities



### How the clean energy transformation will make lives better for vulnerable populations and highly impacted communities

This CEIP will use the highly impacted communities designation and vulnerable populations factors to ensure the equitable distribution of benefits by:

- identifying the existing disparities in benefits and burdens between customers,
- tracking and measuring progress over time,
- including as a criterion when developing and implementing customer programs, and
- providing guidance on targeted education and awareness to customers.

### Equitable Clean Energy Future

With CETA's intent in ensuring the equitable distribution of benefits, identifying named communities allows PSE to track and report on the progress toward a more equitable future. First, PSE will use these designations to understand the disparities within PSE customer groups. A snapshot of existing customer disparities was reflected in the 2021 IRP, Appendix K[31], to show the difference between various attributes and identify areas where highly impacted communities and vulnerable populations are experiencing a disproportionate burden or benefit in PSE's territory. PSE will continue to evaluate and analyze this data over time and use the information to create and implement new or existing customer programs. Before the 2023 CEIP progress report, PSE will identify and use metrics to monitor the benefits and burdens on vulnerable populations and highly impacted communities through this clean energy transition. In collaboration with the EAG and stakeholders, PSE will define the metrics to track and provide results to the EAG for continued dialogue on progress within these named communities. See Chapter 7, Tracking and Reporting; Appendix H, Customer Benefit Indicator Metrics and Future IRP - Economic, Health, and Environmental Benefits Assessment. An example of this tracking is monitoring the participation rates of PSE customers within a designated highly impacted community. PSE could track the number of participants over time and compare to the broader PSE territory. This information would help identify any gaps in program participation and guide PSE toward targeting the program in a particular area.

These named community designations also assist PSE to create and implement customer programs.

- Vulnerable population factors help shape and design customer programs, based on the factors identified. PSE would look to create programs that provide opportunities for vulnerable populations, like weatherization or distributed storage projects for low-income or multi-family housing areas. An example of this is using one of the vulnerable population factors of poverty, and PSE designing a program that alleviates these existing burdens and still allows for customers experiencing poverty to participate in the clean energy transition. PSE will work with

[31] 2021 IRP Appendix K, Economic, Health and Environmental Benefits Assessment of Current Conditions: https://pse-irp.participate.online/2021-irp/reports

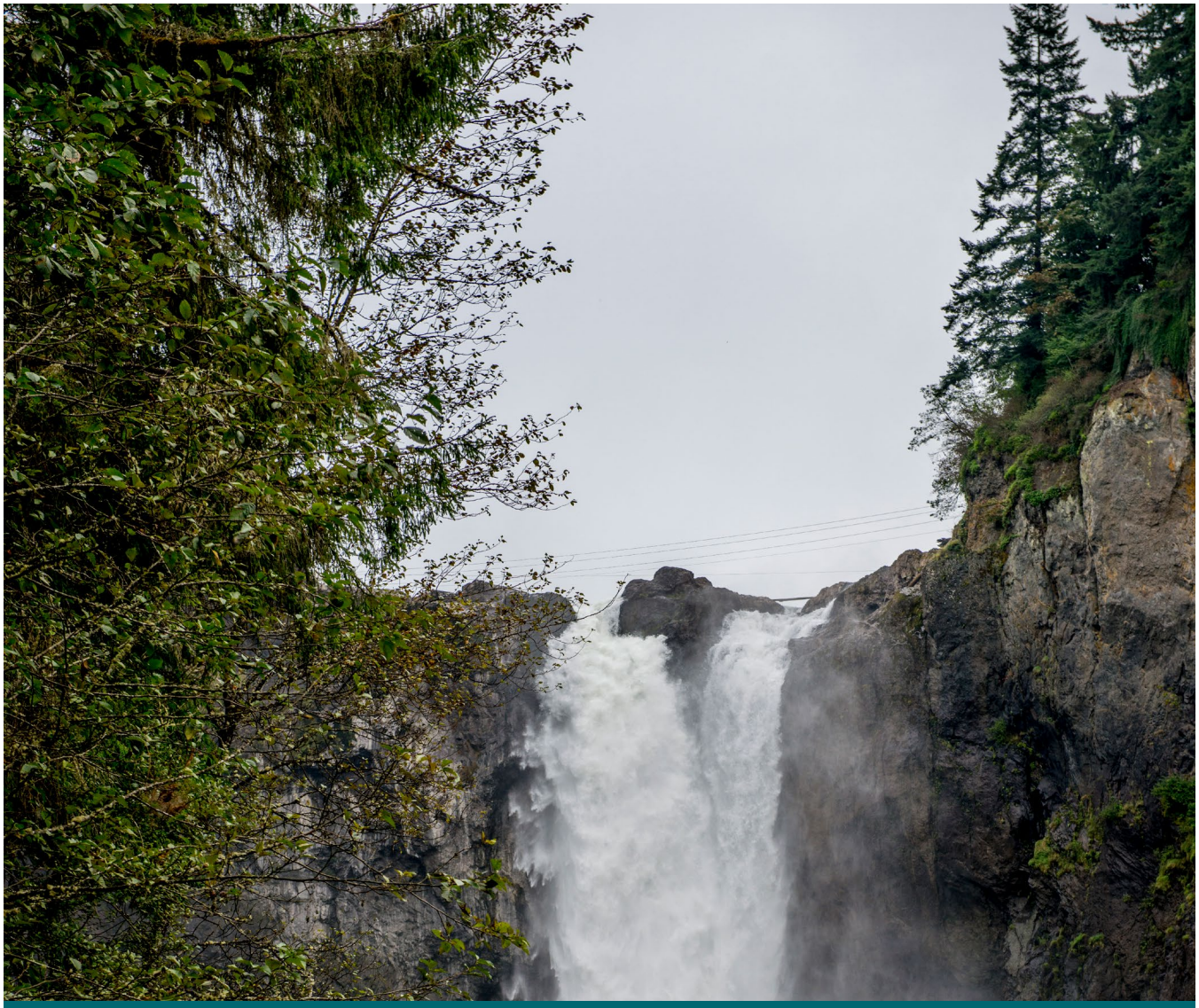
stakeholders to identify some of the burdens of participation for vulnerable populations, and begin to create a program that reduces barriers and provides increased benefits to customers.

- Highly impacted communities help determine the location of potential PSE customer programs. Because these are geographic factors, PSE may look to target specific areas of highly impacted communities for program implementation. One example of this is choosing a specific location within PSE's service territory to initiate an income-eligible community solar project, or income-eligible solar incentive program. By using this highly impacted community mapping, PSE will work directly with customers in the identified area to begin program design and implementation. (See Chapter 4, Specific Actions for additional programs)

**Communication**

A burden PSE heard from stakeholders with a resounding voice was the need for an increase in outreach, education and awareness toward highly impacted communities and vulnerable populations. To begin our targeted communication effort, designating specific communities helps to identify where and how messages are created and delivered. By knowing the factors for vulnerable populations, PSE may adjust and update our marketing and communication efforts, especially for vulnerable populations who may not be aware of the customer programs PSE offers. Knowing who participates in PSE's existing programs is one way to identify where the gaps exist. Mapping participation rates between vulnerable populations and the general customer population will illuminate the disparities and thus raise the question, "What are the barriers?" Much like program implementation, designating highly impacted communities can target specific areas for increased outreach and education. The geographic nature of highly impacted communities gives PSE a visual of where specific highly impacted communities reside, and where to concentrate marketing and personnel. For example, PSE may use the factor of linguistic isolation to revamp its marketing and communication strategy to cater to customers who may not speak English. PSE could work with community-based organizations to develop material for customers in their home language, as well as develop workshops and open houses in a non-English language.

Designating highly impacted communities and vulnerable populations informs PSE, the EAG, and stakeholders on the existing disparities, and indicates where PSE may focus efforts to engage with named communities. This effort provides a pathway forward to diminish disparities and increase participation in programs and clean energy opportunities provided by PSE. This approach also allows PSE to target clean energy investments within specific communities and create opportunities that engage customers who have historically been unable to participate and underrepresented in the customer programming process.



# 4 Specific Actions

# Chapter Four: Specific Actions

## Specific Actions

These specific actions demonstrate Puget Sound Energy's (PSE's) progress toward meeting the standards that all retail sales of electricity to Washington electric customers are greenhouse gas neutral by 2030 and that non-emitting electric generation and electricity from renewable resources supply one hundred percent of all retail sales of electricity by 2045. They also show an assessment of current benefits and burdens on customers and the projected impact of specific actions on the distribution of customer benefits and burdens during the implementation period. Where applicable or feasible, PSE includes the location and population impacted by the distribution of benefits. We not have solidified the data to quantify these benefits yet. However, PSE will continue to investigate ways to address this gap in data in the 2023 Clean Energy Implementation Plan (CEIP) update. We include a description of how the specific actions in the CEIP mitigate risks to highly impacted communities and vulnerable populations in Appendix L and are consistent with the longer-term strategies and actions described in PSE's 2021 Integrated Resource Plan (IRP) and Clean Energy Action Plan (CEAP).

The programs mitigate risks in various ways including reducing costs, increasing resiliency, and increasing participation in clean energy programs. Additionally, the CEIP's specific actions are consistent with the proposed interim and specific targets because the sum of the actions builds to the specific and interim targets, and PSE's resource adequacy requirements. This section includes a description of how the resources identified will meet PSE's resource adequacy standard. The specific actions in the CEIP are consistent with PSE's IRP as described in Chapter 2, Interim and Specific Targets.

PSE's All-Source RFP and Targeted DER/DR RFP are the primary solicitation vehicles for securing resources at the lowest reasonable cost while maximizing customer benefit.

## Energy Efficiency

### Energy Efficiency Specific Actions

Energy efficiency programs and actions reduce the amount of electricity used by customers to meet their needs. This collective reduction in PSE's retail sales results in lower needs for new renewable and non-emitting resources to meet CETA requirements in RCW 19.405.040 and 19.405.050. As a result, both participating customers and nonparticipating customers experience increased affordability of clean energy from these investments. Other customer benefits provided through these investments are the reduction of greenhouse gas emissions and improved outdoor air quality from the reduction of fossil fuel generation needed to serve loads and increases in clean energy jobs. Targeted energy efficiency programs can also produce a decrease in frequency and duration of outages by providing solutions to distribution system constraints. Participating customers see additional benefits and burden reduction through improved home comfort, affordability of clean energy, and improved community health.

PSE is actively planning actions across EE programs to mitigate risk and increase benefits to highly impacted communities and vulnerable populations. PSE formed an internal Diversity Equity and Inclusion (DEI) Committee during the biennial planning process. The DEI Committee is an integrated planning group with PSE staff representing residential programs, business programs, programs support, marketing, outreach, and more. During the planning year, this group added a supplier commitment to diversity section in the RFP process and has worked to develop a more comprehensive understanding of vulnerable populations, highly impacted communities, high energy burden, and emerging factors from the EAG. The group also worked to provide program staff with a basic planning template, metrics, and resources related to these efforts. PSE is also improving its outreach efforts—during the 2022–2023 biennium, PSE will utilize internal and external research to develop culturally relevant outreach to bring integrated energy efficiency (EE) opportunities to highly-impacted communities and vulnerable populations. Related to this effort, there will be a particular focus on "transcreation" of collateral and contractor training to better reach English as a Second Language (ESL) customers within the residential energy management sector.

### Residential Energy Management

Residential energy management programs provide energy efficiency services targeted to PSE customers in their homes. We list the programs we will introduce during the four-year, primary implementation of electric savings within the residential energy management sector in Figure 4-1.

Figure 4-1: Residential Energy Management Programs

- Low Income Weatherization
- Single Family Existing
- Single Family New Construction
- Multifamily Retrofit
- Multifamily New Construction

PSE is taking steps to ensure that highly impacted communities and vulnerable populations (named communities) benefit from the distribution of benefits and reduced burdens from energy efficiency programs. The residential energy management programs will contribute benefits to highly impacted and vulnerable populations. Within these programs, PSE has taken actions to expand benefits to named communities. For example, PSE is expanding equipment and weatherization incentives and customized home energy reports for manufactured home customers.

### Business Energy Management

Business energy management programs provide EE services to PSE's commercial and industrial customers. In Figure 4-2 we list the programs we will implement in the business energy management sector during the four-year period.

Figure 4-2: Business Energy Management programs

- Commercial/Industrial Retrofit
- Commercial/Industrial New Construction
- Energy Performance Incentive Programs
- Large Power User/Self-Directed
- Energy Efficient Technology Evaluation
- Commercial Rebates

PSE is still investigating how business energy management programs can provide benefits and reduced burdens to highly impacted and vulnerable populations. The Commercial Rebates program has a suite of offerings that focus on small-to-medium sized commercial customers, many who are considered hard-to-reach.

**Regional Programs**

In addition to residential energy management programs and business energy management programs, there are energy efficiency programs that provide energy savings that benefit all PSE customers.

Pilots: Pilot programs are developed to test effectiveness and conservation potential of new technologies, test enhanced evaluation, measurement, and verification methodologies, discover ways in which evolving customer demands can be met, and demonstrate adaptive management. Pilot programs help inform future program design and potentially fill the long-term technology pipeline. Most of the time, pilot programs have uncertain savings.

Northwest Energy Efficiency Alliance (NEEA): PSE participates in NEEA as a partner in developing market transformation for energy efficiency that results in energy savings across the region. PSE is assigned a share of those savings proportional to its service territory.

Targeted Demand-side Measures (DSM): Targeted DSM (TDSM) is an energy efficiency initiative that identifies local conservation and demand response potential to mitigate acute infrastructure costs required for capacity constraints. This allows PSE to offer rebates and incentives to PSE customers in these locations that are higher than those in its broader service territory.

Distribution Efficiency: The Production and Distribution Efficiency program involves implementing energy conservation measures within PSE's own production and distribution facilities that prove cost-effective, reliable, and feasible. Within production facilities— power generation—conservation measures reduce ancillary loads at the site and exclude efficiency improvements made to the generating equipment itself. These measures may include, but are not limited to, lighting upgrades, variable speed drives, and compressor upgrades. For transmission and distribution (T&D) efficiency, improvements are implemented at PSE's electric substations to manage distribution system voltage, for example.

For more information regarding PSE energy efficiency programs please refer to Appendix L, CEIP Programs and Actions Master Table.

## Demand Response

### Demand Response Explained

PSE will launch programs that give customers an incentive to shift or permanently reduce their electricity use during peak times. This modification of consumer behavior is called demand response (DR). DR is when customers change their regular electricity consumption in response to changes in the price of electricity or in response to other incentives. DR programs give customers an incentive to use less electricity when the cost of power is high, when system reliability is jeopardized, or when the customer may have an incentive to increase or decrease electricity consumption behind-the-meter. An example of a DR program is a peak hour program where a customer is signed up to participate and their smart thermometer adjusts during these peak conditions.

DR resources are flexible, price-responsive loads that may be curtailed or interrupted during system emergencies or when power prices exceed the utility's supply cost. These loads may be controlled directly by the utility or a third-party partner or may require customers to take action in response to communications and price signals from the utility. DR programs provide customers the opportunity to play a critical role in the operation of the electric grid and receive financial rewards for being flexible. PSE will solicit the marketplace for demand response programs to meet the resource needs as presented in our IRP.

### Demand Response Specific Actions

Per CETA, PSE must meet at least 80 percent of electric sales with non-emitting/renewable resources by 2030 and 100 percent by 2045. Renewable resources are often non-dispatchable, intermittent, distributed, and sometimes controlled by customers behind-the-meter. PSE also requires capacity to continue to meet its peak energy needs. Relying on a high percentage of renewable resources to meet peak energy needs can create challenges for balancing supply and demand, especially during peak times of high use. DR programs ideally result in more efficient asset utilization and reduced reliance on peaking generation, which is often a higher carbon-emitting sources such as natural gas. Demand response programs provide financial incentives for users to be flexible in their electricity use. These programs offer system planners and operators another alternative to balance supply and demand during periods of high use and reduce the total electric resource capacity needed to meet peak demand. PSE anticipates 23.66 MW of total demand response will offset peak demand needs by 2025.

DR programs also contribute benefits to customers and reduce burdens. DR programs allow enrolled customers to gain financial rewards (e.g., participation and performance payments) for reducing electricity use during high-demand times, increasing affordability of clean energy for these customers. The dispatch of DR during peak events can increase resiliency as PSE balances supply and demand within system capacity constraints and can result in decrease in frequency and duration of outages. DR

programs reduce the need to invest in capacity, lowering the overall system costs and customer bills so that all customers experience increased affordability of clean energy from these investments. These shifts and load reductions can also reduce greenhouse gas emissions as the need for carbon-intensive peaking power plants is reduced, also improving outdoor air quality. The information from the Targeted DR RFP will help PSE refine the data necessary to refine forecasted distribution of energy and nonenergy costs and benefits.

PSE is still evaluating how specific DR programs and actions will mitigate risks to highly impacted communities and vulnerable populations. We will use customer benefit indicators and diversity, equity, and inclusion evaluation methods in our procurement selection processes and program design and implementation for all demand response programs.

The CEIP projects specific cost-effective demand response programs for the 2022-2025 implementation period. All the programs are direct load control (DCL) programs. Direct Load Control programs seek to interrupt specific end-use loads at customer facilities through utility-directed control. When necessary, the utility, typically through a third-party contractor, is authorized to cycle or shut off participating appliances or equipment for a limited number of hours on a limited number of occasions. Customers do not have to pay for the control equipment or installation costs and typically receive incentives that are paid through monthly credits on their utility bills.

See Table 4-1 for a program breakdown of the demand response target. These programs and the related acquisition estimates will be refined and adapted based on the results of PSE's forthcoming DER RFP, which is discussed in more detail below. You can find more details on PSE's procurement approach in the DER Enablers - Procurement section.

Table 4-1: 2022–2025 Demand Response Programs

| | Projected MW in 2025 |
|---|---|
| Residential Direct Load Control (DLC) Heat—Switch | 16.41 |
| Residential DLC Heat—Bring your own thermostat (BYOT) | 0.36 |
| Residential DLC Electric Resistance Water Heater—Grid Enabled | 5.10 |
| Residential DLC Heat Pump Water Heater—Grid Enabled | 0.08 |
| Medium Commercial DLC Heat—Switch | 1.71 |
| TOTAL PROGRAMS | 23.66 |

To pursue demand response in this CEIP, PSE takes two initial actions:

1. Complete the distributed energy resource and demand response RFP, and
2. Initiate the time-varying rates pilot.

We may identify additional actions based on responses to the Targeted DER/DR RFP and the time varying rate pilot, which we will incorporate in the 2023 CEIP update.

### Demand Response Request for Proposals and Program Development

On April 1, 2021, PSE issued a Request for Information (RFI) to discern available DER options, including DR, and inform the development of a well-designed and Targeted DER RFP. Using the knowledge gained through the RFI process, the information in the demand response assessment in the 2021 IRP, and knowledge from past pilot projects, PSE will submit a draft DER RFP to the WUTC by November 15, 2021. Once approved by the WUTC, PSE will issue the DER RFP, which we anticipate in early 2022.

### Annual Actions and Costs

#### 2022

PSE will file a draft Targeted DER RFP by November 15, 2021, with the WUTC that includes a request for demand response programs to meet the resource needs established in the 2021 IRP.

At the beginning of 2022, PSE will consider stakeholder feedback on its draft DER RFP and submit a revised DER RFP to the WUTC seeking approval. Once approved PSE will issue the final Targeted DER RFP to vendors in early 2022, develop a shortlist of finalists, and notify bidders in mid-2022. After we create the shortlist, PSE will negotiate proposal specifics and then select vendors and programs.

It is important to note that the management and dispatch of demand response programs require coordination with PSE's Information Technology (IT) and Operational Technology (OT) strategies and operations. In early 2022, PSE will develop a DER asset management strategy to support PSE-owned DR programs (see DER Enablers—Operations Enablement). PSE will develop a DER dispatch and operations strategy to operationalize DR peak load reduction. This strategy will inform the requirements of the final Targeted DER RFP.

In the second half of 2022, PSE will develop an Information Technology/Operations Technology (IT/OT) strategy to create new standards, processes, and roles for operating an extensive portfolio of DERs. To provide a centralized platform for dispatching DERs and to create real-time visibility, PSE aims to incorporate DR into the virtual power plant (VPP) once it is operating. We will also streamline the coordination and operation of DR programs. Please see Grid Mod—Virtual Power Plant for more details on the VPP.

PSE will continue to investigate potential high-value DER opportunities through pilot products, services, and resources. These pilots provide insight into the costs and benefits of unproven concepts proposed through the RFP process or identified later. PSE will include the EAG, highly impacted communities and vulnerable populations in the design and implementation of these programs.

#### 2023

PSE will begin to roll out DR programs and enroll customers as contracted in the Targeted DER RFP process throughout 2023. In early 2023, PSE will start scoping enhancements to the customer

notification platform to communicate DR events, and the customer relationship management (CRM) system to provide critical enrollment and customer support. See DER Enablers—Customer Enablement.

In the first half of the year, PSE will launch a customer enrollment and education portal to create a centralized landing page to help customers learn about the range of DR and other programs available. See DER Enablers—Customer Enablement.

By the end of 2023, enhancements and changes to PSE's billing system customer notification functions to support DR event transactions will be operational and support a comprehensive portfolio of DR programs.

PSE plans to register 5 MW of demand response in 2023.

**2024**

As noted in the Targeted DER RFP, PSE will continue expanding program outreach and enrolling customers in 2024. By the middle of 2024, PSE will launch the enhanced device marketplace where customers can shop for devices and services. PSE will also coordinate with the vendors selected through the RFP to promote specific technologies that support the portfolio of DR programs.

PSE plans to register 6 MW of demand response in 2024.

**2025**

Throughout 2025, PSE will continue rolling out programs and enrolling customers as contracted in the Targeted DER RFP process. PSE will also start an advanced distribution management system (ADMS)-integrated distributed energy resource management system (DERMS) and prepare to incorporate the VPP solution. The robust ADMS-integrated DERMS and VPP solution will enable PSE to coordinate operations with front-of-the-meter and behind-the-meter renewable, storage, and DR solutions.

PSE plans to register 12 MW of demand response in 2025.

**Track and report on progress, costs, and benefits**

PSE's program will track capacity metrics, customer metrics such as program enrollment, customer segment, geographic location, customer benefit indicators, and cost metrics such as administration, equipment, incentives, and operations and maintenance (O&M). For a complete list of reporting metrics, see Chapter 7, Tracking and Reporting. We will start reporting annually in 2023. See Appendix F-2 for detailed estimated Demand Response program budgets and Appendix L, CEIP Programs and Actions Master Table.

## Time-varying Rates Pilot Program

### Time-varying Rates (TVR) Explained

In 2020, Puget Sound Energy (PSE) initiated a process to define goals and objectives (Phase 1) for the creation of a set of alternative pricing pilot programs, time-varying rates. Through customer focus groups and stakeholder engagement, PSE determined the future Time-varying Rates pilot program will be built on the foundations of time-of-use (TOU) and peak time rebate (PTR) rate designs.

PSE is currently in discussion with stakeholders working on rate design process. We will begin to implement a pilot of Time-varying rates in 2024, once we complete rate design, receive tariff approvals, establish measuring and billing systems, and provide for customer enrollment. We developed the proposed treatments after a process of internal calibration of abilities and with the support of the Brattle Group and external stakeholders. The pilot and subsequent treatments totaling roughly 11,200 customers will allow PSE to evaluate the potential implications on revenues commensurate with offering such rates in a full deployment situation while trying to understand customer response and sensitivity to pricing signals more aligned with system constrained periods and marginal costs.

### How these actions move us closer to meeting CETA goals

This program reduces load required to meet peak capacity need and enables greater integration of renewables bringing PSE closer to 80 percent CETA compliance. A glimpse at the impacts to peak reduction by the potential pilot programs are illustrated in Table 4-2.

Table 4-2: TOU Pilot Programs[32]

| Rate | Season | Ratio *(P:OP)* | Estimated Peak Demand Reduction | 50% Derate for Winter Peaking System[33] |
|---|---|---|---|---|
| Residential TOU | Winter | 5.2:1 | 10.9% | 5.5% |
| | Non-winter | 2.8:1 | 6.8% | 3.4% |
| Residential TOU+PTR | Winter | 2.3:1 | 5.5% | 2.8% |
| | Non-winter | 2.2:1 | 5.2% | 2.6% |
| | Event day | 8.4:1 | 11.0% | 5.5% |
| Residential Three-Period TOU (EV) | Winter | 7.5:1 | 12.6% | N/A |
| | Non-Winter | 3.6:1 | 11.9% | N/A |
| Small C&I TOU+PTR | Winter | 2.4:1 | 5.8% | 2.9% |
| | Non-Winter | 2.3:1 | 5.5% | 2.8* |
| | Event day | 8.9:1 | 11.3% | 5.7% |

### Annual Actions and Costs

**2022**

PSE will file for TVR pilots. PSE will also finalize the pilot design, develop customer online tools, implement IT enablement, and develop a go-to-market strategy.

**2023**

PSE will implement an educational and outreach plan to recruit and provide guidance to customers on participating in the program.

**2024**

Implement TVR and customer experience management.

**2025**

Conclude TVR pilot and begin impact evaluation.

---

[32] *For Illustrative Purposes Only, Filed Rates will depend on the GRC Revenue Requirement, COS, and Rate Spread.*

[33] The estimated peak reduction is cut in half because PSE's system is a winter peaking system.

### Customer Benefits

This pilot encompasses four overarching objectives that directly and indirectly benefit customers:

- System cost minimization: reduce costs to serve customers by improving capacity utilization, encourage economic conservation, and peak shaving.
- Customer choice: offer customers options to help them manage their energy bills.
- Equity and accessibility: design and offer rates and programs that consider needs and effects on low-income and vulnerable populations.
- Integrate renewables: invest in and successfully and economically integrate renewable resources to help PSE achieve CETA goals.

### Track and report on progress, costs, and benefits

PSE will track the total peak demand reduction within each pilot treatment group as compared to the control group. Despite the relatively small pilot sample sizes of roughly 11,200 customers, PSE will also measure retention rates, customer satisfaction, and bill savings. See Appendix L, CEIP Programs and Actions Master Table

## Renewable Energy

### The renewable energy target includes predictable changes in energy costs

PSE seeks to meet an incremental cost in 2022–2025 that meets the 2 percent annual average incremental cost guidance. To determine which resources to use to meet this target, we consider the relationship between the different targets. During the first CEIP period, energy efficiency is adopted according to its cost effectiveness, which is required by rule. Demand Response is adopted according to the most cost-effective programs and at the market potential rate to achieve the goals of the CEAP, which are over 80 percent of the 25-year market potential adopted in just the first 10 years. Distributed solar is adopted at a rate that provides market acceleration from todays' installation rate, but not an unachievable pace.

The rest of this section describes the renewable energy actions we will take during the 2022–2025 period, and how they contribute to the renewable energy target. Some of these actions decrease the retail load used to calculate PSE's CETA compliance position, while others directly meet PSE's CETA compliance needs.

## Actions that Contribute to Renewable Energy

### 2021 All Resources Request for Proposals (All-Source RFP)

**The annual MWh associated with this program over the next four years is:** 1,256,988 MWh

### 2021 All-Source Request for Proposals Explained

An All-Source RFP follows an IRP if the IRP demonstrates that a utility has a resource need within four years (WAC chapter 480-107). The 2021 IRP shows PSE needs additional resources to help meet its peak capacity and CETA compliance targets. The 2021 All-source RFP seeks bids from commercially proven and CETA-compliant resources 5 MW or larger to supply up to 1,669 GWh of CETA energy resources by 2026. This figure aligns with our preferred portfolio's 10-year CEAP annual resource additions, which forecasts 400 MW of renewable resource additions in 2025. The actual nameplate capacity we acquire may vary depending on the type and capacity factors of the resources that submit bids. The All-Source RFP also seeks up to 1,506 MW of CETA-compliant capacity resources by 2027. PSE will consider any electric generation, storage, or other resource type or technology that can meet all or part of the resource need, provided that the resource complies with all laws and regulations and meets the minimum qualification requirements of the RFP.

### How these actions move us closer to meeting the CETA goals

This All-Source RFP will result in the acquisition of clean energy resources that will help PSE reach the CETA renewable energy target.

In addition to a quantitative (price) analysis, the All-Source RFP features a qualitative (non-price) evaluation. Our RFP review assigns the highest weight to the customer benefit category among the qualitative evaluation criteria, i.e., a proposal's potential to contribute to customer benefit provisions outlined in RCW 19.405.040(8). All bidders must submit a customer benefits plan and provide information on how their proposals contribute to CETA's aim to ensure that all customers benefit from the transition to clean energy. Our qualitative evaluation will measure how the proposal aligns with the customer benefit indicators introduced further refined and prioritized in the CEIP.

### Annual Actions and Costs

### CETA Energy Need

To align PSE's procurement approach with the IRP's ramping strategy to meet the company's 2030 CETA requirement, PSE prefers to acquire enough CETA-eligible resources by the end of 2025 to meet our 2026 target. Table 4-3 provides an approximate strategy, or glide path, for meeting the CETA needs we identified in the 2021 All-Source RFP by 2026. We presented an estimated glide path to inform bidders that PSE has flexibility in the timing of resource additions and that we prefer a smooth transition. A smooth ramp-up will help flatten potential rate effects and ease operational impacts. The glide path is indicative; the timing of actual resource acquisitions will depend on the proposals received, their relative portfolio benefit, and how they maximize customer benefits. We will evaluate all eligible resource types, wind, solar, DR, DER, and other CETA-eligible resources, based on their ability to help meet the need and the capacity identified in Table 4-3. The All-Source RFP does not include resource-specific targets.

Table 4-3: CETA Need by Year in Approved RFP

| CETA Need in GWh | 2022 | 2023 | 2024 | 2025 | 2026 |
|---|---|---|---|---|---|
| CETA qualifying resources | 7,398 | 9,045 | 9,087 | 8,963 | 9,016 |
| 2021 IRP Draft CETA Energy Target - Mid with Conservation | 7,398 | 8,345 | 9,297 | 10,059 | 10,958 |
| CETA Need/(Surplus) | 0 | (699) | 210 | 1,096 | 1,942 |
| Net Hydro CETA energy additions | (499) | (499) | (442) | (275) | (273) |
| Adjusted CETA Need/(Surplus) | (499) | (1,198) | (232) | 821 | 1,669 |
| Need Assuming 36% Capacity Factor (WA Wind) (MW) | | | | 260 | 529 |
| Need Assuming 24% Capacity Factor (East WA Solar) (MW) | | | | 391 | 794 |

** CETA need figures above may be revised to consider resources sought through the Targeted DER RFP when finalized and approved.*

### Capacity Need

PSE's demand forecast demonstrates a need for 369 MW of new electric capacity resources in 2026, which we expect will increase to 527 MW in 2027. This forecast reflects PSE's F2020 typical peak load forecast. The forecast also includes the impact of removing PSE's interests in the Colstrip Power Plant Units 3 and 4 from PSE's allocation of electricity after 2025; the expiration of the Centralia Power Purchase Agreement (PPA); the additional resources PSE acquired through the 2018 All-Source RFP; and the addition of intermediate-term hydroelectric contracts.

PSE's current transmission portfolio includes approximately 1,500 MW of firm transmission rights that deliver energy from the Mid-C trading hub to the PSE load center. Chapter 7 of the 2021 IRP[34] included a market risk assessment that evaluated the ongoing availability of the short-term power contracts associated with the transmission rights. As a result, PSE proposes to address market risk by gradually reducing the short-term market purchase limit associated with the transmission rights from the Mid-C trading hub from approximately 1,500 MW to about 500 MW by the year 2027. This reduction in market reliance increases the capacity need. In this All-Source RFP, PSE will seek contracts backed by CETA-compliant resources to replace those short-term contracts.

Table 4-4 provides an approximate strategy, or glide path, for meeting the capacity needs identified in the 2021 All-Source RFP by 2027. We presented an estimated glide path to inform bidders that PSE has flexibility in the timing of resource additions and that we prefer a smooth transition. A smooth ramp-up will help flatten potential rate effects and ease operational impacts. The glide path is indicative; the timing of actual resource acquisitions will depend on the actual proposals received, their relative portfolio benefit, and how they maximize customer benefits.

[34] *2021 IRP Chapter 7: https://oohpseirp.blob.core.windows.net/media/Default/Reports/2021/Final/07.IRP21_Ch7_032921.pdf*

Table 4-4: Cumulative Capacity Need by Year

| Need/(Surplus) and Additions in MW | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 |
|---|---|---|---|---|---|---|
| 2021 Draft IRP Need/(Surplus) | (230) | (350) | (306) | (257) | 369 | 527 |
| Reduced Market Reliance Need | | 185 | 372 | 574 | 776 | 979 |
| Total Resource Need/(Surplus) | (230) | (165) | 66 | 317 | 1,145 | 1,506 |
| Net Hydro Capacity Additions | (101) | (106) | (71) | (71) | (71) | |
| Adjusted Total Resource Need/(Surplus) | (331) | (271) | (5) | 246 | 1,074 | 1,506 |
| Estimated Glide Path of Incremental Resource additions | | 300 | 300 | 300 | 300 | 306 |

**2022**

We received responses to PSE's All-Source RFP September 1, 2021, and PSE expects to complete Phase 1 of our evaluation process in the first quarter of 2022. PSE will conduct portfolio optimization modeling and due diligence on the proposals that make it to Phase 2 and we expect to establish a shortlist for contract negotiations by July 2022. Phase 2 of the RFP will also include an updated load forecast, which incorporates climate change, as well as updated effective load carry capabilities of resources. This work will be used in the 2023 IRP update. PSE aims to execute contracts with shortlisted bidders by the end of 2022.

