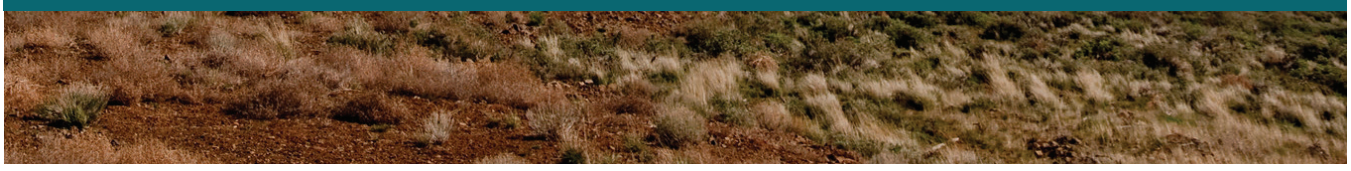
PUGET SOUND ENERGY

2021 PSE Clean Energy Implementation Plan

Corrected, February 1, 2022



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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). The plan must include, but is not limited to: A request that the WUTC approve its 10-year conservation potential and biennial conservation target. The extent of public participation in the development of the 10-year conservation potential and the biennial conservation target. The 10-year conservation potential, the biennial conservation target, biennial program details, biennial program budgets, and cost-effectiveness calculations. A description of the technologies, data collection, processes, procedures, and assumptions the utility used to develop the figures in (b)(iii) of this subsection. A description of and support for any changes from the assumptions or methodologies used in the utility's most recent conservation potential assessment. An evaluation, measurement, and verification plan for the biennium including, but not limited to: (A) The evaluation, measurement, and verification framework. (B) The evaluation, measurement, and verification budget; and (C) Identification of programs that will be evaluated during the biennium.

Acronyms and Definitions (Continued)

Term	Definition
	For the purposes of this section, 10-year conservation potential is derived pursuant to Washington Administrative Code (WAC) 480-109-100
BTM	Behind the meter
burden reduction benefits	A customer benefit indicator category required by the WUTC for named communities.
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.

Acronyms and Definitions (Continued)

Term	Definition
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.
dispatchable	Electric energy whose production whose output can be switched off or on or otherwise moderated according to demand
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.
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.

Acronyms and Definitions (Continued)

Term	Definition
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
FOTM	front-of-the-meter
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

Acronyms and Definitions (Continued)

Term	Definition
IRP	Integrated Resource Plan: required by law to be filed every four 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
LIHEAP	Low-income Home Energy Assistance Program
LINA	Low-income Needs Assessment: a study PSE conducted 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.

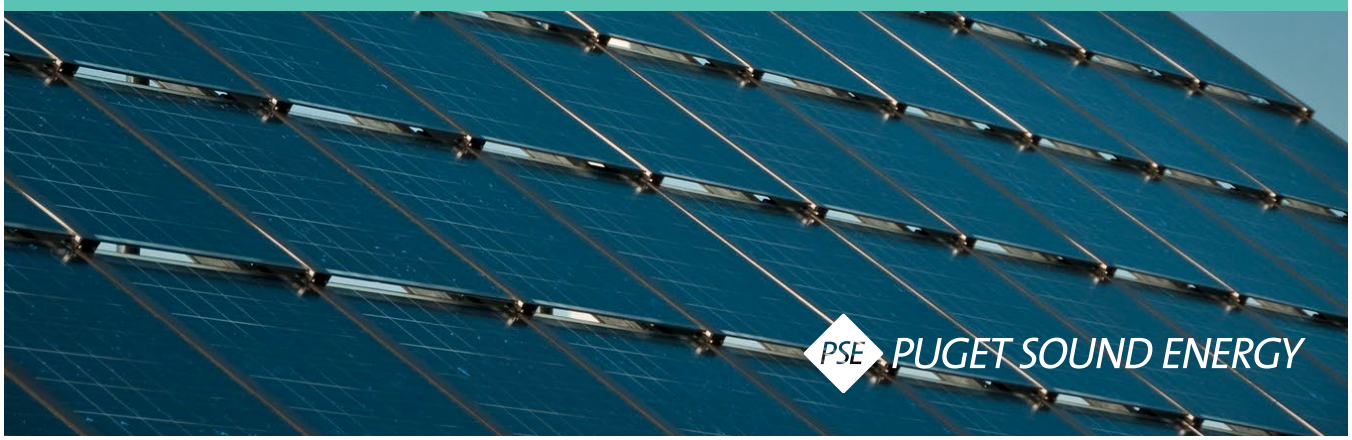
Acronyms and Definitions (Continued)

Term	Definition
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.
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.

Acronyms and Definitions (Continued)

Term	Definition
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 populations: 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 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 affordable, clean electricity, and an electric supply that benefits our customers and reduces burdens on our vulnerable customers. It also reflects stakeholder input and feedback that resulted in substantive changes between the draft and final plan.

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 to source 63 percent of our electric supply from renewable or non-emitting resources in 2025, up from 34 percent in 2020. This 2025 interim target is a crucial stepping-stone on the way to a carbon-neutral future. Over the longer term, we forecast supplying at least 80 percent of electricity sales from renewable and non-emitting sources along with other carbon reducing opportunities to reach carbon neutrality by 2030. This timeframe means we must keep a consistent 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) in this CEIP. 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: 536,717 MWh for 2022-2023, 536,717 MWh for 2024–2025

PSE's energy efficiency programs have been the foundation of our cost-effective energy resources for more than three decades, and this will continue. Over the next four years, we must continue to stretch further and think creatively to hit higher and more challenging targets. PSE will also identify and incorporate a broader vision 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) 480-100-640(11), we will update our forecast of available, achievable, and cost-effective energy efficiency in 2023 as part of the biennial conservation plan requirements and use this information to update the 2024–2025 energy efficiency 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. In this CEIP period, we will create new programs that allow us 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.

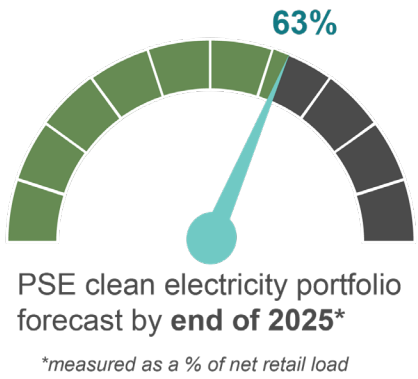
Although we have some experience with residential and commercial pilot programs, we need to build the knowledge, systems, and processes to maximize the benefits of demand response on a larger scale. In this plan, we set the target based on our modeled mix of potential programs. When we complete the program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

Renewable Energy: 63 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 Wildhorse, Hopkins Ridge, Lower Snake River wind, and other hydroelectric facilities.

As we look to 2025, we must move faster in this space than ever before. We will bring recently acquired renewable energy contracts into our electric portfolio and seek to add 1,917,068 MWh of CETA-eligible utility-scale and distributed resources in 2025. We also set aspirational 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. PSE's distributed energy resources are a key part of our strategy to achieve an electric resource plan that is equitably distributed.

Figure 1-1: Interim and Specific Targets



Energy Efficiency

- 1,073,434 MWh from 2022–2025

Demand Response

- 23.7 MW in active demand response programs

Renewable Energy

- 63% of retail sales in 2025, totaling approximately 11,381,593 MWh of renewable energy, including:
- 800 MW of new utility-scale renewables
- 80 MW of new distributed solar resources

For this first CEIP, PSE seeks approval from the Washington Utilities and Transportation Commission (WUTC) for the following targets, actions, and projected associated costs:

1) **Interim Target:** 63 percent of retail sales by 2025, totaling approximately 11,381,593 MWh

2) **Energy Efficiency Target:** 1,073,434 MWh for 2022–2025, subject to update in 2023 to reflect the 2024–2025 Biennial Conservation Plan

3) **Renewable Energy Target:**

    a. 800 MW of new utility-scale renewables

    b. 80 MW of new distributed solar resources

4) **Demand Response Target:** 23.7 MW by 2025

5) **Specific Actions:** Conduct an All-Source Request for Proposal (RFP) and a Targeted DER RFP in 2022–2023 to secure resources to meet PSE's specific and interim targets expressed above plus 50 MW of utility-scale storage and 25 MW of distributed storage by the end of the CEIP period.

6) **Incremental Cost:** To meet targets consistent with the goals of CETA, PSE estimates we will need to spend, on average, a two-percent average annual rate increase specifically to implement the above-stated targets consistent with CETA.

In future CEIPs, when we can better align the timing of resource acquisition processes with the schedule for filing and seeking approval of a CEIP, PSE anticipates including more specific actions and details regarding the resources and costs associated with meeting these targets.

Table 1-1: Specific Targets from 2022–2025, Incremental

	2022	2023	2024	2025
Energy Efficiency (MWh)	268,358.5	268,358.5	268,358.5	268,358.5
Demand Response (MW)	-	5	6	12.7
Renewable Energy [Utility-scale] (MWh)	-	-	1,052,863	833,468
Distributed Energy Resources (MW)	7	23	25	25

For a complete discussion of the interim and specific targets, please read Chapter Two, 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 metrics to include customer benefits that 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. This journey began with the 2021 Integrated Resource Plan (IRP), which proposed a balanced portfolio of resources no longer rooted under a strict “least cost” paradigm because PSE applied draft customer benefit indicators to the resource portfolio selection process for the first time.

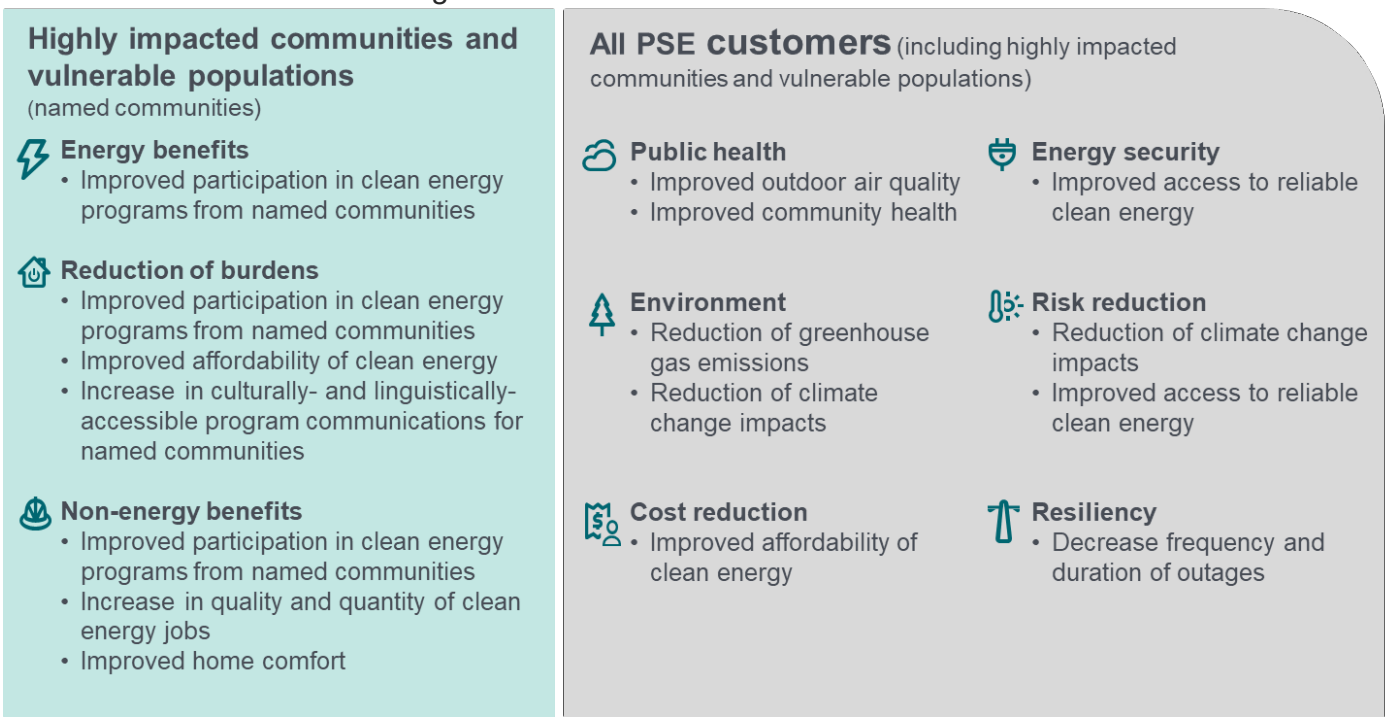
In this first CEIP, PSE engaged customers, advisory groups, and stakeholders to further develop customer benefit indicators. Benefits customers envision from the transition to clean electricity include opportunities to improve our communities through outcomes like cleaner air, better public health, new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

The customer benefit indicators in this CEIP guide PSE on the type and potential mix of distributed energy programs to pursue, customer program designs, and in evaluating and selecting utility-scale and distributed resources. By the end of the CEIP period, PSE anticipates we will achieve our customer benefit goals and reach a future state that is more equitable by delivering on the types of actions illustrated in this plan.

Customer benefits are iterative and will evolve. PSE is still developing baseline data for several customer benefit indicators for this CEIP so we can measure change over time. We will estimate and

measure the impacts of those benefits and communicate with customers to ensure we are focusing on the correct indicators throughout the first implementation cycle, 2022 through 2025.

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 Four, Specific Actions),
- Proactively engaging with customers in communities and partnering with community-based organizations (Chapter Six, 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 Three, Highly Impacted Communities and Vulnerable Populations, and Customer Benefit Indicators.

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.

PSE has already made significant progress in acquiring renewable energy over the past several years. We've taken steps to procure and increase our electric portfolio with CETA eligible resources since 2020. Figure 1-3 gives an overview of the diverse mix of resources, including wind, solar and hydro, either currently contributing to PSE's portfolio, or contracted to contribute in the coming years.

Figure 1-3: New CETA-eligible Resources 2020–2023

	2020	2021	2022	2023
Resource specific (existing or contracted)	• 40 MW Selis Ksanka Qlipse hydroelectric	• 27 MW SPI Biomass	• 100 MW BPA Capacity product hydroelectric • 200 MW Golden Hills Wind • 77 MW Chelan PUD hydroelectric • 33 MW Colville/Douglas PUD hydroelectric	• 350 MW Clearwater Wind

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 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 1-4: Summary of 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 RFP	• Start Demand Response Programs	• Expand Demand Response programs	• Expand Demand Response programs
	• Complete All-Source RFP and Targeted DER RFP • 7 MW of DER solar in service	• 23 MW of DER solar in service • 5 MW of distributed battery storage in service	• 200 MW of wind in service • 200 MW of solar in service • 25 MW of utility-scale storage • 25 MW of DER solar in service • 7 MW of distributed battery storage in service	• 300 MW of wind in service • 100 MW of solar in service • 25 MW of utility-scale storage • 25 MW of DER solar in service • 13 MW of distributed battery storage in service
Other Investments	• Begin tariff filings for DER programs • Customer-centered program design • Baseline data collection for CBIs • Enabling technologies planning	• Tariff filings for DER programs • Build and deploy new DER and DR programs • Initial customer programs and education launch • Begin installing enabling technologies • Progress reporting and CEIP Update	• Utility-scale renewables and DERs in service • Progress reporting • Ongoing programs and education • Ongoing installation of enabling technologies	• Utility-scale renewables and DERs in service • Ongoing programs and education • Ongoing installation of enabling technologies • File 2026–2029 CEIP

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

The progress of CEIP implementation and the success of many of the programs and resources at the local distribution level depend on a strong, modern grid. PSE has been preparing for and advancing a modern grid for several years, consistent with WUTC policies. Most of PSE's planned grid modernization investments are not included in this CEIP because they are not deemed incremental costs due to CETA. However, it is important to note that without these investments, our ability to implement this plan and our progress on the path to clean energy would be hindered significantly. Without these previously planned and foundational grid modernization efforts, the incremental cost of implementing CETA likely would be much higher and could present more operational challenges. Investments that have been accelerated or are unique to progressing capabilities such as microgrids are discussed further in chapter Four and reflected in Appendix E according to their allocation to the incremental cost.