**2023**

Most proposals to the All-Source RFP will be development proposals. Therefore, after executing contracts with the shortlisted bidders as power purchase agreements or ownership by PSE at or after commercial operation, PSE will begin work with the successful bidders. We will monitor the progress and completion of development work, construction, and energization of these new resources to ensure they reach timely commercial operation. Depending upon the type of resource and stage of development, lead times can be two years or more. The estimated RFP glide path for resource additions anticipates that we may add new resources to PSE's portfolio as early as 2023. The actual timing of new resources acquisitions through the RFP will depend on the nature of bid proposals received, their relative portfolio benefit, and how they maximize customer benefits. In 2023, PSE will also look to the two-year IRP progress report for any changes in resource need that might necessitate an additional resource solicitation.

**2024**

The 2021 All-Source RFP's estimated glide path anticipates PSE will add 821 GWh of new CETA energy resources by the end of 2024. At least 246 MW of CETA-compliant capacity resources are targeted to be online by the start of 2025 to meet the combined incremental IRP capacity need and strategic need for reduced reliance on short-term market purchases. The glide paths are indicative; the timing of resource acquisitions will depend on the actual proposals received, their relative portfolio benefit, and how they maximize customer benefits.

### 2025

By the end of 2025, the estimated glide path anticipates PSE will secure an additional 848 GWh of CETA energy resources to meet the 2021 RFP target of 1,669 GWh of new CETA energy starting in 2026. This timeframe is in line with the IRP's ramping strategy. We anticipate new capacity resource additions will reach 1,107 MW by the start of 2026 to meet both incremental capacity needs and the strategic need for reduced reliance on short-term market purchases. The glide paths are indicative; the timing of resource acquisitions will depend on the actual proposals received, their relative portfolio benefit, and how they maximize customer benefits. In 2025, the planned release of a new IRP will inform and potentially trigger the start of a new All-Source RFP cycle. In the meantime, PSE also can issue a Targeted or voluntary RFP prior to the next required RFP.

### Customer Benefits

Resources acquired through the All-Source RFP can provide a broad spectrum of customer benefits: environment, economic, health, energy and non-energy benefits, and energy security and resiliency. The 2021 All-Source RFP will introduce a sizable amount of renewable and CETA-compliant resources, including wind, solar, and storage, to PSE's portfolio and displace retiring coal generating facilities. This scenario will significantly reduce greenhouse gas emissions, improve public health, as well as create new jobs, business opportunities, and local revenue sources. The All-Source RFP encourages and assigns value to resources that demonstrate reduced burdens to vulnerable populations and highly impacted communities. The RFP also weighs programs that provide opportunities to underrepresented segments of people, including women-, disabled-, and veteran-owned businesses. By aiming to secure resource-specific contracts that reduce reliance on short-term market purchases, the All-Source RFP will also contribute to the energy security of our customers, in line with the regional resource adequacy program in development by the Northwest Power Pool.

### Track and report on progress, costs, and benefits

The All-Source RFP asks bidders to identify and explain specific plans and ways their proposals will address the CETA customer benefits and incorporate diversity, equity, and inclusion. PSE will look for commitments from bidders to carry out the customer benefit plans required of all submissions and to track the contributions of a proposed project.

In addition to evaluating proposals for commitments by bidders to track the customer benefit contributions of their projects, contracts with selected shortlisted resources will contain provisions that require PSE's contractual counterparties to provide periodic reports.

Beyond the evaluation process, PSE will internally track the progress of projects with signed PPA’s to meet the capacity and energy need. PSE will monitor any delays or challenges to construction and any cost implications. See Appendix L, CEIP Programs and Actions Master Table.

## Distributed Energy Resources (DER) Solar

### Solar Programs

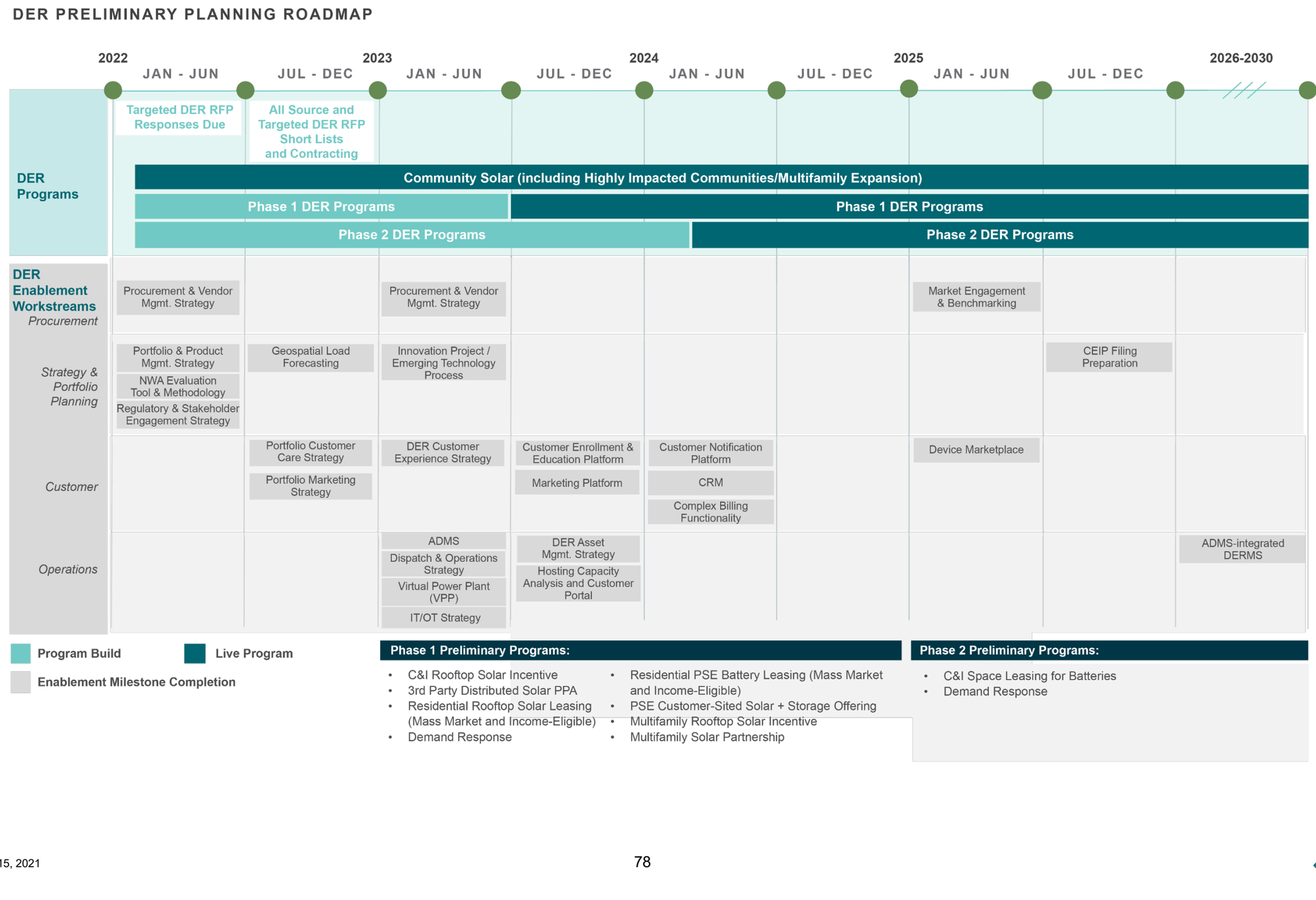
The 2021 IRP preferred portfolio identified 80 MW of distributed solar needed by 2025. PSE aims to meet this need through a diverse set of solar programs. PSE is committed to delivering distributed solar programs for our customers that are affordable, safe, and accessible to all. PSE's proposed suite of solar programs go beyond current offerings, such as net metering, and will enable customers to participate in and benefit from clean energy generation, either at a reduced cost from incentives or without any upfront investment, including innovative programs for traditionally underserved populations. PSE developed a preferred portfolio selection process to derive a selection of distributed solar program concepts that will help PSE achieve its goals. A final set of program designs will be determined through the outcomes of the Targeted DER RFP. To learn more about how we selected these preferred program concepts, refer to Chapter 2, Interim Targets and Specific Targets, CEIP Methodology and Appendix D. We discuss the Targeted DER RFP process below.

To help fulfill the needs of the preferred portfolio, PSE will seek program designs from the market through an RFP process. PSE issued an RFI to understand the availability of DER resources in our service territory on May 15, 2021. Using the information gathered from the RFI, PSE will issue a draft RFP on November 15, 2021, seeking bids from the market for DER solutions and services, including distributed solar programs. PSE plans to release the final RFP to bidders in February 2022, with the shortlist and bidder notification period to follow in mid-2022.

PSE proposes to implement distributed solar programs with different ownership models to expand participation to traditionally underserved populations. PSE will own and operate distributed solar by leasing rooftop space from residential customers, enabling PSE to generate renewable energy to supply the grid while paying customers a monthly lease. PSE will also offer incentives for customers and third-party solar owners to reduce cost barriers of solar ownership for all customers, including income-eligible populations. PSE will facilitate solar photovoltaic (PV) installation at multi-family unit buildings by partnering with technology providers and providing billing support that spreads production across tenant units and enables customers who live in apartment buildings to benefit from the solar programs.

The solar programs described in this section will add additional renewable solar generation to PSE's service territory while contributing to an equitable distribution of energy and non-energy benefits and reducing burdens to vulnerable populations and highly impacted communities. A timeline for the proposed introduction of distributed solar programs is available in Figure 4-1. Please see the summary of program energy benefits and program costs in Table 4-7.

Figure 4-3. PSE's **Preliminary** DER Program Roadmap



## Distributed Solar Programs with Utility-owned Assets

**The annual MWh associated with this program over the next four years is:** 6,600 MWh

### Distributed Solar Programs with Utility-owned Assets Explained

Distributed Energy Resources (DERs), including distributed solar, comprise a significant portion of the preferred portfolio in the 2021 IRP. This section focuses on programs with PSE-owned solar installations to expand access and benefits of solar. Besides providing Community Solar programs (see Chapter 4 – Community Solar), this CEIP identifies that a residential rooftop leasing program, where PSE will lease rooftop space from residential customers to install and operate solar photovoltaic, would also be part of a low-cost portfolio that provided significant customer benefit. Customers will receive a monthly lease payment, and PSE will generate renewable energy to supply the grid. This DER approach enables customers to participate and benefit from clean energy generation without any upfront investment.

### How these actions move us closer to meeting CETA goals

This DER solar program brings additional renewable solar generation to PSE's service territory, which contributes to meeting peak capacity requirements. The MWh generated by this program counts toward the CETA MWh compliance need. PSE anticipates a total of 4.9 MW of nameplate solar capacity and 6,600 MWh of annual solar energy generation for the complete program by the end of 2025.

### Annual Actions and Costs

#### 2022

In 2022, PSE will first identify and work with community members to design the program and leverage our Targeted DER RFP. We will determine program costs and create an implementation timeline with input from stakeholders, including the Equity Advisory Group, external benchmarking, and cost data obtained through our Targeted DER RFP.

Throughout 2022, PSE will work internally to develop the scope and costs of the program, including capital purchases. PSE, in consultation with stakeholders, will design a marketing and outreach plan for customer enrollment. PSE will establish program eligibility requirements and enrollment processes. We will complete vendor selection contingent on program approval based on the functional and technical requirements defined in the portfolio and product management strategy (see DER Enablers – Strategy and Portfolio Planning).

PSE will investigate potential high-value distributed solar opportunities throughout 2022 through pilot products, services, and resources (see DER Enablers—Strategy and Portfolio Planning). These pilot programs will provide insight into the costs and benefits of unproven concepts proposed through the RFP process or later identified.

**2023**

In the beginning of 2023, PSE will research enhancements to the customer relationship management (CRM) system (see DER Enablers—Customer Enablement). PSE will also scope billing system changes to reflect monthly lease payments on customers' bills and begin complex billing enhancements as needed (see DER Enablers—Customer Enablement). PSE will file tariffs for Phase 1 programs, including the Residential Rooftop Solar Leasing program, to submit to the WUTC (see DER Enablers—Strategy and Portfolio Planning).

By mid-2023, PSE will launch the new program and implement an educational and outreach plan to educate and guide customers on how they can participate. In late 2023, PSE will prioritize complex billing and CRM feature sets minimally needed to support the roll out of the Residential Rooftop Solar Leasing program.

By the end of 2023, PSE will complete the installation of 1.3 MW of nameplate distributed solar capacity.

**2024**

In early 2024, PSE will launch a customer enrollment and education portal to create a centralized landing page to help customers learn about the range of distributed solar programs and other programs available (see DER Enablers—Customer Enablement). Also, additional CRM capabilities and billing features will launch.

PSE will continue to construct rooftop solar on enrolled customers' homes. PSE plans to complete 1.6 MW of nameplate distributed solar capacity construction in 2024. PSE will provide education through mass-market residential channels such as online, bill inserts, and partnerships with market actors.

**2025**

PSE will continue building rooftop solar projects for enrolled customers and educating customers on the program. PSE will complete 1.9 MW of nameplate distributed solar capacity construction in 2025. PSE will provide education through mass-market residential channels such as online, bill inserts, and partnerships with market actors.

**Customer benefits**

This program provides non-energy, environmental, and health customer benefits. The program contributes to reduced greenhouse gas emissions by allowing PSE to install solar for clean energy generation, which contributes to improved air quality. This program directly benefits customers by providing a credit to the customer's utility bill through reduced cost impacts. The installation of these solar PV systems will support an increase in clean energy jobs. By taking these specific actions, customers, including named communities, will face decreasing health and environmental burdens. See Table 3-1 for PSE's customer benefit indicators.

### Track and report on progress, costs, and benefits

PSE will track system and program capacity and energy metrics, customer metrics such as program enrollment, customer segment, geographic location, customer benefit indicators, and cost metrics such as administration, equipment, and O&M. For a complete list of reporting metrics, see Chapter 7, Tracking and Reporting. PSE will report annually, starting in 2023. See Appendix L, CEIP Programs and Actions Master Table.

## Distributed Solar Programs with Non-utility-owned Assets

**The annual MWh associated with this program over the next four years is:** 62,737 MWh

### Distributed Solar Programs with Non-utility-owned Assets Explained

In addition to the programs that use PSE-owned solar, we will also launch programs that support customer- and third-party-owned solar. PSE will offer various incentive programs such as commercial and industrial (C&I) rooftop solar incentives and PSE customer-sited solar and storage to help reduce cost barriers to solar ownership. In addition to programs specifically focused on vulnerable populations, PSE will offer higher incentives for income-eligible customers and non-profit organizations. PSE will also work with third parties to expand distributed solar through PPAs.

### How these actions move us closer to meeting CETA goals

These distributed solar programs bring additional renewable solar generation to PSE's service territory. This new energy contributes to meeting peak capacity requirements and is a renewable energy source. PSE can count MWh generated by these programs toward the CETA MWh compliance and load reduction. We anticipate 46.2 MW of nameplate solar capacity and 62,737 MWh of annual solar energy will be generated when the program is complete, at the end of 2025.

### Annual Actions and Costs

### 2022

In 2022, PSE will begin to design the programs. We will identify and work with community members to start the process and use information gathered via our Targeted DER RFP. We will determine program costs and create an implementation timeline with input from stakeholders, including the Equity Advisory Group, external benchmarking, and cost data obtained through our Targeted DER RFP.

Throughout 2022, PSE will work internally to develop the scope and costs of the program, including capital purchases. PSE, in consultation with stakeholders, will design a marketing and outreach plan for customer enrollment. PSE will establish program eligibility requirements and enrollment processes.

PSE will investigate potential high-value distributed solar opportunities throughout the year through pilot products, services, and resources (see DER Enablers—Strategy and Portfolio Planning). These pilots

will provide insight into the costs and benefits of unproven concepts proposed through the RFP process or later identified.

**2023**

In the beginning of 2023, PSE will research enhancements to the customer relationship management (CRM) system (see DER Enablers—Customer Enablement). PSE will also scope billing system changes to reflect monthly lease payments on customers' bills and begin complex billing enhancements as needed (see DER Enablers—Customer Enablement). PSE will file tariffs for Phase 1 programs, including the C&I Rooftop Solar Incentive, Third-Party Distributed Solar PPA, and the PSE customer-sited Solar + Storage, to submit to the WUTC (see DER Enablers—Strategy and Portfolio Planning).

By mid-2023, PSE will launch Phase 1 programs. We will implement an educational and outreach plan to educate and provide guidance to customers on how they can participate in the programs. PSE will also begin registration and interconnection support for new systems.

In late 2023, PSE will prioritize complex billing and CRM feature sets minimally needed to support the roll out of the programs. PSE plans to register 14.7 MW of nameplate distributed solar capacity in 2023.

**2024**

In early 2024, PSE will launch a customer enrollment and education portal to create a centralized landing page to help customers learn about the range of distributed solar programs and other programs available (see DER Enablers—Customer Enablement). Additional CRM capabilities and billing features will launch.

We will continue registration and interconnection support for new systems throughout 2024. PSE will scope a device marketplace that includes a list of potential solar products so customers can shop for solar PV systems and services. We will launch this marketplace in the first half of 2025 (see DER Enablers—Customer Enablement).

PSE will register 15.4 MW of nameplate distributed solar capacity in 2024. We will provide education through mass-market commercial and residential channels such as online, bill inserts, and partnerships with market actors.

**2025**

PSE will continue device registration and interconnection support for new devices throughout 2025. Early in 2025, the device marketplace will launch and allow PSE to support more customers in their journey to adopting solar.

We plan to register 16.1 MW of nameplate distributed solar capacity enrolled in these programs in 2025. PSE will also educate targeted populations through mass-market commercial and residential channels such as online, bill inserts, and partnerships with market actors.

### Customer Benefits

These programs provide customer benefits in energy, non-energy, environmental, health, energy security, and resiliency. These programs reduce greenhouse gas emissions by supporting the adoption of solar for clean energy generation, which contributes to improved outdoor air quality. These programs increase the affordability of clean energy by lowering the cost of solar energy. When paired with storage, solar will contribute increased resiliency with decreased time and duration of outages and can improve home comfort and community health when using energy storage instead of generators. Finally, the installation of these solar PV systems will support an increase in clean energy jobs. See Table 3-1 for PSE's customer benefit indicators.

### Track and report on progress, costs, and benefits

The program will track system and program capacity and energy metrics, customer metrics such as program enrollment, customer segment, geographic location, customer benefit indicators, and cost metrics such as administration, equipment, and O&M. For a complete list of reporting metrics, see Chapter 7. PSE will report annually, starting in 2023. See Appendix L, CEIP Programs and Actions Master Table.

## Distributed Solar Programs for Vulnerable Populations

**The annual MWh associated with this program over the next four years is:** 3,622 MWh

### Distributed Solar Programs for Vulnerable Populations Explained

In addition to PSE-, customer-, and third-party solar programs described in prior sections, PSE will offer programs specifically designed to reduce barriers for vulnerable populations to access and benefit from DERs. PSE will expand beyond existing programs (e.g., the portion of the community solar program that will directly benefit income-eligible customers and installations funded by PSE's Green Power Solar Grants) to offer programs that support vulnerable populations. PSE will provide a monthly lease payment option to income-eligible and highly impacted single-family residential customers to access rooftop space for photovoltaic (PV). PSE will support the adoption of solar PV at multi-family unit buildings through partnerships and incentives for multi-family customers. PSE will facilitate solar PV installation on multi-family buildings by connecting with technology providers and billing support systems to share production across units. PSE will also offer multi-family unit building owners incentives to reduce their upfront cost to install and own solar in PSE's service territory.

### How these actions move us closer to meeting CETA goals

These programs bring additional renewable solar generation to PSE's service territory and contribute to an equitable distribution of energy and non-energy benefits by reducing burdens to vulnerable populations and highly impacted communities. These programs contribute to meeting peak capacity requirements and are also a renewable energy source for customers. PSE can count MWh generated by these programs toward the CETA MWh compliance need and load reduction. We anticipate a total

of 2.7 MW of nameplate solar capacity and 3,622 MWh of annual solar energy will be generated when the program is complete, at the end of 2025.

**Annual Actions and Costs**

PSE can count MWh generated by these programs toward the CETA MWh compliance need and load reduction. We anticipate a total of 2.7 MW of nameplate solar capacity and 3,622 MWh of annual renewable energy generation by the end of 2025. In partnership with community-based and non-profit organizations, PSE will educate targeted vulnerable populations through open houses, multilingual offerings, and billing inserts. We will conduct stakeholder feedback sessions with community organizations to help plan subsequent CEIP programs.

**2022**

In 2022, PSE will begin to design the programs. We will identify and work with community members to start the process and use information gathered via our Targeted DER RFP. PSE will conduct community outreach and solicit input on expanding solar PV access and benefits for vulnerable populations. We will determine program costs and create an implementation timeline with input from stakeholders, including the Equity Advisory Group, external benchmarking, and cost data obtained through our Targeted DER RFP.

Throughout 2022, PSE will work internally to develop the scope and costs of the program, including capital purchases. In consultation with stakeholders, PSE will design a marketing and enrollment outreach plan that maximizes accessibility to a diverse set of customers. PSE will establish program eligibility requirements and enrollment processes.

PSE will complete vendor selection contingent on approval for the Residential Rooftop Solar Leasing program based on the functional and technical requirements defined in the portfolio and product management strategy (see DER Enablers—Strategy and Portfolio Planning).

PSE will investigate potential high-value distributed solar opportunities throughout the year through pilot products, services, and resources (see DER Enablers—Strategy and Portfolio Planning). These pilots will provide insight into the costs and benefits of unproven concepts proposed through the RFP process or later identified.

**2023**

In the beginning of 2023, PSE will scope enhancements to the customer relationship management (CRM) system. PSE will also scope billing system changes to reflect monthly lease payments on customers' bills and begin complex billing enhancements as needed (see DER Enablers—Customer Enablement). PSE will file tariffs for Phase 1 programs, including the Residential Rooftop Solar Leasing program for income-eligible customers and multi-family solar programs, to submit to the WUTC (see DER Enablers—Strategy and Portfolio Planning).

By mid-2023, PSE will launch Phase 1 programs. PSE will implement an educational and outreach plan to educate and guide customers on how they can participate. In late 2023, PSE will prioritize complex billing and CRM feature sets minimally needed to support the roll out of the programs.

By the end of 2023, PSE will complete 0.8 MW of nameplate distributed solar capacity.

In partnership with community-based organizations and non-profit organizations, PSE will continue to educate targeted vulnerable populations, including income-eligible, through open houses, multilingual offerings, and billing inserts.

**2024**

In early 2024, PSE will launch a customer enrollment and education portal to create a centralized landing page to help customers learn about the range of distributed solar programs and other programs available (see DER Enablers—Customer Enablement). Additional CRM capabilities and billing features will launch.

PSE will enroll customers in our Residential Rooftop Solar Leasing, Multi-family Solar Partnership, and Multi-family Rooftop Solar Incentive programs throughout 2024. PSE will identify potential solar products and scope a device marketplace where customers can shop for devices and services. PSE will launch the device marketplace in the first half of 2025 (see DER Enablers—Customer Enablement).

By the end of 2024, PSE plans to support 0.9 MW of nameplate distributed solar capacity construction. In partnership with community-based and non-profit organizations, PSE will educate targeted vulnerable populations, including income-eligible, through open houses, multilingual offerings, and billing inserts. PSE will also hold stakeholder feedback sessions with community organizations to help plan subsequent CEIP programs.

**2025**

Early in 2025, the device marketplace will launch and allow PSE to support more customers in their journey to adopting solar.

PSE will enroll customers in our Residential Rooftop Solar Leasing, Multi-family Solar Partnership, and Multi-family Rooftop Solar Incentive programs throughout 2025. PSE will support 0.9 MW of nameplate distributed solar capacity construction by the end of 2025. In partnership with community-based and non-profit organizations, PSE will educate targeted vulnerable populations, including income-eligible, through open houses, multilingual offerings, and billing inserts. We will conduct stakeholder feedback sessions with community organizations to help plan subsequent CEIP programs.

**Customer Benefits**

These programs provide customer benefits in non-energy, environmental, and health. The Community Solar and Residential Rooftop Solar Leasing programs will improve participation from named communities and reduce the energy burden for income-eligible customers through monthly credits at no

cost to the consumer. The multi-family programs help broaden access and improve the affordability of clean energy. These programs contribute to reduced greenhouse gas emissions by allowing PSE to install solar for clean energy generation, which contributes to improved air quality. Finally, the installation of these solar PV systems will support an increase in clean energy jobs. See Table 3-1 for PSE's customer benefit indicators.

**Track and report on progress, costs, and benefits**

These programs will track system and program capacity, energy metrics, customer metrics such as program enrollment, customer segment, geographic location, customer benefit indicators, and cost metrics such as administration, equipment, and O&M. For a complete list of reporting metrics, see Chapter 7, Tacking, and Reporting. We will report annually, starting in 2023. See Appendix L, CEIP Programs and Actions Master Table.

## Community Solar

**The annual MWh associated with this program over the next four years is:** 35,685 MWh

**Community Solar Explained**

PSE is currently launching a customer-facing renewable energy product called Community Solar. This new program allows customers to share the costs and benefits of local solar projects in PSE's service territory. Customers subscribe to shares in a newly constructed, local solar energy site of their choice and receive bill credits for their shares' energy produced. This renewable energy replaces some or all their regular electricity use and helps drive a clean energy supply, which wouldn't be possible without support from subscribers. PSE will implement the program in multiple rounds. In Round 1, we will develop 7 MW across five projects by the end of 2022, including shares in each project specific for income-eligible customers. In future rounds of Community Solar development, we will identify an additional 13 MW of resources, including income-eligible focused projects, by the end of 2024.

In addition to the 20 MW Community Solar program already approved, PSE’s DER preferred portfolio (see Chapter 2, CEIP Methodology) included an additional 5.4 MW of Community Solar based on input from internal and external stakeholders. The feedback from both stakeholder groups was to include a greater DER program emphasis on highly impacted communities and multi-family customer participation. Given the limited market potential of other DER concepts focused on highly impacted communities, the expansion of community solar enables PSE to provide an option for customers who may not have the ability to install solar at their home or business. This expansion is further supported by regional and national benchmarking, which identifies community solar programs as a primary option for addressing the specific needs and barriers of highly impacted communities and multi-family customers.

### How these actions move us closer to meeting CETA goals

PSE's Community Solar program adds resources to PSE's electric supply portfolio and will contribute to meeting our renewable energy target.

This program brings additional renewable solar generation to PSE's service territory in partnership with customers. This program provides a renewable energy source for customers. The MWh generated by this program counts toward the CETA MWh compliance need. The program also allows us to collaborate with our customers to give them an opportunity to participate in renewable energy projects. PSE anticipates a total of 25.6 MW of nameplate capacity and 35,685 MWh of solar energy will be produced annually by project completion in 2025.

### Annual Actions and Costs

#### 2022

PSE's first round of Community Solar will be fully subscribed in 2022, with a total of five projects that have an installed capacity of 6 MW. This first round will enroll approximately 4,300 customers; about 1,200 of those will be income-eligible customers enrolled at no cost.

PSE will also develop a sixth community-located project in the Olympia Center with the support of a Department of Commerce grant. The benefits of this project will flow entirely to income-eligible households and service providers. Income eligibility will be 200 percent at or below the federal poverty level.

PSE will also continue to explore community solar resources that could be a good fit for future rounds of our Community Solar program.

#### 2023

PSE will construct and offer customers an additional approximately 6 MW of Community Solar. We will also allocate a portion of Round 2 for income-eligible customers at no cost.

PSE will maintain enrollment in our legacy projects and continue to explore community solar resources that could be a good fit for future rounds of our Community Solar program.

#### 2024

PSE will construct and offer customers an additional 7 MW of Community Solar. We will also allocate a portion of Round 2 for income-eligible customers at no cost. PSE will file for approval of an additional 5.4 MW to be focused on highly impacted communities and multi-family customers.

PSE will maintain enrollment in our legacy projects and continuously improve the program.

**2025**

PSE will construct an additional 5.4 MW of Community Solar projects and make the subscriptions available to customer subscribers. This round will be focused on highly impacted communities and multi-family customers.

PSE will maintain enrollment in our legacy projects and continuously improve the program.

**Customer Benefits**

These programs provide customer benefits in energy, burden reduction, environmental, and health. Both the initial Community Solar Program with an income-eligible focus as well as the expanded Community Solar Project focused on highly impacted communities and multi-family customers will increase participation from named communities and support the affordability of clean energy. These programs will also support an increase in clean energy jobs through the need for solar installers. Furthermore, these programs will result in reduced greenhouse gas emissions as PSE installs solar for clean energy generation, which contributes to improved air quality.

**Track and report on progress, costs, and benefits?**

PSE will track the total number of MW of solar installed, carbon emission reduction, numbers of customers (general, income-eligible, highly impacted communities, and multi-family) subscribed, the energy output of each site, and customer generation credits. See Appendix L, CEIP Programs and Actions Master Table.

### Non-Wire Alternatives (NWA) – Bainbridge Island Capacity/Reliability Project

**The annual MWh associated with this program over the next four years is:** 8,147 MWh

**Bainbridge Island Capacity/Reliability Project Explained**

PSE delivers electric service to Bainbridge Island, home to a population of 24,400 residents and Washington State Ferries Eagle Harbor Maintenance Facility and Ferry Terminal. In 2019, through the delivery system planning process, PSE assessed the transmission and distribution system reliability and capacity considering growing interest in electrification of the ferry system. A solution was proposed that best addressed the multiple needs and concerns. This solution included a new 115 kV transmission line, battery storage, demand response, solar generation, and replacement of aging infrastructure. Together these solutions will meet growing demand and improve reliability for Bainbridge Island customers.

Specifically relative to clean energy, battery storage, the Bainbridge Island battery energy storage system or BESS, will provide 3.3 MW of Bainbridge Island's 6.6 MW peak capacity need over the 10-year planning horizon, essentially shaving the peak demand for the island. PSE will deploy a demand response program and 3 MW of distributed solar generation. The BESS and demand response program combined will defer the need for a new substation for at least 10 years. In addition to meeting

capacity needs, the battery will provide PSE operational flexibility and time to bring distributed energy (DERs) and demand response (DR) resources online to meet Bainbridge Island's additional 3.3 MW capacity need. The BESS will help address near-term capacity needs. PSE will implement a program to add DER and DR resources over 10 years or more to address longer-term capacity needs.

**How these actions move us closer to meeting CETA goals**

When operating at peak, the combination of the renewable distributed energy resources will contribute to a lower system peak load.

**Annual Actions and Costs**

**2021**

PSE will complete a request for proposal (RFP) process to select an Engineering, Procurement, and Construction (EPC) battery vendor. Seven pre-selected EPC battery vendors received the RFP on May 14, 2021. Bid proposals were due August 5, 2021. Upon executing a contract with the successful bidder, PSE will begin to design the battery energy storage system and PSE's interconnection facilities in late 2021 or early 2022.

**2022**

PSE will prepare a system impact and facilities study to complete the Schedule 152 process. The battery storage system will be designed per PSE's technical specifications, standards, and contract documents. PSE will review and approve the battery storage system and interconnection facility designs at established milestones. PSE will start procuring long-lead or non-standard materials. PSE will submit land use and environmental permit applications. If required, PSE will apply to rezone the selected battery site from residential to business or industrial use. PSE will continue active public engagement throughout the project.

**2023**

PSE will review and approve the final engineering drawings, construction work plan, and safety plan. Site preparation, including clearing and grading, and civil work for the battery system and interconnection facilities will occur spring or early summer. All equipment installation work will be completed, and PSE will participate in the factory acceptance test. Battery test plans and commissioning procedures will be prepared.

**2024**

We will complete on-site testing, final inspection, and connection.

### Customer Benefits

Bainbridge Island customers benefit from battery storage, distributed solar generation, and the demand response program in three ways; increased resiliency, energy savings, and avoided infrastructure investment. Battery storage on Bainbridge Island will benefit customers through increased resiliency. The 3.3 MW battery provides frequency response which PSE estimates a benefit of 0.1hz annually because of reduced energy purchases from neighboring utilities. This benefit value is about $330,000 annually saved. BESS also defers investment in a substation.

### Track and report on progress, costs, and benefits

PSE will track project completion relative to scope schedule and budget. PSE will track battery operation and peak reduction benefit. PSE will track demand response program participation and peak and energy reduction. PSE will track solar installation and customer participation rates. Project status and benefit realization will be reflected in the CEIP progress report and CEIP update. See Appendix L, CEIP Programs and Actions Master Table.

## Non-Wire Alternatives (NWA) – Issaquah Area Capacity and Reliability

**The annual MWh associated with this program over the next four years is:** TBD

### The Issaquah Area Capacity and Reliability explained

Through the delivery system planning process, PSE forecasts a future substation capacity need of 9.1 MW in the City of Issaquah in 2028, primarily associated with summer peak demand. PSE may be able to address this capacity need with distributed energy resources in lieu of additional substation investment which may include a mix of targeted energy efficiency and demand response (3.1 MW), distributed solar generation (3 MW), and battery storage (3 MW).

### How these actions move us closer to meeting the CETA goals

When operating at peak, the combination of the renewable distributed energy resources will contribute to a lower system peak load by 9.1MW.

### Annual Actions and Costs

### 2021

PSE will complete the need and solution assessment including an alternative analysis. This analysis will determine the hours and days of the year where there is a capacity deficiency in the system. PSE will determine the size and scope of the targeted energy efficiency and demand response programs and the optimal battery and distributed solar generation sizes to meet the need. PSE will complete preliminary scope and project costs.

**2022**

PSE will reach out to customers to educate them about the project and receive stakeholder feedback on its implementation. PSE technical leads from across the company will engage with solar and battery developers to develop technical specifications for the respective systems. PSE will then complete a request for proposals (RFP) to select the most cost-effective implementer. PSE will also begin scoping any enhancements to the billing system to reflect monthly lease payments.

**2023**

PSE will prepare a system impact and facilities study to complete the Schedule 152 process. The battery storage system will be designed per PSE's technical specifications, standards, and contract documents. PSE will review and approve the battery storage system and interconnection facility designs at established milestones. PSE will start procuring long-lead or non-standard materials. PSE will submit land use and environmental permit applications. PSE will continue active public engagement throughout the project. PSE will begin implementing targeted energy efficiency measures in impacted areas and begin scoping demand response programs by identifying opportunities to reduce energy use and develop programs to target these savings.

**2024**

PSE will review and approve the final engineering drawings, construction work plan, and safety plan. Site preparation, including clearing and grading, and civil work for the battery system and interconnection facilities will occur spring or early summer. We will complete all equipment installation and participate in the factory acceptance test. Battery test plans and commissioning procedures will be prepared. PSE will begin piloting demand response to gauge customer adoption rates and modify the program as appropriate to realize the full energy reduction needed.

**2025**

We will complete on-site testing, final inspection, and connection. PSE will also implement demand response programs to reduce peak demand in the impacted area.

**Customer Benefits**

The stakeholder groups we interviewed support solar generation and energy storage batteries as an alternative to traditional wired solutions. The general community also accepts non-wired alternatives.

PSE customers in the Issaquah area will benefit from battery storage, distributed solar generation, and the demand response program in three ways: increased resiliency, energy savings, and avoided infrastructure investment. Battery storage will benefit customers through increased resiliency should the distribution system experience an outage. The 3.3 MW battery provides frequency response which PSE estimates a benefit of 0.1hz annually because of reduced energy purchases from neighboring utilities. This benefit value is about $330,000 annually saved and this defers investment in a substation.

**Track and report on progress, costs, and benefits**

PSE will track project completion relative to scope schedule and budget. PSE will track battery operation and peak reduction benefit. PSE will track demand response program participation and peak and energy reduction. PSE will track project progress, including customer installation rates. Project status and benefit realization will be reflected in the CEIP progress report and CEIP update. See Appendix L, CEIP Programs and Actions Master Table.

## Non-Wire Alternatives (NWA)—Sumner Valley Area Capacity

**The annual MWh associated with this program over the next four years is:** TBD

**Sumner Valley Area Capacity Project Explained**

Through the delivery system planning process, PSE forecasts a future substation capacity need of 7 MW in the Sumner Valley area, specifically the Lakeland Hills area, in 2021, primarily associated with summer peak demand. PSE may be able to address this capacity need with distributed energy resources in lieu of additional substation investment which may include a mix of targeted energy efficiency and demand response (3.2 MW) and battery storage (3.8 MW).

**How these actions move us closer to meeting CETA goals**

When operating at peak, the combination of the renewable distributed energy resources will contribute to a lower system peak load by 7MW.

**Annual Actions and Costs**

**2021**

PSE will complete the need and solution assessment including an alternative analysis. This analysis will determine the hours and days of the year where there is a capacity deficiency in the system. PSE will determine the size and scope of the targeted energy efficiency and demand response programs and the optimal battery and distributed solar generation sizes to meet the need. PSE will complete preliminary scope and project costs.

**2022**

PSE will reach out to customers to educate them about the project and receive stakeholder feedback on its implementation. PSE technical leads from across the company will engage with solar and battery developers to develop technical specifications for the respective systems. PSE will then complete a request for proposals (RFP) to select the most cost-effective implementer. PSE will also begin scoping any enhancements to the billing system to reflect monthly lease payments.

**2023**

PSE will prepare a system impact and facilities study to complete the Schedule 152 process. The battery storage system will be designed per PSE's technical specifications, standards, and contract documents. PSE will review and approve the battery storage system and interconnection facility designs at established milestones. PSE will start procuring long-lead or non-standard materials. PSE will submit land use and environmental permit applications. PSE will continue active public engagement throughout the project. PSE will begin implementing targeted energy efficiency measures in impacted areas and begin scoping demand response programs by identifying opportunities to reduce energy use and develop programs to target these savings.

**2024**

PSE will review and approve the final engineering drawings, construction work plan, and safety plan. Site preparation, including clearing and grading, and civil work for the battery system and interconnection facilities will occur spring or early summer. All equipment installation work will be completed, and PSE will participate in the factory acceptance test. Battery test plans and commissioning procedures will be prepared. PSE will begin piloting demand response to gauge customer adoption rates and modify the program as appropriate to realize the full energy reduction needed.

**2025**

We will complete on-site testing, final inspection, and connection. PSE will also implement demand response programs to reduce peak demand in the impacted area.

**Customer Benefits**

PSE customers in the Sumner Valley area will benefit from battery storage and the demand response program in three ways; increased resiliency, energy savings, and avoided infrastructure investment. Battery storage on will benefit customers through increased resiliency should the distribution system experience an outage. The 3.8 MW battery provides frequency response and defers investment in a substation.

**Track and report on progress, costs, and benefits**

PSE will track project completion relative to scope schedule and budget. PSE will track battery operation and peak reduction benefit. PSE will track demand response program participation and peak and energy reduction. Project status and benefit realization will be reflected in the CEIP progress report and CEIP update. See Appendix L, CEIP Programs and Actions Master Table.

## Other PSE Programs and Actions

### DER Storage

### Storage Programs

PSE is committed to delivering DER programs for our customers that are affordable, safe, and accessible to all. PSE's proposed suite of storage programs will add flexible load consumption and dispatchable stored generation to PSE's service territory. These DER storage solutions can help stabilize the grid by charging during periods of low demand and dispatching during periods of peak demand. In addition, these DER storage solutions can reduce greenhouse gas emissions by charging from clean energy (e.g., directly from renewables or the grid during high-renewable times of the day) and reducing generation from higher-carbon peaker plants.

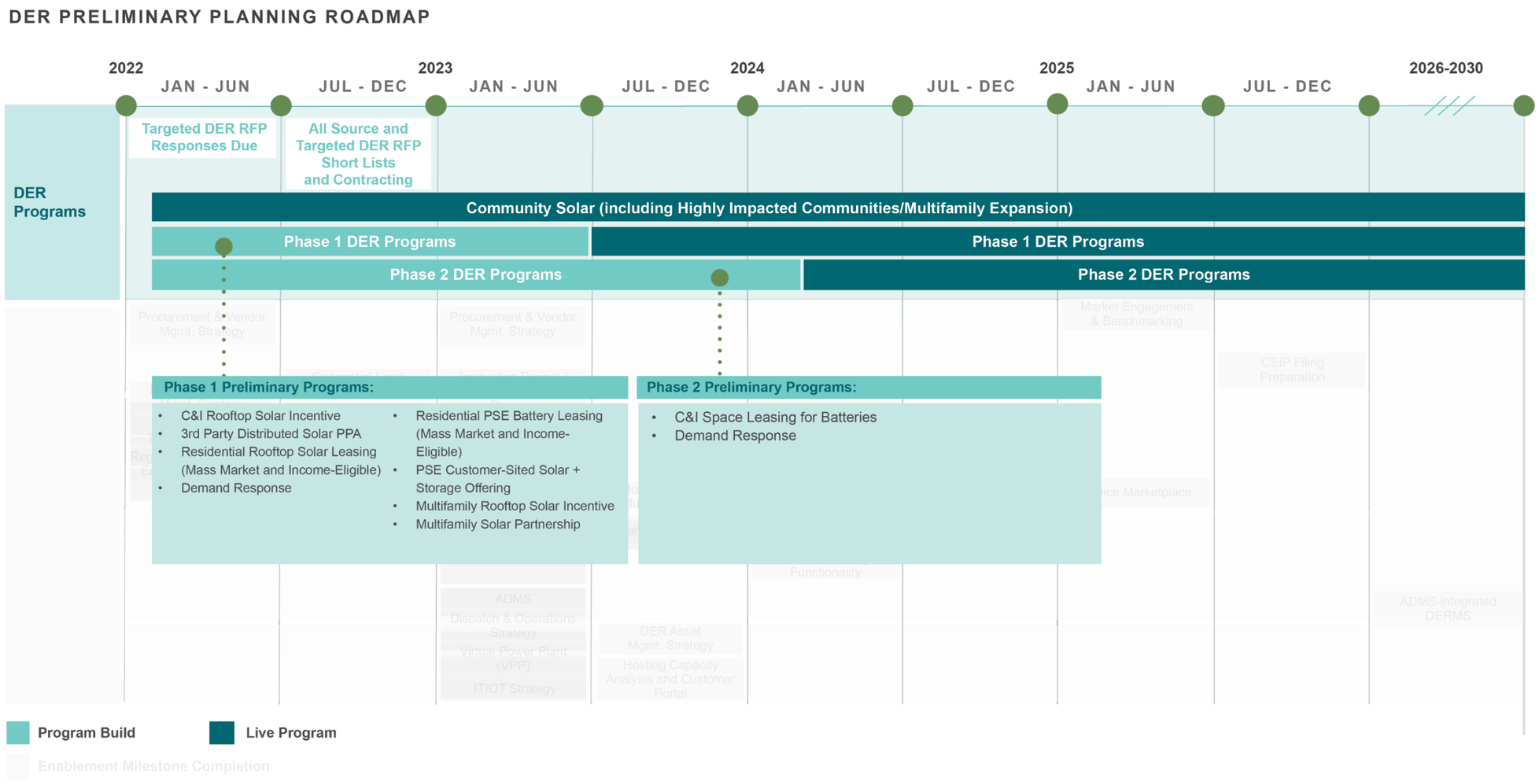
PSE proposes implementing battery storage programs that expand participation in general and in traditionally underserved populations. Through identifying mixes of distributed energy resources that have both high customer benefit and low costs (see Chapter 3: Interim and Specific Targets and CEIP Methodology), PSE has identified a targeted mix of distributed energy resources, including energy storage. This includes several different high-level program models, including PSE and customer ownership. Detailed program design, as well as the availability of vendors and equipment to support these different models will be identified through the RFP evaluations and program design in 2022.

These program concepts include programs intended to allow participation by a wide range of customers, and that can provide benefits to customers in highly impacted communities and to vulnerable populations. In some programs, PSE will own and operate distributed battery storage by leasing systems to residential customers, who will use batteries to manage system peaks. Customers will pay a small monthly fee for backup power services. PSE will also site battery energy storage at businesses and organizations by leasing space to install and operate batteries. PSE will offer customers and third-party battery owners incentives to charge and dispatch their batteries to align with system wide troughs and peaks.

The 2021 IRP preferred portfolio identified there would be 25 MW of battery storage needed by 2025. PSE aims to meet this need through a diverse set of distributed battery energy storage programs. To help fulfill the needs of the preferred portfolio, PSE plans to seek storage resources and programs from the market through an RFP process. PSE issued an RFI to understand the availability of DER resources in our service territory on May 15, 2021. Using the information gathered from the RFI, PSE will issue a draft Targeted DER RFP in early 2022, seeking bids from the market for DER solutions and services, including battery storage programs. This RFP will also include requirements for integrating battery energy storage with a virtual power plant ("VPP") platform that we will use to dispatch DERs. Resources and programs will be selected through this process, with the shortlist and bidder notification period in mid-2022.

We will target vulnerable populations as options in these programs to promote equity. A timeline for the proposed introduction of storage programs is available in Figure 4-4.

Figure 4-4. PSE's DER Program Focused Roadmap



## Battery Energy Storage Programs with Utility-owned Assets

**Peak Capacity Contribution:** 0.7 MW

### Battery Energy Storage Programs with Utility-owned Assets Explained

The 2021 IRP preferred portfolio identified a 25 MW battery storage need by 2025. Based on an evaluation of the benefits of different program structures, as discussed in Chapter 3, Modeling – BCA and Suite Selections, an initial list of targeted programs was identified, which included a range of programs intended to provide benefits and accessibility to many customers. This section focuses on programs with PSE-owned battery energy storage to expand access and benefits of storage. Based on the program evaluation, PSE will seek to offer battery energy storage programs for residential and C&I customers. For residential customers, PSE will install batteries in customer homes, where customers will pay a monthly fee for backup power services, and PSE will use battery storage to manage system and local peaks. For C&I customers, PSE will lease space from the Commercial and Industrial (C&I) customers to deploy battery storage with an option to provide backup power for customers for a small monthly fee. These storage programs will improve power quality and resiliency and manage system and local peaks.

### How these actions move us closer to meeting CETA goals

Distributed battery energy storage offers several operational benefits that contribute to a more reliable and resilient grid. Batteries can charge during off-peak times and with excess renewable generation. Batteries can then discharge during peak demand times. This storage solution enhances how we integrate intermittent renewable energy generation and can help avoid or defer grid capacity upgrades. PSE anticipates a total 12.8 MW of PSE-owned storage capacity to offset peak demand needs.

### Annual Actions and Costs

#### 2022

In 2022, PSE will first identify and work with community members to design the program and leverage our Targeted DER RFP. We will determine program costs and create an implementation timeline with input from stakeholders, including the Equity Advisory Group, external benchmarking, and cost data obtained through our Targeted DER RFP.

Throughout 2022, PSE will work internally to develop the scope and costs of the program, including through the RFP process. PSE, in consultation with stakeholders, will design a marketing and outreach plan for customer enrollment. PSE will establish program eligibility requirements and enrollment processes. We will complete vendor selection contingent on program approval based on the functional and technical requirements defined in the portfolio and product management strategy (see DER Enablers—Strategy and Portfolio Planning), and Dispatch Operations and DER IT/OT Strategy and Planning (see DER Enablers—Operations Enablement).

PSE will also develop the interconnection requirements and processes to support these programs.

PSE will investigate potential high-value DER throughout 2022 through pilot products, services, and resources (see DER Enablers—Strategy and Portfolio Planning). These pilots will provide insight into the costs and benefits of unproven concepts proposed through the RFP process or later identified.

**2023**

In early 2023, PSE will file tariffs for Phase 1 programs, including Residential PSE Battery Leasing, to submit to the WUTC (see DER Enablers – Strategy and Portfolio Planning).

PSE will begin implementation of a Virtual Power Plant (see DER Enablers – Operations Enablement) to dispatch battery energy storage systems during peak events. We will define asset management strategy and planning (see DER Enablers – Operations Enablement) to enable operations and maintenance of these devices to support grid operations.

PSE will research enhancements to the customer relationship management (CRM) and notification systems. PSE will also scope billing system changes to reflect new incentives and tariff structures and begin complex billing enhancements as needed (see DER Enablers – Customer Enablement).

By mid-2023, PSE will launch Phase 1 programs. PSE will implement an educational and outreach plan to educate and guide customers on how they can participate. PSE will prioritize complex billing and CRM feature sets minimally needed to support the roll out of the Residential PSE Battery Leasing program.

PSE will file and submit to the WUTC, Phase 2 programs during that period, including C&I space leasing for batteries (see DER Enablers – Strategy and Portfolio Planning). We plan to complete the needed complex billing enhancements by the end of 2023.

PSE plans to register 1.2 MW of battery energy storage capacity from the Residential PSE Battery Leasing program within 2023. PSE will provide education through mass-market commercial and residential channels such as online, bill inserts, and partnerships with market actors.

**2024**

In the first half of 2024, PSE will launch Phase 2 programs. PSE will add C&I space leasing for batteries program to our customer enrollment and education portal. PSE will launch a customer enrollment and education portal to create a centralized landing page to help customers learn about the range of distributed solar programs and other programs available (see DER Enablers – Customer Enablement). Additional CRM capabilities and billing features will launch.

PSE plans to register 3.1 MW of battery energy storage capacity from these programs within 2024. PSE will provide education through mass-market commercial and residential channels such as online, bill inserts, and partnerships with market actors.

**2025**

PSE plans to register 8.5 MW of battery energy storage capacity from these programs in 2025. PSE will provide education through mass-market commercial and residential channels such as online, bill inserts, and partnerships with market actors.

**Customer Benefits**

These programs provide energy, non-energy, environmental, health, and energy security and resiliency customer benefits. In addition to delivering grid benefits during peak events, a battery energy storage system increases resiliency because customers can use their systems for backup power. As a result, this storage program will decrease the time and duration of outages for participating customers. This can increase home comfort and improve community health as an alternative to a diesel generator. In addition, when batteries are charged by clean energy sources, they will contribute to reduced greenhouse gas emissions when dispatched during peak hours. The installation of these devices supports an increase in clean energy jobs. In addition, when batteries are charged by clean energy sources, they will contribute to reduced greenhouse gas emissions when dispatched during peak hours.

**Track and report on progress, costs, and benefits**

The program will track system and program capacity and energy metrics, customer metrics such as program enrollment, customer segment, geographic location, customer benefit indicators, and cost metrics such as administration, equipment, and O&M. For a complete list of reporting metrics, see Chapter 7, Tracking and Reporting. PSE will report annually, starting in 2023. See Appendix L, CEIP Programs and Actions Master Table.

## Battery Energy Storage Programs with Non-utility-owned Assets

**Peak Capacity Contribution:** 2.4 MW

**Battery Energy Storage Programs with Non-utility-owned Assets Explained**

In addition to the programs with PSE-owned battery energy storage, PSE plans to launch a program to give residential customers an incentive to enroll their battery energy storage assets. PSE will use a specialized tariff or rider to promote customer charging and dispatch to align with system-wide troughs and peaks. By pairing battery energy storage with solar PV, customers can leverage the Federal Investment Tax Credit for additional benefit. PSE plans to offer periodic incentives to residential customers with solar and battery storage systems, which can then respond to settings or dispatch signals from PSE. In addition to the programs specifically focused on vulnerable populations, PSE plans to offer higher incentives for income-eligible customers to enable their participation, while also receiving benefits of onsite storage through backup power.

### How these actions move us closer to meeting CETA goals

Distributed battery energy storage offers several operational benefits that contribute to a more reliable and resilient grid. Batteries can charge during off-peak times and with excess renewable generation. Batteries can then discharge during peak demand times. This storage solution enhances how we integrate intermittent renewable energy generation and can help avoid or defer grid capacity upgrades. PSE anticipates a total 12.5 MW of storage capacity to offset peak demand needs.

### Annual Actions and Costs

#### 2022

In 2022, PSE will first identify and work with community members to design the program and incorporate the results of the Targeted DER RFP. We will determine program costs and create an implementation timeline with input from stakeholders, including the Equity Advisory Group, external benchmarking, and cost data obtained through our Targeted DER RFP.

Throughout 2022, PSE will work internally to develop the scope and costs of the program, including capital purchases. PSE, in consultation with stakeholders, will design a marketing and outreach plan for customer enrollment.

PSE will begin scoping technical requirements for the battery storage devices to determine program qualification. PSE will also develop the interconnection requirements and processes to support this program. We will establish program eligibility requirements and enrollment processes.

PSE will investigate potential high-value DER throughout 2022 through pilot products, services, and resources (see DER Enablers – Strategy and Portfolio Planning). These pilots will provide insight into the costs and benefits of unproven concepts proposed through the RFP process or later identified.

#### 2023

In 2023, PSE will implement a Virtual Power Plant (see DER Enablers – Operations Enablement) to dispatch battery energy storage systems during peak events. PSE will develop dispatch operations and DER IT/OT strategy (see DER Enablers—Operations Enablement). PSE will file tariffs for Phase 1 programs, including PSE Customer-sited Solar+Storage, to submit to the WUTC (see DER Enablers—Strategy and Portfolio Planning).

During 2023, PSE will research enhancements to the customer relationship management (CRM) and notification systems (see DER Enablers—Customer Enablement). PSE will also scope billing system changes to reflect new incentives and tariff structures and begin complex billing enhancements as needed (see DER Enablers-Customer Enablement).

By mid-2023, PSE will launch Phase 1 programs. PSE will implement an educational and outreach plan to educate and guide customers on how they can participate. PSE will prioritize complex billing and

CRM feature sets minimally needed to support the roll out of the PSE Customer-sited Solar+Storage program.

In late 2023, PSE plans to register 3.5 MW of battery energy storage capacity from this program in 2023. PSE will provide education through mass-market commercial and residential channels such as online, bill inserts, and partnerships with market actors.

**2024**

In early 2024, PSE will launch a customer enrollment and education portal to create a centralized landing page to help customers learn about the range of distributed solar programs and other programs available (see DER Enablers—Customer Enablement). Additional CRM capabilities and billing features will launch.

PSE will continue device registration and connection support for new devices in 2024.

PSE plans to register 4.0 MW of battery energy storage capacity from this program in 2024. PSE will provide education through mass-market commercial and residential channels such as online, bill inserts, and partnerships with market actors.

**2025**

In the first half of 2025, PSE plans to launch our Device Marketplace, which will allow customers to select an eligible device that meets their needs.

PSE will connect more customer storage and supplement educational material to reinforce favorable charging and dispatch behaviors. PSE plans to register 5.0 MW of customer-owned storage by the end of 2025.

**Customer Benefits**

This program provides energy, non-energy, environmental, health, and energy security and resiliency customer benefits. Creating a solar + battery program contributes to reduced greenhouse gas emissions by supporting the adoption of solar for clean energy generation. Additionally, when batteries are charged by clean energy sources from the grid, they can reduce greenhouse gas emissions when dispatched during peak hours. By lowering the cost of solar + battery, this program increases the affordability of clean energy. In addition to providing grid benefits during peak events, a solar + battery energy storage system increases resiliency as customers can use their systems for sustained backup power reducing the time and duration of outages. This can increase home comfort and improve community health as an alternative to a diesel generator. Increased solar + battery adoption also supports more clean energy jobs.

### Track and report on progress, costs, and benefits

The program will track system and program capacity and energy metrics, customer metrics such as program enrollment, customer segment, geographic location, customer benefit indicators, and cost metrics such as administration, equipment, and O&M. For a complete list of reporting metrics, see Chapter 7. PSE will report annually, starting in 2023. See Appendix L, CEIP Programs and Actions Master Table.

## Battery Energy Storage Programs for Vulnerable Populations

**Peak Capacity Contribution:** 0.2 MW

### Battery Energy Storage Programs for Vulnerable Populations Explained

In addition to the broader mass-market programs with PSE-owned and customer-owned battery energy storage described in prior sections, PSE will design a portion of its PSE-owned program to reduce barriers for vulnerable populations to access and benefit from DERs. PSE will launch a program that leases battery energy storage systems to residential customers that incorporates a focus on vulnerable populations, including income-eligible residents. Customers will pay a small monthly fee for backup power services. PSE will also use batteries to manage system and local peaks.

### How these actions move us closer to meeting CETA goals

Distributed battery energy storage offers several operational benefits that contribute to a more reliable and resilient grid. Batteries can charge during off-peak times and with excess renewable generation. Batteries can then discharge during peak demand times. This storage solution enhances how we integrate intermittent renewable energy generation and can help avoid or defer grid capacity upgrades. Battery storage solutions also contribute to equitable distribution of energy and non-energy benefits and reduced burdens to vulnerable populations and highly impacted communities. PSE anticipates a total 0.3 MW of storage capacity to offset peak demand needs based on market adoption modeling, but will seek to increase this amount in program design.

### Annual Actions and Costs

#### 2022

In early 2022, PSE will first identify and work with community members to design the program and leverage our Targeted DER RFP. PSE will conduct community outreach and solicit input to expand battery energy storage access, address concerns about leasing programs, and benefit income-eligible populations. We will determine program costs and create an implementation timeline with input from stakeholders, including the Equity Advisory Group, external benchmarking, and cost data obtained through our Targeted DER RFP (Refer to DER Enablers – Procurement).

Throughout 2022, PSE will work internally to develop the scope and costs of the program. PSE, in consultation with stakeholders, will design a marketing and outreach plan for customer enrollment. We

will complete vendor selection contingent on program approval based on the functional and technical requirements defined in the portfolio and product management strategy (see DER Enablers—Strategy and Portfolio Planning), and Dispatch Operations and DER IT/OT Strategy and Planning (see DER Enablers—Operations Enablement).

PSE will also develop the interconnection requirements and processes to support this program. We will establish program eligibility requirements and enrollment processes that maximize accessibility to a diverse set of customers.

PSE will investigate potential high-value DER throughout 2022 through pilot products, services, and resources (see DER Enablers – Strategy and Portfolio Planning). These pilots will provide insight into the costs and benefits of unproven concepts proposed through the RFP process or later identified.

**2023**

In 2023, PSE will implement a Virtual Power Plant (VVP) (see DER Enablers—Operations Enablement) to dispatch battery energy storage systems during peak events. We will define asset management strategy and planning (see DER Enablers—Operations Enablement) to enable operations and maintenance of these devices to support grid operations. PSE will file tariffs for Phase 1 programs, including residential PSE Battery leasing, to submit to the WUTC (see DER Enablers—Strategy and Portfolio Planning).

During 2023, PSE will research enhancements to the customer relationship management (CRM) and notification systems. PSE will also scope billing system changes to reflect new incentives and tariff structures and begin complex billing enhancements as needed (see DER Enablers—Customer Enablement).

By mid-2023, PSE will launch Phase 1 programs. PSE will implement an educational and outreach plan to educate and guide customers on how they can participate. PSE will prioritize complex billing and CRM feature sets minimally needed to support the roll out of the residential PSE battery leasing program.

PSE plans to register 0.1 MW of battery energy storage capacity from this program in 2023. In partnership with community and non-profit organizations, PSE will educate targeted income-eligible populations through open houses, multilingual offerings, and billing inserts.

**2024**

In early 2024, PSE will launch a customer enrollment and education portal to create a centralized landing page to help customers learn about the range of distributed solar programs and other programs available (see DER Enablers—Customer Enablement). Additional CRM capabilities and billing features will launch.

PSE plans to register 0.1 MW of battery energy storage capacity from this program in 2024. In partnership with community and non-profit organizations, PSE will educate targeted income-eligible populations through open houses, multilingual offerings, and billing inserts. PSE will conduct stakeholder feedback sessions with community organizations to help plan for subsequent CEIP programs.

**2025**

PSE plans to register 0.1 MW of battery energy storage capacity from these programs in 2025. In partnership with community and non-profit organizations, PSE will educate targeted income-eligible populations through open houses, multilingual offerings, and billing inserts. PSE will hold stakeholder feedback sessions with community organizations to help plan for subsequent CEIP programs.

### Customer benefits

This program provides energy, non-energy, environmental, health, and energy security and resiliency customer benefits. This program will improve participation from income-eligible populations and improves the affordability of clean energy. Through the installation of these devices, this program will support an increase in clean energy jobs. In addition to delivering grid benefits during peak events, a battery energy storage system increases resiliency because customers can use their systems for backup power. As a result, this storage program will decrease the time and duration of outages for participating customers. This can increase home comfort and improve community health as an alternative to a diesel generator.

### Track and report on progress, costs, and benefits

The program will track system and program capacity and energy metrics, customer metrics such as program enrollment, customer segment, geographic location, customer benefit indicators, and cost metrics such as administration, equipment, and O&M. For a complete list of reporting metrics, see Chapter 7, Tracking and Reporting. PSE will report annually, starting in 2023. See Appendix L, CEIP Programs and Actions Master Table.

## Resource Enablement and Delivery

## DER Enablers

### Introduction

The Demand Response, DER Solar, and DER Storage sections, describe the types of DER programs, actions, and proposed targets to support PSE's commitment to reducing emissions and meeting the Washington state mandate of 100 percent carbon-free electric supply by 2045. To achieve these targets, PSE's DER program portfolio will require a series of cross-functional initiatives. These efforts will source suitable resources and programs, market to and acquire qualified customers, activate relevant DER products, and dispatch energy to support grid operations when needs arise. Successfully

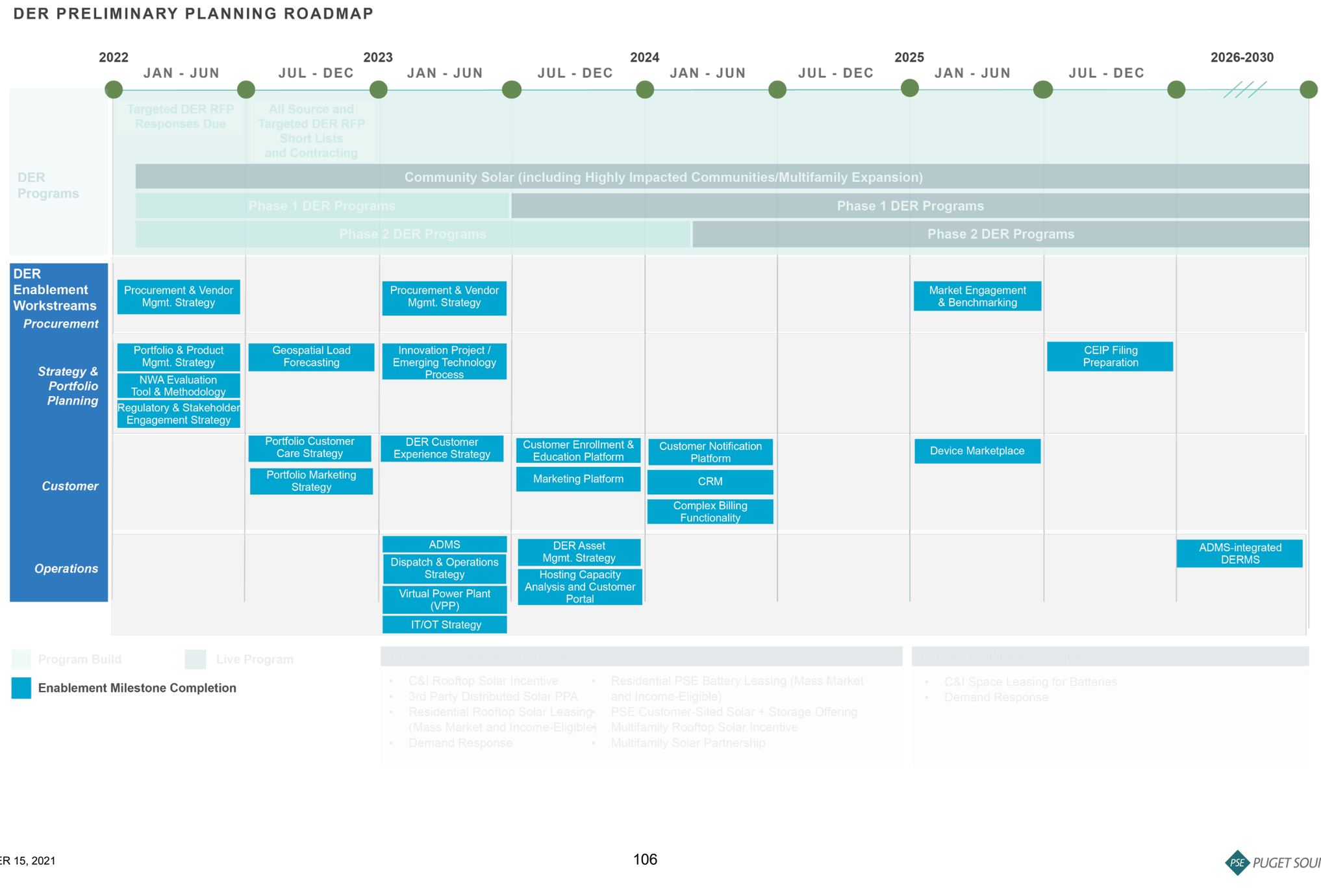
coordinating these initiatives across PSE's business functions will allow PSE to scale DER operations cost-effectively while ensuring a diverse program portfolio accessible to all PSE customers.

PSE has structured these cross-functional enablement activities into four major work streams: strategy and portfolio planning, operations enablement, procurement, and customer enablement. To support the creation of the DER portfolio, PSE must:

- Create and execute an overarching portfolio strategy that includes vendor management, portfolio planning processes, and ongoing market benchmarking.
- Expand our operations capabilities to connect, dispatch, and manage DERs.
- Develop procurement strategies to source goods and services and manage vendors; and
- Reimagine our customer experience, develop new approaches to marketing and outreach, enrollment, billing, communications, and customer service.

Figure 4-5, below, provides an overview of the timeline and scope of each enablement work stream as the scope aligns with the expected rollout of PSE's DER preferred portfolio.

Figure 4-5. PSE's Proposed DER Enablement Roadmap



## Strategy and Portfolio Planning

### PSE Work stream Guiding Principles

In the following sections, PSE establishes guiding principles for how we expect to execute on each work stream, what major enablement activities are needed, and why, and what platforms, tools, staffing, or outside services are essential to success. We also note an action plan for each year of this CEIP and the annualized enablement costs proposed to support the DER portfolio.

By establishing clear processes, platforms, and organizational models to focus on through these key work stream initiatives, PSE will achieve the goals and objectives of the CETA, provide PSE customers with clean, affordable, and safe energy, and ensure an open and transparent stakeholder engagement process.

CETA sets important planning standards to ensure all customers benefit from the transition to clean energy. PSE recognizes the importance of having processes in place in which all voices are included and heard throughout the development of the DER portfolio. The IRP laid out four current actions intended to ensure all customers benefit from the transition to clean energy.

1. Establish the Equity Advisory Group.
2. Develop a public participation plan for the CEIP to obtain input on equitable distribution of benefits and burdens.
3. Refine customer benefit indicators and metrics with the EAG and the CEIP public participation process.
4. Update the Customer Benefits Analysis to incorporate the customer benefit indicators and related metrics in the CEIP and future IRPs.

These actions and the guiding principles we describe below collectively set the stage for PSE's execution of a holistic DER strategy and effective DER portfolio planning. The guiding principles for this work stream are:

- Public and stakeholder engagement is essential.
    - PSE's stakeholder engagement process for the 2021 IRP generated valuable feedback and suggestions from organizations and individuals. Public involvement will continue to increase as PSE submits its portfolio of DER programs for WUTC review. PSE established an Equity Advisory Group (EAG) in 2021 to advise us to ensure all PSE customers benefit from the transition to clean energy. Knowing the complexity of the issues involved and the need to meet many different interests, PSE sees continued public and stakeholder engagement as critical to the success of this DER portfolio.

- Equitable distribution of benefits is a priority.
  - CETA adds a new dynamic to resource planning as we evaluate and determine equitable distribution of benefits for all customers, specifically highly impacted communities and vulnerable populations. Continued portfolio planning activities will include a specific focus on these populations.
- A range of potential future resource portfolios will ensure balance.
  - PSE will balance identifying the lowest reasonable cost and risk portfolios that meet customer needs, policy requirements and support the equitable transition to a clean energy future while maintaining affordability and reliability for customers. Our preferred portfolio embodies PSE's commitment to these objectives.
- Technology advancement will allow PSE to keep pace
  - Monitor and assess innovation and technology advancements. PSE anticipates a rapid evolution of technology in energy efficiency, demand response, and energy storage and will create processes to evaluate these advancements and adjust plans to incorporate them appropriately.