PSE also will continue to focus on foundational tools such as advanced meter infrastructure (AMI), to enable our progress to clean energy. Additional investments will include those in transmission capacity that comply with the North American Electric Reliability Corporation (NERC) reliability standards, which will be required to deliver the increased load and provide the flexibility and reliability that will be needed with the proliferation of DERs and electric vehicles.

Engaging Customers

The development of this CEIP marked the first time PSE intentionally sought participation from new, diverse voices in energy planning considerations. PSE formed a new Equity Advisory Group (EAG) to bring voices of those who have not traditionally participated and engaged with our other advisory groups. The EAG played a central role in 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 equitable distribution of the benefits of clean energy as we implement the CEIP.

In addition, feedback from customers, advisory groups, and other community members have helped further shape this CEIP.

For a complete description of public participation in developing this plan and for 2022 through mid–2023, please see Chapter Six, Public Participation, and Appendix C-1, Public Participation Plan Current and Future. For a complete description of vulnerable populations, please see Chapter Three, Highly Impacted Communities and Vulnerable Populations, and Customer Benefit Indicators. For a summary of public comments and how PSE addressed them, please see Appendix C-2.

Maintaining Reliability and Affordability

As we transition from an electric system that has historically operated with predictable, utility-controlled 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.

What's changed between the Draft and the Final

As part of PSE's public participation process, we hosted a public comment period from October 18–November 12, 2021, to gather feedback on the draft CEIP. PSE received more than 350 comments. Between October 18 and early December 2021, PSE reviewed and reflected on feedback from stakeholders to revise the CEIP.

Based on stakeholder feedback, major changes between the draft and final CEIPs are listed below:

- Interim target: accelerated the clean electricity transition
- More details on highly impacted communities and vulnerable populations
- Refined CBIs, metrics, and baseline data
- Specific actions updated to match PSE's Biennial Conservation Plan (BCP) and include customer benefit details
- Incremental cost details explained
- Public participation details added and future audiences broadened
- Future work and commitments to continue to make progress in equity assessment, guiding principles, and evolving customer benefit indicator (CBI) scoring for the next CEIP

See Appendix C-2 for a summary of comments received and how PSE addressed them.

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 $450 million more than PSE would have incurred without pursuing these plans. This amount equals an additional ≈ $6/month per residential customer in 2025 and barely exceeds the mark of a two-percent average annual rate increase.

For more details on cost, please see Chapter Five, 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.

Chapter Highlights

Chapter Two: Interim and Specific Targets, CEIP Methodology

- By the end of 2025, 63 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 meeting CETA's 2030 and 2045 goals, and it reflects stakeholder feedback on our draft CEIP to increase the renewable ramp up rate.

- Energy efficiency saves 1,073,434 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, updated resource costs, 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 Three, Highly Impacted Communities and Vulnerable Populations and Customer Benefit Indicators.

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

- 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 to identify disparities, track, and measure progress over time, and include as a lens to develop and implement customer programs.
- PSE developed 11 customer benefit indicators based on feedback from customers, advisory groups, and others for this first CEIP. We expect to make additional refinements during implementation. These CBIs include outcomes our customer’s desire, like reduced greenhouse gas emissions, cleaner air, better public health, new jobs, or different ways for customers to get their electricity. In response to stakeholder feedback, PSE adjusted the CBI on clean energy jobs and added new metrics. We also added a new CBI on culturally- and linguistically-accessible program communication.
- PSE applied the customer-informed CBIs to evaluate and select the DER concept mix to include in our Targeted DER RFP. PSE will include CBIs as part of the evaluation process for demand response and large-scale renewables in the RFPs. Moving forward, PSE will apply these CBIs at the beginning of the resource planning cycle, beginning with the 2023 IRP electric progress report.
- 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.

Chapter Four: Specific Actions

- PSE specific actions are the programs and investments needed to help us reach the CETA clean energy standards and provide customer benefits. In response to stakeholder feedback, these benefits are more explicitly detailed for each specific action.
- 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 Targeted Distributed Energy Resources (DER) Request for Proposal (RFP) to identify programs and implementing time-varying rates pilot programs.
- Renewable energy actions will largely stem from 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. Specific actions include selecting programs through the Targeted DER RFP.
- Other specific actions include DER enablers, grid modernization, and other activities to support our drive to carbon neutrality.

Chapter Five: Cost

- Transitioning to clean electricity will increase customers' bills during the CEIP period. 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 CEIP 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 CEIP monitoring and reporting.
- Although this path to a clean electricity future will increase the average customer bill over time, the CEIP includes opportunities for customers to reduce their energy bills through energy efficiency and new demand response and distributed energy resource programs.

Chapter Six: 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 advisory groups, and other 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. In addition, customer, advisory group, and stakeholder feedback on the draft CEIP resulted in substantive feedback that shaped this final CEIP.

Chapter Seven: Tracking and Reporting

- PSE will track and report progress on specific actions and energy metrics. Utilizing this tracking process will 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 Eight: 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 iterative and allows for these changes.
- PSE's commitments for this iterative process include:
  - Implement a climate change temperature analysis and updating resource-specific effective load carrying capability (ELCCs) as part of the updated load forecast and resource adequacy analysis.
  - Incorporate the results of the 2021 All-Source RFP, 2021 Targeted DER RFP, and 2023 IRP electric progress report in the 2023 biennial CEIP update.
  - Engage highly impacted communities and vulnerable populations on program design elements beginning in Q4 of 2022.
- Identify the building blocks of an equity assessment, disparities within existing programs and customers, and root factors creating barriers for customers.

- Continue to work with stakeholders to identify and develop future customer benefit indicators and data sources for CBI metrics and baseline data in 2022.
- Work with the EAG to develop guiding principles for future use in the CEIP implementation period based on the pillars of accessibility, affordability, and accountability.

2 Interim and Specific Targets, Clean Energy Implementation Plan (CEIP) Methodology

PSE PUGET SOUND ENERGY

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 maintains 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 63 percent. This means 63 percent of PSE's electric sales will be served by clean, CETA-eligible energy by 2025. 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]. Thirty-four percent[2] of PSE's retail sales of electricity was supplied by renewable and non-emitting resources in 2020. Using the median water conditions[3], 33 percent of PSE's retails sales of electricity was supplied by renewable and non-emitting resources in 2020. This calculation is based on the publicly available 10K filing[4] and shown in Table 2-1. To calculate median water conditions, median generation for each project is calculated for each month, and annual median generation is the sum of these monthly values.[5]

Table 2-1: 2020 Renewable Energy Comparison with Median Water Conditions

	Renewable energy with actual water conditions	Renewable energy with median water conditions
Total Retail Sales	24,855,073	24,855,073
- CETA Adjustments	1,611,563	1,611,563
CETA Retail Electric Load	**23,243,510**	**23,243,510**
Hydro	5,360,549	5,122,538
Wind	2,516,625	2,516,625
Total Clean Energy Used	**7,877,174**	**7,639,163**
Percentage supplied by renewable and non-emitting resources	**34%**	**33%**

[1] WAC 480-100-640(2)(a)(iii)
[2] WAC 480-100-640(2)(b)
[3] WAC 480-100-640(2)(c)
[4] https://www.sec.gov/ix?doc=/Archives/edgar/data/81100/000108539221000011/psd-20201231.htm
[5] CETA specifically asks utilities to consider median water conditions along with average water conditions to help address potential future climate change conditions and water availability.

To meet the interim target, PSE is pursuing all cost-effective, reliable, and feasible conservation and efficiency resources and demand response consistent with RCW 19.405.040(6)(ii), while protecting the safety, reliable operation, and balance of the electric system[6]. PSE is also working to ensure all customers benefit from the transition to clean energy.

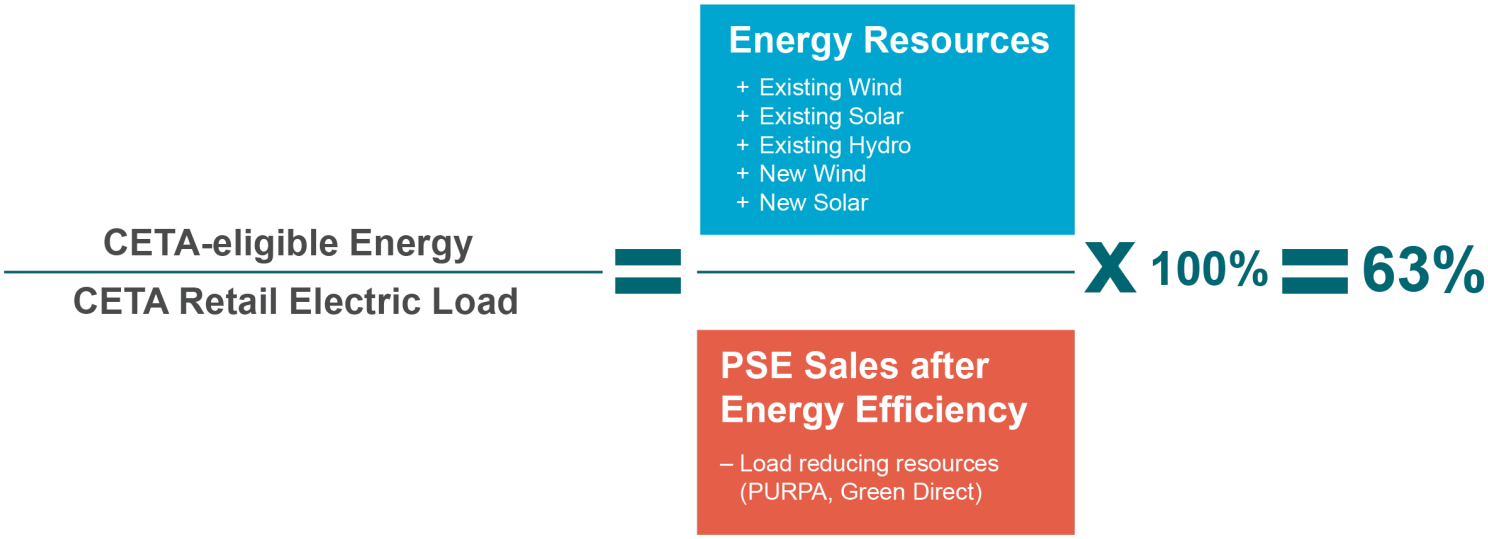
To calculate the interim target, PSE calculates the ratio between the CETA-eligible energy and CETA need:

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 calculation includes existing wind, hydroelectric and solar, and new wind and solar resources.

Figure 2-1 illustrates this calculation and Table 2-2 breaks down the calculation for the forecasted energy in the years 2022 through 2025.

Figure 2-1: Calculating the Interim Target



[6] WAC 480-100-640(2)(a)(ii)

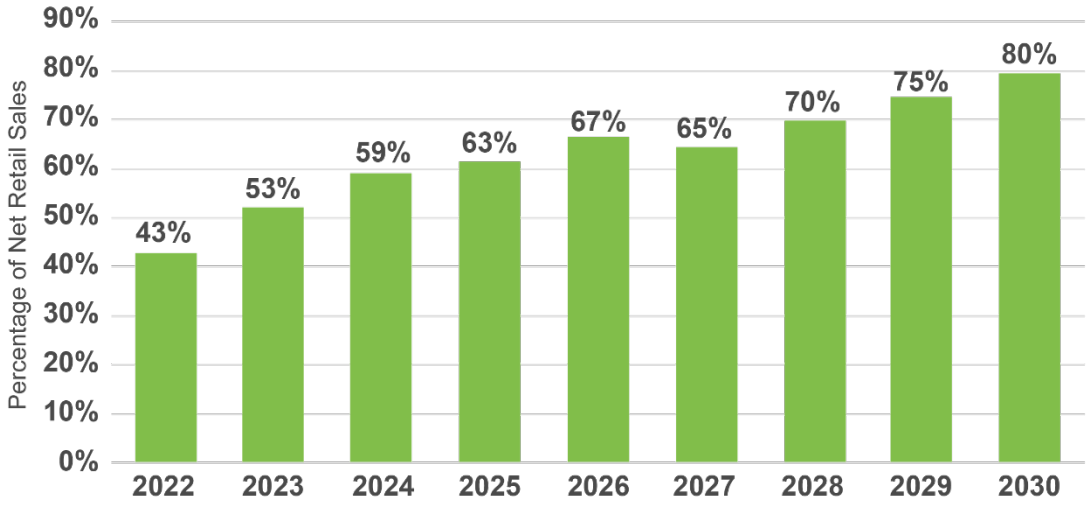
Table 2-2: 2022–2025 Interim Target Calculation[7] (Cumulative energy in MWh)

CETA Summary	2022	2023	2024	2025
Forecast Retail Sales	20,236,296	20,378,670	20,604,482	20,722,203
Energy Efficiency (2022–2023 Biennial Conservation Plan (BCP))[8]	268,359	536,717	805,076	1,073,434
New Demand Response	0	5,702	17,331	47,256
PURPA Contracts	581,349	580,814	624,150	580,304
Green Direct	656,726	656,726	659,726	970,973
DER Solar — Load Reduction	5,585	20,577	37,144	52,749
CETA Retail Electric Load	**18,724,277**	**18,578,133**	**18,461,057**	**17,997,487**
New Wind	0	0	632,336	1,256,988
New Utility-scale Solar	0	0	420,527	629,343
New DER/Non-Wires Solar	0	4,074	8,162	8,148
DER Solar — CETA Eligible	0	7,029	14,584	22,589
Existing Wind/Solar/Biomass (includes signed contracts)	2,390,017	4,054,688	4,076,546	4,054,720
Existing Hydro	5,714,766	5,696,227	5,669,840	5,4049,805
CETA-eligible Energy	**8,104,783**	**9,762,017**	**10,821,995**	**11,381,593**
Interim Target	**43%**	**53%**	**59%**	**63%**

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

[8] Energy Efficiency includes updated target from the 2022 – 2023 Final BCP

Figure 2-2: 2022–2030 Interim Targets



The projected decrease in the interim target in 2027 reflects the expiration of a hydropower contract. However, PSE does not intend to move backward in the progress to deliver CETA-eligible energy and meet the 2030 and 2045 standards. We will revisit these interim target projections as we prepare a second CEIP covering 2026–2029.

Figure 2-3: 2031–2045 Interim Targets

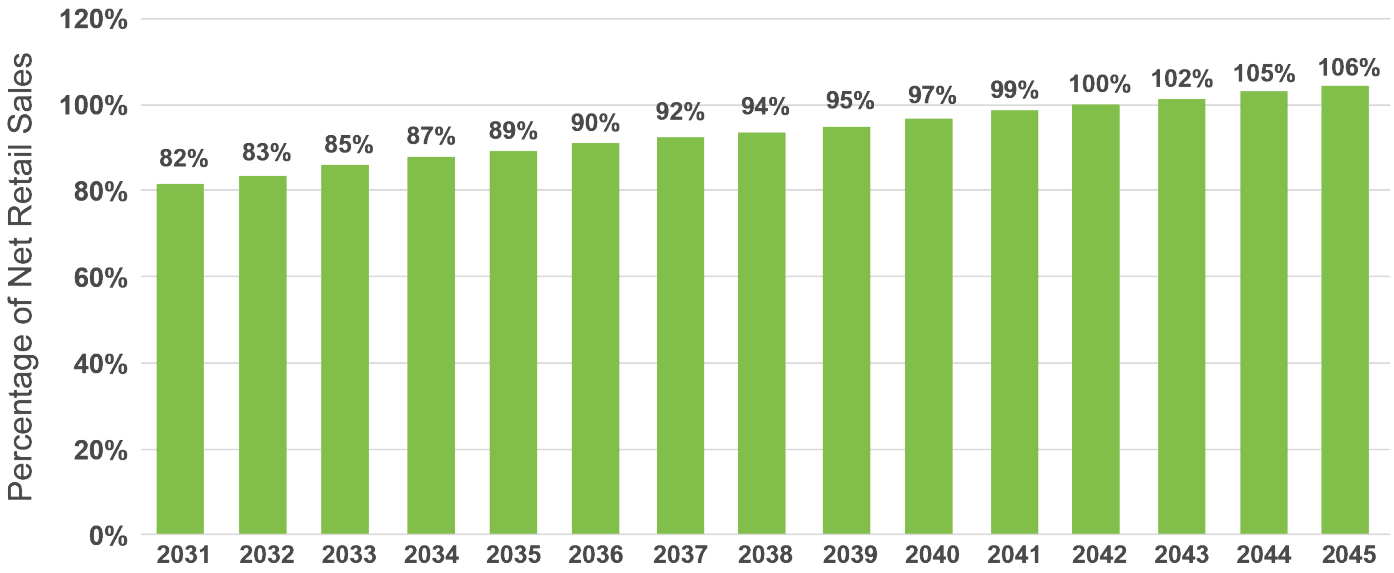


Figure 2-2 shows the ramp-up to the interim target over four years and into 2030. We use the same approach to calculate the interim targets for 2031 through 2045, shown in Figure 2-3.

As shown in Figures 2-2 and 2-3, PSE assumes a linear ramp rate to reach 80 percent by 2030 and 100 percent by 2045. The targets beyond 2025 do not reflect acquiring resources at a ramp rate that meets or exceeds a 2 percent incremental cost of compliance. Instead, the targets build resources to meet the CETA energy need, considering the portfolio cost for the 20 years. As the target goes beyond 2043, the energy used to serve load is more than 100 percent. This is due to market interactions and charging for battery storage that help PSE to balance generation to load across varying hours and conditions. For example, at certain times PSE may generate more energy than it needs to serve load and will sell surplus energy to the market. At other times, PSE will generate more energy than it needs to serve load and use that energy to charge batteries to have the electricity stored and available when it is needed. And in certain instances, PSE generation may fall short of meeting load and the battery storage or market purchases serve to fill in the gap. Interim targets go beyond 100 percent before 2045 because our mix of resources balances fluctuations in the system, like seasonal demand and curtailments. These market interactions are critical to maintaining reliability and reducing costs. PSE's 2021 IRP analyzed the impacts of prohibiting sales to the market and the resulting portfolio costs were almost $1.6 billion dollars more than the comparison portfolio without this constraint due to significantly higher levels of renewable curtailment and other factors[9].

Achieve Desired Resource Adequacy Target

Resource adequacy means ensuring the electric system, the infrastructure and supply, has enough flexibility to balance needs and unexpected events, such as variations in temperature, hydro, wind, and solar generation, equipment failure and forced plant outages, transmission interruption, potential curtailed wholesale power supplies, or any other sudden departure from forecasts. PSE's peak capacity planning standard derived from our 2021 Integrated Resource Plan (IRP) is to achieve a 5 percent Loss of Load Probability[10] (LOLP). The CEIP portfolio reaches that 5 percent target. Table 2-3 illustrates that the CEIP has an adequate peak capacity to maintain at least 5 percent LOLP. This analysis applies the resource adequacy metrics from the 2021 IRP, including the planning reserve margin and effective load-carrying capability of existing and generic resources. Table 2-3 illustrates the peak capacity value for each resource over the four-year CEIP period. As we note in the last column of the table, PSE is surplus in MW to meet the resource adequacy target. Find additional information in Chapter Seven of the 2021 IRP.

[9] 2021 IRP, Chapter Eight, Electric Analysis, Page 41: https://oohpseirp.blob.core.windows.net/media/Default/Reports/2021/Final/08.%20IRP21_Ch8_032921c.pdf

[10] 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. We provide complete discussion of the peak capacity need in the 2021 IRP, Chapter Seven, Resource Adequacy Analysis[10].

Table 2-3: CEIP Maintains Resource Adequacy Targets — Values Shown are MW

	2022	2023	2024	2025
Existing[11] and Recently Acquired Resources	4,295	4,439	4,428	4,369
New Demand-side Resources	73	133	200	262
New Wind & Solar	-	-	40	82
New Energy Storage	-	-	3.1	6.2
New Demand Response	-	1.6	3.5	9.2
CEIP Distributed Solar	0.1	0.5	0.9	1.2
CEIP Distributed Energy Storage	-	0.9	2.4	5.5
Sub-total Resources	4,369	4,575	4,678	4,735
Short-term Market Purchases	1,518	1,485	1,472	1,474
Total Resources	5,887	6,060	6,150	6,209
2021 IRP Mid Demand + Planning Margin	5,656	5,706	5,792	5,845
Surplus/(Deficit) capacity to address customers' peak energy needs	231	354	358	364

Specific Targets

Energy Efficiency Target

Energy efficiency programs and actions reduce the amount of electricity used by customers to meet their energy needs, which reduces customers' carbon footprints, lowers bills, and reduces the overall electric supply needed. This load reduction results in a lower need for new renewable and non-emitting resources and brings PSE closer to meeting the CETA standard of 100 percent by 2045.

PSE's energy efficiency target for the 2022–2025 CETA implementation period is 1,073,434 MWh consistent with the Final Biennial Conservation Plan (BCP) filed on November 1, 2021. Table 2-4 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).

[11] Existing includes two contracts for resources that are not yet online. Golden Hills is a 200 MW solar contract expected to come online in 2022. Clearwater is a 350 MW Montana wind project scheduled to come online in 2023.

Table 2-4: Energy Efficiency Targets

	2022–2023	2024–2025	Total
Energy Efficiency Targets	536,717 MWh	536,717 MWh	1,073,434 MWh

In our modeling through Aurora, energy efficiency is modeled as a resource. After performing the Long-term Capacity Expansion study and Hourly Economic Dispatch, the new energy efficiency selected by the model is subtracted from the projected retail sales to calculate the CETA interim target.

Energy Efficiency Methodology

PSE's Biennial Conservation Plan (BCP) informed the CEIP energy efficiency targets. To create the BCP, we conduct a Conservation Potential Assessment (CPA), a study that determines the conservation potential — the amount of energy efficiency available in our service territory. We build the conservation potential with a bottom-up approach, using unique energy-efficient technologies applied to appropriate end uses and building types to determine the achievable technical potential.

We use the CPA as inputs for the PSE IRP economic portfolio modeling. The models select the amount of annual energy efficiency that is cost-effective compared to alternative resources. Variables that influence this selection process include load growth, additional generation costs, and other factors. In conjunction with our Conservation Resource Advisory Group (CRAG), PSE uses the achievable, technical, and economic potential to build biennial targets.

We calculate the targets 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 Northwest Energy Efficiency Alliance (NEEA) savings[12], and then adds a 5 percent decoupling target. On top of this, we add additional firm savings (Schedule 449 Program) and estimated pilot program savings to obtain the final two-year conservation goal. See Table 2-5 for a detailed explanation of this calculation.

Working with our CRAG, we use the information in the conservation potential assessment and other relevant data to build PSE's portfolio of programs that will achieve the targets. These programs fall in residential energy management, business energy management, pilots, and regional programs, like participating in the NEEA and system distribution efficiency activities. The work to implement the biennial targets constitutes specific actions under CETA. For more information on specific actions, see Chapter Four.

[12] 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 2-5: Electric Portfolio Savings Target Calculation Summary[13]

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, Two-year Portfolio View.					
	Calculate the EIA[14] Target				
a	CPA[15] Pro-rata Share IRP & CPA Guidance	497,564	56.8	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	497,564	56.8	Meets RCW 18.285.040(1)(a) and (b) requirements	
	Calculate the Penalty Thresholds				
c	Subtract NEEA[16] Savings	-28,382	-3.24	Option A in savings calculation table from NEEA forecast — current method.	
d	EIA Penalty Threshold	469,182	53.6	$61–$64/MWh shortfall penalty, based on 2020 inflation, per RCW 19.285.060.	= b - c
e	Decoupling Threshold	24,878	2.8	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	536,717	61.3	The total portfolio PSE manages.	= b + e + (f + g)

[13] Appendix B: Biennial Conservation Plan 1217_Appendix B_BCP_2022-2023_12-17-2021.pdf (cdn-website.com)

[14] 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".

[15] CPA: Conservation Potential Assessment

[16] NEEA: Northwest Energy Efficiency Alliance

PSE's current BCP includes the 2022 and 2023 conservation targets because it is a two-year plan. To obtain the total four-year energy efficiency savings target for the CEIP, we applied the same numbers and methodology for years three and four, although we will adjust the energy efficiency target in our 2023 biennial CEIP update to align with the target identified in the 2024–2025 BCP.

Because of the timing of these two distinct processes, the customer benefit indicators developed through the CEIP process were not available to influence the current BCP. However, PSE used non-energy impacts (NEIs) to develop the target and programs in the BCP. As discussed in Chapter Three, these NEIs reflect some of the same principles of the customer benefit indicators and provide value to each program. In the future, PSE will use customer benefit indicators to determine programs for energy efficiency, and coordinate this with the ongoing work for NEIs.

Demand Response Target

Demand response (DR) programs and actions can reduce the demand on the system during peak events. These programs can lower the need for peaking generation like emitting resources. This reduced need for peaking capacity decreases the use of emitting resources to meet PSE's load and brings us closer to the CETA standards. PSE's demand response target for the 2022–2025 CETA implementation period is 23.7 MW.

Demand Response Methodology

In 2021, PSE commissioned a CPA 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 CPA in portfolio modeling to estimate the cost-effectiveness of the 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 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. The conservation potential assessment is the most up-to-date information assessing demand response potential. This target and mix of demand response programs represent what we aspire to achieve over the four-year period. As PSE gains additional insight from the targeted Distributed Energy Resources (DER) Request for Proposal (RFP), which includes demand response, we may update this target.

Although selected by the model as cost-effective, we did not include critical peak pricing and time-of-use programs in the 2021 CEIP DR target calculation. PSE is developing a time-of-use pilot to identify these savings; we describe this action in Chapter Four, Specific Actions. As we learn more about the

specific rate designs and customer response to those rate designs, we can adjust our DR target to incorporate the projections of including these rates.

We made no changes to the DR target based on customer benefit indicators. PSE will use the results of the Targeted DER RFP to consider customer benefit indicators in the evaluation process. We describe how these programs will be evaluated using the customer benefit indicators in Chapter Three.

Renewable Energy Target[17]:

Renewable resources are essential to meet CETA's clean energy standard because they are clean, non-emitting sources of energy to serve PSE's load. As more load is served with renewable energy, PSE moves closer to reaching the 100 percent goal by 2045. Sixty-three percent of the energy used to serve retail sales will be delivered by CETA-eligible energy by the end of 2025.

Renewable Energy Methodology

Renewable Energy Target is Informed by Updated Information

PSE added more than 750 MW of renewable energy to its power supply between 2005 and 2020. As of 2020, CETA-eligible renewable energy makes up 34 percent of the energy supplied to PSE customers. To establish the renewable energy target for the 2022–2025 period, PSE built on the work of the 2021 CEAP and incorporated new information as it became available and was feasible. We describe this new information in detail in the Methodology section.

PSE also accelerated the forecasted pace of adopting renewable energy from the CEAP. This acceleration and the impact on renewable energy in PSE's portfolio can be seen in Table 2-6 below. PSE pushes beyond 56 percent as originally forecasted in the 2021 IRP to bring in more renewable resources to reach a 63 percent renewable energy target by 2025. The costs associated with meeting this proposed renewable energy target and the other targets in this CEIP are projected to barely exceed the two-percent incremental cost of compliance, as explained further in Chapter 5.

Table 2-6: Increase in Renewable Energy from 2021 IRP/CEAP to CEIP

		2022	2023	2024	2025
2021 IRP	aMW of Renewable Energy	845	1,033	1,038	1,183
	Percent of Retail Sales	39%	48%	48%	56%
2021 CEIP	aMW of Renewable Energy	**935**	**1,145**	**1,290**	**1,379**
	Percent of Retail Sales	43%	53%	59%	63%

PSE proposes to accelerate the pace at which we adopt renewable energy in this CEIP for several reasons. First, we heard from numerous stakeholders a general desire to see PSE move further and

[17] The Renewable Energy target also ensures PSE meets (and exceeds) its EIA target.

faster to the clean energy future. This accelerated pace does that. Second, PSE believes a steady pace of renewable energy acquisition increases the likelihood that we can reach 80 percent by 2030 without using the incremental cost alternative compliance pathway to comply. Finally, PSE prefers to take more aggressive early action in this first CEIP period as opposed to waiting until the second CEIP period when the costs and risks are less clear and could be higher.

PSE currently complies with Washington's Energy Independence Act. The forecasted resource additions of wind and solar are also compliant with Washington's Energy Independence Act. We anticipate these added resources will keep PSE in compliance with the Energy Independence Act renewable portfolio standard (RPS). PSE understands that "renewable" has a different meaning under the Energy Independence Act as compared to CETA. PSE recognizes that only incremental hydro counts as renewable under the Energy Independence Act.

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 distributed 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 the aggregate and for specific programs. For this initial CEIP, we adopt a sub-target to our renewable energy target of 80 MW of distributed solar capacity in 2025, which is the same amount from the IRP preferred portfolio. The market potential evaluation, as described in Appendix K, indicates this sub-target reflects a feasible market adoption rate.

Distributed energy resources provide customer benefits and provide an important risk mitigation measure by providing foundational experience in distributed energy resources. The 2021 IRP analyzed the impacts of a lack of regional transmission availability, which led to an unrealistic pace of development of distributed energy resources[18]. 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.

Equitable Distribution of Energy and Non-energy Benefits

A critical part of CETA is ensuring all customers benefit from the transition to clean electricity. PSE does not currently have a specific forecast of the distribution of energy and non-energy benefits for each specific target, although certainly many of the energy and non-energy benefits are known generally for the resource types. It is difficult to forecast the distribution of energy and non-energy benefits without knowing the specific resources or programs PSE will implement, which is dependent on the results of the All-Source RFP and Targeted DER RFP processes. To equitably distribute

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

benefits, PSE must understand our existing distribution of benefits, identify who experiences these disparities, and measure how much customers benefit. We will continue to develop this system of measuring energy and non-energy benefits as we discuss in greater detail in Chapter Three. We will:

- Use internal benchmarks to uncover disparities within our service territory, including in existing programs like energy efficiency,
- Understand the burdens that may prevent customers from participating, especially in highly impacted communities and vulnerable populations through stakeholder engagement,
- Develop programs through the RFP that alleviate burdens and increase benefits for customers, especially highly impacted communities and vulnerable populations, and
- Implement ways to quantify what benefits are achievable and set up a way to track and report on these benefits for each program or action, over time.

PSE Seeks Commission Approval in this CEIP of its Interim Target, Specific Targets, and Associated Costs

For this first CEIP, PSE seeks approval from the Washington Utilities and Transportation Commission (WUTC) for the following targets, actions, and projected associated costs:

1) **Interim Target:** 63 percent of retail sales by 2025, totaling approximately 11,381,593 MWh
2) **Energy Efficiency Target:**1,073,434 for 2022–2025, subject to update in 2023 to reflect the 2024–2025 Biennial Conservation Plan
3) **Renewable Energy Target:**
    a. 800 MW of new utility-scale renewables
    b. 80 MW of new distributed energy resources
4) **Demand Response Target:** 23.7 MW by 2025
5) **Specific Actions:** Conduct an All-Source Request for Proposal (RFP) and a Targeted DER RFP in 2022–2023 to secure resources to meet PSE's specific and interim targets expressed above plus 50 MW of utility-scale storage and 25 MW of distributed storage by the end of the CEIP period.
6) **Incremental Cost:** To meet targets consistent with the goals of CETA, PSE estimates we will need to spend, on average, a two-percent average annual rate increase specifically to implement the above-stated targets consistent with CETA.