**Actions to support the launch and operation of PSE's DER portfolio**

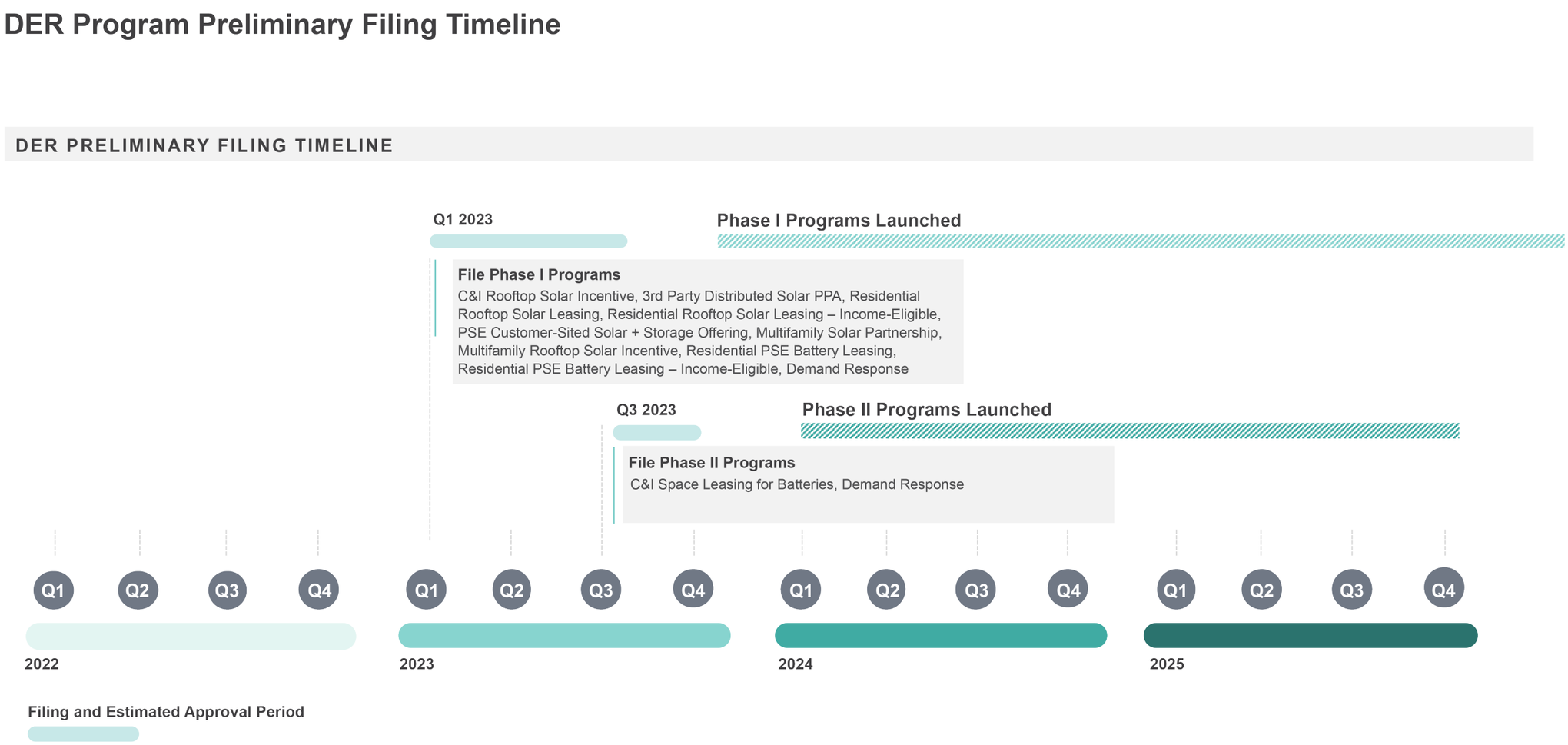
There are four strategic actions that will drive a sustained process and opportunities to cultivate healthy growth DERs in PSE's system; 1) engagement strategy to coordinate closely with regulators and other stakeholders, 2) create a portfolio and product management strategy, 3) as technology evolves in this space, create a process to identify, select, implement, and manage key innovation projects, and 4) maintain a non-wires first methodology in finding solutions to delivery system needs.

**Regulatory and Stakeholder Engagement Strategy:** Launching the DER programs will require approvals from WUTC and alignment with stakeholders. Based on PSE's preferred portfolio selection and the underlying capabilities needed to support certain types of programs, PSE has proposed a preliminary filing plan available in Figure 4-5. PSE will develop a portfolio-level strategy to engage key external stakeholders, including regulators prior to program regulatory filings of specific programs to include different perspectives and feedback during program design. Representative activities addressed in this strategy will include:

- Outline approach for stakeholder engagement, filing, and seeking approval of all CEIP DER programs. To assist with program review and engagement, we will group the filing process based on the suite of programs selected through the Targeted DER RFP process and operational dependencies as identified in the rest of the DER Enablers section.
- Establish processes to ensure coordinated outreach and tariff development and filing efforts across the entire portfolio.

- Provide strategic direction for individual DER program activities.
- Define the strategies between distributed energy resources that are interconnected in “Front of the Meter” (FOTM), or on the utility system, and “Behind the Meter” (BTM) or on the customer’s electrical system, to ensure regulatory processes are correctly defined.

Figure 4-6: DER Program Preliminary Filing Timeline



**Portfolio and Product Management Strategy:** Managing an extensive portfolio of DER products and programs brings unique challenges and will require a plan. The planning process will cover how PSE will organize and operate the portfolio, ensures the DER portfolio serves our intended purposes, and contributes to PSE energy and carbon-neutral goals. The plan will need to be adjusted through time to meet targets and objectives. The portfolio and product management strategy will validate that programs and the underlying products fulfill CEIP targets and contribute to PSE's clean energy goals. Representative activities include:

- Establish portfolio-level organization structure and management processes, including identification of roles and responsibilities across the PSE organization.
- Develop a year-over-year DER growth plan of launched products.
- Seek out lessons learned as DER programs are launched and look to capitalize on operational synergies within the portfolio to reduce cost and accelerate enrollment.
- Track customer satisfaction and feedback to inform portfolio design.
- Establish scope for innovation projects and emerging technology evaluations that would support future DER programs.
- Lead market engagement and benchmarking initiatives to inform continuous improvement.
- Determine cross-portfolio cost allocation strategy and mechanisms to recover costs.

**Innovation Project / Emerging Technology Process:** As DER technology evolves rapidly, PSE will need to create a formalized process to identify, select, implement, and manage key innovation projects. The strategy will need to allow PSE to identify quickly, test, and demonstrate emerging technologies and collaborate with vendors to align products to better support the needs of PSE's customers and internal operations. Representative activities include:

- Execute RFI or conduct secondary research to create a list of potential technologies for further evaluation.
- Build a roadmap of test and demonstration needs based on the portfolio strategy to test and improve programs prior to full-scale rollout.
- Establish forums to engage vendor community in knowledge sharing on program learnings, collaborate on focus areas for future program development, and learn about new offerings in the market.
- **Non-Wires Alternative ("NWA") Evaluation Tool & Methodology:** NWAs are DERs used to defer investment in traditional transmission or distribution infrastructure for electric utilities (poles, wires, and substations) or gas utilities (pipelines, compressor stations, and city

gate stations) to meet the needs of the electric transmission and distribution (T&D) systems. NWAs can defer— and sometimes eliminate—the significant infrastructure investments required to improve capacity and reliability.

- PSE is already applying a framework to assess when NWA options are suitable to address a system need and evaluate proposed solutions against traditional solutions and approaches. This framework is necessary because there is no universal answer for all situations; each potential NWA must consider internal operations, grid configuration and conditions, and the regulatory constructs. PSE will invest in building a tool to evaluate proposals effectively and quickly for non-wire alternatives against traditional infrastructure investments. A business cost analysis tool will guide PSE's consideration of NWA in our transmission and distribution planning and operation, manage the NWA implementation, and design the appropriate rates.

- With the launch of multiple DER programs over the next four years, PSE expects increased staff and additional external service support to assist with defining and executing the overall DER strategy and portfolio planning processes. We summarize the forecasted costs to develop and operationalize the four tools described in the Grid Modernization Section below.

- **Geospatial Load Forecasting:** The proliferation of DERs driven by the CETA creates the need for PSE to plan the systems to accommodate the upcoming DERs and decide what type of DERs we should install to meet the CETA requirements as replacement of fossil fuels. To accomplish this, PSE will design a spatial load forecasting tool that will predict load and power changes, where the loads will occur on the grid, how distributed generation (DG) changes the load shape and when we must supply the load.

- Design a spatial load forecasting tool that will predict load and power changes, where the loads will occur on the grid, how distributed generation (DG) changes the load shape and when we must supply the load.

**Supporting technology, tools, or people resources**

PSE's DER portfolio planning approach will require the next generation of distribution planning tools to identify potential capacity constraints quickly and conduct more complex distribution load forecasting. We will use other tools to support DERs in specific distribution or more significant transmission capacity challenges such as infrastructure deferral or voltage regulation. PSE plans to develop several tools described in Appendix G. Grid Modernization Strategy. These tools are summarized below:

**Annual Actions and Costs**

**2022**

The DER portfolio's strategy and portfolio planning enablement activities begin before much of the other work streams because the overall strategy directly influences the other work streams. At the beginning of 2022, PSE will develop the portfolio and product management strategy and organizational

structure. This design will drive the individual program goals and targets as explained in this document's DER Solar, DER Storage, and Demand Response sections. When responses are delivered on the Targeted DER RFP, PSE expects to complete the regulatory and stakeholder engagement planning activities and ensure the response review and individual program filing process meet the guiding principles.

By the end of 2022, PSE expects the supporting tools—NWA evaluation and methodology and geospatial load forecasting only—will be ready to guide the ongoing portfolio planning activities.

**2023**

At the beginning of 2023, PSE will file and seek approval of the Phase 1 DER programs as described in Figure 5.4.

By the middle of 2023, PSE will launch the Phase 1 DER programs and execute critical activities to enable PSE's innovative project and emerging technology process. This work includes secondary research on the latest technologies under development, engaging vendor communities in discussions on the latest solutions available and finalizing a roadmap of key priority innovation projects that will shape PSE's future DER portfolio. Also, PSE will have the hosting capacity analysis, map, and customer interconnection portal operational to support the major phase of programs launching at the same time.

By the end of 2023, PSE will file the Phase 2 DER programs as described in Figure 5.4 and will add 17 MW of distributed solar capacity, 5 MW of distributed storage capacity and 5.1 MW of demand response capacity to the PSE resource mix.

**2024**

As PSE's DER portfolio continues to ramp up enrollment and launches the Phase 2 programs, PSE will continue to evaluate our portfolio strategy and execute an initial set of emerging technology demonstrations to prepare for the next CEIP phase.

By the end of 2024, we will add 18 MW of solar capacity, 7 MW of storage capacity, and 5.9 MW of demand response capacity to the PSE resource mix.

**2025**

In 2025, PSE will begin preparing the next CEIP filing leveraging the outcomes of these significant strategic functions around portfolio management and stakeholder engagement.

By the end of 2025, we will add 19 MW of solar capacity, 14 MW of storage capacity, and 17.7 MW of demand response capacity to the PSE resource mix.

## Operations Enablement

**DER Enabling Activity Set:** Operations Enablement

**PSE Work Stream Guiding Principles**

At PSE, we focus on meeting our customers' needs reliably when we make sourcing decisions and operate PSE's energy supply portfolio. PSE must have enough renewable or clean resources to meet legal requirements while delivering electricity reliably during peak demand hours and every hour of the year. To meet the DER and demand response forecasts identified in the 2021 IRP and deliver on our customer's expectations for reliable electric service every hour of the year, we will expand our capabilities to connect, dispatch, and manage the products installed in the DER portfolio. PSE has defined the following guiding principles to support operations enablement:

- Ensure transparency and consistency for product vendors and site hosts: PSE will streamline standards, technologies, and processes to ensure external vendors and customers understand interconnection and communication requirements and deliver the resource reliably per our requirements.
- Continual testing and validation of the process and function effectiveness to deploy and utilize the available DER products and services: PSE's operational capabilities to install and enroll, interconnect, and otherwise acquire and activate, the DER portfolio must be able to scale quickly enough to achieve IRP MW targets. As the DER portfolio scales, it will become an increasingly critical resource to maintaining grid reliability. Thus, PSE and vendors must sufficiently maintain both DER devices and supporting technologies to ensure the reliability of the resources.
- Ensure we account for the entire lifecycle of DER products and services as we manage these assets: DER technologies require new asset management approaches, have varying degrees of remaining useful life, and different maintenance approaches. PSE operations staff expects process enhancements, job aids, and training are necessary to ensure the DER solutions are maintained effectively and do not impact reliability when called on to meet grid service needs.

**Actions to support the launch and operation of PSE's DER portfolio**

PSE grid operations to support the DER assets—in front of the meter and behind the meter—will require processes and organization enhancements to utilize those assets to meet grid service needs efficiently. PSE has identified key initiatives for operations enablement.

**Asset Management Strategy and Planning:** PSE must augment existing asset management processes and enabling systems to support the proper design, acquisition, construction, operation, maintenance, and disposal of these new DER assets. Representative activities addressed in this strategy include:

- Conduct fit-gap analyses that will identify process and skill gaps and evaluate new IT systems or people skills needed to support field and back-office asset management functions.
- Develop asset data strategy and governance process enhancements for DER products.
- Set up DER asset tracking, network hierarchy definition, and energy contract mapping.
- Develop engineering standards, operational procedures, job-aids, and quality control for maintenance (both planned and unplanned) and retirement processes.
- Implement and test system and data architecture needs identified through fit-gap analysis.
- Integrate and test monitoring alarms and asset performance data for real-time equipment tracking with third-party and PSE-owned assets.
- Conduct field and back-office resource training to comply with established standards and procedures.

**Dispatch Operations Strategy and Planning:** PSE expects to enhance and scale our capabilities in dispatch operations so we can leverage DERs for a variety of grid services. This effort will include defining clear processes to determine where, when, and how to dispatch available DERs reliably. Representative activities include:

- Identify specific requirements for each DER product qualified in PSE's DER programs, device specifications, data, and use cases for grid services and determine which programs require dispatch by PSE.
- Develop dispatch flow diagrams including end-to-end process, notifications, measurement, and other requirements for dispatch operations.
- Assess PSE Virtual Power Plant (VPP)/DER Management System (DERMS) platform needs based on dispatch designs and define a roadmap to phase-in functionality (see Grid Mod-Virtual Power Plant).
- Design and implement dispatch optimization framework to maximize the value of dispatching from the DER portfolio.
- Build test protocols in conjunction with IT/OT systems planning staff to verify operational readiness for each device or third-party system enabled.
- Streamline DER alert monitoring standards for system integration based on information gleaned from demonstration DER installations.
- Develop roles and responsibilities for DER dispatch processes and training appropriate staff. Also, determine rules of engagement where third-party vendors are involved.

- Specify safety procedures for the operation and troubleshooting of each potential DER technology for PSE staff, customers, and vendors.

**DER IT/OT Strategy and Planning:** Monitoring and controlling DERs will rely on a complex and highly interconnected network of IT/OT systems, including those owned by third parties. Using lessons from previous DER projects, PSE plans to create new standards, processes, and roles. We will also map critical systems for the reliable operation of a more extensive suite of DER products in the field. Representative activities include:

- Evaluate vendor IT/OT capabilities through PSE's RFI filed on May 14, 2021, other market sources, and appropriate standards to assess interoperability practices.
- Identify critical IT/OT system requirements across various parts of activating, dispatching, and maintaining the DER assets (telecom, telemetry, VPP, SCADA, DERMS, notifications).
- Develop end-to-end IT/OT system designs for monitoring, control, and safety.
- Develop a roadmap for system integration, security requirements, enhancements rollout, and interoperability standards for vendors.
- Conduct thorough systems testing and testing procedures with third-party vendors.
- Establish roles and responsibilities, operating procedures, and service level agreements for interaction with third-party vendors.

**Supporting technology, tools, or human resources**

The key planning activities described above will prepare PSE to oversee a dispersed portfolio of intermittent resource solutions. The complex processes we will enable will require complementary systematic solutions that allow for easy and safe activation, quick decision-making, efficient issue monitoring and resolution, and intelligent reporting for measurement and verification settlements. PSE's planned methods include the Virtual Power Plant (VPP) platform, hosting capacity analysis map and customer portal, and ADMS-integrated Distributed Energy Resource Management System (DERMS).

> **Hosting Capacity Analysis, Map, and Customer Portal:** Hosting capacity is the number of DERs that the distribution system can accommodate at a given time and location under existing grid conditions and operations. Visible hosting capacity can help customers and developers avoid losing time and application fees for planned projects that turn out to be not feasible. PSE seeks to provide a snapshot of available DER capacity for planning purposes to customers and developers. Also, PSE will launch a customer-facing portal to provide digital records about interconnection requests and transparency in queuing status. You can find more information about the hosting capacity analysis project and enhancements to the customer interconnection portal in Hosting Capacity Analysis, Map, and Customer Portal.

PSE expects we will require increased staff or outside services for the planning process for asset management, dispatch operations, and IT/OT systems and to support the increased asset portfolio expected with the launch of the DER portfolio. PSE will dedicate staff and leverage outside services where appropriate to support the process definition, define roles and responsibilities, build standards, define system requirements, engage selected third-party vendors, and conduct thorough testing of said processes and logistics.

**Annual Actions and Costs**

**2022**

During the first half of 2022, PSE will define the dispatch functions and requirements and an overall IT/OT strategy. This plan will identify the system interactions and data streams to prepare the DER programs launch in 2023-early 2024. PSE will review the Targeted DER RFP responses during this period and incorporate essential parts of our asset management process and dispatch design into the contracting process with third-party vendors.

**2023**

PSE will complete the fit-gap assessment and plan for asset management for the DER devices in each program in early 2023.

During the year, PSE will manage and adapt processes for asset management, dispatch operations, and overall IT/OT system design to ensure quality and reliability throughout the remainder of the year. We will also configure and launch the Virtual Power Plant solution to support dependent program launches. The new Virtual Power Plant platform will allow us to dispatch capacity from PSE's array of DER storage programs and from PSE's selected demand response programs.

PSE will launch enhancements to the interconnection process coordinated with executing our hosting capacity analysis tool (see Grid Mod—Hosting Capacity Analysis, Map, and Customer Portal) and conduct robust testing of the broader DER programs' IT/OT platform structure. In the first half of 2023, a majority of the DER preferred portfolio will launch and all critical Operations components are planned to be ready to support enrollments and project development.

By the end of the year, PSE will roll out revised roles and responsibilities to support dispatch operations for DERs and complete training. We will also complete training and education for existing field and back-office staff that support asset management functions. We will add 17 MW of distributed solar capacity, 5 MW of distributed storage capacity and 5.1 MW of demand response capacity to the PSE resource mix.

**2024**

In 2024, PSE will refine processes and implement system improvements as we test DER products for grid services. We will apply continuous improvement methods to create efficiencies in operations and update responsibilities.

By the end of 2024, we will add 18 MW of solar capacity, 7 MW of storage capacity, and 5.9 MW of demand response capacity to the PSE resource mix.

**2025**

In 2025, PSE will evaluate requirements and use cases for an ADMS-integrated DERMS solution to prepare for the next CEIP cycle. PSE will also pursue continuous improvement with current processes and platforms while engaging product vendors on opportunities to streamline data management and monitoring where appropriate.

By the end of 2025, we will add 19 MW of solar capacity, 14 MW of storage capacity, and 17.7 MW of demand response capacity to the PSE resource mix.

### Procurement

**DER Enabling Activity Set:** Procurement

**PSE Work stream Guiding Principles**

Distributed energy resources (DER), including demand response, are a significant component of PSE's preferred portfolio identified in the 2021 IRP and represent a piece of PSE's strategy for achieving the targets laid out under CETA. In 2021, PSE filed an RFI for DERs to enhance our understanding of options available in our service territory and inform a well-designed DER RFP. To successfully execute a Targeted DER RFP, properly plan for further DER needs, and ensure a diverse program portfolio with options for vulnerable populations, we have defined the following principles to guide the procurement work stream:

- Coordinate and make strategic procurement decisions across all programs and portfolios: Ensure that we evaluate all resources across a consistent set of criteria that focus on reliable, safe, equitable, and affordable solutions; and ensure appropriate enabling technologies sufficiently support both distributed energy and utility-scale renewable resources.
- Create a procurement process that is accessible and fair for all bidders: Encourage all bidders who can meet the Targeted DER RFP's requirements to participate, including bidders who represent minority-, women-, disabled- and veteran-owned businesses. Support supplier diversity through inclusive, competitive procurement processes and using independent evaluators. We will encourage bidders to promote diversity and inclusion.

- Encourage all suppliers and employees to follow PSE's Code of Conduct: Create a culture of ownership, accountability, honesty, integrity, and trust by encouraging everyone involved in procurement to follow the Code of Conduct.[35]

- Continually benchmark and identify best practices. Continuously improve through industry and customer engagement to inform ongoing procurement plans.

**Actions to support the launch and operation of PSE's DER portfolio**

Creating and launching a suite of DER programs will require PSE to procure goods and services to support the DER program portfolio. To accomplish this, PSE will need to develop a strategy to source goods and services, manage vendor performance, and benchmark to stay informed on market developments.

**Procurement and Vendor Management Strategy:** The DER programs will require sourcing hardware, software, implementation contractors, and related services across the broader DER portfolio. PSE will also seek suppliers and program designs that specifically address the needs of vulnerable populations. Developing a strategy can help lay the groundwork for balancing the technical requirements for functioning DER solutions, cost-effectiveness, and equity across PSE's territory. By soliciting DERs across programs, PSE may also benefit from volume negotiation for lower prices. Representative activities addressed in this strategy include:

- Prioritize business models that best suit the DER portfolio and operational goals (e.g., performance guarantees, power purchase agreements, shared savings, customer engagement model).

- Develop strategies to build participation by vendors that represent Black, Indigenous, and People of Color- (BIPOC), veteran-, women-, and disabled-owned businesses.

- Define preferred ownership models for different DER types.

- Define preferred operational models for utility front of meter (FOTM) or behind-the-meter (BTM) DERs (third-party PPA, third-party build, run, transfer ownership, or utility ownership from day 1).

- Identify key roles and responsibilities for procurement, operation, maintenance, and decommissioning.

- Define key requirements for enabling technologies in line with industry best practices (cybersecurity requirements, communication protocols, operations and maintenance support, Diversity, Equity, and Inclusion (DEI) best practices).

- Acquire and build DER contracting expertise.

[35] https://oohpseirp.blob.core.windows.net/media/Default/Reports/2021/Final/07.IRP21_Ch7_032921.pdf

- Coordinate the Targeted DER RFP execution informed by the portfolio management strategy (for more information on PSE's actions to develop a portfolio management strategy, refer to DER Enablers – Strategy and Portfolio Planning).
- Assess responses to the All-Source RFP with the Targeted DER RFP to coordinate across both set targets.

**Market Engagement and Benchmarking:** PSE needs to understand the DER marketplace to know the latest market trends, best practices, and emerging needs and technologies to incorporate into our product portfolio and innovation activities. Seeking best practices and the latest in enabling technologies is vital to our continued development of the DER portfolio. PSE will scale DER programs most effectively by creating opportunities to test and evaluate new, cost-effective, or more efficient solutions. PSE will engage with utility peers, perform benchmarking analysis, and understand the broader DER/aggregator marketplace to align products to PSE and customer needs. Representative activities include:

- Participation in key industry organizations (e.g., PLMA, SEPA, GridFWD) and conferences (e.g., DistribuTECH).
- Identify emerging technologies, products, and vendors.
- Understand vendor capabilities and proven performance in the marketplace.
- Coordinate with vendors to improve the alignment of products to PSE and customer needs.
- Coordinate market potential studies to understand costs and scale of resources.
- Review outcomes of IRP/RFI/Targeted DER RFP to inform next CEIP.

### Supporting technology or people resources

With the launch of multiple DER programs over the next four years, PSE expects an increase in staffing requirements to lead the strategy definition, coordinate the procurement requirements for the DER portfolio, and oversee benchmarking efforts that will inform the next CEIP submission.

PSE will coordinate a procurement and vendor management process that delivers a balanced DER portfolio accessible to all. As we plan and launch DER solutions, PSE will establish procurement procedures, staff training, and job aids to support the procurement process.

### Annual Actions and Costs

#### 2022

In preparation for the Targeted DER RFP, PSE will define a procurement and vendor Management strategy using lessons learned from other major procurement initiatives for customer-facing resources like EV charging infrastructure. By evaluating a procurement plan that looks at the whole DER portfolio,

PSE can efficiently coordinate procurement of goods and services, ensuring consistency with vendor requirements while creating opportunities for innovative solutions from the market. PSE plans to issue the Targeted DER RFP to bidders in early 2022 to incorporate the technical and operational requirements for the VPP platform.

By the end of Q2 2022, PSE will deliver the All-Source RFP vendor shortlist and collect all Targeted DER RFP responses. PSE will generate the Targeted DER vendor shortlist from the Targeted DER RFP responses by the end of Q3 2022. PSE will also engage an independent evaluator ("IE") for the Targeted DER RFP, following the selection process used for the All-Source RFP.

By the end of 2022, PSE will iterate the procurement and vendor management strategy based on the outcomes of the Targeted RFP process and lessons learned.

**2023**

In 2023, PSE will complete the contracting process with chosen vendors through the Targeted DER RFP and launch the selected Phase 1 DER programs. The PSE DER procurement team will establish key performance milestones to ensure vendors launch their programs, products, and services aligned with PSE's overall DER enablement roadmap.

By the end of 2023, PSE will refine the procurement and vendor management processes and procedures to support the planned DER portfolio. We will continue to refine the strategies as we evaluate RFP responses. Based on the results of the RFP, PSE will determine whether additional DER procurement processes are needed in 2023 and 2024 to meet the demand response and distributed energy resource targets.

By the end of 2023, we will add 17 MW of distributed solar capacity, 5 MW of distributed storage capacity and 5.1 MW of demand response capacity to the PSE resource mix.

**2024**

In the beginning of 2024, PSE will launch Phase 2 DER programs following contract execution with the selected vendors (see Figure 5.4).

By the end of 2024, PSE will complete market engagement and benchmarking by engaging with peer utilities and the broader DER marketplace. This outreach will help us understand the latest market trends, best practices, emerging needs, and technologies and incorporate these insights into our product portfolio and innovation activities. PSE will participate in key industry organizations (e.g., PLMA, SEPA, GridFWD) and conferences (e.g., DistribuTECH) to identify emerging technologies, products, and vendors. Our participation will help us understand vendor capabilities and proven performance in the marketplace and coordinate with vendors to align our product to PSE and customer needs. PSE will also coordinate market potential studies to understand costs and MW.

By the end of 2024, we will add 18 MW of solar capacity, 7 MW of storage capacity, and 5.9 MW of demand response capacity to the PSE resource mix.

**2025**

In 2025, the DER procurement team will prepare the next procurement phase, which we will describe in the 2026-2030 CEIP.

By the end of 2025, we will add 19 MW of solar capacity, 14 MW of storage capacity, and 17.7 MW of demand response capacity to the PSE resource mix.

### Customer Enablement

**DER Enabling Activity Set:** Customer Enablement

**PSE Work Stream Guiding Principles**

PSE will launch and operate a portfolio of DER programs in a way that benefits all customers and communities, especially those who have not traditionally had access to or benefitted from clean energy. Affordability has been a key PSE focal point for almost 150 years and will remain so throughout this journey. To deliver affordable clean energy programs that are accessible to everyone in PSE's diverse communities, we have defined the following principles to guide the DER customer experience:

- Program enrollment is simple and easily accessible. Create one streamlined enrollment process that is simple to use and provides a positive customer experience.
- Be a Clean Energy Partner of Choice for PSE customers. Provide education and support for customers along their journey, including available energy solutions, program participation requirements, costs, and benefits.
- Easily pair a customer with the right program design to meet their needs. Ensure DER programs are accessible for all customers and help them select the appropriate program.

**Actions to Launch and Operate PSE's DER Portfolio**

PSE will explore new approaches to marketing and outreach, enrollment, billing, communications, and customer service to guide customers through our suite of DER programs.

**Portfolio Customer Care Strategy:** PSE will establish a comprehensive strategy across the DER product line that outlines an approach to manage customer inquiries, educate customers, drive program enrollment, and resolve customer issues or concerns. This approach will be critical to maintaining positive experiences as PSE begins to offer many new customer options. Representative activities addressed in this initiative will include:

- Determine how to structure and staff parts of PSE customer care activities.

- Identify resource and training needs of customer-facing roles like the Energy Advisors and Customer Service Representatives.
- Create a framework for identifying and offering program recommendations to customers such as digitally and through customer service process.
- Create procedures, job aids, and guidance to resolve critical customer issues related to DER programs, such as bill updates or timely response procedures.

**Portfolio Marketing Strategy:** Effective customer outreach will be critical for PSE to achieve the volume of enrollment needed to meet the CEIP goals. Since PSE will offer more DER products, we must be cautious not to overload customers with too many marketing communications. A portfolio marketing strategy will reveal opportunities for synergies and cost savings for our marketing efforts. Representative activities include:

- Develop strategy and approach to target potential DER customers.
- Execute marketing and outreach strategy across the DER/customer solution portfolio.
- Align the DER brand strategy and portfolio with the PSE corporate brand.
- Determine customer acquisition strategy, including opportunities for cross-promotion.
- Develop centralized source for vital DER program customer data, such as leads, interests, enrolled customers.

**Portfolio Customer Experience Strategy:** A defined end-to-end customer experience workflow will allow PSE to help customers overcome common barriers to adoption, including information awareness and clearly communicated program benefits. A customer experience roadmap will also set PSE up for streamlined processes, data management, and reporting. Representative activities include:

- Define customer onboarding workflows that synchronize program enrollment with DER operations.
- Inform customer and program data flow to optimize customer acquisition strategies and program attribution reporting.

**Supporting technology or people resources**

PSE will enhance or enable a series of integrated platforms to drive a coordinated enrollment, outreach, and communication process.

**Customer Relationship Management (CRM) Platform:** As PSE's portfolio grows in the number of product options and total customer participation, a CRM platform will provide critical support to generate leads and manage program enrollment and customer support. PSE customer service representatives and Energy Advisors will provide meaningful program information efficiently and help

the customer understand the status of their enrollment application on our CRM platform. The PSE CRM system will also easily provide necessary technical details to quickly register the customer's DER device or complete transactions when PSE provides the DER solution on our CRM platform. We will enhance our current CRM capabilities to address multiple program engagement workflows, such as capturing device information and allowing third parties to send and receive appropriate customer information for program operations. We will also design, implement, and test interfaces that quickly send participant information to relevant IT/OT, billing, and reporting systems. Key functions include:

- Track customer communications through outreach and enrollment processes and respond to customer inquiries throughout the customer's journey with these programs.
- Track and gather information about enrolled products, home devices, and other data to improve customer support and product recommendations.
- Support for customer service functions such as create a contact and case management center.

**Customer Enrollment and Education Portal:** With more PSE customer program choices, a centralized landing page will help customers learn about the range of programs available, increase cross-sell opportunities, and quickly navigate to educational content and tools for each program, such as savings calculators. A centralized portal will help accelerate program enrollment processes and reduce customer confusion. Key features include:

- Centralized educational content database to support customer awareness.
- Simple calculators to advanced financial modeling tools to help customers evaluate benefits.
- Messaging and prompts to support program lead generation.

**Customer Notification Platform:** Many DER products require PSE to communicate with customers as part of the program design. These products require a messaging platform to store customer communication preferences and to notify customers of events or other essential program information. PSE will enhance our current notification solution capabilities to send and receive communications during event windows and customer service needs related to the customer's DER solution. Key features include:

- Two-way communication through various communication methods based on the customer's communication preference.
- Ability to easily opt-out of certain events with immediate feedback.
- Interface with CRM to support customer issue resolution.

**Complex Billing Functionality:** Many DER products will require implementing billing system changes, including some which will require the support of new tariffs with differing levels of transaction complexity. With planned strategic IT billing system upgrades, PSE will save substantial costs to

implement the new DER products and programs. We will use a coordinated approach to enable multiple DER programs with common billing functionality such as fixed monthly payments, event-based compensation, time-of-use periods, and interconnection billing/payment. By bringing multiple programs online simultaneously, we can execute this plan quickly and save money. We must make substantial changes to PSE's current billing system to allow for the different payment structures required for our DER programs. We will also enhance features for online billing and paper bill design. Key features include:

- Custom configurable payment parameters that are common to DER programs.
- Updated billing design to show payment calculations.

**Marketing Platform:** PSE will update our marketing platform to enable more data-driven marketing tactics to support the DER program outreach, resulting in increased program participation per dollar spent. Key features will include:

- Augment existing propensity modeling tools to support targeting for DER programs and align with campaign strategy.
- Explore and implement automated approaches to messaging customers based on propensity outcomes and communication preferences.

**Device Marketplace:** The device marketplace is a PSE-branded web portal that enables customers to shop for devices or services related to participation in a DER program linked directly from our website. These portals will support increased program adoption and improve customer experiences by streamlining enrollment processes. PSE expects to augment existing device marketplaces, available for energy efficiency, to promote qualified DER solutions and supporting contracting services for installation. PSE will also explore opportunities to cross-promote energy solutions for customers in different areas for optimal customer engagement. Key features include:

- A searchable website with available products and complimentary services that qualify for PSE DER programs.
- Access to the enrollment portal for a seamless program set up once a product has been selected.

With the launch of multiple DER programs over the next four years, PSE expects an increase in staffing requirements and external service support to help us define and execute customer initiatives. We will add customer service representatives to support increased customer interactions and additional staff or outside services to support the suite of platforms described above.