In future CEIPs, when we can better align the timing of resource acquisition processes with the schedule for filing and seeking approval of a CEIP, PSE anticipates including more specific actions and details regarding the resources and costs associated with meeting these targets.

Table 2-7: Specific Targets from 2022–2025, Incremental

	2022	2023	2024	2025
Energy Efficiency (MWh)	268,358.5	268,358.5	268,358.5	268,358.5
Demand Response (MW)	-	5	6	12.7
Renewable Energy [Utility-scale] (MWh)	-	-	1,052,863	833,468
Distributed Energy Resources (MW)	7	23	25	25

Methodology to Develop Targets: from Integrated Resource Plan (IRP) to Clean Energy Implementation Plan (CEIP)

The 2021 IRP/CEAP set the stage for PSE to meet resource needs at the lowest reasonable cost while providing customer benefits over a 10-year horizon. As PSE transitioned 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 resource additions to better represent target programs over 2022–2025 using the AURORA long-term capacity expansion model, a benefit-cost analysis (BCA) model, and customer benefit indicators, and iterated on various permutations to maximize spending to the incremental cost guidance.

PSE's CEIP accelerates adding large-scale wind and solar resources and adds some utility-scale battery storage. Table 2-8 highlights the changes in the large-scale resource additions from the 2021 IRP preferred portfolio to the 2021 CEIP. Specifically, there is an overall increase of 100 MW in wind resources over the four-year period and a shift in the timing of some of the forecasted wind energy estimated to come online in 2024. We also add 300 MW of solar energy beginning in 2024. We add 25 MW of utility-scale battery storage in 2024 and 25 MW in 2025. Although this battery storage does not contribute to the overall CETA need, it does contribute to system reliability and renewable resource integration benefits to the portfolio. Over the four-year period, there is no change in other resources as compared to the 2021 IRP preferred portfolio.

These resource additions are an estimate of the types of clean energy resources that PSE may acquire during the four-year CEIP period, and the anticipated timing — they are not intended to be definitive, nor is PSE committing in this CEIP to secure this proposed mix of renewable energy resources through the ongoing RFP processes. Rather, as detailed earlier in this Chapter and in Chapter One, PSE seeks WUTC approval of the specific and interim targets, the associated MW/MWh, certain specific actions, and the overall projected incremental cost associated with achieving those targets and specific actions. As outlined in the plan, these targets and costs ensure reasonable near-term progress that will enable

PSE to spread the costs and risks to customers associated with the clean energy transition gradually over the decade. PSE will incur a high incremental cost to meet the distributed energy resource sub-target; we expect none of these investments would be cost-effective before adopting CETA and considering customer benefit indicators. As such, PSE seeks WUTC approval that our investment in DERs and the DER enabling costs associated with these investments is reasonable and prudent at the level proposed in this plan.

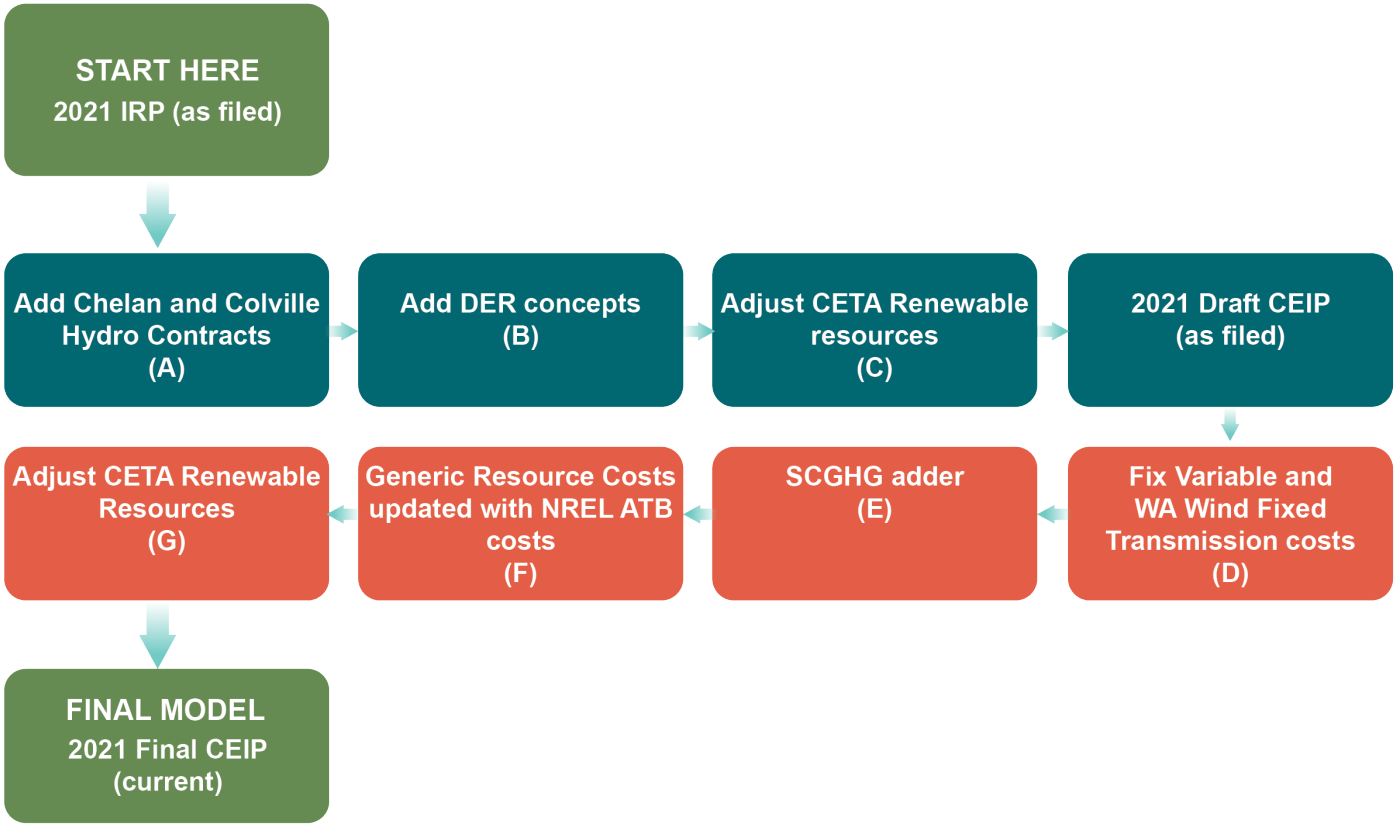
It is important to note the portfolio optimization model is non-linear, highly sensitive to changes to the inputs or assumptions, and has multiple possible solutions. The adjusted CETA needs and new hydroelectric contracts we executed resulted in a different optimization path, which created in a different portfolio. This portfolio satisfies PSE's peak needs, energy needs, and CETA requirements. However, there are other possible permutations of this portfolio that may also satisfy PSE's peak needs, energy needs, and CETA requirements that may be considered through the RFP evaluation processes as we gather actual resource specific information and costs.

Table 2-8: 2021 IRP vs. CEIP Utility Scale Resource Additions in MW (2022–2025)

Scenario	Resource Type	2022	2023	2024	2025	Total
2021 IRP Preferred Portfolio	Battery Storage	-	-	-	-	0
	Solar	-	-	-	-	0
	Wind	-	-	-	400	400
2021 CEIP	Battery Storage	-	-	25	25	50
	Solar	-	-	200	100	300
	Wind	-	-	200	300	500

For the 2021 CEIP, PSE made several updates to the resource inputs from the 2021 IRP. These updates include resource additions, cost assumptions, and accelerating CETA-eligible resources. Figure 2-4 illustrates the process PSE undertook to update assumptions in modeling for the CEIP. We explain the steps we took to update modeling from the 2021 IRP to the 2021 CEIP in greater detail in Figure 2-4.

Figure 2-4: IRP Portfolio to CEIP Portfolio Modeling Updates



A. Add Chelan and Colville Hydro 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, providing approximately 49 aMW of energy. The second 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 for a 5.5 percent share from October 1, 2021, through September 30, 2024, providing approximately 26 aMW of energy. With the acquisition of these hydroelectric contracts, PSE adjusted its CETA need for this CEIP.

B. Specific distributed energy resource programs and costs: As described here and in Appendix D-1, 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. In the 2021 IRP preferred portfolio, the 80 MW distributed solar and 25 MW distributed battery storage projections were based on generic resource cost assumptions developed in the IRP process. As discussed previously in

this chapter, PSE used updated resource costs for distributed solar and distributed battery storage, 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 the resource cost and the cost for each DER program in this CEIP.

C. Adjust CETA renewable resources: Based on stakeholder feedback, PSE adopted a more aggressive pace of renewable energy acquisition than noted in the 2021 IRP. PSE updated the renewable resource need given the impacts of the additional hydroelectric contracts and made additional adjustments to the resource mix to stay close to the two-percent incremental cost threshold.

D. Fix variable and WA wind fixed transmission costs: PSE learned of two errors in the 2021 IRP modeling related to transmission cost assumptions after the 2021 IRP was completed. The first error was an update to the spinning and supplemental reserve cost used as part of the variable transmission cost for resource modeling. The models assumed the full costs of this transmission rate, however in alignment with the BPA transmission tariff, these costs should have only used 3 percent of the rate. The assumed cost in the 2021 IRP was $9.53/MWh. Once corrected, the variable cost decreased to $0.27/MWh. This change decreases the variable transmission cost for renewable resources outside of PSE's territory. The other error involves the escalation used for WA wind fixed transmission costs. The error was reflected in the conversion of fixed transmission costs from nominal dollars to 2012 dollars in AURORA. As a result, costs for WA Wind fixed transmission costs were lower by 12 percent in 2025 and 46 percent by 2045. We checked all other costs and escalations and this issue only occurred for WA Wind fixed transmission costs; it has been corrected for the final CEIP.

E. Social Cost of Greenhouse Gas Emissions (SCGHG) Adder: PSE recalculated the SCGHG adder for existing and thermal resources based on updated emissions output and the current social cost of carbon price using the 2020 GDP as published on the WUTC website versus the 2019 GDP we used in the 2021 IRP[19]. This inflation update resulted in a minor cost adjustment of about $0.74/metric ton by the year 2025.

F. Generic resource costs: In response to feedback from stakeholders, PSE updated the generic resource costs used in the final CEIP to reflect cost assumptions developed by the National Renewable Energy Lab's Annual Technology Baseline 2021 Report (NREL ATB 2021 Report). The NREL ATB cost assumptions are generally lower for most resources than the costs in PSE's 2021 IRP or the range of bids received in the All-Source RFP. However, it is difficult to compare the generic utility-built and owned resources modeled in the IRP to the PPAs from the

[19] WUTC Social Cost of Carbon update: https://www.utc.wa.gov/regulated-industries/utilities/energy/conservation-and-renewable-energy-overview/clean-energy-transformation-act/social-cost-carbon

All-Source RFP due to the differences in financing, tax incentives, returns, and various cost assumptions including transmission, interconnection, and operational costs. In general, NREL ATB's cost assumptions appeared to be closer to the range of bids received in the All-Source RFP than to the IRP generic resource cost assumptions. PSE bases the premise that NREL ATB cost assumptions are directionally closer to the All-Source RFP solely on the company's preliminary analysis conducted during the Draft CEIP comment period. PSE plans to examine these cost assumptions in more detail and make better-informed assumptions in the next IRP. As a result of this update as well as the acceleration of the forecasted pace of renewable energy resources, the CEIP projects the acquisition of more renewable resources during the CEIP period than the Draft CEIP targeted.

G. Adjust CETA Renewable resources: Except for the utility-scale resources, we carried over the 2021 IRP and CEAP resource need by category targets to this 2021 CEIP. We ran the utility-scale resources through the modeling process after completing the resource cost updates. We gave the utility-scale resources the flexibility to adjust based on CETA MWh need in the modeling process. PSE held the demand response and distributed solar and battery targets constant for the final CEIP. We also updated the energy efficiency target to reflect the final BCP and held it constant.

PSE performed multiple modeling iterations to understand the mix of utility-scale resources for the CEIP and discern their incremental cost and CETA-energy impact on the preferred portfolio.

In the first run, the model selected a large amount of WA wind to meet the clean energy targets at the end of the CEIP period in 2025 to take advantage of the expiring production tax credits (PTCs). This outcome did not seem to reflect what PSE likely would acquire through our All-Source RFP process, given the risk to system reliability from an overreliance on WA wind. Although PSE received a strong response from bidders for wind energy projects, we also received a strong response for solar and BESS projects[20].

Next, PSE performed a second model run that considered a more diverse set of renewable resources: a smaller amount of wind (500 MW) spread over two years instead of one, plus the addition of 300 MW of solar in 2024–2025.

Finally, PSE performed a third model run that kept the wind and solar resources and added 50 MW of batteries over 2024–2025. Although the first model run did not select batteries or solar purely on economics, PSE decided those resources should be in the proposed resource mix for this final CEIP for a couple of reasons. First, a diversified portfolio provides benefits that an all-wind portfolio does not. Second, the addition of batteries supports power system resilience, another benefit to PSE's system. Given the strength and diversity of the proposals seen in the All-Source RFP, this proposed resource mix of solar, wind, and batteries seemed reasonable and more in line with the type of diversified portfolio PSE would like to pursue over the next several years.

[20] *See "*2021 All-Source RFP: Proposal Summary" in Docket UE-210220, which summarizes bids received by resource type.

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 customer and third-party adoption of clean energy resources. 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 guiding principles we developed internally and with a third-party consultant, West Monroe. These principles will guide PSE's DER strategy:

- Ensure DER 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 proposed DER preferred portfolio for solar and battery storage programs, we partnered with West Monroe to benchmark and study other utilities' DER programs. We captured characteristics such as technology, ownership structure, and customer and utility benefits (see Appendix D-4). 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 and prioritized these concepts based on scalability, feasibility, and accessibility to develop groupings of programs to include in the CEIP (see Appendix D-5). See Tables 2-9 and 2-10 for the lists of concepts we used to select 25 MW of distributed battery storage and 80 MW of distributed solar.

Some of the concepts were dropped from consideration based on their feasibility and lack of information. For example, the rent-to-own solar and community battery share were on the list or supported by stakeholders but did not make the list of concepts. Rent-to-own distributed solar had a

similar market potential as the rooftop solar leasing program but had lower returns for customers. For community battery share, PSE noted a lack of price signals and benchmarks in other utilities, low feasibility, and concerns with costs. Additional details on these and other concepts are in Appendix D-4, D-6, and K. However, even if we did not move a concept on and include it in PSE's proposed preferred DER portfolio, we may consider it in future evaluations based on our Targeted DER RFP responses.

Table 2-9: Distributed Battery Storage Programs

#	Program Concept	Program Description
1	Third-party Customer-sited Distributed Battery Power Purchase Agreement (PPA)	Third-party installs/managed 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/managed 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 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).
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.

#	Program Concept	Program Description
11a	Residential PSE Battery Leasing — Income-eligible	PSE provides targeted deployment of batteries for income-eligible customers. Customers pay a monthly fee for backup power services; PSE uses battery to manage system/local peaks.

Table 2-10: 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 — Income-eligible	Provides community solar access to income-eligible 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.

#	Program Concept	Program Description
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.
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.
19	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	Multi-family Community Solar	Provides community solar access to 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 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 various criteria shape a portfolio. We show the objectives and methodology for each suite selection in Table 2-11. PSE took the following steps to create and analyze each suite:

1. Organize concepts by suite
2. Gather cost data for each concept
3. Apply cost test to evaluate each suite

We constructed each suite from concepts that aligned with the individual suite objective. We included community solar and income-eligible 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 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-1, 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. [21] 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 2-11: 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 Two
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 Three, Highly

[21] 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/.

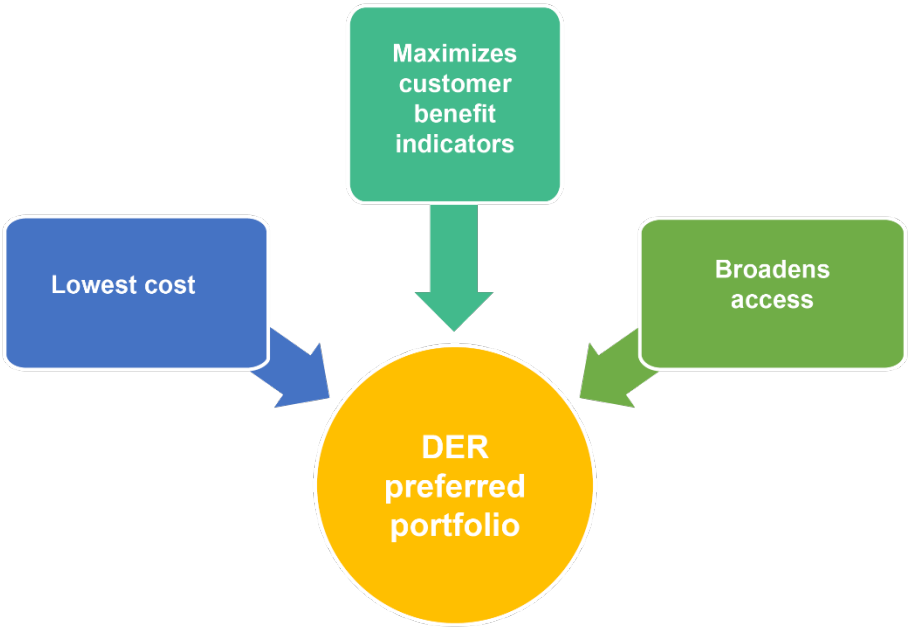
Suite #	Name	Suite Objective	Methodology
			Impacted Communities and Vulnerable Populations, and Customer Benefit Indicators,
6	Preferred Portfolio	Balanced review of all criteria	Hybrid approach to balance lower costs, CBI scores, and diverse program offerings

PSE compared and contrasted portfolio options in the suite selection process to create and inform a balanced DER preferred portfolio that promotes customer benefits, diverse offerings, and minimizes costs. The results of this suite evaluation process are in Appendix D.

DER Preferred Portfolio Selection

To develop the 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 and promotes customer benefits, diversified offerings, and minimized costs. Figure 2-5 illustrates how we assembled multiple suites to form the DER preferred portfolio.

Figure 2-5: CEIP DER Preferred Portfolio Selection Process



Preferred Portfolio Selection Approach

Phase 1: Develop a short list of concepts — distributed solar and battery storage (Table 2-12)

1. Rank all 25 concepts from lowest to highest, based on 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 average, rounded down, CBI score. In the case of the CEIP, the average score is 15. Concepts in bold have a score of 15 or more and will move on to Phase 2. We provide more details on the CBI scoring in Chapter Three and Appendix D, DER Suite Selection and Evaluation.

Table 2-12: Phase 1: DER Concept Capacity Cost and Customer Benefit Indicator Score

DER programs	Capacity $/Watt Cost ($/Watt)	Customer benefit indicator score
PSE Community Solar[22]	$ (1.84)	14
C&I Battery BYO	$ (0.53)	13
Third-party Utility-scale Distributed Battery PPA	$ -	14
Net Metering (Existing)[21]*	$ -	-
Net Metering (Successor)[21]	$ -	-
C&I Rooftop Solar Incentive	$ 0.45	16
Multi-family Community Solar	$ 3.08	16
Third-party Distributed Solar PPA (or Solar Lease)	$ 4.64	15
PSE Substation Batteries	$ 4.71	12
C&I Battery Install Incentive	$ 5.22	13
Residential Battery Install Incentive	$ 6.36	15
PSE Mobile Batteries	$ 6.39	12
PSE Customer-sited Solar+Storage Offering	$ 6.46	19
PSE Community Solar — Income-eligible[21]	$ 7.10	16
PSE Utility-scale Distributed Battery Stations	$ 8.87	14
C&I Rooftop Solar Leasing	$ 8.96	16
Multi-family Rooftop Solar Incentive	$ 9.21	16

[22] These concepts are considered must take and did not undergo any further evaluation. These concepts will be included in the preferred portfolio

DER programs	Capacity $/Watt Cost ($/Watt)	Customer benefit indicator score
Third-party Customer-sited Distributed Battery PPA	$ 13.10	16
Residential PSE Battery Leasing	$ 13.92	19
Multi-family Unit Battery Program	$ 14.19	17
Residential PSE Battery Leasing — Income-eligible	$ 16.13	20
Residential Rooftop Solar Leasing	$ 18.42	16
Multi-family Solar Partnership	$ 18.53	16
Residential Rooftop Solar Leasing — Income-eligible	$ 22.47	17
C&I Space Leasing for Batteries	$ 26.33	17

Phase 2: Select preferred portfolio for distributed solar and battery storage (Table 2-13 and 2-14)

3. Rank remaining concepts by SCT, from highest to lowest.
4. Select concepts ranked by high CBI score, high SCT, and low-cost. The concepts in bold represent the concepts that were selected for the preferred portfolio.
5. Ensure offerings are available for all customer classes, include a mix of utility- and customer-sited/owned DER concepts.

Table 2-13: Phase 2 DER Solar Concept Selections

DER programs	Capacity $/Watt Cost ($/Watt)	Customer Benefit Indicator Score	SCT
Third-party Distributed Solar PPA or Solar Lease	$ 4.64	15	0.65
C&I Rooftop Solar Incentive	$ 0.45	16	0.50
Multi-family Community Solar	$ 3.08	16	0.49
C&I Rooftop Solar Leasing	$ 8.96	16	0.38
Residential Rooftop Solar Leasing	$ 18.42	16	0.21
PSE Customer-sited Solar+Storage Offering	$ 6.46	19	0.18
Residential Rooftop Solar Leasing — Income-eligible	$ 22.47	17	0.18
Multi-family Solar Partnership	$ 18.53	16	0.17

DER programs	Capacity $/Watt Cost ($/Watt)	Customer Benefit Indicator Score	SCT
Multi-family Rooftop Solar Incentive	$ 9.21	16	0.12

Table 2-14: Phase 2 DER Storage Concept Selections

DER programs	Capacity Cost ($/Watt)	Customer Benefit Indicator Score	SCT
Third-party Customer-sited Distributed Battery PPA	$ 13.10	16	0.28
Residential PSE Battery Leasing — Income-eligible	$ 16.13	20	0.25
Multi-family Unit Battery Program	$ 14.19	17	0.23
C&I Space Leasing for Batteries	$ 26.33	17	0.23
Residential PSE Battery Leasing	$ 13.92	19	0.22
Residential Battery Install Incentive	$ 6.36	15	0.19
PSE Customer-Sited Solar+Storage Offering	$ 6.46	19	0.18

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 to all customer classes like single-family residential, multi-family residential, commercial, and industrial. We show the basis for each concept in Appendix D. After reviewing a draft DER preferred portfolio with internal and external stakeholders like the EAG and IRP, we added additional community solar with a greater MW emphasis on highly impacted communities and multi-family customers (see Chapter Four, Specific Actions). The DER preferred portfolio consists of the DER programs shown in Figure 2-6.

Figure 2-6: CEIP DER Preferred Portfolio Selection

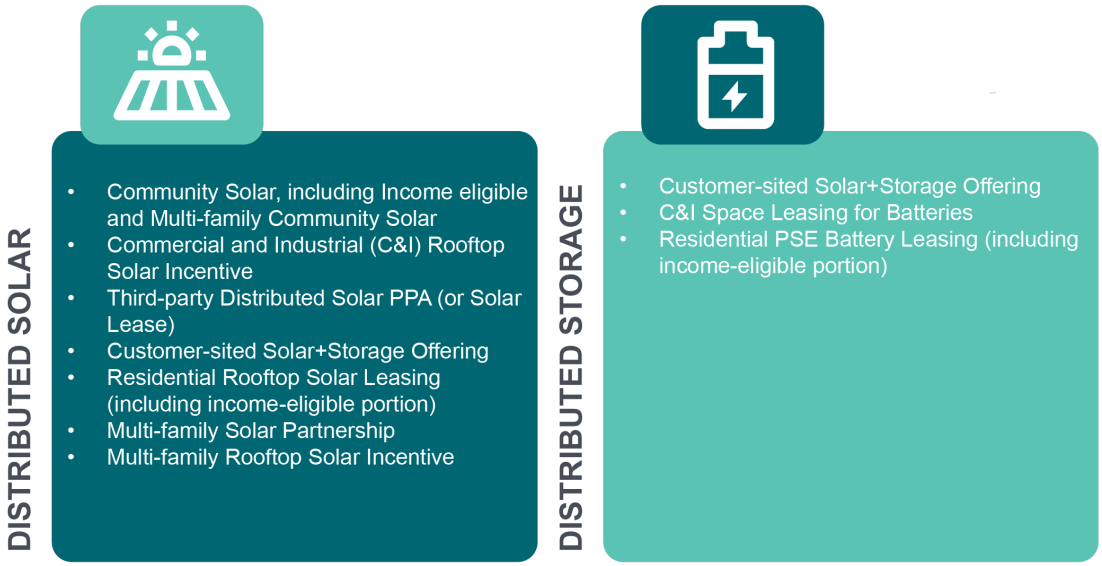


Table 2-15 shows the output of the DER preferred portfolio and the forecasted incremental installed capacity for each concept. The total installed capacity for distributed solar concepts encompasses the 80 MW target and 25 MW for the distributed storage target. The table also forecasts how much PSE plans to install for each concept during the four-years covered by the CEIP. Results may vary depending on what we learn through the Targeted DER RFP process.

Table 2-15: Installed Capacity of DER Preferred Portfolio 2022–2025[23]

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 Customer-sited Solar+Storage (storage)	0.00	3.68	4.23	4.83	12.74
Total Distributed Storage	**0.00**	**4.98**	**7.43**	**13.43**	**25.84**
PSE Community Solar	5.60	4.80	5.60	0.00	16.00

[23] 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
PSE Community Solar — Income-eligible	1.40	1.20	1.40	0.00	4.00
Multi-family Community Solar	0.00	0.00	0.00	5.40	5.40
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	20.88
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
Residential Rooftop Solar Leasing	0.00	1.19	1.60	2.00	4.79
Residential Rooftop Solar (Income-eligible) Leasing	0.00	0.17	0.23	0.28	0.68
PSE Customer-sited Solar+Storage (solar)	0.00	4.41	5.07	5.80	15.28
Total Distributed Solar	**7.00**	**23.12**	**25.25**	**24.83**	**80.2**

PSE's proposed DER preferred portfolio is our initial path to meet CEIP targets with a diverse set of distributed energy resource programs. The All-Source and Targeted DER RFPs will provide important data on available resources and programs. Resources we acquire through those processes may vary from what is reflected in the DER preferred portfolio. Customer research and program design will provide additional insight on potential customer adoption rates. We will also be able to better understand how we can expand the scope of programs beyond what is listed in the DER preferred portfolio during the program design and implementation phase. 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 Four, Specific Actions and Appendix E, Incremental Costs.

Other CEIP Methodology 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:

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 us to optimize 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 in the IRP process.

Effective Load Carrying Capability

There are five programs in the CEIP: (i) the multi-family unit battery, (ii) residential battery install incentive, (iii) residential PSE battery leasing, (iv) the residential PSE battery leasing — income-eligible, and (v) customer-sited Solar+Storage offering, that uses three-hour lithium-ion batteries with 90 percent round-trip efficiency. The three-hour Li-Ion battery option 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. When we moved from generic resources to specific resources in our modeling, we used this three-hour battery as the assumed battery resource. The methodology to determine this ELCC is consistent with the 2021 IRP, Chapter Seven. The ELCC value is 19.40 percent in the years before 2031, and 24.4 percent in 2031.

In the PSE customer-sited Solar+Storage program, the distributed battery storage is charged differently than in the IRP hybrid system model assumptions. The distributed battery in this CEIP program can be charged by any generation resource and market purchase, not just on-site solar. This flexible charging resource provides a higher ELCC than the hybrid system. We treat the distributed solar and the distributed battery storage in the hybrid system as an independent resource for ELCC calculation purposes. In the 2021 CEIP, the ELCC value is 19.40 percent in the years before 2031, and 24.4 percent in the year 2031 and thereafter for the customer-sited storage resource. The ELCC value of the customer-sited solar resource uses the same values as the generic DER rooftop solar resource in the IRP.

Resource Adequacy/Peak Capacity Need

Like the modeling for the IRP preferred portfolio, the CEIP will continue to meet resource adequacy and CETA energy needs. PSE studied 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. PSE's AURORA modeling forecasts a peak capacity shortfall beginning in 2026 due to the retirement of existing coal resources. PSE currently uses a loss of load probability (LOLP) consistent with the Northwest Power and Conservation Council to determine the peak capacity need for our 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 Seven, Resource Adequacy Analysis[24].

The resource adequacy analysis is complex; it ensures the resource system is flexible enough to balance 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 CEIP. Since the 2021 IRP was published, PSE has started an additional analysis of its load forecast to incorporate temperatures that reflect climate change and an analysis of the impacts of resource assumptions. Together, these analyses may change the peak capacity need and the capacity contribution of different resources. We will complete the study of these factors in 2022 as part of the 2023 Electric IRP progress report and incorporate them in the 2023 biennial 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 our 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.

The resources secured to meet the targets in this CEIP will help reduce PSE's short-term market reliance, but we do not expect these resources to provide significant peak capacity. PSE may require additional resources over time to reduce our dependence on the Mid-C market to meet capacity needs. We will provide an update on our reliance on short-term market purchases in the 2023 Electric IRP progress report and 2023 biennial CEIP update.

To stay consistent with the 2021 IRP and because of time constraints in the development of the 2021 CEIP, many analytical inputs, methodologies, and assumptions were carried from the 2021 IRP to the 2021 CEIP. The most important of these are:

Power Demand and Energy Demand

PSE uses 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.

[24] 2021 IRP Chapter Seven, Resource Adequacy Analysis: https://oohpseirp.blob.core.windows.net/media/Default/Reports/2021/Final/07.IRP21_Ch7_032921.pdf

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, we use 93 degrees Fahrenheit 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[25]

Moving energy from where it is generated to where it is used often relies on transmission lines — like moving hydropower from eastern Washington to customers in western Washington. Transmission constraints impact the availability of resources to serve load and significantly constrict 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 transmission constraints for the CEIP.

As in the IRP, transmission within PSE's service territory was assumed to be adequate to deliver resources to end use meter, but transmission improvements will be necessary to meet dynamic load and changing flows and remain compliant with mandated NERC reliability standards. PSE will pursue non-wires alternatives to alleviate local transmission needs where possible, which will also contribute to CETA needs. Chapter Four discusses three planned non-wires alternative projects that will contribute 22 MW to resource need.

CETA Contribution Reduction

The DER concepts included in the CEIP help us achieve PSE's CETA goals and meet our stated DER guiding principles. The unique design of the various DER concepts includes retaining environmental attributes, like renewable energy credits, for exported generation and offset by PSE's incentive payment to the customer. While behind-the-meter (BTM) generation for customer-generators has

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

historically been considered net-electric-metering (NEM), PSE intends to retain all environmental attributes for any generation not used to meet on-site load that is exported to the grid.