### Annual Actions and Costs

#### 2022

In 2022, PSE will evaluate and enhance current customer care processes and structures to prepare for the launch of upcoming DER programs in 2023-2024. Following the Targeted DER RFP outcomes, we will define key coordinated marketing strategies and customer acquisition goals for the coming program launches.

By the end of the year, PSE will begin work on customer experience journey(s) to inform the design process with selected vendors from the DER RFP and ensure stakeholders can provide input on the most effective ways to reach vulnerable populations.

#### 2023

At the beginning of 2022, PSE will complete the development of customer use cases and journey mapping in coordination with the selected vendors and appropriate community stakeholders. Throughout the first half of 2023, PSE will start enrollment for most of the Distributed Solar, Distributed Storage and Demand Response programs. Also, during this time, PSE will coordinate the appropriate CRM, Complex Billing, and Customer Notification Platform feature sets minimally needed to support the roll out of the respective programs and by the end of the year, initial capabilities will be live.

Also, during the year, PSE will refine our customer care processes and procedures to support the planned DER portfolio and establish the integrated marketing approach that provides choices to meet the customer where they are at in their DER journey.

Customer Care staff will attend training on the various program designs, educational tools, and benefits to support outreach and answer questions. Customer Care, as well as Marketing, staff will also be trained on the enhanced CRM and Complex Billing features expected to go live throughout the year to support the portfolio of programs launching in 2023.

By the end of 2023, we will add 17 MW of distributed solar capacity, 5 MW of distributed storage capacity and 5.1 MW of demand response capacity to the PSE resource mix.

#### 2024

In early 2024, PSE's billing system enhancements and a bill redesign will be ready to support program operations and ensure a positive customer experience and fully operational for ongoing program enrollment, lead management, and customer billing and notification operations.

In the first half of the year, PSE will launch Phase 2 programs which includes Commercial and Industrial space leasing for batteries and additional Demand Response programs based on the outcomes of the Targeted DER RFP. By the end of the year, PSE will be utilizing the full capabilities of its customer application platforms to ramp up program enrollment, serve up relevant DER educational

material, equipment, and installation information. Also, Customer Care and Energy Advisor groups will increase outreach activity to support the targets expected for each resource area.

PSE will perform a gap analysis and define appropriate enhancements to our current device marketplace solutions to include devices that support the DER portfolio.

By the end of 2024, we will add 18 MW of solar capacity, 7 MW of storage capacity, and 5.9 MW of demand response capacity to the PSE resource mix.

**2025**

In early 2025, PSE will launch the enhanced device marketplace and continue to evaluate potential improvements to the platforms based on our DER portfolio performance. Throughout 2025, PSE will continue to optimize available program information to create a better customer experience and promote enrollments for PSE's programs.

By the end of 2025, we will add 19 MW of solar capacity, 14 MW of storage capacity, and 17.7 MW of demand response capacity to the PSE resource mix.

### Transmission Capacity Constraints

To deliver centralized and distributed energy resources, while ensuring reliable operation of the grid, transmission will be required. The 2021 IRP discussed transmission capacity constraints, specifically modeling whether there is enough transmission capacity available to carry power from remote renewable resources to PSE's service territory (2021 IRP Chapter 5 and Appendix J). The IRP recognized that PSE would need to work to optimize use of its existing regional transmission portfolio to meet our growing need for renewable resources in the near term, but in the long term, the Pacific Northwest transmission system may need significant expansion, optimization, and possible upgrades to keep pace with the growing demand for clean energy. It also recognized that investments in the delivery system, within PSE's service territory, are also needed to deliver energy to PSE's customers from the edge of PSE's territory and support the integration of distributed energy resources and demand response within the delivery grid. It also identified that a significant change in PSE's portfolio to distributed resources would be required if additional transmission could not be secured (2021 IRP, Chapter 8, Sensitivity C).

Delivery system transmission improvements are discussed in 2021 IRP Chapter 8 and Appendix M and further in Grid Modernization section.

### Grid Modernization

Investments in the delivery system, including planning and operational tools, are needed to deliver energy to PSE's customers from the edge of PSE's territory and to support DERs within the delivery grid. PSE's Grid Modernization Strategy (Appendix G) identifies work that is needed to ensure safe, reliable, resilient, smart and flexible energy delivery to customers. Specific delivery system investments

will become known when energy resources, whether centralized or DERs, begin siting through the established interconnection processes. A grid and customers ready for DER integration will decrease the cost for interconnection and increase the number of viable locations. Proactive investments in grid modernization are also critical to support the clean energy transition and maximize benefits.

**Preparing for clean energy for many years**

PSE has been actively preparing for clean energy pursuits and DERs for many years. Dating as far back as 2010, WAC 480-100-505 focused on electric utility's preparation and progress toward a "smart grid" that enabled many elements outlined in this CEIP. This includes the advancement of digital information relating to electricity use, costs, prices, time-of-use, nature of use, and storage and delivery signals to allow end use load device automation, controlling and managing electricity demand, congestion management, voltage control, operating reserves, and frequency regulation. It sought progress in the grids' ability to:

- sense local disruptions or changes in power flow,
- use two-way communication to enable different customer contracts or programs, such as real time prices or demand response programs,
- manage new end-use services to reduce operating or power costs, improve reliability, or improve energy efficiency, such as charging electric vehicles,
- use real time measurement of power generated from customer-owned power facilities and
- use digital information to improve the reliability or efficiency of generating equipment in an integrated manner to improve flexibility, functionality, interoperability, cyber-security, situational awareness, and operational efficiency of the transmission and distribution system.

Since 2010 there are additional policies that highlight a future cemented by CETA including the WUTC issued Report and Policy Statement on Treatment of Energy Storage Technologies in Integrated Resource Planning and Resource Acquisition[36] that encouraged greater energy storage alternatives in planning processes, suggesting a future grid to embrace this technology. These tea leaves were not hard to read, and PSE has been developing and advancing a modern grid, planning for and investing in infrastructure that ultimately supports clean energy goals and arguably makes the transition easier. Grid modernization requires a holistic approach for clean energy to be used by customers when they need it.

**CEIP Allocation Methodology**

There are a handful of tools and programs that PSE will discuss in the context of incremental costs for CETA as they are key enablers accelerated to keep pace with the preferred portfolio and processes envisioned in the CEAP. The clean energy action plan based on the 2021 IRP preferred portfolio identified a significant number of DERs needed by 2030. In total, 634 MW of distributed batteries, solar

[36] UTC Docket U-161024

and demand response with PSE's service territory by 2030. This is over 10 times the amount of DERs than the grid has accommodated over the last 4 years, a total of 52 MW. PSE's grid modernization investments were keeping pace with the economic driven customer adoption of DERs across the grid, the pace of DERs driven specifically by the CETA law and resulting policies a reset on some programs.

To accommodate the rapid increase in DERs the grid needs to support over the next 10 years, portions of the grid modernization investments need to be accelerated to match that pace. The overall target over the next 5 years is to enable 5 percent (~55) distribution circuits to be fully ready to support high penetrations of DERs in the range of 2–5MW per circuit. To ensure the grid can support this while continuing to deliver reliable and resilient power to customers, we accelerated specific investments and identified new ones. This included as examples:

- Enhancing the SCADA system equipment at substations supporting DER high penetration circuits,
- Enhancing circuit visibility and control by installing additional voltage regulation and automated circuit switching equipment on DER high penetration circuits.
- Enhancing resilience focused on proactive high risk grid monitoring and associated DER microgrid installations to enable alternate sources of power for customers experiencing limited grid flexibility.
- Proactive DER property acquisition adjacent to existing substation facilities that can enable lower cost interconnection for DERs while maximizing benefits to the system while incorporating equity considerations.

Additionally, PSE focused on tools that are just now being developed, recognizing tools like ADMS will be foundational as we progress toward clean energy, but is already underway. But it is important to recognize that the investment in grid modernization in its entirety is needed for successful transition irrespective of whether work occurred before the effective date of the CETA or whether it facilitates additional benefits not specifically envisioned by CETA. For example, transmission capacity investments in compliance with the NERC Reliability Standards are required to deliver the increased load and provide the flexibility and reliability that will be needed with the proliferation of DERs and electric vehicles, power must still flow along lines and those transmission and distribution lines must be reliable. These investments are intentionally not included in the incremental costs for CETA, but should not be assumed unnecessary by any stretch. Review and approval of PSE's CEIP must consider the foundational, sustaining, and advancing programs and plans associated with PSE's entire grid modernization investments and be mindful of the risk to clean energy delivery if the assumption "PSE will do this work anyway" is faulty or hindered.

PSE's 2021 IRP, Chapter 8 and Appendix M, recognized the important investments in the grid to enable this transition and avoid reactive expenditures to accommodate unanticipated growth in

distributed energy resources[37] and CEAP reaffirms the 10-year plan for the deliverability of resources[38]. PSE's entire grid modernization investments drive progress in visibility, analysis, and control; reliability and resiliency; DER integration processes; security, cybersecurity, and privacy; and backbone infrastructure.

**Visibility, Analysis, and Control**

Data availability, integrity and granularity are critical aspects to planning for and operating DERs. Through PSE's ongoing investment in Advanced Metering Infrastructure (AMI) and SCADA at distribution substations, PSE will have new data and visibility that can be utilized for delivery system planning, customer program planning and operational analytics. AMI is an integrated system of smart meters, communications networks and data management systems that enables two-way communication between utilities and customers, technology that has become industry standard[39]. AMI meters will serve to provide significant enhancements to the types and granularity of data PSE can collect to proactively plan for growth, integrate new technologies, offer services to customers, respond more quickly to system needs and operate the system safely.

PSE is currently implementing an Advanced Distribution Management System (ADMS). ADMS is a computer-based, integrated platform that provides the tools to monitor and control our distribution network in real time. The implementation of ADMS will ultimately lead to advanced operational capabilities for DERs including an integrated Distributed Energy Resource Management System (DERMS). Prior to implementation of a fully integrated DERMS, PSE plans to implement a Virtual Power Plant (VPP). Virtual Power Plants forecast and aggregate different types of DERs to coordinate dispatch to meet system resource needs. VPPs can aggregate DERs including demand response, EV charging management, CHP, solar PV (smart inverters) and distributed storage. Some VPPs can also manage alternative pricing programs such as Peak Time Rebates. To realize the dispatchable capacity benefits of the DER additions expected over the next 5 years, PSE needs a VPP to manage DER customer acquisition, forecasting, dispatch and settlement. PSE has developed the technical and operational requirements for a VPP and is currently undertaking an acquisition process.

In addition to AMI and ADMS, SCADA provides real-time visibility and remote control of distribution equipment to reduce duration of outages, improve operational flexibility and enhance overall reliability of the distribution system. Data analytics programs will support optimization of customer service and system operations including predicting asset replacement needs before failure as DERs are added to the grid. PSE is currently implementing a geospatial load forecasting tool that includes DER forecasting capabilities, as well as end-use forecasting information that supports our energy efficiency and demand response programs. With this tool we can understand not only the anticipated growth of DERs, but also

[37] RCW 19.280.100(2)(e)
[38] IRP; pg 2-20
[39] UE-190529 and UG - 190530; PSE 2019 General Rate Case Final Order ¶ 153

the specific feeder locations. Along with hosting capacity analysis, geospatial load forecasting will enable proactive system investments and potentially uncover targeted demand-side management options and support non-wires alternatives. PSE will continue to enhance its modeling tools and capabilities to ensure grid stability.

**Reliability and Resiliency**

To avoid reactive investments due to unanticipated DER adoption and integration PSE will pursue targeted, proactive asset management and system upgrades to enable DER integration and transportation electrification through ensuring a healthy system, managing load and DERs, and ensuring reliable operation. Grid modernization investments will improve the reliability of PSE systems, improve their ability to withstand and recover from extreme events, and enable smart and flexible grid capabilities. Ongoing and site-specific asset investments are needed such as pole replacement, tree-wire conductor, cable remediation, programmatic transformer replacements as DERs and electric vehicles propagate, and substation and circuit enhancements that ensure or expand DER effectiveness. This is aligned with the DER Planning requirements of RCW 19.280.100.

Managing increasing loads will be intentional with advanced capabilities such as Volt-Var Optimization (VVO) and enabling faster system outage restoration through use of Fault Location, Isolation Service Restoration (FLISR), all enabled through the ADMS platform and additional investments in reclosers, switches, voltage regulators, capacitors banks and network communications infrastructure. FLISR will support grid reliability. VVO will manage voltage and reactive power as loads shift due to DER implementation. PSE will also pursue energy security and resiliency investments such as microgrids or infrastructure hardening where specific locations require increased resilience. These locations could include highly impacted communities, transportation hubs, emergency shelters and areas at risk for isolation during significant weather events or wildfires.

**DER Integration Processes**

In addition to the enabling technologies, analytical capabilities and system component upgrades, PSE is developing a hosting capacity analysis tool, map, and enhanced web-based interconnection portal. The hosting capacity analysis tool and map will create greater transparency for siting DERs on the distribution system. The interconnection portal would streamline the interconnection process for both customers and developers by prescreening applications.

**Security, Cybersecurity, and Privacy**

While pursuing our grid modernization strategy, PSE will continue to put a strong focus on cyber-security. PSE applies the same level of due diligence across the enterprise to ensure risks are consistently addressed and mitigated in alignment with the rapidly changing security landscape. PSE utilizes a variety of industry standards to measure maturity as each standard approaches security from a different perspective. As critical infrastructure technology becomes more complex, it is even more crucial for PSE to adapt and mature cyber-security practices and programs allowing the business to

take advantage of new technical opportunities such as Internet of Things (IoT) devices. In addition, we continue to foster strong working relationships with technology vendors to ensure their approach to cyber-security matches PSE's expectations and needs.

**Backbone Infrastructure**

Finally, PSE will continue to upgrade its local transmission system to meet NERC compliance requirements and evolving regulations related to DER integration and markets and meet peak demand reliably. PSE will deploy identified, project-specific non-wires solutions to support the near-term integration of DERs and continue to validate the DER forecast to realize predicted solutions to meet resource needs.

**Actions and costs 2022–2025**

Specific grid modernization investments that directly enable or support the Clean Energy Portfolio are described in more detail in the following sections:

- Virtual Power Plant
- Distributed Energy Resource Management System
- Volt-Var Optimization
- Hosting Capacity Analysis Tool, Map, and Customer Portal
- SCADA
- Distributed Energy Resource Circuit Enablement
- Property Acquisition
- Resilience Enhancement

More generally, grid modernization investments will include important accomplishments:

- Implement AMI by 2023–2024
- Implement ADMS by 2023–2024
- Upgrade over 11,000 poles, 240 miles of underground cable, 320 substation assets
- Improve reliability and resilience of 135 worst performing circuits, 50 substations and circuits with added automation, 70 targeted circuit upgrades, added 5-10 microgrids with completion of Tenino pilot
- Continue energy savings (addressed in resource programs) through conservation voltage reduction on 14-20 substations,

- Enable EV growth through 30,000 transformer upgrades
- In addition to the three non-wire projects discussed, pursue additions to the backbone including five transmission line upgrades and one substation upgrade and continue evaluating and begin implementing solutions associated with five transmission reliability and capacity needs and four substation capacity needs. Many of these will include evaluation of non-wire alternatives to address the 28 MW in the next CEIP.

## Virtual Power Plant

### Virtual Power Plant Explained

The Virtual Power Plant (VPP) software establishes a platform by which aggregated DERs can be forecasted, controlled, and dispatched by PSE as part of the clean energy portfolio. A VPP is a software tool that enables PSE to utilize diverse types of DERs at desired magnitudes to meet resource needs. The primary use case for the VPP is dispatch of DERs to meet system-wide clean energy and capacity resource needs. The secondary use case is control for specific groups of DERs where there might be localized system needs. Establishing a Virtual Power Plant will allow PSE to utilize existing DERs and acquire additional DERs to meet customer and portfolio needs.

### How these actions move us closer to meeting CETA goals

The VPP will provide a platform to cost-effectively manage the increasing numbers of DERs that PSE will acquire in the future. It will also give us the ability to continuously develop and integrate clean energy resources to meet customer and portfolio needs. The VPP will track and report DER capacity and energy available and utilized for dispatch. As the centralized operations platform for DERs, the VPP will support CETA milestones for DER integration.

- Integrating the VPP in a timely manner will help accelerate DER acquisition to meet CETA requirements.
- A predefined and established VPP in PSE will improve the efficiency in DER acquisition and decrease the costs. Given that PSE will already have a software platform defined for the DER program development, this prevents the need to have multiple software platforms for each DER program. As a result, the VPP will decrease the capital cost of integrating multiple software platforms
- The centralized VPP architecture will decrease the number of interfaces and software required for DER operations, reducing future IT O&M costs.

### 2022

Finalize the contracting process, select a vendor to support integration, and move forward with the design and execution of the VPP software platform.

**2023**

Continue with the execution of the VPP platform and close out the project. During the first half of 2023, PSE's first and largest wave of DER programs will be launching and will start utilizing the VPP functionality and enable PSE to realize more benefits from this platform. For more information, refer to DER Enablers—Operations Enablement.

**2024**

PSE will use existing or new FTEs to provide ongoing support and maintenance to the latest software platform.

**2025**

Ongoing support and maintenance to the latest software platform.

**Customer Benefits**

Establishing the VPP prior to acquisition of DERs will enable PSE to avoid the cost and operational complexity of procuring and implementing multiple dispatch platforms. Multiple dispatch platforms would result in additional costs to customers and create operational challenges associated with forecasting and dispatching across many different platforms. The VPP project will set a standard approach to DER integration and operations.

The VPP enables cross-aggregator dispatch and prioritization, managing all aggregators as a common platform. This approach will allow PSE to acquire and deliver diverse DER programs that meet customer needs over time.

**Track and report on progress, costs, and benefits**

PSE will monitor and report on progress, costs, and benefits through the Grid Mod Report.

### Distributed Energy Resource Management System (DERMS)

**Distributed Energy Resource Management System (DERMS) Explained**

While the VPP will manage distributed energy resources in the near term to meet system-wide needs, PSE's vision is to have an ADMS integrated DERMS to enable system operators to have visibility and control over aggregated and larger individual DERs, and the capability to safely maximize possible benefits. ADMS integration provides important information about power flows on the distribution system that are not available with the VPP, enabling the dispatch of distributed energy resources to address localized issues and provide non-wires alternative solutions. ADMS integration also coordinates distributed energy resource dispatch with other advanced applications, such as volt-var optimization (VVO) and distribution automation FLISR.

### How these actions move us closer to meeting CETA goals

An ADMS integrated DERMS will enable PSE to scale DER integration and operations to meet the needs of the clean energy portfolio. Without an ADMS integrated DERMS, PSE will be limited in the ability to dispatch DERs, and the distribution system needs to manage multi-directional power flows in coordination with other advanced applications.

**2024**

Develop DERMS requirements and acquisition process and begin implementation.

**2025**

DERMS implementation. Implementation to be completed in 2026.

### Customer Benefits

The DERMS is required from an operational standpoint to accommodate the wide range and scale of DERs anticipated, and to coordinate with non-wires alternatives projects and the other advanced applications (FLISR and VVO) that are necessary to provide reliable delivery of energy.

### Track and report on progress, costs, and benefits

PSE will track and report on progress, costs, and benefits within the Grid Mod Report.

## Volt-Var Optimization

### Volt-Var Optimization Explained

Volt-Var Optimization (VVO) is a process to achieve efficient grid operation by reducing system losses, peak demand, and energy consumption. VVO uses power regulation equipment like load tap changers and capacitor banks to improve power quality, minimize losses, and conserve energy. The VVO process is more sophisticated and extensive than conservation voltage reduction but relies on similar principles.

VVO will utilize PSE's ADMS software platform and associated network model to control power regulation equipment and manage voltages and reactive power flows in the distribution network. The VVO application within ADMS determines the optimal Volt-Var strategy to achieve the specified operating objective within the operating constraints.

### How these actions move us closer to meeting CETA goals

The Volt-Var Optimization Pilot (2021 – 2023) and program implementation (2024 – future) will include the installation of new voltage/var regulating equipment capable of remotely communicating and coordinating with PSE's ADMS (Advanced Distribution Management System). This real-time visibility and coordination will provide energy benefits to customers, improve power quality, defer capital

investments, and reduce system losses. PSE anticipates we will save approximately two to three percent of the MWh served by each substation implemented. This conservation is part of the clean energy portfolio. In addition, VVO will manage voltage and reactive power as loads shift due to DER implementation and can be targeted to areas with high DER penetration.

**2022**

PSE will begin 2022 by closing out the design phase of the pilot, ordering and testing the functionality of the new equipment, developing a new standard operating procedure, and coordinating new roles/responsibilities and change management practices. PSE will then begin the new switchgear field installations on approximately eight circuits served by Hobart and Blumaer Substations. PSE will close out the year by developing training guides and working closely with the ADMS team to coordinate the implementation of the advanced application software.

**2023**

PSE will focus on testing and commissioning the new equipment installed on the eight feeders served by Hobart and Blumaer substations and coordinate with the ADMS team on the advanced application software implementation. PSE will begin validating the results and success criteria established at the beginning of the pilot and develop plans to integrate the new technology into the business permanently. The pilot program will be closed out, and we will create a business case for a program rollout in 2024. PSE will roll out four to six new substations in 2024, targeted at residential customers.

**2024**

PSE will begin the rollout of the Volt-Var Optimization program with four to six substations. For this launch, PSE will plan, design, install, and commission new equipment on approximately 16 – 24 feeders, including three or four new pieces of voltage/var regulating equipment per feeder. We will note and document the benefits of the pilot implementation.

**2025**

PSE will continue to roll out four to six Volt-Var Optimization substations per year. To do this, we will continue to plan, design, execute, commission, and close projects.

**Customer Benefits**

The intended benefits of VVO include:

- Levelized voltage profile for all the customers on a feeder
- Improved power factor and reduced line losses
- Conservation voltage reduction (energy savings)

- Reduced demand (peak shaving)
- Percent voltage reduction in the emergency conditions (avoiding load shedding)

Energy conservation savings are realized both for PSE in terms of reduced supply, and for the customer as reduced consumption and bill savings. Improved power factor and a levelized voltage profile also results in better power quality for the customer. If not addressed, power quality issues, can damage customer electrical equipment and result in brownouts.

**Track and report on progress, costs, and benefits**

PSE will track and report on progress, costs, and benefits within the Grid Mod Report/Dashboard. This report is updated monthly and located on PSE's PowerBI Server.

## Hosting Capacity Analysis, Map, and Customer Portal

**Hosting Capacity Analysis, Map, and Customer Portal Explained**

For most interconnection application reviews, PSE will automate hosting capacity analysis based on power flow modeling and technical criteria. The analysis can indicate whether an interconnection should be approved, rejected, or require further analysis due to project complexity.

An associated hosting capacity heatmap provided to customers and developers will provide transparency to participants and locational value in relative terms. It will also reduce time and cost for the interconnection applicants, reduce applications that may require further studies, and free up PSE's planning resources from interconnection projects that are infeasible due to inadequate hosting capacity.

PSE will launch a customer-facing portal to provide added permanent digital records and queuing information of the interconnection process to customers and automate internal departmental reviews for DER interconnections. Customers can enter interconnection requests with project information through this portal, such as location, DER type, capacity, etc. This portal will import customer information from the GIS for applicants who are existing PSE customers.

**How these actions move us closer to meeting CETA goals**

The HCA platform and interconnection portal will enable the distribution grid to incorporate or integrate new technologies and streamline and guide DER interconnections in sizing and siting. The HCA platform will enable proactive electric system investments that support PSE's strategic goals and customer DER and EV installations. It will help customers and developers avoid lost time and application fees for planned projects that turn out to be infeasible, leading to the strengthening of PSE's customer service and grid transparency. The hosting capacity analysis tool, map, and customer portal will allow PSE to scale DER integration as the pace identified in the IRP.

The proposed clean energy portfolio will increase the interconnection effort five-fold by 2025. The hosting capacity analysis and interconnection portal program is estimated to automatically process 80

percent of the applications of those DERs. Applicants will benefit from a transparent, streamlined, and expedited process, and ratepayers will benefit from substituting human intervention in the application review process with software tools.

**2023**

PSE plans to move through the planning, design, and execution phases of the project in 2023. The HCA platform will consist of three deliverables: the hosting capacity analysis tool, hosting capacity map, and enhanced interconnection portal. During the first half of 2023, PSE will launch our first and largest wave of DER programs and customers can use the enhanced HCA Tool, Map, and Customer Portal to support their project planning. For more information, refer to DER Enablers – Strategy and Portfolio Planning

**2024**

PSE will provide ongoing support to the new HCA platforms (tool, heatmap, portal) with one additional business unit and an IT full-time employee (FTE).

**2025**

PSE will provide ongoing support to the new HCA platforms (tool, heatmap, portal) with one additional business unit and an IT FTE.

**Customer Benefits**

The HCA tool and map will enable electric system planners to identify areas of potential investment to enable DER interconnection. This proactive investment from PSE will enable interconnections without costly upgrades paid by the customer.

The HCA map and interconnection portal will enable more interconnection requests to be processed, and minimize withdrawn interconnection projects due to lack of hosting capacity.

Overall, the project will deliver greater customer self-service, grid transparency, and better project decisions through:

- Reduced customer planning, siting time, commute time, and fuel consumption
- Increased application success rate
- Avoided application fees for infeasible projects.

**Track and report on progress, costs, and benefits**

PSE will track and report on progress, costs, and benefits through the and within the Grid Mod Report.

## Substation Control and Data Acquisition (SCADA)

### Substation Control and Data Acquisition (SCADA) Explained

Substation SCADA (Supervisory Control and Data Acquisition) is a means of monitoring, protecting and controlling various different pieces of interconnected equipment on PSE distribution circuits and substations through data collection and remote operation. SCADA enablement includes the installation of controllers, relays, sensors, software and IT (Information Technology) upgrades for communication along with the smart breakers in the substation.

SCADA-enabled smart breakers and distribution feeder equipment provide real-time visibility and fault detection, this allows for automatic or remote control operation of distribution equipment during a fault event. The primary objective of the program is to improve reliability on distribution circuits, by reducing outage duration and restoring power to customers faster. Substation SCADA also benefits other initiatives such as distribution automation (DA) and will facilitate the introduction of ADMS when implemented.

The increased investment in the Substation SCADA program will enable PSE to upgrade all the remaining 145 substations out of the 268 total by 2028.

### How these actions move us closer to meeting CETA goals

The SCADA program supports Grid modernization efforts that will facilitate DER integration which helps PSE in meeting its CETA goals. SCADA data will be integrated with ADMS and support VVO and DERMS.

**2022**

Install or upgrade SCADA in 16 substations.

**2023**

Install or upgrade SCADA in 18 substations.

**2024**

Install or upgrade SCADA in 24 substations.

**2025**

Install or upgrade SCADA in 23 substations.

### Customer Benefits

The implementation of SCADA will provide supervisory control to system operators and enable them to operate the system in a timely manner to effectively reduce outage time during an event and restore

power to customers faster. This improves reliability for PSE customers and reduces the risk of extended outages. SCADA projects combined with distribution automation upgrades helps to detect and locate faults faster. Automatic or remote switching improves resiliency by protecting the infrastructure from further damage and maintains service to customers.

The benefits to customers are quantified as 'Customer Minute Interruptions' (CMI) saved which can be converted into SAIDI minutes saved.

**Track and report on progress, costs, and benefits**

The Substation SCADA program costs and progress are tracked and documented by the Project Manager.

Benefits (CMI) saved are recorded per project completion and reported on by Asset Management end of year for the annual Electric reliability report.

## Data Lake and Data Analytics

**Data Lake and Data Analytics Explained**

Advanced operational and planning capabilities require significant enhancements to data availability and granularity. Examples of required data include DER asset information, near real-time metering data, customer DER program participation, and detailed GIS and electric system asset information. The grid modernization Data Lake brings these disparate data sources together to enable new system operations, planning functions, and business processes based in analytics. Advanced operational and planning capabilities include, among others, unbalanced load flow and state estimation that support a wide range of enterprise tools. This project will also develop new business processes and tools to support analytics capabilities.

**How these actions move us closer to meeting CETA goals**

An architecture that enables data to be validated and utilized across the enterprise by planning and operational tools will allow PSE to scale DER deployment at the pace anticipated by the IRP. The architecture will ensure all DER operational and planning tools are utilizing the same as-built and as-operated models and normalize data exchange and model information. This will be critical as the pace of interconnection increases and DER penetration increases throughout the service territory. New business processes and tools combined with analytics will enable PSE to perform operational planning and real-time operations that maximize the potential benefits of DERs—including locational and market value—while minimizing grid disruptions.

**2022**

N/A

**2023**

Develop IT/OT architecture to support current and future DER enabling technologies including Data Lake, enterprise service bus, and operational technology/control bus. Develop business processes and tool enhancements that support timely and complete updates to GIS data as changes are made in the field. Develop business processes and tool enhancements that support timely and complete updates to DER asset information.

**2024**

Begin implementation of architecture and business processes/tools identified in 2023.

**2025**

Complete implementation and reassess ongoing data needs and gaps.

**Customer Benefits**

This project enables PSE to integrate DERs at the pace anticipated in a more cost-effective and efficient manner. Business processes and tool enhancements combined with data analytics will deliver actionable intelligence for optimal network performance and grid reliability as the system becomes increasingly complex.

**Track and report on progress, costs, and benefits**

PSE will track and report on progress, costs, and benefits through the Grid Mod Report.

## Circuit Enablement – DERs and Microgrids

**Circuit Enablement – DERs and Microgrids Explained**

As the DER portfolio scales, the peak capacity output for DERs on a circuit will be constrained by existing grid infrastructure, as the system does not accept high amounts of reverse power flow. PSE has identified the need to enable 5 percent of circuits (~55) for high DER penetration. Voltage imbalances caused by DER production onto the grid impact reliability and power quality, which in turn limits available hosting capacity. The DER and microgrid circuit enablement program proactively improves electric infrastructure to expand DER hosting capacity equitably. Program population size and data will ultimately be determined by hosting capacity studies, the CEIP, and the DER strategy. Although a range of factors can contribute to limited hosting capacity, lightly loaded substation circuits pose as key investment areas for infrastructure upgrades.

Below are key tasks to achieve DER and Microgrid circuit enablement:

- Upsizing of assets such as conductors and service transformers to accommodate additional renewable energy capacity

- Additional line regulators and/or substation transformer upgrades for voltage regulation
- Additional reclosers and protective relays to form microgrids
- Substation upgrades such as smart circuit breakers, 115 kV circuit switchers, or communications to protect system from higher fault currents
- Improving communication networks for granular loading data

**How these actions move us closer to meeting CETA goals**

Current grid infrastructure limits the ability for mass DER export as anticipated in the IRP. Managing the diverse and distributed energy portfolio with intermittent resources while being able to maintain adequate utility power creates new planning and operating parameters on the grid. Close studies of the circuits with higher DER penetration shall address circuit infrastructure constraints and create a path forward to enable them for DERs and Microgrids.

**2022**

N/A

**2023**

Enable 7-8 circuits for up to 5 MW of DERs.

**2024**

Enable 8-9 circuits for up to 5 MW of DERs.

**2025**

Enable 12 circuits for up to 5 MW of DERs.

**Customer Benefits**

In addition to the deployment of PSE owned assets, customer, and developer interconnection requests of DERs are expected to grow to support the clean energy portfolio. This program aims to create more opportunities for customers seeking to interconnect DERs or form microgrids by proactively enabling circuits that are limited in hosting capacity/microgrid capabilities.

**Track and report on progress, costs, and benefits**

PSE will track and report on progress, costs, and benefits through the Grid Mod Report.

## DER Property Acquisition

### DER Property Acquisition Explained

The ability to implement DER on the system is dependent on the availability of land that is of sufficient size to accommodate a DER installation, is located close to areas of the system that have available capacity and has easy access to corridors needed to transport that energy to the customer.

Following a technical analysis of the system to identify areas with the available capacity to incorporate a high penetration of DER, PSE will proactively evaluate and identify properties and corridors that would allow for low-cost interconnection of these resources. Consideration will be given to existing PSE properties with the potential for expansion, which would provide lower overall interconnection costs and allow for more DER within the identified areas. Priority will be given to the incorporation of DERs in areas of the system that serve highly impacted communities and vulnerable populations.

DER property acquisition will focus not only on the purchase of land to develop into DER or substation property, but also in the acquisition of rights of way, such as easements, for delivering that energy to PSE's customers.

### How these actions move us closer to meeting CETA goals

The proactive acquisition of properties and rights of way to facilitate the interconnection of DER will enable PSE to streamline the planning and implementation process for new DER projects to support PSE's strategic goals. The evaluation and development of locations for siting new infrastructure can be a significant hurdle in planning and implementation of new infrastructure. Having proactively identified sites available for development in areas of the system that are known to have the capacity available to accommodate DERs will allow for flexibility in considering solutions for system needs and ease of implementation.

### 2022

PSE plans to evaluate the system to identify areas of priority in 2022. This analysis will focus on areas of the system with the available capacity to accommodate DER, areas of the system that serve highly impacted communities and vulnerable populations, and existing PSE-owned locations with the ability to be expanded.

### 2023

PSE will focus our efforts on property acquisition utilizing the findings of the system analysis.

### 2024

PSE will focus our efforts on property acquisition utilizing the findings of the system analysis.

**2025**

PSE will focus our efforts on property acquisition utilizing the findings of the system analysis.

**Customer Benefits**

The proactive acquisition of property by PSE will enable interconnections and minimize costly upgrades paid by the customer. The interconnection process will be simplified by proactively identifying the areas of need on the system and focusing on the expansion of existing PSE properties. It will also facilitate the implementation of DER for highly impacted communities and vulnerable populations which may not otherwise have access to new technologies such as DER.

Overall, the project will deliver greater customer self-service and better project decisions through:

- Reduced system upgrades needed to incorporate DER
- Reduced interconnection costs
- Increased application success rate
- Avoided application fees for infeasible projects

**Track and report on progress, costs, and benefits**

PSE will track and report on the number and size of the properties and/or easements acquired as well as the estimated MW of DER the property will accommodate.