DER solar programs contribute MWh to meet CETA needs. However, energy generated by BTM DER solar programs does not fully contribute to CETA because some of the BTM energy produced is consumed by the load, and the environmental attributes are owned by the host customer. Therefore, this energy would account for the load-reducing portion of the CETA calculation as opposed to the renewable energy generated on the system. To determine the amount of energy from each DER program that contributes to PSE's CETA need, we developed a CETA contribution fraction. This contribution fraction is the percentage of energy forecasted by a distributed solar program that is eligible for PSE to include in our CETA calculation in Figure 2-1. For instance, PSE community solar has a CETA contribution factor of 56 percent. If 1,000 MWh were produced by the community solar program, only 560 MW would contribute to PSE's CETA calculation. It is assumed that the remaining 440 MWh are consumed by the customer who receives the environmental attributes for those MWh. We show the CETA contribution fractions for each distributed solar program in Table 2-16.

Table 2-16: DER Solar CETA Contribution Fraction

DER Solar Program	CETA contribution (Load reducing or CETA eligible)	CETA Contribution Fraction (%)
PSE Community Solar	Load reducing	56%
PSE Community Solar — Income-eligible	Load reducing	56%
Third-party Distributed Solar PPA	CETA-eligible energy	100%
C&I Rooftop Solar Incentive	Load reducing	52%
C&I Rooftop Solar Leasing	CETA-eligible energy	100%
Multi-family Solar Partnership	Load reducing	81%
Multi-family Unit Rooftop Solar Incentive	Load reducing	81%
PSE Customer-sited Solar+Storage Offering (Solar)	Load reducing	81%
Residential Rooftop Solar Leasing	CETA-eligible energy	100%
Residential Rooftop Solar (Income-eligible) Leasing	CETA-eligible energy	100%
Multi-family Community Solar	Load reducing	56%

Although our exact DER program design regarding environmental attribute ownership will depend on the outcome of PSE's Targeted DER RFP, we allocated all exported generation environmental attributes to PSE in our BTM DER program concepts model. PSE intends to retain environmental attributes from exported generation, but this will not impact existing or future net-electric-metering agreements.

3 Highly Impacted Communities and Vulnerable Populations, and Customer Benefit Indicators (CBI)

PSE PUGET SOUND ENERGY

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

Equitable Distribution of Benefits

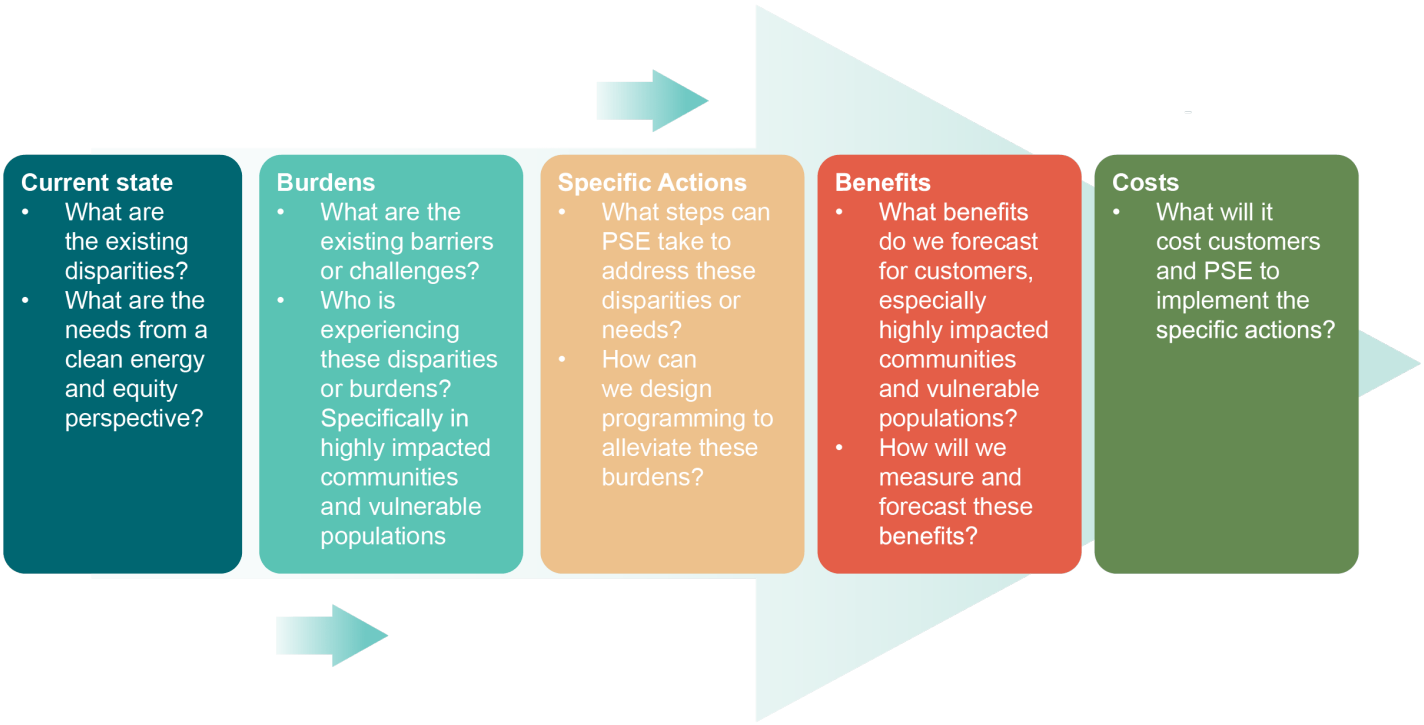
The Clean Energy Transformation Act (CETA) creates an inclusive approach to clean energy. It also requires that all customers benefit from the transition to the 2030 carbon-neutral standard and the 2045 requirement of 100 percent non-emitting and renewable electric resources. Identifying, measuring, and applying customer benefit indicators 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 reduces burdens and benefits all customers, including highly impacted communities and vulnerable populations, which we refer to here collectively as "named communities." CETA's overall goal is to meet the targets at the lowest reasonable cost while maximizing customer benefits.

PSE began this journey in late 2020 when we developed an Economic, Health, and Environmental Benefits (EHEB) Assessment consistent with RCW 19.280.030(1)(k) of energy and non-energy benefits and reductions of burdens to vulnerable populations and highly impacted communities for the 2021 Integrated Resource Plan (IRP). We also assessed long- and short-term public health and environmental benefits, costs and risks, and energy security and risk. This assessment was informed mainly by the Department of Health's February 2021 Cumulative Impact Analysis and stakeholder feedback collected at the November 2020 IRP meeting. We provide more details in the IRP, Chapter Two, and Appendix K. The timing of the CETA rulemaking and the Cumulative Impact Analysis in late 2020, all challenged by the effects of the pandemic, resulted in a compressed timeframe for this work with less stakeholder engagement and dialogue than we originally anticipated[26]. PSE anticipates our next IRP assessment will benefit from more robust dialogue with stakeholders and advisory groups, including the Equity Advisory Group (EAG), and the evolution of our customer benefit indicators.

PSE's initial EHEB Assessment was still an important first step for PSE to meet these important new planning standards and ensure all customers benefit from the transition to clean electricity. To ensure the equitable distribution of energy and non-energy benefits for highly impacted communities and vulnerable populations, PSE envisions the process framework shown in Figure 3-1.

[26] For example, in 2019, the Washington Department of Health envisioned a sub-workgroup for stakeholders to review and provide input on the Cumulative Impact Analysis throughout its development in 2020. Due to the challenges of the ongoing COVID-19 public health crisis in 2020, and Department of Health's important role in that effort, these opportunities for stakeholder engagement during development of the Cumulative Impact Analysis did not occur.

Figure 3-1: Equity Assessment Framework



PSE is working to identify disparities in current PSE programs and in our efforts to serve customers with clean energy resources. We are reviewing our programs to determine the rates of burdens and benefits between the PSE customer base and named communities, and we are researching best practices to address these discrepancies. A burden can be economical and environmental. The following categories were raised as burdens and barriers during conversations with our EAG, Low Income Advisory Committee (LIAC), and community-based organizations:

- Renting as a barrier to participation in programs
- Lack of awareness and education
- Program access and complexity
- Return on investment
- Cost of participation and economic barriers
- Trust and politics
- Other issues, such as siting infrastructure and disruption of rural areas.

In addition, through our “clean electricity values” survey we heard the four most common potential challenges residential customers, business customers, and community customers identified when considering clean electricity transformation were:

- Costs and potential bill increases,
- Potential environmental impact of source material for clean energy technology,
- Dependability of variable clean electricity sources like wind and solar,
- Construction impacts for new electric infrastructure.

PSE takes a deeper dive into the factors and makeup of identifying highly impacted communities and vulnerable populations in the sections that follow. One of the first steps in this process is to analyze the burdens and disparities experienced by highly impacted communities and vulnerable populations. For example, a burden to participating in the energy efficiency rebate programs may be the resources required to purchase energy efficient appliances. Particularly for highly impacted communities, the upfront costs may be a barrier for low-income customers to participate. PSE is also examining the specific actions needed to address the disparities and reduce burdens. For example, PSE may look at different program elements that can assist highly impacted communities and vulnerable populations in participating in the energy efficiency rebate programs, such as incentives or subsidies for customers to purchase more efficient appliances. We identify some of these programs or specific actions in Chapter Four.

We next identified what benefits customers, especially those in highly impacted communities and vulnerable populations, would see because of these specific actions. PSE defines, measures, and tracks the benefits of these actions through the lens of customer benefit indicators. In the case of the energy efficiency (EE) rebate program, an example of these benefits includes increased participation and reduced bills. The EE rebate program would improve the affordability of clean energy. In the future, PSE will quantify customer benefits, especially those for highly impacted communities and vulnerable populations. PSE also looks at the costs of implementing these specific actions as part of this process. In the case of the rebate program again, PSE would review the costs of different program options to create an EE rebate program and deliver the benefits to customers. We will identify the gaps we need to fill with new programs to address the disparities.

To accomplish this work, PSE anticipates a glide path of multiple years because we must work closely with stakeholders, including advisory groups and internal PSE teams. PSE plans to establish touchpoints with stakeholders and the Washington Utilities and Transportation Commission (WUTC) as we continue the process. PSE will continue to explore several aspects of disparities, such as:

- What magnitude of need defines a disparity?
- How should we quantify this magnitude? Customer percentage?
- Who is missing from participation based on a program’s intended audience?
- What are the root factors that create these disparities?

In this chapter of the CEIP, PSE lays out the initial components of our framework. We define highly impacted communities and vulnerable populations and identify baseline data for most customer benefit indicators. PSE proposes a work plan in Chapter Eight to develop and solidify outstanding questions.

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 non-energy benefits and the reduction of burdens. This year, PSE has invested considerable effort to understand and identify customers who may belong to these named communities through customer outreach and collaboration with the Equity Advisory Group (EAG) and demographic analysis of our 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 in the IRP process, which we document in the 2021 IRP Appendix K, Customer Benefits Assessment[27]. Since the publication of the 2021 IRP, PSE has engaged numerous times with the EAG, the Washington State Department of Health, the WUTC, customers, and other internal and external stakeholders. Those efforts provided valuable insight into identifying 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 CEIP, and PSE expects the characterization to evolve as more data, new perspectives, and industry best practices continue to emerge.

Definitions

Named populations include vulnerable populations and highly impacted communities, each with a specific definition derived from the CETA statute and subsequent 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

PSE held a series of meetings with our EAG to develop a more comprehensive understanding of vulnerable populations. The collaboration with the EAG informs and directs PSE’s work to define,

[27] 2021 IRP Appendix K, Economic, Health and Environmental Benefits Assessment of Current Conditions: https://pse-irp.participate.online/2021-irp/reports

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 hospitalization rates. 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 3-1 shows a list of primary factors identified by PSE and their definitions. The EAG expanded the primary list and added factors derived from their collective experience and interactive sessions with PSE. The gray-shaded factors in the table reflect factors for which PSE is either still investigating data resources that will provide metrics to apply to our 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.

Table 3-1: Vulnerable Population Factors and Definitions[28]

Sensitive Populations (SP) Socioeconomic (SE)	Factors	Definition
SP	Disability	Percentage of households reporting a member with disability
SP	Cardiovascular Disease	Rate of death from cardiovascular disease
SP	Low Birth Weight Rates	Rate of low birth weight
SP	Higher Rates of Hospitalization	Rate of hospitalization
SP	Heat Islands	Urban heat island and surface temperature
SP	Arrearage/Disconnections	Percentage of customers in arrearage/disconnected per block group
SE	Access to Digital/Internet Resources	Percentage of low digital engagement customers
SE	Access to Food	Low income and low access food flag
SE	Access to Health Care	Percentage of population with a primary care provider
SE	Educational Attainment Level	Percentage of customers with less than or high school education

[28] Factors shaded in blue are required from CETA and duplicate elements of the criteria used for Highly Impacted Communities.

Sensitive Populations (SP) Socioeconomic (SE)	Factors	Definition
SE	Estimated Energy Burden	Percentage of energy burdened customers
SE	Historical Red Line Influence	Past discriminatory housing lending practices
SP	Home Care	TBD
SE	Housing Burden	Percentage of population paying more than 30% of income for housing
SE	Linguistic Isolation	Percentage of households with limited English proficiency
SP	Mental Health/Illness	Self-reported poor mental health
SE	Poverty	Percentage of households in poverty
SE	Race (People of Color/BIPOC)	Percentage of households identifying as BIPOC
SE	Renter vs. Owner	Estimated percentage of customers renting
SE	Seniors with Fixed Income	Estimated percentage of customers over 65 at 80% or lower AMI
SE	Transportation Expense	Percentage of households with more than a 35-minute commute
SE	Unemployment	Percentage of households experiencing unemployment

PSE will integrate data from several different resources to identify vulnerable communities. We list most of the resources PSE intends to use in Table 3-2, except those we are still investigating. We report the data at varied scales, ranging 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 are 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 measurement.

Table 3-2: 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	Census Block Group
Heat Islands	Tree Equity Score Data Set 2018	Census Block Group
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	National Historic Geographic Information System, University of Michigan	Census Tract and Block Group
Home Care	TBD	
Housing Burden	American Community Survey 2019	Census Block Group
Linguistic Isolation	American Community Survey 2019	Census Block Group
Mental Health/Illness	Tree Equity Resource Data Set 2018	Census Block Group
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[29], 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. 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 flagged these metrics with 0 or 1, where 0 indicates an absence of the condition and one indicates the condition is present.

After we rescaled the factors from 1–5, we ran analyses to determine if there were discernable patterns in the data that would provide contrast in dimensions of vulnerability. PSE first ran a k-means cluster analysis algorithm varying the number of clusters between 1 and 100. Through these iterations, no pattern emerged, creating clean breaks between the groupings. Following the k-means analysis, PSE summed the overall score for each block group and divided the results into terciles labeled high, medium, and low. Please see Figure 3-2 for the mapping of these terciles. Next, PSE considered the mean score for each factor within each tercile and identified the range of the means across the three terciles. This analysis illuminated the most significant changes from low to high terciles, and they were associated with multiple vulnerability factors. Table 3-3 lists selected factors in descending order of mean range across tercile. Energy burden emerged among the highest factors and may be a helpful lead indicator to engage multiple dimensions of vulnerability in PSE's Service Area. Because PSE can estimate energy burden for residential customers, using this as a lead metric may help address some of the concerns of block group level metrics obscuring individual instances of vulnerability.

Table 3-3: Range of Mean Across Terciles

Factor	Range of Mean across Terciles
Death from Cardiovascular Disease	3.3
Educational Attainment	2.2
Low Birth Weight	2.1
Poverty	1.9
Energy Burden	1.9
Percentage of Renters	1.9
Mental Health	1.9

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

Hispanic	1.8
Race Black	1.6
No Health Insurance	1.6
No Internet	1.5
Heat Island	1.4
Disability	1.4
Multiple Room Occupants	1.2
Unemployment	0.9
Renter Housing Burden	0.9
Low-income Senior	0.9
Higher Rate Hospitalization	0.8
In arrears	0.8
Larger Household Size	0.7
Limited English	0.6
Owner Housing Burden	0.6
Food Desert	0.2
Long Commute	-0.1
Race White	-1.2
Housing Owner Percent	-1.8

We also considered the proportion or count of vulnerable populations within PSE's service area compared to statewide populations, shown in Table 3-4.

Table 3-4: Vulnerable populations in PSE's Service Area vs. the State of Washington

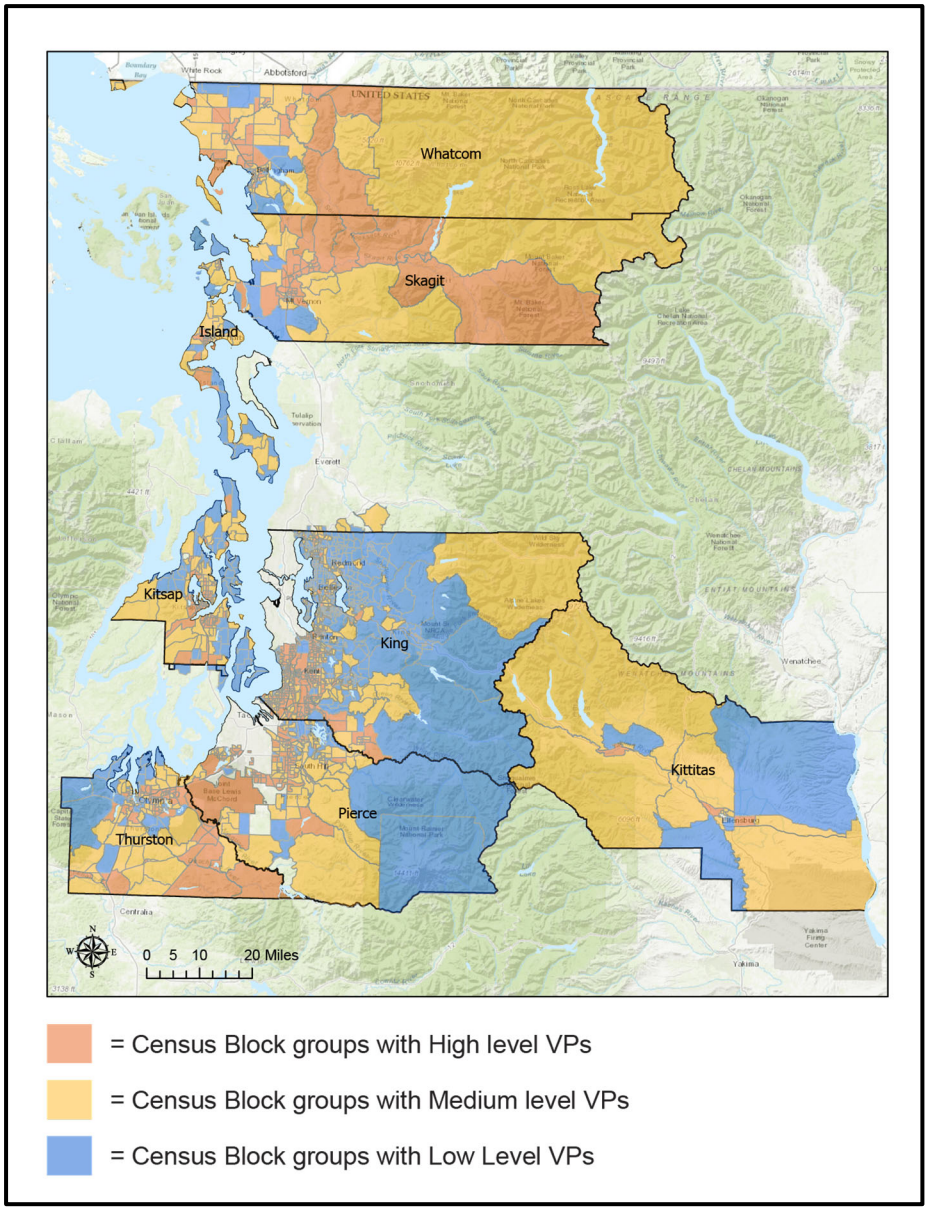
Vulnerable Population	PSE Service Area Proportions	Washington Statewide Proportions
Cardiovascular Disease	20% of Census Tracts have 9 or 10	20%
Low Birth Weight	8% of Census Tracts have 9 or 10 (42 tracts)	7%
Housing Burden	Owner 25% Renter 41%	Owner 24% Renter 45%
Linguistic Isolation	3.5%	4%
Poverty	9%	11%
Transportation Expense (35 minute or more commute)	31%	28%
Unemployment	5%	5%
Disability	12%	13%
Higher rates of Hospitalization	39	35
Heat Islands	93.7	106.9
Home Care	N/A	N/A
Mental Health/Illness	12.2	12.7
Arrearage/Disconnections	Forthcoming	N/A
No access to Digital/Internet Resources	7%	9%
Access to Food	26%	29%
Access to Health Care No Health Insurance	6%	6%
Educational Attainment Level	28	31
Estimated Energy Burden	10.8% (by PSE metric) 2.3% average energy burden	15.1% per PacCorp WA Commerce Utility Energy Program Assistance Survey Tool reference 2% average energy burden
Historical Red Line Influence	N/A	N/A
Race (People of Color/Black, Indigenous, and People of Color)	26%	22%
Renter vs. Owner	Forthcoming	37

Seniors with fixed income	6.9% ACS (13% by 80% AMI)	7.5
Multiple Occupants per Room	5.3%	6.3%
Household Size	2.5	2.6

PSE will locate higher concentrations of vulnerable populations for those census block groups with a 4 or 5 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 3-3, it appears most census blocks within PSE's electric service area have lower levels of vulnerability. For these census block groups identified with a 1 or a 2, there may be other indicators available at the individual customer level, such as energy burden, that are an indicator to identify customers who may also be experiencing stressors from additional vulnerability factors.

Figure 3-2 is a map of vulnerable populations by census block groups within PSE's Electric Service Area. The map illuminates the areas where high, medium, and low levels of vulnerability are experienced by customers within PSE's service area. As discussed, this geographic representation gives PSE an indication of where we should focus efforts for outreach or program implementation.

Figure 3-2: Vulnerable Populations by Census Block Groups within PSE Electric Service Area



Highly Impacted Communities

Highly impacted communities 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)[30] map of 9 or 10, or any census tract with tribal lands.[31] Of the 164 highly impacted communities census tracks within PSE service territory, 72 are on tribal lands, ~44 percent. The EHD map ranks communities based on the risks they face, from environmental burdens and vulnerabilities to the impacts of climate change. Figure 3-3 shows the criteria we used to determine these risks. We

[30] https://fortress.wa.gov/doh/wtn/WTNIBL

[31] https://www.doh.wa.gov/DataandStatisticalReports/WashingtonTrackingNetworkWTN/ClimateProjections/CleanEnergyTransformationAct

calculated the risks using the criteria shown, which creates a final composite score for each census tract. We identify census tracts with a score of 9 or 10 as highly impacted.

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

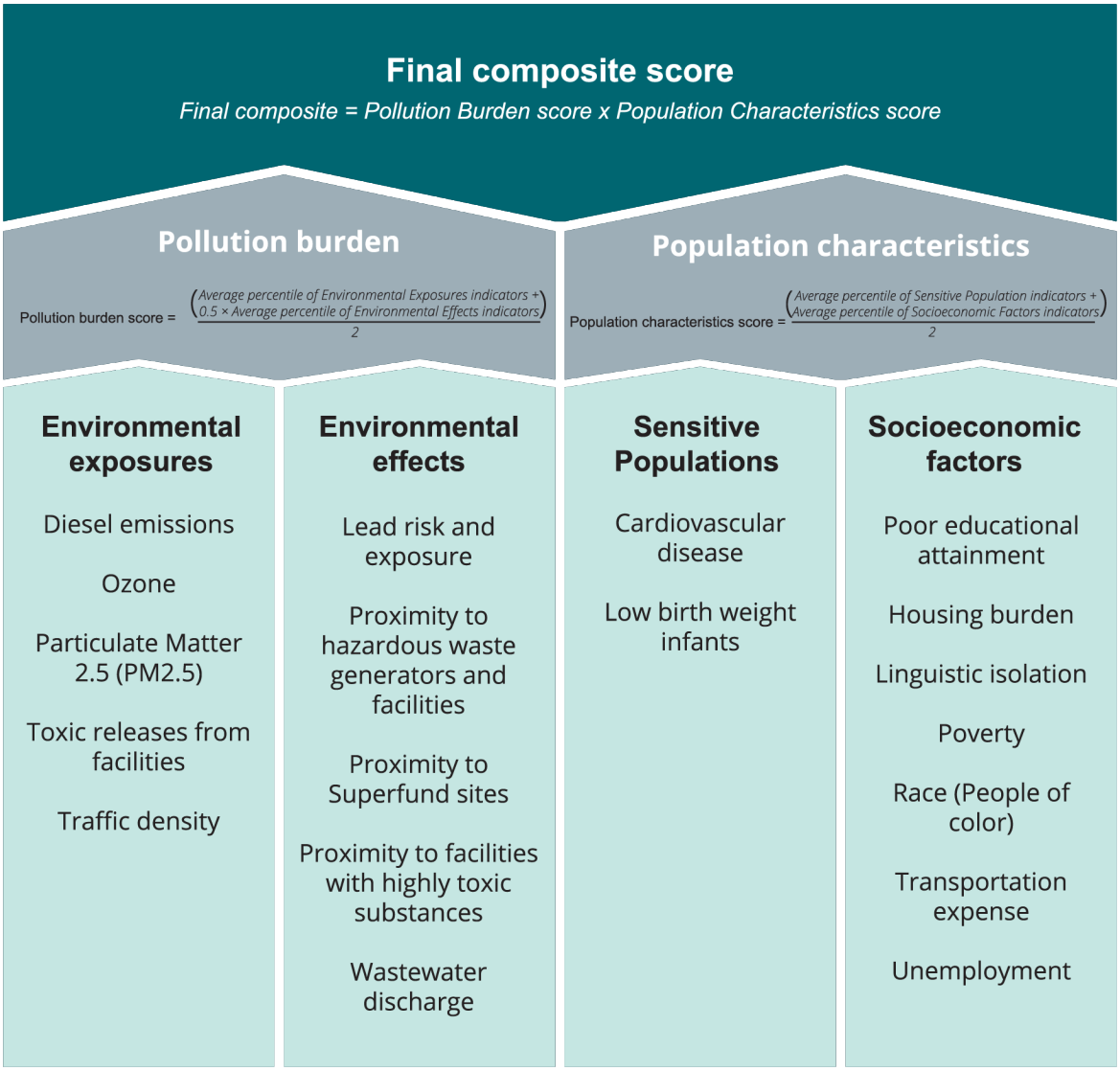
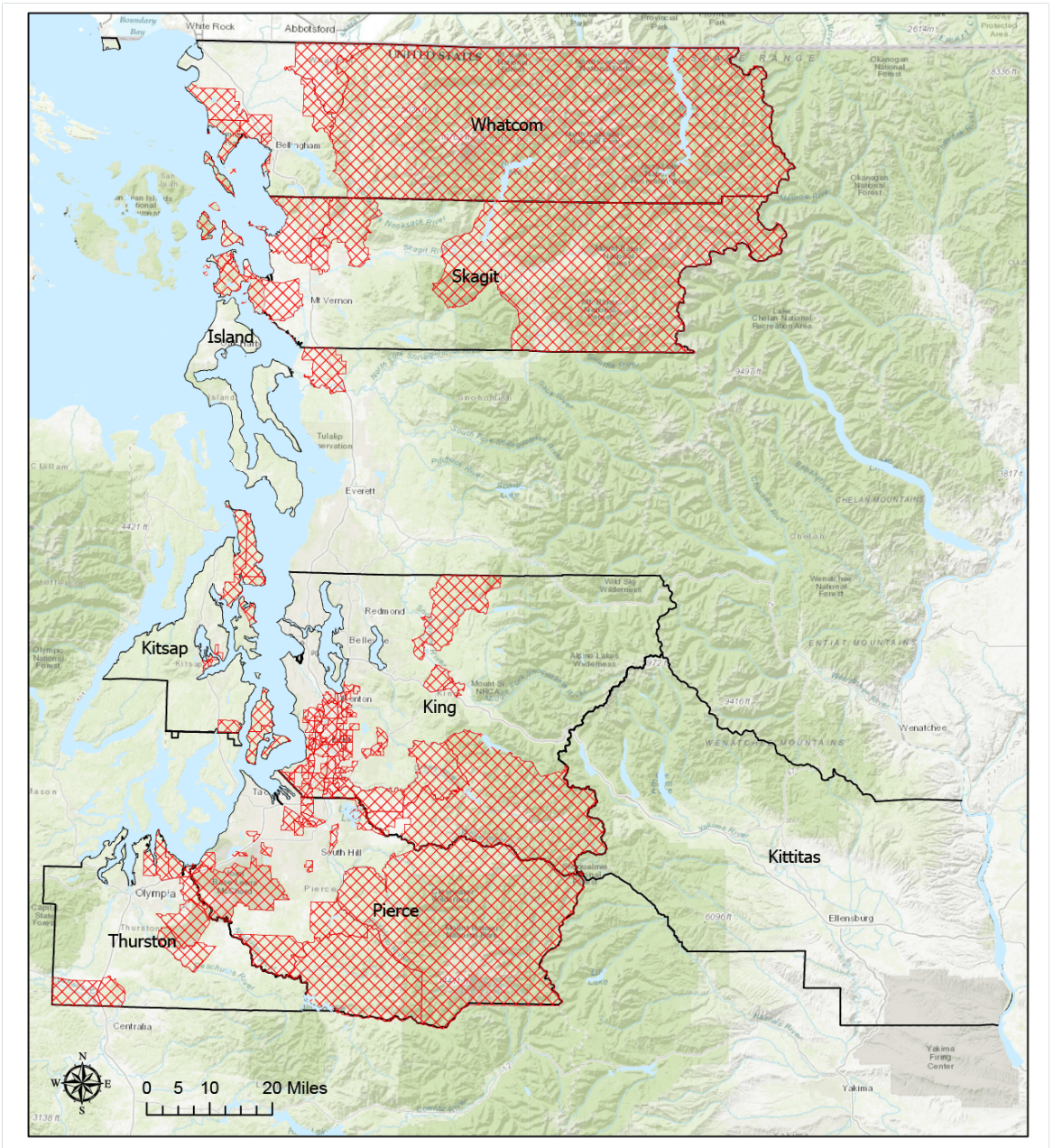


Figure credit: University of Washington Department of Environmental & Occupational Health Sciences. Washington.

We used the EHD map to locate highly impacted communities within PSE's service area. Figure 3-4 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 Washington Department of Health of this inconsistency, and we await further refinement of the CIA by the Washington Department of Health.

Figure 3-4: Highly Impacted Communities Census Tracts in PSE Electric Service Area



Highly impacted communities and vulnerable populations encompass various factors to define a specific community. Some PSE customers may overlap categories and fall into either group. Figure 3-5 shows the overlap between highly impacted communities and the vulnerable populations within PSE's service areas. Table 3-5 counts the approximate number of PSE customers who fall within each group described in this section. We will use these numbers to help us determine existing disparities and burdens experienced by PSE customers.