## Resilience Enhancement

**Resilience Enhancement Explained**

PSE's resilience efforts are focused on low probability, high consequence risks that take significant efforts to understand and mitigate along with ongoing system-wide asset health issues that make the electrical system more susceptible to destabilization. Included in these programs are wildfire mitigation, earthquake preparedness, drone-based LiDAR and IR scanning, and microgrid systems that can serve customers during widespread interruptions.

**How these actions move us closer to meeting CETA goals**

Building a robust asset management strategy is an underlying need for DER enablement and system improvements on the edge of the electrical grid drive system resilience. Resilience enhancements include microgrid enablement for radial fed areas which enhance the effective use of DERs and improve customer reliability and resiliency.

### Customer Benefits

Microgrids improve both reliability and resiliency by reducing the impact of interruptions to customers by providing alternate sources of energy, whether under normal conditions or during large scale disruptive events. Asset monitoring and management programs improve both as well by reducing the risk of failed or failing equipment from causing interruptions or preventing microgrids from offering an alternate source of power during interruptions.

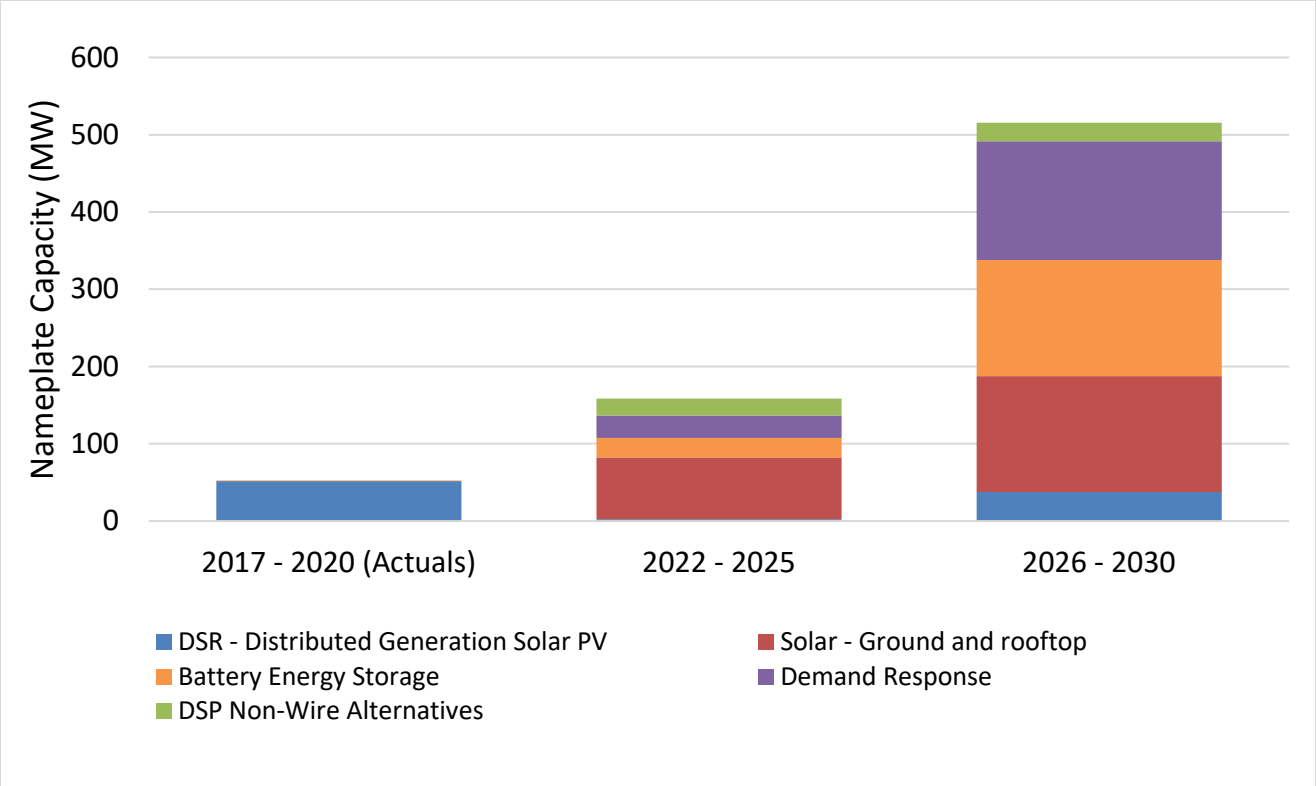
### Track and report on progress, costs, and benefits

PSE tracks progress on projects, costs, and benefits in corporate database (SAP) and will communicate results in the Grid Mod report.

## Grid Modernization CEIP Investment Impacts

PSE continues to implement a robust grid modernization strategy which includes several investments to enhance the delivery infrastructure. One part of the objective is to further DER integration on the grid. The clean energy action plan based on the 2021 IRP preferred portfolio identified a significant number of DERs needed by 2030. In total, 634 MW of distributed batteries, solar and demand response with PSE's service territory by 2030. This is more than 10 times the amount of DERs than the grid has accommodated over the last 4 years as shown in figure 4-6.

Figure 4-7: Incremental DER Resource Additions per CEAP



To accommodate the rapid increase in DERs the grid needs to support over the next 10 years, portions of the grid modernization investments need to be accelerated to match that pace. The overall target over the next five years is to enable 5 percent (~55) of distribution circuits to be fully ready to support high penetrations of DERs in the range of 2–5MW per circuit. To ensure the grid can support this while continuing to deliver reliable and resilient power to customers, we accelerated specific investments and identified new ones. This included:

- Enhancing the SCADA system equipment at substations supporting DER high penetration circuits.
- Enhancing circuit visibility and control by installing additional voltage regulation and automated circuit switching equipment on DER high penetration circuits.
- Enhancing resilience focused on proactive high risk grid monitoring and associated DER microgrid installations to enable alternate sources of power for customers experiencing limited grid flexibility.
- Proactive DER property acquisition adjacent to existing substation facilities that can enable lower cost interconnection for DERs while maximizing benefits to the system while incorporating equity considerations.
- Accelerated implementation of operational platforms such as Virtual Power Plant (VPP) and Distributed Energy Resource System (DERMS)

While grid modernization investments were keeping pace with the economic driven customer adoption of DERs across the grid, the pace of DERs driven specifically by the CETA law and resulting policies have necessitated a 10-fold increase in DERs than originally anticipated. Adding DERs to the grid while maintaining operational flexibility, to ensure no degradation of customer reliability and enhancing resiliency will take additional investment and, for many programs, faster investment to ensure the grid can fully meet the CEAP targets.

## Other Actions that reduce retail sales

### Public Utility Regulatory Policies Act (PURPA) / Schedule 91 Resources

#### PURPA explained

The Public Utility Regulatory Policies Act of 1978 (PURPA) created a new class of generating resources known as qualifying facilities. Per Washington Administrative Code (WAC) chapter 480-106, PSE provides qualifying facilities with a long-term—up to 15 years—power purchase agreement for projects up to 5 MW that connect to PSE's system. Under WAC chapter 480-106, "The rates for purchases from qualifying facilities include any energy and capacity that is made available from a qualifying facility: (a) directly to the utility; or (b) indirectly to the utility in accordance with subsection (4) of this section." The Washington Administrative Code defines a qualifying facility in WAC 480-106-007

as a “cogeneration facility or small power production facility that is a qualifying facility under 18 C.F.R. Part 292 Subpart B."

The rates, or avoided costs, offered under Schedule 91 are updated annually in Q4 and filed with the WUTC for approval. Approved rates apply to any new agreements signed after the updated rates go into effect. The project owner retains any renewable energy credits (RECs) associated with energy generated by the project unless PSE and the project owner formally agree to PSE’s purchase of the renewable energy credits.

PSE currently has Schedule 91 Agreements with 17 active projects, ranging from a 26-kilowatt solar installation to a 4.5-MW landfill gas facility. In addition, PSE has Schedule 91 Agreements in place with three 4.99-MW solar projects that anticipate being operational in late 2021 and 2022. PSE must acquire all electricity generated by these Schedule 91 projects delivered to PSE’s system.

**How these actions move us closer to meeting CETA goals**

The PURPA/Schedule 91 program provides additional renewable energy to PSE’s electric supply. Per the requirements for calculating PSE’s percentage of renewable energy, PURPA resources are subtracted from PSE’s retail electric load for the purposes of CETA compliance calculations[40], but still provide renewable energy to PSE’s system.

This program brings additional renewable energy generation to PSE’s service territory, reduces the load needed to meet peak capacity, and is a renewable energy source. The MWh generated by this program contribute to load and thus reduces the CETA MWh compliance need. These MWhs generated by PURPA projects bring PSE closer to our 80 percent target by reducing the load and thus reducing the amount of generation needed to meet system load. Today PSE has a total of 23 MW of nameplate capacity and anticipates an additional 15 MWs of solar will be added by mid-2022.

**Annual Actions and Costs**

**2022–2025**

PSE will continue to update Schedule 91 rates in Q4, per WAC 480-106-007. Interested customers can learn more on PSE’s Distributed Renewables webpage at www.pse.com/distributedrenewables, or they can reach out to a PSE energy advisor for additional guidance. Where applicable, PSE may enter an agreement to purchase the RECs from the project to contribute to our voluntary renewables programs such as Green Power, Solar Choice, or Community Solar.

Ten MW of new solar energy will come online in Kittitas County by mid- to late- 2022.

[40] RCW 19.405.020(36)

### Customer Benefits

The PURPA/Schedule 91 program provides environmental benefits to PSE customers by deploying renewable energy within our service area. With the development of these renewable resources, less energy is needed from PSE resources to meet system load, and therefore decreases the amount of greenhouse gas emissions by PSE resources. A decrease in greenhouse gas emissions is linked to improving the outdoor air quality for customers as well.

### Track and report on progress, costs, and benefits

The PURPA/Schedule 91 program will track the total MW of renewable energy installed, the energy output of each site, and customer benefit indicators by type of resource deployed and the carbon intensity and carbon avoided because of each project. See Appendix L, CEIP Programs and Actions Master Table

## Green Direct

### Green Direct Explained

Green Direct is a voluntary program that gives PSE corporate and government customers the ability to buy 100 percent of their energy from a new, dedicated, local, renewable energy resource while providing them with a stable, cost-efficient solution. The program was first approved in 2016 and fully subscribed by 21 customers in mid-2017. The first project to serve Green Direct customers was Skookumchuck Wind, a 136.8 MW wind resource located in Lewis County, which achieved commercial operation on November 7, 2020. A second phase of the program was approved in 2018 and will serve an additional 20 customers with the addition of the Lund Hill Solar Power Purchase Agreement (PPA), under which PSE began receiving renewable energy delivered to our system on March 1, 2021. We expect the 150 MW Lund Hill Solar project to achieve full commercial operation at the end of mid-2022. Customers in both phases of Green Direct receive a blend of Skookumchuck Wind and renewable energy under the Lund Hill PPA.

### How these actions move us closer to meeting CETA goals

The Green Direct program will decrease PSE's electric supply portfolio load to contribute to our renewable energy target.

The Green Direct product brings new, additional renewable energy generation to PSE's service territory. The output from Green Direct resources, including both the energy and renewable energy credits (RECs), is purchased by participating customers to meet their enrolled loads. Like PURPA contracts, Green Direct resources reduce PSE's retail electric load used for CETA compliance calculations[41]. The Skookumchuck Wind and Lund Hill Solar projects have a combined nameplate capacity of 287 MW for a total expected annual output of 773,546 MWh of renewable energy production

[41] RCW 19.405.020(36)

delivered to PSE's system. Future phases of the program will depend on the costs and benefits working out economically for interested and qualifying customers. Assuming new projects costs are favorable, PSE anticipates adding a third project for an additional 40 aMW or approximately 350,000 MWh of annual output by 2025. The addition of this third project would bring the total yearly renewable energy production from Green Direct resources to more than 1,100,000 MWh when completed.

### Annual Actions and Costs

#### 2022

PSE will purchase the entire output of Skookumchuck Wind and Lund Hill Solar on behalf of the 41 existing Green Direct customers. Customers will pay the Green Direct charge on their enrolled accounts to cover the costs of the power purchase agreements (PPAs), administrative expenses, and reporting fees. Customers will receive a Green Direct credit on their enrolled accounts for the WUTC approved value of the energy replaced by the two designated Green Direct projects. Green Direct customers will also receive the renewable energy credits (RECs) associated with their share of the Green Direct resources output, retired, and reported on annually.

To advance the third phase of Green Direct, PSE will review the results of an “RFI” for Washington Renewable Energy to Serve PSE Green Direct, issued in 2021. PSE may choose to release an RFP to better assess resources for viability and cost. We will use the selected resource solution to file a requested expansion and update to the Green Direct tariff, Schedule 139, with the new option and pricing. Eligible customers can enroll during the open enrollment period, 30 business days following tariff approval, anticipated in Q3 2022. Once the project is fully subscribed, PSE will execute the PPA for the selected resource.

#### 2023–2025

PSE will purchase the entire output of Skookumchuck Wind and Lund Hill Solar on behalf of the 41 existing Green Direct customers. Customers will pay the Green Direct charge on their enrolled accounts to cover the costs of the PPAs, administrative expenses, and reporting fees. Customers will receive a Green Direct credit on their enrolled accounts for the WUTC approved value of the energy replaced from the two designated Green Direct projects. Green Direct customers will also receive the renewable energy credits (RECs) associated with their share of the Green Direct resources output, retired, and reported on annually.

PSE will continue to monitor the development and construction of the selected resource to supply the third phase of Green Direct customers. Once the project has achieved commercial operation, PSE will begin billing the enrolled customers and retiring the RECs on their behalf.

### Customer Benefits

The Green Direct program reduces greenhouse gas emissions by deploying new, additional renewable energy resources that deliver energy and RECs to our system on behalf of Green Direct customers.

The power generated from these resources allows participating customers to reduce their carbon footprint from electricity use within PSE's service area and meet sustainability goals ahead of state targets.

Green Direct brings new, clean energy jobs to rural Washington communities. In the case of Lund Hill Solar, the developer and the Engineering, procurement and construction (EPC) contractor agreed to use union labor to construct the project in line with rules set out by the state. PSE will require that future projects include union labor provisions in their agreements.

In addition to creating new clean energy jobs, the renewable energy resources used to supply the Green Direct customers help support the local economies through lease revenue for the landowners and new tax revenue for the host communities.

**Track and report on progress, costs, and benefits**

PSE will track and identify all costs and benefits of Schedule 139 separately in our power cost adjustment (PCA) mechanism to seek a prudency determination for and recovery of the costs associated with acquiring any PPA.

PSE will track all energy used by enrolled accounts and the power generated by the assigned resources. Renewable energy credits will be tracked and retired on the customers' behalf through the Western Renewable Energy Generation Information System (WREGIS). In the first quarter of each year, PSE will provide each customer with a WREGIS REC retirement report and attestation to show the total RECs retired on their behalf, equal to their prior year's energy consumption under Green Direct. PSE will also participate in an annual third-party audit of Green Direct sales and REC retirements that follows the Center for Resource Solutions' green-e ® energy audit protocols. See Appendix L, CEIP Programs and Actions Master Table

## Net Metering (Schedule 150)

**Net Metering Explained**

PSE's Net Metering program, also referred to as Customer Connected solar, provides interconnection, metering, and billing to qualifying customer-generators in accordance with State legislation enacted into law on February 11, 1999, and most recently amended July 28, 2019 (see RCW 80.60). Customer-generators who operate fuel cells, hydroelectric, solar, wind, or biogas generators of no more than 100 kW AC are eligible to participate. This service is required under RCW 80.60 and outlined in Electric Schedule 150 on a first-come, first-served basis until the total of cumulative nameplate generating capacity reaches four percent of PSE's peak 1996 load, or 179.2 MW. As of July 2021, PSE has a total of 95 MW of net metered generation operating in its service territory.

No direct customer incentives are provided under the Net Metering tariff. Energy produced by customer-generator systems directly reduce the energy used in the home or business. When energy generated exceeds home or business electrical loads, the excess energy flowing to PSE is metered

and credited to the customer at the retail rate for future use. Any excess credit each month is rolled forward to the following month until March 31 annually, when “banked” net metering credit is reset to zero.

In advance of PSE net metered systems reaching the cumulative capacity of 179 MW, or June 30, 2029, whichever comes first, PSE will file a successor tariff with the WUTC.

**How these actions move us closer to meeting CETA goals**

This program brings additional renewable solar generation to PSE’s service territory. This reduces the load needed to meet peak capacity need and it is a renewable energy source for customers. The MWh generated by this program contribute to load reduction and thus reduce the CETA MWh compliance need. These MWh’s will bring PSE closer to 80 percent by reducing the load and thus reducing the amount of generation needed to meet system load. Today, PSE’s net-metered customers account for more than 95 MW of nameplate capacity. We anticipate an additional 15-20 MW of capacity each year from 2022-2025.

**Annual Actions and Costs**

**2022–2024**

PSE will continue to offer net metering to eligible customers under Schedule 150. Interested customers can learn more by visiting the PSE website at https://www.pse.com/pages/customer-connected-solar; or they can reach out to an Energy Advisor for additional guidance. PSE also provides referrals to qualified contractors who can install solar at their home our businesses.

PSE anticipates interconnecting an additional 15 – 20 MW of customer-owned, net-metered systems in 2022 – 2023.

**2024**

In 2024, PSE plans to file a successor tariff with the WUTC in early 2024 in anticipation of reaching the net metering threshold of 4 percent of 1996 electric loads, or 179 MW in cumulative capacity.

**2025**

PSE will continue to offer net metering to eligible customers under Schedule 150. Interested customers can learn more by visiting the PSE website at https://www.pse.com/pages/customer-connected-solar or they can reach out to an Energy Advisor for additional guidance. PSE also provides referrals to qualified contractors who can install solar at customer’s’ homes or businesses. PSE anticipates connecting an additional 15 – 20 MW of customer-owned, net-metered systems in 2024.

If PSE reaches the four percent of 1996 electric loads net metering threshold, or 179 MW of cumulative capacity, the Company will enroll any new customer-owned system into a WUTC approved successor tariff.

### Customer Benefits

This program provides customer benefits in the areas of environment through the deployment of renewable energy within PSE's service area. With an increase in renewable energy, less carbon emitting resources are used, thus reducing greenhouse gas emissions from the energy portfolio. From an economic perspective, this program positively impacts solar installation companies within the area, providing jobs and an economic benefit to the community.

### Track and report on progress, costs, and benefits

PSE will track the total MW of renewable energy installed and enrolled in the program, and total energy exported to the grid. PSE can also track customer benefit indicators by type of resource deployed and the carbon intensity and carbon avoided because of cumulative projects. See Appendix L, CEIP Programs and Actions Master Table

## Green Power Solar Grants

### Green Power Solar Grants Explained

Starting in 2017, PSE has offered competitive funding awards to local non-profits, public housing authorities, and tribal entities to install solar on their facilities. This grant is funded through PSE's Green Power and Solar Choice customers to bring local, community-oriented solar projects to PSE's electric service area, while providing vital support to those in need through lower utility bills for our low-income or Black, Indigenous, and People of Color (BIPOC) customers and the organizations that serve them. To date, PSE has awarded $2,400,000 in total grant funding to 30 local organizations to install new solar projects. In 2021, PSE issued a fifth round of funding for a total of up to $750,000, in amounts up to $100,000 per project.

Over 75,000 PSE customers chose to support renewable energy by participating in PSE's Green Power and Solar Choice programs. These programs now support the generation of 590,000 MWh annually of renewable energy in Washington, Oregon, and Idaho through the purchase of Green-e Certified Renewable Energy Credits (RECs). The Green Power Solar Grants are additional to the purchase of RECs to match customer purchases.

### How these actions move us closer to meeting the CETA goals

The Green Power Solar Grants result in additional renewable solar generation on PSE's system, at the distribution level. The projects reduce loads, by generating renewable energy behind the customer meter, thus reducing the CETA MWh compliance need. These MWh will bring PSE closer to 80 percent by reducing the load and thus reducing the amount of generation needed to meet system load. In addition, the MWh generated by these projects help to reduce the energy burden for low-income and BIPOC customers and the organizations that serve them.

### Annual Actions and Costs

#### 2022–2025

PSE will distribute $750,000 in funding from the 2021–2025 Green Power Solar Grant solicitation for projects to be installed in 2022.

PSE anticipates issuing a similar RFP for $750,000 in funding to be awarded at the end of each year for projects to be installed in the following year. PSE will work with the Community Outreach and Community Engagement teams to reach out to eligible organizations and Tribal Governments. In addition, PSE will alert solar installers in PSE's Contractor Alliance Network. Customers and organizations can learn more at PSE.com/greenpowergrant.

### Customer Benefits

This program provides customer benefits in the areas of burden reduction in named communities, as well as environmental benefits through the deployment of renewable energy within PSE's service area. The program reduces a barrier of financial resources and provides an opportunity for organizations to invest in localized renewable energy. This localized renewable energy reduces the overall system need from emitting resources and thus reduces greenhouse gas emissions. Furthermore, highly impacted communities and vulnerable populations can actively participate in clean energy.

### Track and report on progress, costs, and benefits

PSE will track the total dollars awarded, the number of organizations served, and the number of MW of renewable energy installed annually and in aggregate. PSE will also track the carbon intensity and carbon avoided because of cumulative projects.


# 5 Incremental Cost

# Chapter Five: Cost

## Calculation of Incremental Cost

WAC 480-100-640(7) requires we calculate and include the incremental cost of achieving the 2030 carbon-neutral and 2045 clean energy targets. We determined the incremental cost by comparing the costs to a hypothetical portfolio of activities that a utility would have pursued in the absence of these targets. To be included in the projected incremental cost calculation, the cost must be incurred during the 2022–2025 period, be directly attributable to activities that move the utility toward compliance with the 2030 and 2045 targets and not be required by other statutes. This section outlines how we identified these incremental activities and how we calculated the projected associated costs.

## Investments in Transitioning to Clean Energy

Achieving the specific targets and other requirements to meet CETA's 2030 and 2045 goals requires a wide range of actions and investments. These actions range from developing renewable energy resources to grid modernization to customer education.

PSE considers the costs of achieving CETA's targets as groupings of related investments, each supporting different associated activities designed to achieve the goals of the act. These investment categories include resources, delivery systems, operations, technology, and customer and administrative costs. The table below lists the primary types of systems and examples of the kind of investments needed to support the changing resource mix required under CETA.

Table 5-1: Investments Categories

| Investment Category | Examples of Specific Investments |
|---|---|
| Resources | • Energy efficiency program development, operation, and customer incentives<br>• Demand Response Program development, operation, and customer incentives<br>• Power Purchase Agreements for renewable energy or emissions-free capacity<br>• Purchase renewable resources of emission-free capacity sources<br>• Operations of energy resources, including large scale and distributed resources |
| Resource Enablement and Delivery | • Distributed Energy Resource design actions and tools<br>• Transmission capacity to deliver new resources<br>• Grid modernization to support distributed energy resources<br>• Grid operations to incorporate distributed energy resources<br>• Operations of distributed energy resources |
| Customer Education and Engagement | • Detailed program design and customer enrollment<br>• Customer education and engagement on the clean energy transition |
| Administration and Monitoring | • Measuring customer benefit indicators<br>• Tracking and reporting |

The investment profile we need to achieve the clean energy goals will change over time. For example, in this Clean Energy Implementation Plan (CEIP), PSE required no investments in energy transformation projects. Investment needs, however, may change in future Clean Energy Implementation Plans.

## Specific Costs for the Transition to Clean Energy

From 2022–2025, a connected set of investments will allow PSE to meet the specific and interim CETA targets and ensure we achieve customer benefits in the process. This section discusses the costs for the 2022–2025 period within each investment category.

## Resource Costs

Between 2022 and 2025, we will add utility-scale and distributed energy resources to PSE's power supply portfolio to add renewable energy supplies, battery energy storage, demand response, and energy efficiency.

**Energy Efficiency:** A low-cost resource, energy efficiency is a core component of PSE's energy supply portfolio. PSE provides energy efficiency programs across all customer types, based on the targets established through the conservation potential assessment in the IRP, an energy efficiency RFP, and oversight by the Conservation Resources Advisory Group. Programs operate in two-year cycles, with the 2022–2023 biennial cycle aligned with the first two years of the Clean Energy Implementation Plan. PSE's electric savings target for 2022-2023 is 505,448 MWh and the budget is $202M. This budget is based on the energy efficiency 2021 request for proposal and PSE's experience with existing programs to develop the total cost estimate to reach our energy savings targets. We provide more information on energy efficiency costs in Appendix F1.

**Demand Response:** We base the forecast costs of demand response resources included in the CEIP on the cost estimates in the IRP, which are detailed in Appendix J and Summarized in Appendix F2. To refine these costs and forecast programs, PSE will issue an RFP for distributed energy resources and demand response in early 2022. We will incorporate the actual costs of programs proposed in the RFP process as the CEIP unfolds and into a cost forecast when we update the CEIP in 2023.

**Renewable Energy:** A wide range of activities contribute renewable energy to PSE's energy supply portfolio, as we discuss in Chapter 5. We have not identified specific renewable energy resources in this CEIP. We will pinpoint these resources when we review the results of the 2021 All-source, the 2022 distributed energy resource, and demand response RFPs.

To develop this CEIP, PSE used several sources of cost data for renewable energy programs. For large-scale generating resources, we used the generic resource costs from the 2021 IRP, which are included in Appendix F3. For distributed energy resources, PSE commissioned more program-specific cost estimates from Black & Veatch that fully captured the costs of resources and program operations. We include these program-level cost estimates in Appendix K. We will identify updated costs when we choose specific resources and programs from the 2021 All-Source and the 2022 distributed energy

resource and demand response RFPs. We will incorporate these selected resources and their associated resource and program costs in the 2023 IRP and 2023 CEIP updates.

To identify the combined costs of specific portfolios of resources, PSE used the AURORA model, which was updated to incorporate the more specific distributed energy resource costs.

**Energy Storage Resources:** PSE commissioned Black & Veatch to complete a study of equipment and program costs for distributed energy storage resources to provide a current view of the total anticipated costs of a mix of utility-owned and customer-owned energy storage resources. Based on their mix, we fed the costs of these programs into the AURORA modeling to calculate their part of the overall energy supply portfolio. We detail the costs of these resources and the program costs in Appendix E. We will identify updated costs when we select specific resources and programs from the responses to our 2021 All-Source RFP and the 2022 distributed energy resource and demand response RFPs. We will incorporate these selected resources and their associated resource and program costs in the 2023 IRP and 2023 CEIP updates.

### Resource Enablement and Delivery

**DER Enabling Systems**: In Chapter 4 we describe how we will sequence enabling strategies, tools, and functions so PSE can effectively operate distributed energy resources at scale. This process includes systems to operate and implement distributed energy resources.

**Transmission:** During this Clean Energy Implementation Plan, PSE may acquire additional transmission rights to deliver utility-scale resources to our electric service territory. We may also use our existing transmission rights to support the delivery of new renewable resources. In the 2021 All-Source RFP, PSE specifically sought renewable resources that meet both scenarios. To estimate costs in this CEIP, PSE continues to rely on the transmission costs used in the 2021 IRP. As we select specific resources through the 2021 All-Source and 2022 distributed energy resource and demand response RFPs process, we will detail revised costs in the 2023 IRP and CEIP updates.

#### Grid Modernization Costs

There are a handful of tools and programs that PSE will discuss in the context of incremental costs for CETA as they are key enablers accelerated to keep pace with the preferred portfolio and processes envisioned in the CEAP. The clean energy action plan based on the 2021 IRP preferred portfolio identified a significant number of DERs needed by 2030. In total, 634 MW of distributed batteries, solar and demand response are needed within PSE's service territory by 2030. This is over 10 times the amount of DERs than the grid has accommodated over the last 4 years, a total of 52 MW. PSE's grid modernization investments were keeping pace with the economic driven customer adoption of DERs across the grid, the pace of DERs driven specifically by the CETA law and resulting policies necessitate a reset on some programs.

This CEIP sets specific distributed energy resource targets in Chapter 2 and outlines related grid modernization activities in Chapter 4. These related grid modernization activities are only one small part

of PSE's overall grid modernization strategy. More details of the grid modernization strategy are included in Appendix G.

To accommodate the rapid increase in DERs the grid needs to support over the next 10 years, portions of the grid modernization investments need to be accelerated to match that pace. The overall target over the next five years is to enable 5 percent of (~55) distribution circuits to be fully ready to support high penetrations of DERs in the range of 2-5MW per circuit. To ensure the grid can support this while continuing to deliver reliable and resilient power to customers, we accelerated specific investments and identified new ones. This included:

- Enhancing the SCADA system equipment at substations to support DER high penetration circuits, increasing work plan by over 60 percent over historical pace.
- Enhancing circuit visibility and control by installing additional voltage regulation and automated circuit switching equipment on DER high penetration circuits, 100 percent of this work plan added to address the consequences of this penetration.
- Enhancing access to gathered data to drive analysis and process that span many operational tools and investment decisions, increasing focus by over 50 percent. Enhancing resilience focused on proactive high risk grid monitoring and associated DER microgrid installations to enable alternate sources of power for customers experiencing limited grid flexibility, increasing work plan by over 70 percent to focus more aggressively on these valuable customer benefits.
- Proactive DER property acquisition adjacent to existing substation facilities that can enable lower cost interconnection for DERs while maximizing benefits to the system while incorporating equity consideration and increasing work plan by over 10 percent to incorporate proactive expansion.

Additionally, PSE focused on tools that are just now being developed, recognizing tools like ADMS will be foundational as we progress toward clean energy. It is important to recognize that the investment in grid modernization in its entirety is needed for successful transition irrespective of whether work occurred before the effective date of the CETA or whether it facilitates additional benefits not specifically envisioned by CETA. For example, transmission capacity investments in compliance with the NERC Reliability Standards are required to deliver the increased load and provide the flexibility and reliability that will be needed with the proliferation of DERs and electric vehicles, power must still flow, and those transmission and distribution lines must be reliable. These investments are intentionally not included in the incremental costs for CETA but should not be assumed unnecessary by any stretch. PSE's 2021 IRP, Chapter 8 and Appendix M, recognized the important investments in the grid to enable this transition and avoid reactive expenditures to accommodate unanticipated growth in distributed energy resources[42]. The CEAP reaffirms the 10-year plan for the deliverability of

[42] RCW 19.280.100(2)(e)

resources[43]. PSE's entire grid modernization investments drive progress in visibility, analysis, and control; reliability and resiliency; DER integration processes; security, cybersecurity, and privacy; and backbone infrastructure.

PSE's CEIP must consider these foundational investments, and sustain and advance programs and plans associated with PSE's entire grid modernization investments. The CEIP is mindful of the risk to clean energy delivery if the overall grid modernization approach is not on track, even though a small part of it is included in the actions in this CEIP.

### Customer Management Costs

Implementation of CETA requires a range of customer programs and administrative functions.

**Customer Education and Engagement.** As we developed this CEIP, stakeholder and customer feedback focused on the need for customer education. CETA also requires ongoing customer engagement with all customers and members of highly impacted communities and vulnerable populations through education about clean energy. We include PSE's public participation plan as Appendix C. We detail cost estimates for the work in Appendix E.

**Monitoring and Reporting.** Implementing CETA includes several critical administrative activities, including tracking progress toward energy goals, the performance of customer benefit indicators, tracking costs, and reporting. We developed a forecast of the costs of these activities based on our experience with other programs and included it in Appendix E.

### Directly attributable activities

We identify activities directly attributable to pursuing the 2030 and 2045 standards based on those necessary to support the 2022–2025 Clean Energy Action Plan. These activities are consistent with the conditions described in WAC 480-100-640 (3).

Some activities and costs are necessary due solely to 2030 and 2045 standards, and some are increased or accelerated to meet the 2030 or 2045 standards.

To identify incremental activities, PSE compared the energy resource portfolios included in this CEIP to a generic resource portfolio that AURORA selected without CETA but included the social cost of greenhouse gases in the portfolio selection to identify what is incremental. We provide the coming 10-year summary of these portfolios below.

Activities that relate to implementing the resource portfolio in this CEIP include those from all investment categories. Many activities are driven by CETA, such as a significant increase in renewable energy acquisition, whereas others were already part of the non-CETA portfolio, but we increased them due to CETA. An example is energy efficiency. The portfolio without CETA included energy efficiency, but when we added the requirements of CETA, we gained significantly more energy efficiency.

[43] IRP; pg 2-20

## Incremental Cost

We developed the incremental costs from the incremental activities and the overall costs to implement CETA. We considered all costs incremental for those activities driven solely by the requirements to meet the 2030 and 2045 standards. We allocated costs based on the higher activity for those accelerated activities to meet the 2030 and 2045 standards.

Here we describe how we calculated the incremental cost for each CETA-related investment contributing to the incremental cost.

This section includes the terminology "baseline portfolio" and "CEIP portfolio." A baseline portfolio[44] is the portfolio of generic resources that do not have the requirement to meet the energy and carbon content requirements of CETA but do include the social cost of carbon. The CEIP portfolio is the portfolio in this Clean Energy Implementation Plan that takes into account for the need to meet CETA and the social cost of greenhouse gases.

## Resource Costs

**Energy Efficiency**: We calculated incremental costs based on the average cost of savings in the draft 2022-2023 Biennial Conservation Plan and applied them to the ratio of the amount of energy efficiency in the baseline portfolio and the CEIP portfolio to calculate the incremental cost of the CEIP portfolio above the baseline portfolio.

**Demand Response**: We calculated incremental costs based on the difference between program costs for the demand response amounts in the baseline and CEIP portfolios. We based these costs on the generic program costs and costs included in the conservation potential assessment in the Integrated Resource Plan.

**Energy Supply Portfolio, including Generation Resources and Storage**: We calculated incremental costs based on the difference between the generation portion of the baseline and the CEIP portfolio. We isolated the generation costs by providing an AURORA capacity expansion and dispatch of the baseline portfolio, but with the energy efficiency and demand response amounts held at the same amount in the CEIP and baseline portfolios. This method allowed us to consider only the difference in generation costs between the two portfolios. This approach isolated the changes in energy supply cost from any changes in energy efficiency and demand response.

## Resource Enablement and Delivery Costs

**DER Enablers***:* We allocated DER enabling costs to incremental cost based on the increased targets for distributed energy resources and demand response, compared to the baseline portfolio. PSE will

[44] The baseline portfolio is the same as the alternative lowest reasonable cost portfolio. PSE used a portfolio optimization model as basis for calculating the alternative lowest reasonable cost portfolio to show the difference in portfolio choices and investment needs. [WAC 480-100-660(1) and (4)(c)]

use many of these systems beyond 2022–2025, so we based our cost estimate on the incremental amount of these resources over 10 years.

**Transmission***:* We include incremental transmission costs in the energy supply portfolio calculation, as the assumed transmission costs are part of the resource costs. We include the generic transmission estimates used in the 2021 IRP in the resource costs for this projection.

**Grid Modernization***:* We will incur significant incremental grid modernization costs to support the much higher amounts of DER in the CEIP portfolio than the baseline portfolio.

### Customer Education and Engagement Costs

CETA creates significant new requirements for customer education and engagement to support customer benefit indicators[45], in the development of the Clean Energy Implementation Plan[46], implementation of the plan[47], and through customer notices[48]. This work should also seek input from highly impacted communities and vulnerable populations and remove barriers to participation in clean energy planning and implementation.

PSE's work in this area is tied to developing the Clean Energy Implementation Plan to meet the 2030 and 2045 standards while ensuring equitable distribution of benefits and reducing burdens. This work and costs are additional to what PSE would have expended to implement the baseline portfolio in which WUTC did not mandate the clean energy standards.

### Monitoring and Reporting

As part of implementing the Clean Energy Implementation Plan, PSE must collect and manage our progress toward interim and specific targets, actions, customer benefits. We will incur costs to track and report the information to the WUTC. We will include this information in the required annual clean energy program[49] and four-year compliance reports[50]. The measurement and reporting processes are to track progress against the targets and actions in the Clean Energy Implementation Plan, so the costs to maintain and report this data are incremental to what would have been required in the absence of the 2030 and 2045 targets.

### Summary of Incremental Cost Projection

We summarize the incremental cost of the actions in this plan compared to the baseline portfolio below. We developed these incremental costs using the projection, allocation, and modeling methodologies described in this section and include detailed spreadsheets in Appendix E. Consistent with WAC 480-100-660(4), we compared the projected cost to PSE's projected weather-adjusted sales revenue.

[45] WAC 480-100-640(4)(c)
[46] WAC 480-100-655(2)
[47] WAC 480-100-655(2)
[48] WAC 480-100-655(3)
[49] WAC 480-100-650(3)
[50] WAC 480-100-650(1)

Table 5-2: Incremental Cost Summary

| | | | 2022 | 2023 | 2024 | 2025 | 2022–025 Incremental Cost | Percent Forecast |
|---|---|---|---|---|---|---|---|---|
| Estimated Incremental Cost Calculation ($000) | | | | | | | | |
| **Energy Efficiency** | | | | | | | | |
| *Without 2030 and 2045 Requirements* | 662,048 | MWh through 2025 | $65,598 | $65,598 | $65,598 | $65,598 | | |
| *With 2030 and 2045 Requirements* | 967,994 | MWh through 2025 | $95,913 | $95,913 | $95,913 | $95,913 | | |
| *Incremental Cost* | | | $30,314 | $30,314 | $30,314 | $30,314 | $121,258 | 27% |
| **Demand Response** | | | | | | | | |
| *Without 2030 and 2045 Requirements* | 7 | MW by 2025 | $100 | $296 | $365 | $995 | | |
| *With 2030 and 2045 Requirements* | 24 | MW by 2025 | $342 | $1,018 | $1,253 | $3,416 | | |
| *Incremental Cost* | | | $242 | $722 | $888 | $2,421 | $4,273 | 1% |
| **Energy Supply Portfolio** | | | | | | | | |
| *Without 2030 and 2045 Requirements* | 1081 | [a]MW in 2025 | $561,772 | $589,410 | $587,661 | $609,004 | | |
| *With 2030 and 2045 Requirements* | 1316 | [a]MW in 2025 | $562,277 | $606,707 | $702,468 | $705,443 | | |
| *Incremental Cost* | | | $505 | $17,298 | $114,807 | $96,439 | $229,048 | 51% |
| **Technology and Enabling Costs for Distributed Energy Resources** | | | | | | | | |
| *With 2030 and 2045 Requirements* | | | $4,244 | $10,917 | $12,836 | $22,962 | $50,958 | 11% |
| **Customer Education and Outreach** | | | | | | | | |
| *With 2030 and 2045 Requirements* | | | $960 | $9,830 | $10,215 | $10,406 | $31,410 | 7% |
| **Administration and Reporting** | | | | | | | | |
| *With 2030 and 2045 Requirements* | | | $2,058 | $2,110 | $2,162 | $2,216 | $8,547 | 2% |
| **Total Cost** | | | **$665,793** | **$726,494** | **$824,847** | **$840,356** | | |
| **Total Incremental Cost Forecast** | | | **$38,323** | **$71,190** | **$171,223** | **$164,759** | $445,495 | 100% |

## Calculation of Annual Threshold Amount

WAC 480-100-660 (2) specifies the means for identifying the annual threshold amount, which is used for determining eligibility for reliance on RCW 19.405.060(3) for compliance. WAC 480-100-660(4) requires a projection of this amount be filed in the CEIP.

The annual threshold amount is specified by rule as:

$$Annual\ Threshold\ Amount = \frac{(WASR_0 \times 2\% \times 4) + (WASR_1 \times 2\% \times 3) + (WASR_2 \times 2\% \times 2) + (WASR_3 \times 2\%)}{4}$$

For the purposes of projecting the annual threshold amount, we assume a baseline of adjusted electric sales from PSE's 2020 Commission Basis Report, which includes weather normalization. For the purposes of this projection, weather adjusted sales revenue is assumed to rise at an inflation rate of 2.5 percent per year. In addition, the incremental costs of CETA are assumed to increase that rise in the weather-adjusted sales revenue, which is included in the calculations in Appendix E.

Many factors affect weather adjusted sales revenue, including changes in sales volumes not due to weather, changes in wholesale energy markets typically reflected in PSE's annual PCA filing, changes in conservation costs, changes in tax rates, and other rate changes. PSE does not control these factors, so it is impossible to forecast weather adjusted sales revenue accurately. Tracking of actual costs and actual weather adjusted sales revenues will occur during the implementation period.

### Comparison of Incremental Cost and Annual Threshold Amount

We summarize the incremental cost of the actions in this plan compared to the baseline portfolio below. We developed these incremental costs using the projection, allocation, and modeling methodologies described in this section and include detailed spreadsheets in Appendix E, Incremental Cost. Consistent with WAC 480-100-660(4), we compared the projected cost to PSE's projected weather-adjusted sales revenue.

### Currently unquantified costs and benefits

Some costs and benefits of pursuing the 2030 and 2045 targets are not yet quantified. These are emerging or complicated areas. Specific areas of known costs and benefits that are not currently quantified include:

- Integration costs for high amounts of renewable energy
- Changes in reliability standards
- Changes in wholesale market design and regulation
- Updates to federal and state tax structures

As costs and benefits become more known, PSE will integrate these into planning and acquisition decisions.

Table 5-3 Calculation of Annual Threshold Amount and Comparison to Incremental Cost

| | | 2021 | 2022 | 2023 | 2024 | 2025 |
|---|---|---|---|---|---|---|
| **Calculation of Estimated 2% in Weather Adjusted Sales Revenue** | | | | | | |
| PSE 2020 Retail Sales to Customers | $1,988,341 | | | | | |
| **Escalated at 2.5% per year** | $0 | $2,038.050 | $2,089,001 | $2,141,226 | $2,194,757 | $2,249,626 |
| *2% of Previous Year's Forecasted Weather Adjusted Retail Sales* | | | $40,761 | $41,780 | $42,825 | $43,895 |
| *Compounding Effect for CETA Incremental Cost* | | | -- | $766 | $2,190 | $5,615 |
| *Total 2% Increase Estimate, Including Compounding* | | | $40,761 | $42,546 | $45,015 | $49,510 |
| *Estimated 2% Annual Increase in Weather-Adjusted Sales Revenue* | | | $40,761 | $42,546 | $45,015 | $49,510 |
| *Cumulative Estimated 2% Annual Increase in Weather-Adjusted Sales Revenue* | | | $40,761 | $83,307 | $128,322 | $177,832 |
| **Comparison of Forecast Incremental Cost and Estimated 2% Increase in Weather Adjusted Sales Revenue** | | | | | | |
| *Estimated Incremental Cost* | | | **$38,323** | **$71,190** | **$171,223** | **$164,759** |
| *Annual Comparison* | | | **$(2,438)** | **$(12,118)** | **$42,901** | **$(13,073)** |
| *Cumulative* | | | **$(2,438)** | **$(14,556)** | **$28,345** | **$15,272** |

# 6 Public Participation

# Chapter Six: Public Participation

The Clean Energy Transformation Act (CETA) energy planning requirements expanded public participation beyond traditional utility resource planning. Although the timeline for this first Clean Energy Implementation Plan (CEIP) has been ambitious from the start, we have increased public engagement, performed it quickly, and all during a pandemic. PSE broadened outreach to include:

- Engaging and consulting with four advisory groups, including the new Equity Advisory Group (EAG)
- Educating and seeking input from customers, including targeted outreach to highly impacted communities and vulnerable populations
- Reaching other stakeholders, such as community-based organizations, government agencies, and other interested community members
- Public participation influenced the CEIP through the development of vulnerable populations factors, customer-driven customer benefit indicators, and programs and actions that reflect customer vision for an equitable clean energy future. This chapter describes our public participation goals, objectives, activities, outcomes, and next steps.

## Public Participation Activities

The project team prepared a public participation plan that describes how Puget Sound Energy (PSE) staff and their consultant team collaborate with key stakeholders to involve customers and community members in developing the first CEIP in accordance with CETA. Figure 6-1 highlights the roadmap PSE used to engage stakeholders in developing the 2021 draft CEIP.

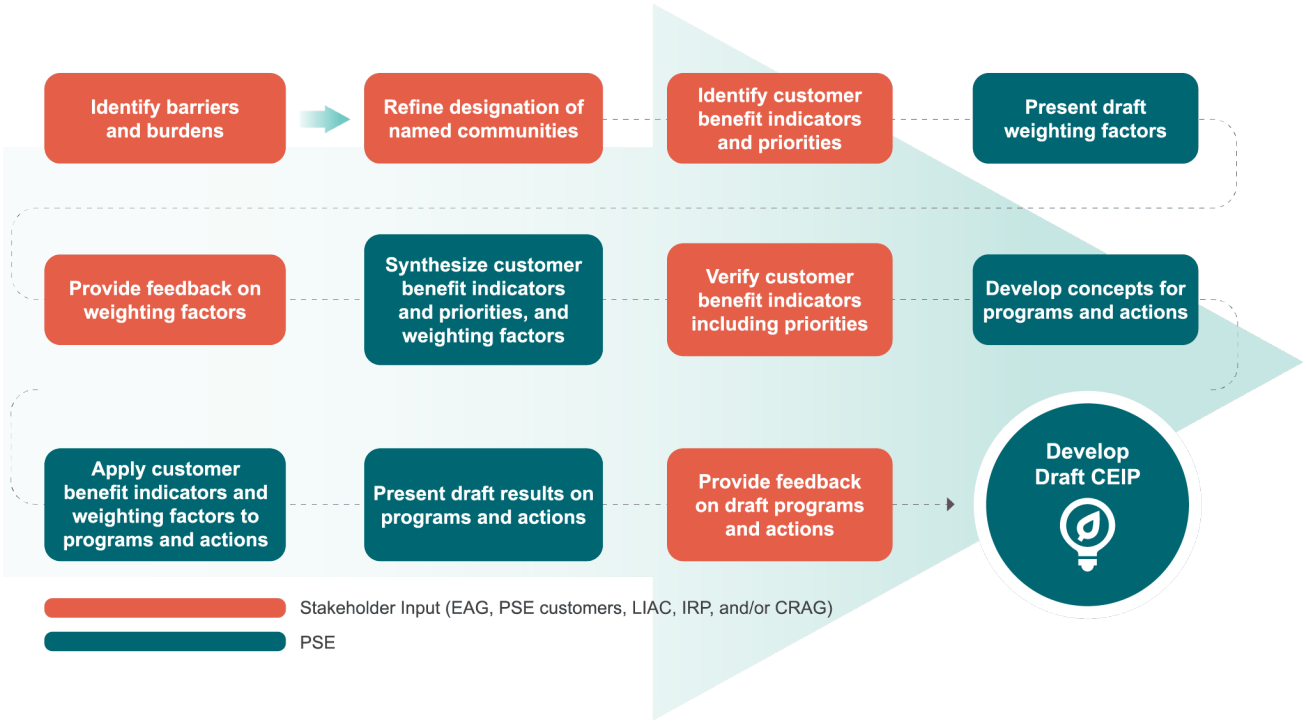
The public participation goals and objectives related to CEIP development included:

- Educate and increase awareness about:
  - Clean electricity transition, as well as other electricity topics as needed
  - Roles of PSE, customers, and our regulator (WUTC) related to the CEIP
- Collect input on:
  - Community values as they relate to clean electricity transition, customer benefits, programs, actions, and implementation approach
- Solicit feedback on:
  - Customer benefit indicators
  - Distribution of clean energy and non-energy benefits

  - Reduction of barriers with emphasis on vulnerable populations and highly impacted communities (often referred to as Named Communities[51])
  - Analysis of actions, targets, programs, and expected outcomes
  - Implementation approach
- Be clear and transparent about:
  - Comments heard and how they affected the outcome
- Build relationships with:
  - Community-based organizations with emphasis on vulnerable populations and highly impacted communities
- Engage expertise of:
  - Equity Advisory Group and other PSE advisory groups
- Evaluate:
  - Public participation process

[51] PSE's CEIP outlines Highly Impacted Communities and Vulnerable Populations (referenced together as Named Communities, and individually defined in WAC 480-100-605). In brief, Highly Impacted Communities are defined by Department of Health around pollution burden, environmental effects and impacts to the human body and communities of people. Vulnerable populations include communities who experience a disproportionate cumulative risk from environmental burdens. For a full description, refer to Chapter 3, Customer Benefit Indicators, Highly Impacted Communities and Vulnerable Populations.

Figure 6-1: CEIP Stakeholder Engagement Process




PSE engaged the groups in Table 6-1 in the public participation process based on their role for the CEIP.

Table 6-1: Advisory Group and Roles

| Advisory Group | Traditional Focus/Role | Role for CEIP |
|---|---|---|
| Equity Advisory Group (EAG) | New advisory group as defined by CETA planning regulations | Provide input to shape:<br>• Public participation, specifically for outreach to named communities<br>• Customer benefit indicators, specifically on energy and non-energy benefits and burden reductions to named communities<br>• Defining vulnerable population factors<br>• Draft programs and actions to help ensure equitable distribution of benefits and burden reduction<br>• Implementation:<br>— Program design, specifically related to equity<br>— Outreach and education, specifically related to named communities<br>— Progress reports<br>— Evaluation of new resources |

| Advisory Group | Traditional Focus/Role | Role for CEIP |
|---|---|---|
| Integrated Resource Plan (IRP) stakeholders | Resource planning for IRP<br>Typically weighs in on modeling scenarios, sensitivities, and assumptions | Provide input to shape<br>• CBIs<br>• Draft programs and actions<br>• IRP participation in implementation<br>• Implementation:<br>— Progress reports<br>— Evaluation of new resources through CBIs |
| Low-income Advisory Committee (LIAC) | Low-income programs to assist customers and lower energy burden | Provide input to shape:<br>• CBIs<br>• Draft programs and actions<br>• Opportunities to reduce barriers and provide support for low-income customers<br>• LIAC participation in implementation<br>• Implementation:<br>— Progress reports |
| Conservation Resources Advisory Group (CRAG) | Energy efficiency programs and development of PSE's Biennial Conservation Plan | Provide input to shape:<br>• CBIs<br>• Draft programs and actions<br>• CRAG participation in implementation<br>• Implementation:<br>— Progress reports |
| Named communities (Customers and Community-based organizations) | | Provide input to shape:<br>• CBIs, specifically for energy and non-energy benefits and burden reductions<br>• Draft CEIP<br>• Public participation, including barriers to participation<br>• Implementation |
| Customers and community members | | Provide input to shape:<br>• Public participation<br>• CBIs<br>• Draft CEIP |

The Table 6-2 summarizes the public input activities PSE completed to inform the Draft CEIP.

Table 6-2: Audience, format, and input

| Audience | Input format | Quantity |
|---|---|---|
| Residential customers | Residential customer survey submissions | 921 |
| Business customers | Business customer survey submissions | 194 |
| Vulnerable populations | CBO meetings | 7 |
| Equity Advisory Group | EAG meetings | 9 |
| Integrated Resource Plan Stakeholders | IRP meetings | 5 |
| Low-income Advisory Committee | LIAC meetings | 4 |
| Conservation Resource Advisory Group | CRAG meetings | 4 |

## Formation of Equity Advisory Group

In spring 2021, PSE convened an inaugural Equity Advisory Group to focus on equity and broaden our engagement with frontline customers as we work to deliver a just and equitable clean energy future and meet the objectives of Washington's Clean Energy Transformation Act. PSE highly encouraged the participation of environmental justice and public health advocates, tribes, and representatives from highly impacted communities and vulnerable populations in addition to other relevant groups as part of this effort. The EAG initially advised PSE on equity issues for our CEIP.

### Convening the EAG

PSE began developing a framework for the EAG in fall 2020 based on the draft CEIP rules. Following the publication of the CEIP rules on December 29, 2020, PSE refined the EAG framework and membership considerations. In January and February 2021, PSE consulted with multiple external stakeholder groups and WUTC staff to discuss the purpose of the EAG, potential membership, and equity issues.

The framework for convening the EAG included:

- **PSE would invite an inaugural EAG group**. PSE invited 10-15 members to serve through Q1 2022. The group will provide input on the CEIP and help develop the long-term approach for EAG membership.
- **Diverse and constructive voices**. We sought diverse and constructive voices from individuals or organizations not actively engaged in PSE's other advisory groups.
- **Membership priorities for 2021**. There are a variety of organizations working on equity issues, and many have overlapping efforts. We focused on groups based on CETA requirements, PSE relationships, customer demographics, and geographic diversity. We specifically looked for people with experience in environmental justice, public health, Tribes, frontline communities, vulnerable populations, or social and economic development issues.
- **Compensate members for their time**.

Based on feedback from Front and Centered and the NW Energy Coalition (NWEC), we sought members from community-based organizations that had existing relationships with PSE. By showing our commitment and accountability to this inaugural EAG's efforts, our goal is to build trust and foster relationships with additional community-based organizations that may consider EAG membership in the future.

The CEIP team engaged with PSE staff working in local government affairs, outreach, and low-income initiatives to understand PSE's existing relationships. Together we identified organizations we could approach for membership and reached out to a variety to gauge their interest or understand their

recommendations for other members. A notable limitation during our recruitment effort was the ongoing COVID-19 pandemic, so the public health seat remained unfilled.

As a result of these efforts, the 13-member EAG held its first meeting on April 19, 2021. Table 6-3 lists the EAG members and their respective organizations.

Organizations we consulted to convene the inaugural EAG include:

- WUTC
- Washington Attorney General's Office of Public Counsel
- Front and Centered
- NW Energy Coalition
- SparkNorthwest
- The Energy Project

**EAG Members**

Table 6-3: EAG Member and Organization

| 2021 EAG Member | Organization/Role |
|---|---|
| Susana Bailén Acevedo | Community advocate |
| Jenny Harding | GSBA and New Chapter Weddings and Events |
| Emily Larson Kubiak | Sustainable Connections |
| Michele Ogden and Lexi Withers (alternate) | Tacoma Urban League |
| Estela Ortega | El Centro de la Raza |
| TJ Protho | Vadis |
| Kate Sander | HopeSource |
| John Sternlicht | Economic Development Alliance of Skagit County |
| Dennis Suarez | Washington Soldiers Home |
| Teresa Taylor | Lummi Indian Business Council's Office of Economic Policy |
| Mariel Thuraisingham | Front and Centered |
| Cheryn Weiser | Island Senior Resources |
| Karia Wong and Michael Itti (alternate) | CISC |

## Equity Advisory Group Meetings

The primary CEIP objectives of the EAG are to advise PSE on how to equitably deliver the benefits of and reduce the burden related to the planning and implementation of Washington's clean electricity standard. PSE consulted the EAG on:

- The definition of vulnerable populations
- Customer benefit indicators, metrics, and methodology
- Burden and barrier reduction
- Equitable delivery of clean electricity benefits
- Public participation

In addition, PSE worked with the Equity Advisory Group to reflect their feedback into implementation principles. PSE discussed each topic iteratively with the EAG. We summarize the objectives of each EAG meeting in Table 6-4 below.

Table 6-4: EAG Meetings

| EAG Meeting | Date | Meeting Objectives |
|---|---|---|
| Meeting 1 | April 19, 2021 | • Provide context on EAG purpose, role, and charter<br>• Provide an overview of PSE and clean energy<br>• Discuss EAG interests and clean energy values |
| Meeting 2 | May 3, 2021 | • Shared understanding around the CETA and the CEIP<br>• Connect how the EAG's discussions will help shape the CEIP<br>• Gather EAG input to inform PSE's understanding of barriers, burdens and opportunities for programs in the CEIP |
| Meeting 3 | May 17, 2021 | • Inform about PSE's demographics and participation research<br>• Shared understanding on the CETA and highly impacted communities and vulnerable populations<br>• Consult on refining the definition of vulnerable populations<br>• EAG determination of recorded meetings, and next steps regarding charter |
| Meeting 4 | May 24, 2021 | • Advance discussion on vulnerable populations definition<br>• Shared understanding on customer benefit indicators and how they shape the CEIP<br>• Engage EAG in developing customer benefit indicators |
| Meeting 5 | June 21, 2021 | • Seek EAG member feedback on customer benefit indicators and weightings<br>• Shared understanding of next steps in developing the draft CEIP<br>• Reflect on how EAG input was incorporated into vulnerable populations' definition |

| EAG Meeting | Date | Meeting Objectives |
|---|---|---|
| Meeting 6 | July 26, 2021 | • Refresh on EAG's role, the electric resource planning process, and our work goals for this four-year CEIP<br>• Seek input on revised customer benefit indicators and path forward |
| Meeting 7 | Sept. 13, 2021 | • Recap on EAG governance<br>• Shared understanding of PSE's draft CEIP targets, programs, actions, and cost<br>• Engage EAG on their initial impressions, questions and input |
| Meeting 8 | Sept. 27, 2021 | • Share approach for Named Communities and draft principles for implementation<br>• Engage EAG on their initial impressions, questions and input on approach for Named Communities and program implementation principles.<br>• Seek EAG's input and questions on draft CEIP targets, programs, actions and cost (initially shared at Sept. 13 meeting) |
| Meeting 9 | Oct. 4, 2021 | • Seek EAG input and questions on program implementation, including EAG's input on guiding principles for implementation |
| Meeting 10 | Nov. 1, 2021 | Draft objectives:<br>• Seek EAG's input on draft CEIP<br>• Share about equity considerations for DER RFP and seek EAG input |

## Other Advisory Groups Meetings

As part of the CEIP process, PSE engaged with its established advisory groups—the Low-Income Advisory Committee (LIAC), Conservation Resource Advisory Group (CRAG), and the Integrated Resource Plan (IRP) stakeholders—to seek their input on key topics. These advisory groups have a long history with PSE and deep experience in low-income programs, energy efficiency, and resource planning. As we worked with the advisory groups, we sought to join them in their existing meetings when possible. Although the meeting topics were typically similar, the approach and feedback sought were tailored, given each group's unique perspective.

To date, PSE consulted with these advisory groups on:

- Participation in the CEIP development process
- Clean energy values
- Customer benefit indicators, metrics, and methodology

PSE discussed each topic iteratively with the advisory groups based on the group's focus and role in the process. We summarize the objectives of each meeting in Table 6-5.

Table 6-5: Other Advisory Group Meetings

| Advisory Group | Date | Meeting Objectives |
|---|---|---|
| IRP Stakeholders Meeting 1 | March 5, 2021 | • Shared understanding of CEIP process, EAG process, and overview of public participation process<br>• Gathered IRP stakeholder input on engagement with IRP and customers, and questions for the EAG |
| LIAC Meeting 1 | March 9, 2021 | • Shared understanding of CEIP process, EAG process, and overview of public participation process<br>• Gathered LIAC stakeholder input on their engagement with the CEIP, methods to engage low-income customers and their understanding of clean energy, and questions for the EAG |
| CRAG Meeting 1 | March 16, 2021 | • Shared understanding of CEIP process, EAG process, and overview of public participation process<br>• Gathered CRAG stakeholder input on their engagement with the CEIP, methods to engage with CRAG members' customers and their understanding of clean energy, and questions for EAG |
| LIAC Meeting 2 | May 11, 2021 | • Reviewed the new energy planning and CEIP process, and update on EAG and public participation efforts.<br>• Shared understanding of CBIs.<br>• Sought input on problems facing low-income customers and benefits they want to see from the clean energy transition, as well as prioritization of those benefits. |
| IRP Stakeholders Meeting 2 | May 26, 2021 | • Reviewed the new energy planning and CEIP process, and update on EAG and public participation efforts.<br>• Shared understanding of CBIs.<br>• Sought input on CBIs related to each CBI category, prioritization of benefits, and potential ways to measure each CBI. |
| CRAG Meeting 2 | June 2, 2021 | • Reviewed the new energy planning and CEIP process, and update on EAG and public participation efforts.<br>• Shared understanding of CBIs.<br>• Sought input on problems facing CRAG members' customers and benefits they want to see from the clean energy transition, as well as prioritization of those benefits. |
| LIAC Meeting 3 | July 27, 2021 | • Refreshed on the energy resource planning process, update on CBIs, and preview potential distributed energy resource concepts under consideration.<br>• Gathered input into CBI metrics, prioritization and scoring. Asked for LIAC members to share DER program concepts they're aware of. |
| CRAG Meeting 3 | July 28, 2021 | • Refreshed on the energy resource planning process, update on CBIs, and preview potential distributed energy resource concepts under consideration.<br>• Gathered input into CBI metrics, prioritization and scoring. Asked for CRAG members to share DER program concepts they're aware of. |

| Advisory Group | Date | Meeting Objectives |
|---|---|---|
| IRP Stakeholders Meeting 3 | July 29, 2021 | • Refreshed on the energy resource planning process, answered IRP/CEIP process questions, update on CBIs, and preview potential distributed energy resource concepts under consideration.<br>• Gathered input into CBI metrics, prioritization and weighting of CBIs, CBI scoring, and initial impressions of the DER concepts and other references PSE should review. |
| IRP Stakeholder Meeting 4 | Sept. 14, 2021 | • Shared updates on the draft CEIP development and what to expect during the CEIP process extension<br>• Consulted on draft CEIP components specifically, draft programs, actions and cost |
| LIAC Meeting 4 | Sept. 28, 2021 | • Briefed on draft CEIP targets, programs, actions and cost<br>• Sought feedback on draft CEIP components and LIAC participation |
| CRAG Meeting 4 | Sept. 29, 2021 | • Briefed on draft CEIP targets, programs, actions and cost<br>• Gathered input on draft CEIP components and CRAG participation |
| IRP Stakeholders Meeting 5 | Oct. 6, 2021 | • Shared about draft CEIP updates<br>• Sought input on draft DER concept scorecard and IRP participation |
| CRAG Meeting 5 | Oct. 20, 2021 | • Draft objective: Share about draft CEIP and seek feedback |
| IRP Stakeholder Meeting 6 | Nov. 3, 2021 | • Draft objective: Share about draft CEIP and seek feedback |
| LIAC Meeting 5 | Nov. 9, 2021 | • Draft objective: Share about draft CEIP and seek feedback |

## Community Input

### Meetings with community-based organizations

A key component of CEIP public participation activities is building relationships with community-based organizations (CBOs) to reach vulnerable populations and highly impacted communities better. CBOs are essential and trusted service providers for the communities they serve. PSE collaboration with CBOs creates opportunities for project audiences to learn about and engage with the CEIP through people and venues familiar to them. This work creates opportunities for PSE staff to build relationships and trust with community members.

PSE has strong relationships with many organizations throughout our service area. As part of public participation for the CEIP project, PSE sought to strengthen or initiate relationships with CBOs that serve the communities fitting CETA's guiding definition of vulnerable populations.

From May through July 2021, the CEIP team contacted seven CBOs in PSE's electric service area and organized meetings with their community members. Meetings focused on raising awareness about the CEIP and collecting input to develop CBIs. The list of community-based organizations is in Table 6-6.

Table 6-6: CBO Engagement

| CBO Name | County | Population Served |
|---|---|---|
| The Rainbow Center | Pierce | LGBTQIA+ |
| Provail | King | People with disabilities |
| NAACP Bremerton | Kitsap | Black/African American |
| Boys and Girls Club Skagit County | Skagit | Youth |
| WWU's Institute for Energy Studies | Whatcom | Students, low-income |
| Opportunity Council of Island County | Island County | Low-income, seniors |
| Island Senior Resources | Island County | Low-income, seniors |

Note: This activity continues during the CEIP schedule extension with the intent to meet our initial goals of two multilingual sessions and eight CBO meetings. Scheduling CBO meetings and multilingual sessions have been more challenging than anticipated given CBO capacity and ongoing challenges related to the COVID-19 pandemic. Based on feedback from EAG members, we are using the additional time provided by the extended schedule to add one or two more activities to reach BIPOC community members, as scheduling allows.

**Online survey**

Puget Sound Energy conducted an informal survey in May 2021 to better understand the types of clean electricity benefits important to our residential and business customers and community members in our service area. The survey also informed the development of PSE's first CEIP). In consideration of the COVID-19 pandemic, the online survey allowed people to participate in CBI development safely.

The community survey was informal and aimed to reach PSE electricity customers and community members, including customers identified as more likely to be low-income populations, Black Indigenous and People of Color (BIPOC) in PSE's service territory, and community members who speak English as a second language. Survey respondents were self-selected. Demographics were collected to provide PSE the data to indicate how we were reaching all of our community members. The survey results are not scientific and are not predictive of the opinions of PSE customers or people in PSE's service area.

The survey for residential customers was available between May 1, 2021, and June 1, 2021. The survey was available in English, Spanish, Russian, Vietnamese, Traditional Chinese, and Hindi. The project team shared opportunities to take the survey using the methods described below.

- Project website: cleanenergyplan.pse.com
- The Voice lead article (bill insert) to all customers
- E-newsletters sent to CEIP interested parties

- Targeted emails to:
  - 42,580 PSE electric customers identified as more likely to be low-income, limited English speaking, and/or BIPOC residents in PSE's service territory
  - Local governments, other project stakeholders and community-based organizations
- Paid and organic social media posts: PSE's Twitter and Facebook accounts
- Partner toolkit: Provided resources in multiple languages to help project partners share the survey, including:
  - Project fact sheet
  - Content for newsletters
  - Content for social media
- Newspaper advertising: print and digital advertisements with local newspapers
- Our approach provided non-digital means for input from individual customers. Although PSE was prepared to provide a printed survey by request, no requests were made. We acknowledge this is an area of improvement for future surveys.

The CEIP project team also distributed a survey for business customers via email to a random sample of 10,507 PSE small and medium sized business customers and approximately 600 of PSE's largest and most complex commercial, industrial, and business. The survey was available in English and included contact information in other languages to request a translated survey. A list of survey responses based on survey language is shown in Table 6-7.

Table 6-7: Residential Survey Responses

| Survey Language | Responses |
|---|---|
| English | 898 |
| Spanish | 8 |
| Russian | 7 |
| Vietnamese | 4 |
| Traditional Chinese | 2 |
| Hindi | 2 |
| **Total Residential Responses** | **921** |

Table 6-8: Survey Results

| PSE Customer Status | Responses (Total / %) |
|---|---|
| Electricity and natural gas | 215 / 32.4% |
| Electricity only | 390 / 58.2% |
| Natural gas only | 35 / 5.3% |
| No | 23 / 3.5% |
| **Total respondents** | **663** |

| How did you learn about the survey? | Responses (Total / %) |
|---|---|
| Email | 556 / 84.4% |
| Social media | 39 / 5.9% |
| Utility bill insert | 14 / 2.1% |
| Presentation | 3 / 0.5% |
| News source | 4 / 0.6% |
| Word of mouth | 36 / 5.5% |
| Other | 17 / 2.6% |
| **Total respondents** | **659** |

| Language spoken at home | Responses (Total / %) |
|---|---|
| Mandarin | 6 / 0.9% |
| English | 625 / 97.7% |
| Russian | 3 / 0.5% |
| Spanish | 17 / 2.7% |
| Other (please specify) | 27 / 4.2% |
| **Total respondents** | **640** |

| Gender Identity | Responses (Total / %) |
|---|---|
| Woman | 380 / 59.2% |
| Man | 231 / 36% |
| Gender non-binary | 12 / 1.9% |
| Transgender | 3 / 0.5% |
| A gender not listed here: | 16 / 2.6% |
| **Total respondents** | **642** |

| Sexual Orientation | Responses (Total / %) |
|---|---|
| Asexual | 18 / 3.3% |
| Bisexual | 18 / 3.3% |
| Gay/Lesbian | 24 / 4.4% |
| Heterosexual/Straight | 320 / 58% |
| Pansexual | 4 / 0.7% |
| Queer | 12 / 2.2% |
| Prefer not to answer | 131 / 23.7% |
| A sexual orientation not listed here | 25 / 4.5% |
| **Total respondents** | **552** |

| Age | Responses (Total / %) |
|---|---|
| 17 or younger | 2 / 0.3% |
| 18 - 25 | 24 / 3.7% |
| 26 - 35 | 79 / 12.2% |
| 36 - 45 | 90 / 13.9% |
| 46 - 65 | 211 / 32.5% |
| 66 + | 244 / 37.5% |
| **Total respondents** | **650** |

| Household Income | Responses (Total / %) |
|---|---|
| Less than $10,000 | 39 / 7% |
| $10,000 - $14,999 | 35 / 6.3% |
| $15,000 - $19,999 | 23 / 4.1% |
| $25,000 - $29,999 | 22 / 4% |
| $30,000 - $34,999 | 28 / 5% |
| $35,000 - $39,999 | 22 / 4% |
| $40,000 - $44,999 | 23 / 4.1% |
| $45,000 - $49,999 | 21 / 3.8% |
| $50,000 - $59,999 | 33 / 5.9% |
| $60,000 - $74,999 | 45 / 8.1 % |
| $75,000 - $99,999 | 50 / 9% |
| $100,000 - $124,999 | 52 / 9.3% |
| $125,000 - $149,999 | 31 / 5.6% |
| $150,000 - $199,999 | 22 / 4% |
| $200,000 or more | 29 / 5.2% |
| Don't know | 4 / 0.7% |
| Prefer not to answer | 50 / 9% |
| **Total respondents** | **557** |

| Race / Ethnicity | Responses (Total / %) |
|---|---|
| Asian or Asian American | 22 / 3.4% |
| Black or African American | 12 / 1.9% |
| Hispanic, Latino, Latina or Latinx | 18 / 2.8% |
| Biracial, Multiracial or Multiethnic | 15 / 2.3% |
| American Indian or Alaska Native | 5 / 0.8% |
| Native Hawaiian or other Pacific Islander | 5 / 0.8% |
| White | 486 / 75.1% |
| Prefer not to answer | 66 / 10.2% |
| An option not listed here: | 18 / 2.8% |
| **Total respondents** | **647** |

| Highest level of education | Responses (Total / %) |
|---|---|
| Some High School | 7 / 1.1% |
| High School | 119 / 18.2% |
| Bachelor's Degree | 275 / 42% |
| Master's Degree | 136 / 20.7% |
| Ph.D. or higher | 31 / 4.7% |
| Trade School | 51 / 7.8% |
| Prefer not to say | 36 / 5.5% |
| **Total respondents** | **655** |

| Number of people in household | Responses (Total / %) |
|---|---|
| 1 | 223 / 34.4% |
| 2 | 253 / 39% |
| 3 | 90 / 13.9% |
| 4 | 47 / 7.2% |
| 5 | 18 / 2.8% |
| 6 or more | 18 / 2.8% |
| **Total respondents** | **649** |

| Rent or own home | Responses (Total / %) |
|---|---|
| Own | 397 / 61.2% |
| Rent | 248 / 38.2% |
| I do not have permanent housing | 4 / 0.6% |
| **Total respondents** | **649** |

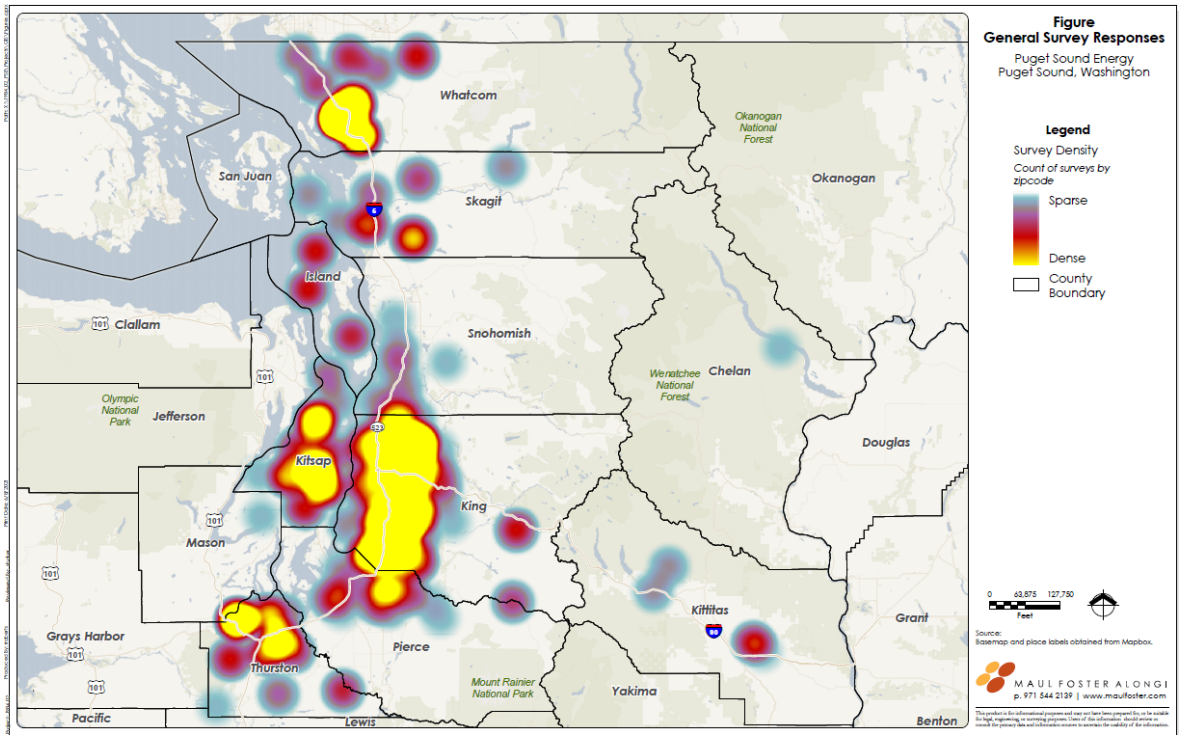


Figure
General Survey Responses
Puget Sound Energy
Puget Sound, Washington
Legend
Survey Density
Count of surveys by zipcode
Sparse
Dense
County Boundary
Whatcom
San Juan
Skagit
Island
Clallam
Snohomish
Okanogan National Forest
Okanogan
Wenatchee National Forest
Chelan
Douglas
Olympic National Park
Jefferson
Kitsap
King
Mason
Kittitas
Grant
Grays Harbor
Pierce
Thurston
Mount Rainier National Park
Yakima
Pacific
Lewis
Benton
0 63,875 127,750
Feet
Source:
Basemap and place labels obtained from Mapbox.
MAUL FOSTER ALONGI
p. 971 544 2139 | www.maulfoster.com

Table 6-9: Business Survey Responses

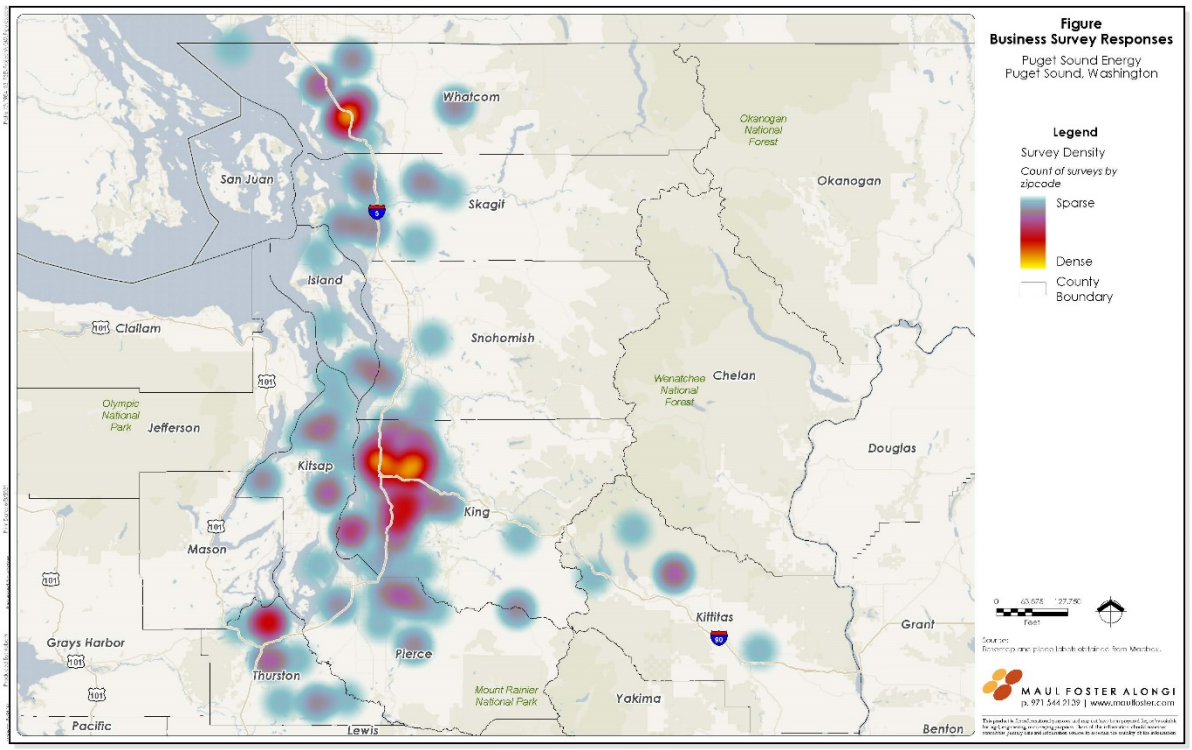
| Business Size | Responses |
|---|---|
| Small/medium businesses | 114 |
| Large businesses | 80 |
| **Total Business Responses** | **194** |

| PSE Customer Status | Responses (Total / %) |
|---|---|
| Electricity and natural gas | 58 / 41.1% |
| Electricity only | 69 / 48.9% |
| Natural gas only | 11 / 7.8% |
| No | 3 / 2.1% |
| **Total Respondents** | **141** |

| Minority-owned Business Status | Responses (Total / %) |
|---|---|
| Yes | 18 / 12.9% |
| No | 112 / 80.6% |
| Unsure | 9 / 6.5% |
| **Total Respondents** | **139** |

| Rent or own business space | Responses (Total / %) |
|---|---|
| Own | 95 / 67.9% |
| Rent | 45 / 32.14% |
| **Total Respondents** | **140** |

| Business Industry | Responses (Total / %) |
|---|---|
| Accommodations/hotel/motel | 3 / 2.2% |
| Administrative and Support and Waste Management and Remediation Services | 0 / 0.0% |
| Agriculture, Forestry, Fishing and Hunting | 7 / 5.2% |
| Arts, Entertainment, and Recreation | 6 / 4.4% |
| Construction | 12 / 8.9% |
| Educational Services | 7 / 5.2% |
| Finance and Insurance | 4 / 2.9% |
| Grocery/convenience store | 1 / 0.7% |
| Health Care and Social Assistance | 8 / 5.9% |
| Information | 3 / 2.2% |
| Management of Companies and Enterprises | 1 / 0.7% |
| Manufacturing | 13 / 9.6% |
| Mining | 0 / 0.0% |
| Other Services (except Public Administration) | 5 / 3.7% |
| Professional, Scientific, and Technical Services | 10 / 7.4% |
| Property management | 6 / 4.4% |
| Public Administration | 3 / 2.2% |
| Real Estate Rental and Leasing | 7 / 5.2% |
| Restaurant/food service | 7 / 5.2% |
| Retail Trade | 9 / 6.67% |
| Transportation and Warehousing | 3 / 2.2% |
| Utilities | 2 / 1.5% |
| Wholesale Trade | 2 / 1.5% |
| Other (please specify) | 16 / 11.9% |
| **Total Respondents** | **135** |




## Stakeholder Input Themes

In spring 2021, PSE gathered input from customers and stakeholders on their clean electricity values and the benefits they want to see from the clean electricity transformation. PSE collected input via customer surveys, advisory group meetings, and “go to you” meetings with community-based organizations (see Table 6-6). We summarized the comments into several topics below.

**Environment: Reduce greenhouse gas emissions and the effects of climate change**

Stakeholders called for benefits that result in lower greenhouse gas emissions and reduced fossil fuel extraction. In addition to reducing the impacts of climate change like wildfires, stakeholders wanted actions that benefit other categories, such as job creation, cleaner air, improved public health, energy independence, long-term cost savings, and improved siting of energy infrastructure.

**Public health: Increase air quality and improve community wellness**

Stakeholders asked for cleaner air and improved community health. These comments also commonly called for a way to measure public health more broadly, including healthcare expenditures, mental health, and other measures of physical wellness.

Stakeholders asked for cleaner air and improved community health. These comments also commonly called for a way to measure public health more broadly, including healthcare expenditures, mental health, and other measures of physical wellness.

### Affordability: Decrease the amount of income spent on electricity and empower low-income populations to participate in clean electricity programs

Stakeholders want affordable electric bills, especially for low-income populations. These comments asked for opportunities to reduce electricity bills by enabling low-income households to generate their electricity or reduce their consumption through energy efficiency measures. Stakeholders also suggested using affordability incentives to encourage more people to participate in clean electricity programs. Business customers asked for cost assistance programs to help them purchase and install new technologies that reduce greenhouse gas emissions.

### Economic: Increase the number of local clean energy jobs and make them accessible to vulnerable populations

Stakeholders suggested that the clean electricity transition should create living-wage jobs and create local economic benefits for the Puget Sound region. Stakeholders called for education, training, and apprenticeship programs to make clean energy jobs accessible for low-income and other vulnerable populations, retrain people with jobs connected to the fossil fuel industry, and prepare youth who are starting to think about their career paths.

### Accessibility: Empower customers to participate in clean electricity programs regardless of income level or homeownership status

Stakeholders said cost and homeownership should not be a barrier for low-income populations to participate in clean electricity programs, particularly for populations that have historically been more impacted by pollution and energy insecurity. Stakeholders also wanted to address education and awareness barriers by increasing outreach about clean electricity programs or making the programs an automatic component of PSE’s electricity service.

### Clean electricity participation: Make the benefits of solar energy available to named communities

Stakeholders proposed that offering low-income households and other vulnerable populations the ability to generate their electricity through solar panels as a way of reducing their electricity bills. Stakeholders called for enhancing programs like community solar and making it easier for people to install rooftop solar panels with electricity storage devices to increase access to these benefits. Businesses were also interested in solar power programs' potential to reduce electricity bills through net metering programs.

### Resiliency: Ensure a resilient clean electricity system

Stakeholders wanted to make the power grid more reliable and less susceptible to mass power outages. They suggested that tools like battery storage devices, microgrids, and rooftop solar could decrease the number of households that experience power outages during disaster events like major storms or earthquakes.

**Comfort and satisfaction: Build a clean electricity system that customers know they can depend on and reflects their environmental stewardship**

Stakeholders said it was vital for them to feel secure about their electricity service. Some said they needed more information about the dependability of variable resources like wind and solar to feel secure. Stakeholders also said they would benefit from knowing the electricity they consumed was not contributing to environmental problems like climate change and air pollution. Business customers said they took satisfaction knowing the electricity that serves their business was reliable. They also asked for ways to demonstrate the environmental values they share with their customers through participation in clean electricity programs.

**Multilingual session**

In addition to engaging community-based organizations, with our consultant Triangle Associates, PSE hosted multilingual sessions (see note above about limitations). We held the first multilingual session in August 2021 with Spanish-speaking participations from El Centro de la Raza. This focus group provided feedback on their understanding of clean electricity and energy efficiency, and ideas for making program design and implementation more accessible and understandable to communities. PSE continues work to host another multilingual session with a partner organization.

**Draft CEIP comment period**

PSE will engage customers, advisory groups, and stakeholders on the draft CEIP. PSE will review and consider the feedback to shape the final CEIP.

## Public Participation Outcomes

We describe high-level stakeholder comment themes and how they shaped various components of the CEIP through public participation in Table 6-10. [52]

[52] In the Final CEIP, PSE will include whether issues raised in the comments were addressed and incorporated into the final CEIP, as well as documentation of the reasons for not including public input (WAC 480100-655 (1) (i))

Table 6-10: Summary of Stakeholder Comment Themes and Use of Feedback

| Theme | Stakeholders Engaged | Use of feedback |
|---|---|---|
| Customer benefit indicators* | • Residential customers<br>• Business customers<br>• Vulnerable populations, including CBOs<br>• EAG<br>• IRP<br>• LIAC<br>• CRAG | PSE used customer, advisory group, and stakeholder feedback to develop the customer benefit indicators. PSE consulted with advisory groups on the customer benefit indicators and draft metrics and sought feedback on the metrics and prioritization of them.<br><br>Chapter 3 provides further descriptions on how PSE used this input and feedback to develop the indicators, metrics and prioritization.<br><br>PSE also provided advisory groups a summary of how their input was used to inform customer benefit indicator development and feedback regarding prioritization. This summary is available in Appendix C. |
| Metrics for customer benefit indicators* | • EAG<br>• IRP<br>• LIAC<br>• CRAG | |
| Clean electricity program scoring method including how to use customer benefit indicators* | • EAG<br>• IRP<br>• LIAC<br>• CRAG | |
| Definition of vulnerable populations | • EAG | PSE collaborated with the EAG to develop a more comprehensive understanding of vulnerable populations within PSE's service area. PSE used the EAG's feedback to expand the definition and add factors derived from their collective experience and interactive sessions with PSE.<br><br>See description in Chapter 3 and Table 3-14. |
| Implementation approach—Updated public participation plan, including:<br>• Calls for broad customer education on clean electricity<br>• Ideas for reducing barriers | • Vulnerable populations, including CBOs<br>• EAG<br>• IRP<br>• LIAC<br>• CRAG | To date, PSE used input from the EAG, LIAC, and community-based organizations to develop customer education goals and outcomes, and to inform barrier reduction considerations in the public participation plan. |

| Theme | Stakeholders Engaged | Use of feedback |
|---|---|---|
| Draft programs and actions, including:<br>• Questions and suggestions on draft CEIP content and costs<br>• Calls for increasing the clean energy interim target<br>• Using CBIs for all resource decisions<br>• Feedback to increase the distributed solar and battery storage actions, as well as to focus on programs for Named Communities including adding more hybrid options<br>• Concerns about lease-to-own programs for DERs | • EAG<br>• IRP<br>• LIAC<br>• CRAG | PSE shared highlights of the draft programs and actions with advisory groups at September and October 2021 meetings. PSE responded to many questions during the September meetings and continues to address those questions at October meetings. Many of the questions and suggestions for draft CEIP content are addressed in this document.<br><br>On increasing the clean energy interim target, PSE is conducting analysis around renewable energy to understand the implications of increasing the ramp up rate. PSE will address this in the final CEIP.<br><br>On using customer benefit indicators for every resource, this is addressed in Chapter 3.<br><br>PSE's distributed solar and battery storage actions are consistent with the 2021 IRP and CEAP; however, the program concept mix could be adjusted based on the results of the Targeted DR/DER RFP.<br><br>PSE is documenting feedback on the DER concept mix for consideration during program design. |
| Implementation approach: guiding principles for equity | • EAG | PSE summarized comments heard from EAG members through the CEIP development process draft preliminary guiding principles for CEIP implementation, which are shown in Chapter 8.<br>PSE will continue working with the EAG on these principles at the Nov. 1, 2021 meeting. |
| Feedback on draft CEIP | • Residential customers<br>• Business customers<br>• Vulnerable populations, including CBOs<br>• EAG<br>• IRP<br>• LIAC<br>• CRAG | PSE will engage customers, advisory groups and stakeholders on the draft CEIP in October and November.<br><br>PSE will review and consider the feedback to shape the final CEIP. |

| Theme | Stakeholders Engaged | Use of feedback |
|---|---|---|
| Suggestions for improving the CEIP development process:<br>• Providing more time for stakeholder feedback on CEIP topics<br>• Add acronym list to presentations<br>• Add breakout group questions to the posted presentation ahead of the meeting<br>• Addressing feedback heard and how it was used at the start of meetings<br>• Facilitating feedback reports in meeting materials<br>• Posting final meeting materials earlier on the day the meeting | • IRP<br>• EAG | In response to stakeholder feedback, PSE: successfully petitioned to extend the CEIP process to allow more time for stakeholder discussions; added acronym lists to all CEIP-related presentations; added breakout group questions in the posted presentation; addressed feedback at the start of meetings; and added links or copies of feedback reports to meeting materials. As for posting final meeting materials, PSE posts materials three business days in advance, and we continue to work to hone and/or address stakeholder feedback up until the meeting time. We will continue to use the "added" and "updated" notes to help in presentations to help identify slides that have changed. |
| Additional feedback and questions heard on 2021 Integrated Resource Plan | • IRP stakeholders | PSE responded to questions on the 2021 IRP during briefings with IRP stakeholders and in feedback forms available on the CEIP website.<br><br>PSE also committed to addressing specific feedback related to the 2021 IRP, which is documented in Chapter 8. |

** EAG focus on energy, non-energy and burden reduction topics*

See Chapter 3, Customer Benefit Indicators, Highly Impacted Communities and Vulnerable Populations for a detailed account of how PSE used public participation to develop the customer benefit indicators.

## Ongoing Public Participation

PSE has prepared an updated public participation plan for January 2022 through April 2023 that describes how the project team will continue to collaborate with key stakeholders to involve customers and community members in the implementation phase of the CEIP. The plan identifies opportunities for stakeholders to stay involved with CEIP activities and tools the project team will use to share information and gather feedback. The public participation plan also includes a general schedule of public participation activities.

Public participation activities will include:

- Building trust and relationship with named communities
- Educate and build customer awareness about the clean electricity transition

- Share information and be transparent about progress toward CEIP targets
- Continue working with PSE advisory groups
  - Engage with EAG to embed equity into electricity planning processes
  - Update and consult with LIAC, CRAG and IRP stakeholders on CEIP topics related to their expertise
- Support clean electricity program design and action
- Align Tribal outreach efforts with CEIP communications

The 2022–2023 public participation plan is included in Appendix C.

# 7 Reporting and Tracking

# Chapter Seven: Tracking and Reporting

This chapter provides an overview of measurements PSE plans to track and report on the 2021 Clean Energy Implementation Plan (CEIP) as part of the annual reporting required under WAC 480-100-650(3). The reporting is based on metrics including energy or capacity output, program participation, customer benefit indicators and costs.

Tables 7-1, 7-2, 7-3, and 7-4 summarize the energy-related metrics that PSE will track and report annually. In addition to the listed measurements, PSE will track and report the percentage of energy supplied by renewable resources and non-emitting resources to monitor progress to the interim target.

In addition to energy tracking, the customer benefit indicators as described in Chapter 3 will also be reported on and tracked in the CEIP progress report and future updates. The metrics and data sources are described in this chapter for each customer benefit indicator. These metrics report on the progress made under each customer benefit indicator as PSE moves through the four-year CEIP cycle.

Table 7-1: Conservation

| Energy | Program Enrollment | Program Costs |
|---|---|---|
| • Annual MW<br>• Annual MWh savings<br>• Projected cumulative lifetime MWh savings | • Number of potential Participants by Segment (Residential/Commercial/Industrial) | • Costs (through Annual Compliance Report) |

Table 7-2: Demand Response

| Energy | Program Enrollment | Costs |
|---|---|---|
| • Annual MW and MWh in DR capacity enrolled<br>• MW peak shift per program (median/maximum/minimum per program)<br>• Annual program achievement in MW and MWh | • Number of Enrolled Participants by Segment (Residential/Commercial/Industrial)<br>• Number of Participants unenrolling<br>• Number of DR Events (Total/by Month)<br>• Number of Participants who Opt Out (Total/by Month) | • Program costs |

Table 7-3: Renewable Energy

| Energy | Program Enrollment | Costs |
|---|---|---|
| • Renewable Energy Resources added to PSE Portfolio (MW) by program (capacity)<br>• Total Renewable Energy generation or purchase (MWh) (usage) | • Number of Enrolled Participants in DER customer programs by Segment (Residential/Commercial/Industrial)<br>• Number of Unenrolled Participants in DER customer programs | • Incremental cost of renewable energy resources added during the year |

Table 7-4: Other Energy Metrics

| Energy | Program Enrollment | Costs |
|---|---|---|
| • Non-emitting resource capacity (MW)<br>• Non-emitting energy generated or purchased (MWh) | | • Incremental costs of non-emitting energy, if any |

## Customer Benefit Indicators

As part of ensuring the equitable distribution of benefits and burdens, PSE will track and measure each customer benefit indicator as it relates to the programs and actions developed in the CEIP. There are separate metrics for each customer benefit indicator that connect with the feedback PSE heard from customers and stakeholders in the public participation process. Some of these metrics have or will directly influence resource decisions or program design, while others are tracked as an indicator of customer status that may inform the next assessment of economic, health, and environmental burdens and benefits. Table 7-5 shows the draft metrics for these customer benefit indicators. With the help and guidance of the third-party consultant DNV, PSE developed draft metrics for each customer benefit indicator. PSE is still in the process of evaluating data availability for the draft metrics. Many of these are new for PSE and will require continued evolution of measurement methods and data. The full report including details of the metrics and data sources is in the Appendix H, Draft Customer Benefit Indicator metrics.

Table 7-5: Customer Benefit Indicators and Metrics

| CETA Category | Customer benefit indicator | Draft Metric |
|---|---|---|
| • Energy benefits<br>• Non-energy benefits<br>• Burden reduction | • Improved participation from named communities | • Count and percentage of participation by PSE customers within named communities |
| • Non-energy benefits | • Increase in clean energy jobs | • Number of jobs created by PSE programs by residents of named communities |
| • Non-energy benefits | • Improved home comfort | • Dollar per kilowatt-hour in benefits for program calculated using indoor air temperature, indoor air quality, and lighting quality |
| • Burden reduction | • Reduced cost impacts | • Percentage of income spent on electricity bills for PSE customers in highly impacted communities and vulnerable populations |
| • Cost reduction | • Affordability of clean energy | • Percentage of income spent on electricity bills for PSE customers |
| • Environment | • Reduced greenhouse gas emissions | • Metric tons of annual CO2 emissions form PSE resources |

| CETA Category | Customer benefit indicator | Draft Metric |
|---|---|---|
| • Environment, risk reduction | • Reduction of climate change impacts | • Reduced peak demand |
| • Public health | • Improved outdoor air quality | • Regulated pollutant emissions (Sox, NOx, PM2.5) from PSE resources<br>• Reduction of particulates from resources in non-attainment areas |
| • Public health | • Improved community health | • Health factors like mortality, hospital admittance, work loss days |
| • Energy security<br>• Resiliency | • Decrease frequency and duration of outages | • Number of outages, total hours of outages and total backup load served during outages |
| • Risk reduction<br>• Energy security<br>• Resiliency | • Increased resiliency | • Number of customers who have access to emergency power (at home/at community center) |

## Actions

In the annual CEIP progress report, PSE will report on progress on planned actions. This will include

- A summary of actions taken
- Positive learnings that could affect future actions, program design, or targets
- Challenges or barriers encountered that could affect future actions, program designs, or targets, and
- A summary of any required changes to actions or programs.

## Public Participation

Ongoing public participation is critical to the success of PSE's CEIP. Customer participation in energy education, program design, and measuring customer benefits is necessary to achieve the targets.

As part of measuring public participation, PSE will include in its annual report a summary of:

- Public participation topics discussed
- Public participation tactics used
- Measurement of engagement in public participation
- Successes and challenges encountered in public participation
- Adjustments made to public participation during the year

PSE also anticipates regular engagement with stakeholders and advisory groups. As part of the annual reporting, PSE will include:

- A summary of advisory group activities during the year
- Copies of or links to advisory group materials and meeting summaries
- A list of regulatory proceedings related to the CEIP during the year

### Renewable Energy Credits

Renewable energy credits are used to verify compliance with multiple different regulatory requirements. These include voluntary customer renewable energy purchase programs, Washington's Energy Independence Act, and the Clean Energy Transformation Act. Renewable energy credits may be acquired through several different mechanisms, including generation by PSE facilities, transfer as part of a power purchase agreement from non-PSE owned facilities, or, through direct purchase of renewable energy credits.

PSE will track and report:

- A summary of the renewable energy credits acquired during the year, identifying the volume from PSE owned generating facilities, in conjunction with purchased power, or individually as renewable energy credits.
- Verification and documentation of retirement of renewable energy credits by program used for, voluntary renewable energy programs, the Energy Independence Act, and/or the Clean Energy Transformation Act

### Emissions

As part of the annual reporting, PSE will report:

- Total greenhouse gas emissions in metrics tons of $CO_2$, and
- Annual greenhouse gas content calculation[53].

### Other Information

- PSE will also provide an annual demonstration of ownership of nonpower attributes for non-emitting generation using attestations of ownership and transfer by properly authorized representatives of the generating facility, all intermediate owners of the non-emitting electric generation, and an appropriate PSE executive, in years PSE is claiming non-emitting energy as

[53] Beginning July 1, 2027, and each subsequent year, PSE will provide an attestation for the previous calendar year that PSE did not use any coal-fired resource as defined in this chapter to serve Washington retail electric customer load.

part of its compliance calculation. PSE will not transfer ownership of the nonpower attributes after claiming them in any compliance report.

- Non-emitting resource capacity will be measured in MW, and non-emitting energy usage in MWh and as a percentage of total electricity supplied by non-emitting energy.
- In each annual report, PSE will also provide an electronic link to its most recent fuel mix disclosure report.
- PSE will provide any additional information the company agreed to or was ordered to report in the most recently approved CEIP.

# 8 Future Work and Commitments

# Chapter Eight: Future work and PSE commitments

This chapter, focused on challenges and our path forward, includes a timeline and is based on current topics identified by stakeholders.

This Clean Energy Implementation Plan (CEIP) is the initial roadmap for PSE to reach a cleaner, more equitable energy future in the next four years. The 2021 CEIP is the first CEIP and sets an important new direction, focused on increased energy efficiency, the addition of demand response to PSE's portfolio, and transforming PSE's portfolio to renewable energy. Driven by the Clean Energy Transformation Act (CETA), the process of energy planning is changing to a more continuous and iterative process, working in concert with other new and existing processes that will impact the direction PSE takes to achieve the targets of CETA over time.

There are essential areas of work ahead in 2022 that will continue to shape the work outlined in this CEIP. These are:

- Results of the 2021 All-Source RFP and 2022 Distributed Energy Resource and Demand Response RFP
- Establish baseline data and measurements for customer benefit indicators
- Design Distributed Energy Resource and Demand Response Programs, including engagement with highly impacted communities and vulnerable populations
- Implement and learn from initial implementation of energy efficiency programs in 2022–2023.

## PSE commitments

As new information becomes available, PSE will continue to engage with its stakeholders through the public participation process. Certain information will be incorporated into RFP evaluations in 2022, and some will be incorporated in the 2023 IRP and 2023 CEIP updates.

Specifically:

1. PSE will include the following in the Phase 2 evaluation of the 2021 All-Source RFP and 2022 Targeted DER/DR RFP analysis[54]:
    a. Climate change analysis, which will be used to update the load forecast and resource adequacy (RA) analysis in 2022
    b. Updated resource specific effective load-carrying capability (ELCCs), based on the updated load forecast and RA analysis
    c. Updates to short-term market reliance

[54] See the ELCC Workshop and Market Reliance Workshop presentations here: https://www.pse.com/en/pages/energy-supply/acquiring-energy#2021all

2. PSE will include the following in the 2023 IRP Progress Report:
    a. Incorporate changes to PSEs resource adequacy modeling consistent with information described for Phase 2 of the All-Source RFP;
    b. Reflect revised market reliance consistent with Phase 2 of the RFP; and
    c. Updated generic resource costs and operating characteristics with the most up to date information

3. PSE will incorporate the results of the 2021 All-Source RFP and 2022 Targeted DER/DR RFP and 2023 IRP Progress Report into the 2023 CEIP update. Results will include updates on costs, feasibility, and program design.

4. PSE will incorporate the results of the 2022 Targeted DER/DR RFP in the 2023 CEIP update. These results will include details of the DER and DR program design, location of programs, targeted participation, and program implementation steps.

5. PSE will continue to develop data sources for metrics related to customer benefit indicators and report these data sources and baseline data in 2022. Appendix H identifies the proposed metrics for the customer benefits. During the development of baseline data for the identified metrics, PSE may identify updated data sources.

6. PSE will engage with highly impacted communities and vulnerable populations in 2022 to design programs that are accessible and affordable and bring benefits directly to these customers that can be measured through the customer benefit indicators.

7. PSE will continue to work with stakeholders to identify and develop future customer benefit indicators, including potential for measuring fish and wildlife impacts.

## Guiding principles for implementation

As we work to create a new clean energy future and the urgent need to address climate change, we must do so in a way that ensures all our customers, especially those who shoulder an outsized share of the climate burden, have a voice in and benefit from the transition to clean energy. In listening to and learning from our new Equity Advisory Group, the following guiding principles arose from these discussions. PSE will use these principles to help guide CEIP implementation.

PSE and the Equity Advisory Group worked together to develop the following preliminary guiding implementation principles[55]:

- Build customer awareness and understanding of clean energy
- Intentionally engage named communities in program design discussions

[55] These are preliminary principles. PSE and the EAG will continue to develop these principles for the Final CEIP and may adjust these further during implementation.

- Create affordable programs for named communities that provide opportunities for renters, multi-family units, small businesses, and low-income households to participate
- Effectively measure program and communication reach to named communities; requires tracking participation broken down by demographics and CBIs
- Outreach and education should be culturally relevant, meaningful, and intentional (e.g., in-language, digital and non-digital communications, partnerships with community-based organizations)
- Build capacity (e.g. education and resources) among partners and customers to increase equity in clean energy programs and benefits, and to expand the benefits of clean energy programs, such as job creation, small business opportunities, supplier diversity, and community economic development

During 2022 and beyond, PSE will continue to engage with our customers, especially those in highly impacted communities and vulnerable populations, in accordance with the Public Participation Plan in Appendix C. PSE will also continue to engage with stakeholder and advisory groups on these issues as part of the public participation process.