Figure 3-5: Combined Vulnerable Populations and Highly Impacted Communities in PSE Electric Service Area

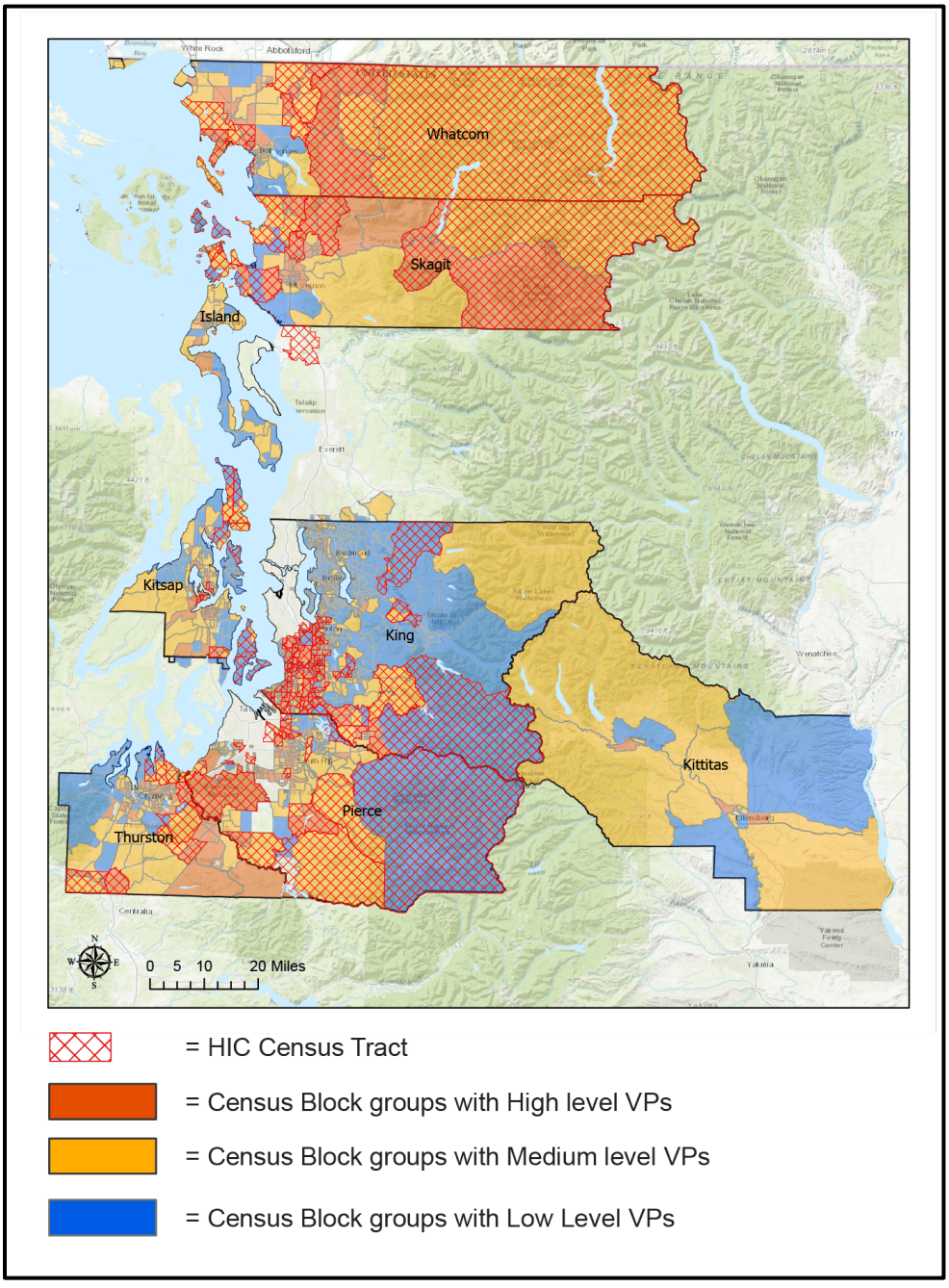


Table 3-5: Number and Percentage of PSE Customers in Highly Impacted Communities and Vulnerable Populations

Customer count (PSE's electric customers)	Customers in highly impacted communities	Customers in vulnerable populations Low	Customers in vulnerable populations in Medium	Customers in vulnerable populations High
1,147,383	310,991 (27%)	333,869 (29%)	387,228 (34%)	426,286 (37%)

Figure 3-6: Percentage of PSE Customers in Highly Impacted Communities

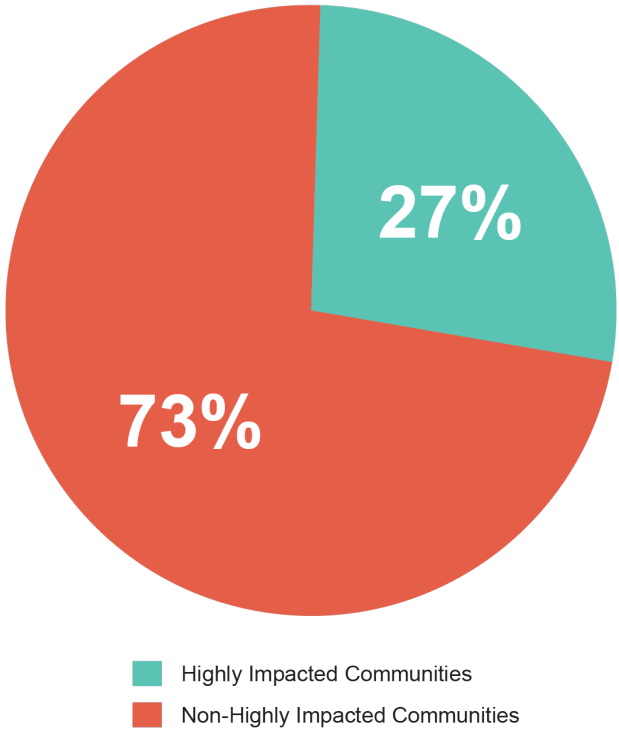
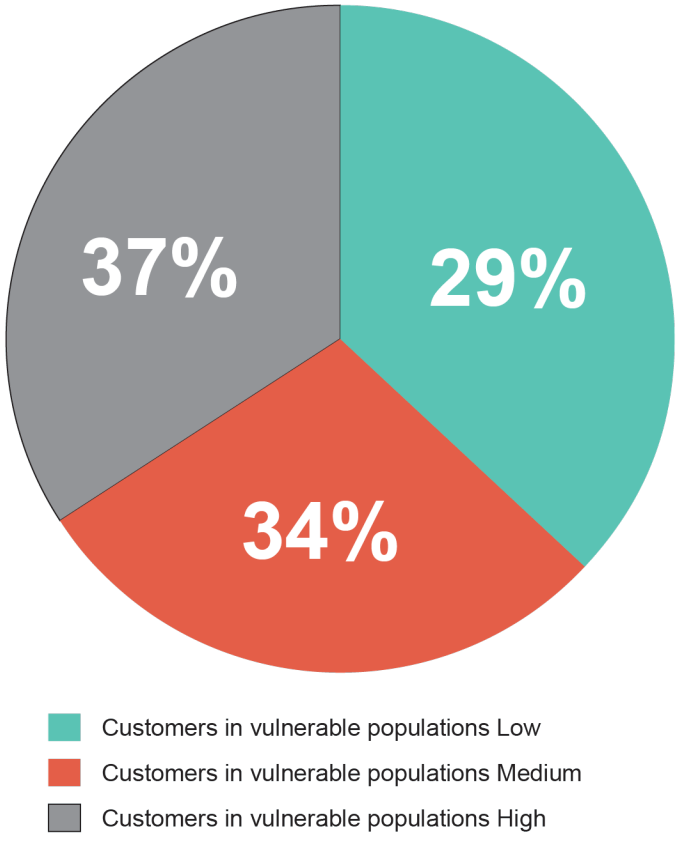


Figure 3-7: Percentage of PSE Customers in Vulnerable Populations



How the Clean Energy Transformation Will Improve Lives in 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 in addressing these disparities over time,
- Considering highly impacted communities and vulnerable populations as part of the resource acquisition process,
- Including them as a criterion when developing and implementing customer programs, and
- Providing guidance on targeted customer education and awareness.

Equitable Clean Energy Future

With CETA's intent to ensure the equitable distribution of benefits, identifying named communities upfront allows PSE to track and report on our progress toward a more equitable future. First, we 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[32], to show the difference between various attributes and identify areas where highly impacted communities and vulnerable populations experience 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 filing our 2023 biennial CEIP update, PSE will identify and use metrics to evaluate the benefits accruing to 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 and other advisory groups for continued dialogue on progress within these named communities. One example of this tracking is analyzing the participation rates of PSE customers within a designated highly impacted community. PSE could track the number of participants over time and compare that participation rate to the broader PSE territory. This information would help identify any gaps in program participation and guide PSE to target the program in a particular area. For additional information, see Chapter Seven, Tracking and Reporting; Appendix H, Customer Benefit Indicator Metrics; and future IRP — Economic, Health, and Environmental Benefits Assessments.

These named community designations also assist PSE in creating and implementing customer programs.

[32] 2021 IRP Appendix K, Economic, Health and Environmental Benefits Assessment of Current Conditions: https://pse-irp.participate.online/2021-irp/reports

- Awareness of vulnerable population factors can help shape and design customer programs, based on the factors identified. PSE will create programs that provide opportunities for vulnerable populations. PSE will work with 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.
- Identifying highly impacted communities helps PSE determine the location of potential customer programs. Because these are geographic factors, PSE may target specific areas of highly impacted communities for program implementation. This highly impacted community mapping will allow PSE to work directly with customers in the identified area to begin designing and implementing programs. For additional information, please see Chapter Four, Specific Actions.

Communication

PSE heard with a resounding voice from Equity Advisory Group, Low Income Advisory Committee, community-based organizations representing named communities, and the Spanish multilingual session about the lack of awareness in highly impacted communities and vulnerable populations of PSE programs and how to participate in them. To address this barrier, PSE needs to increase and target our marketing, outreach education, and awareness efforts in highly impacted communities and vulnerable populations. Adopting a data-driven approach to target our efforts and identify audiences will be important steps in addressing this barrier. To begin our targeted communication effort, designating specific communities helps identify how messages should be created and delivered. By knowing the factors for vulnerable populations, PSE can adjust and update our communication efforts, especially for vulnerable populations who may not be aware of the programs we offer.

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 resources. For example, PSE may use the factor of linguistic isolation to revamp our communication strategy to cater to customers who may not speak English. PSE could work with community-based organizations to develop material for customers in the language they speak at home and develop workshops and open houses in non-English languages. This multilingual initiative will take more resources to deliver and time to measure results because it is intensive and will require unique skills and new ways of engaging.

Customer Benefit Indicators

The 2021 Clean Energy Implementation Plan (CEIP) includes customer benefit indicators, which are the benefits customers want to see as PSE makes this clean energy transition. These indicators are a

crucial part of resource and program evaluation and the selection of future investments. These indicators were developed through the public participation process and reflect the themes PSE heard from customers and stakeholders. PSE explains the following for each indicator:

- The metrics used to measure these benefits,
- A baseline of the current state of these benefits, if available,
- Who receives these benefits,
- How we applied these indicators in this CEIP, and
- How we may use these indicators in the future.

We show these indicators in Table 3-6 and the corresponding CETA category and metric.

Establish Baseline for Each Customer Benefit Indicator Metric

The purpose of setting a baseline is to provide a snapshot of how each indicator stands as it relates to PSE's existing programs or resources. We first looked internally to uncover what information was available to us today. Then we looked at any gaps in data to decide what additional data we would need. Finally, we determined a path to receiving the correct data to measure and display these benefits.

To track and measure the impact of programs on customer benefits, PSE will define specific metrics for each customer benefit indicator. Table 3-6 and Appendix H define these metrics. The table illustrates each customer benefit indicator, the associated metrics, and whether PSE could develop baseline data using data sources readily available. We will explain the data sources in more detail later in this chapter. PSE continues to work to refine our data tracking and sources to provide the most accurate tracking possible.

Table 3-6: Customer Benefit Indicators and Metrics

CETA Category	Indicator	Metric	Baseline data (2020)	Expected Burdens Reduced
Energy Benefits Non-energy Benefits Burden Reduction	Improved participation in clean energy programs from highly impacted communities and vulnerable populations	Increase number and percentage of participation in energy efficiency, demand response, and distributed resource programs or services by PSE customers within highly impacted communities and vulnerable populations	Yes, PSE internal data in which PSE measures the number of programs related to all customers, and PSE customers within named communities. Please see Appendix H.	Lack of awareness and education Cost of participation and economic barriers Costs and potential bill increases

CETA Category	Indicator	Metric	Baseline data (2020)	Expected Burdens Reduced
		Increase percentage of electricity generated by distributed renewable energy projects		
Non-energy Benefits	Increase in quality and quantity of clean energy jobs	Increase quantity of jobs based on: • Number of jobs created by PSE programs for residents of highly impacted and vulnerable populations • Number of local workers in jobs for programs • Number of part-time and full-time jobs by project Increase quality of jobs based on: • Range of wages paid to workers • Additional benefits offered • Demographics of workers	Unavailable currently. This information will be available in the future as PSE contracts with vendors and collects this information.	Access to high quality jobs in clean energy
Non-energy Benefits	Improved home comfort	Increased dollar in net present value (NPV) in NEI benefits for EE programs.	Yes, internal PSE data that is calculated as non-energy impacts within the BCP process; please see Appendix H	Lack of awareness and education Cost of participation and economic barriers
Reduction of burdens	Increase in culturally- and linguistically-	Increase outreach material available in non-English languages	Yes, we will have internal PSE data that quantifies the number	Lack of awareness and education

CETA Category	Indicator	Metric	Baseline data (2020)	Expected Burdens Reduced
	accessible program communications for named communities		of non-English language materials used by PSE in 2022	
Cost Reduction Burden Reduction	Improved affordability of clean energy	Reduce median electric bill as a percentage of income for residential customers Reduce median electric bill as a percentage of income for residential customers who are also energy-burdened	Yes, PSE internal data in which PSE measures the affordability of clean energy related to all customers, and PSE customers within named communities. PSE may also use the Department of Energy's Lead tool can be found here: https://www.energy.gov/eere/slsc/maps/lead-tool. Please see Appendix H.	Cost of participation and economic barriers
Environment	Reduced greenhouse gas emissions	Reduce PSE-owned electric operations metric tons of annual CO_{2e} emissions Reduce PSE contracted electric supply metric tons of annual CO_{2e} emissions	Yes, PSE shares publicly available data on its CO_{2e} emissions at https://www.pse.com/pages/greenhouse-gas-policy	Adverse climate impacts of CO_{2e} emissions
Environment Risk Reduction	Reduction of climate change impacts	Increase in avoided emissions times the social cost of carbon	Yes, publicly available data on the social cost of carbon as defined by the WUTC is available at https://www.utc.wa.gov/regulated-industries/utilities/energy/conservation-and-renewable-energy-overview/clean-energy-transformation-act/social-cost-	Adverse climate impacts of CO_{2e} emissions

CETA Category	Indicator	Metric	Baseline data (2020)	Expected Burdens Reduced
			carbon, and data on PSE's emissions is available at https://www.pse.com/pages/greenhouse-gas-policy	
Public Health	Improved outdoor air quality	Reduce regulated pollutant emissions (SO2, NOx, PM2.5)	Yes, internal PSE data on emissions.	Adverse health impacts from air pollution
Public Health	Improved community health	Reduce the occurrence of health factors like hospital admittance, and work loss days	Yes, based on Washington Department of Health hospital discharge rates, available here: Hospital Discharge Data (CHARS): Washington State Department of Health	Adverse health impacts from air pollution
Resilience	Decrease frequency and duration of outages	Decrease number of outages, total hours of outages, and total backup load served during outages using System Average Interruption Duration Index (SAIDI) and System Average Interruption Frequency Index (SAIFI) Reduction in peak demand through demand response programs	Yes, internal data on named communities and publicly available data regarding PSE's current SAIDI and SAIFI metrics are available at: https://www.utc.wa.gov/regulated-industries/utilities/energy/infrastructure-and-energy-planning/annual-reliability-reports-electric-companies Internal PSE data provided the analysis on named communities.	Dependability of variable clean electricity sources like wind and solar
Risk Reduction Energy Security	Improved access to reliable, clean energy	Increase number of customers who have access to emergency power	Yes, PSE internal data in which PSE measures the number of customers with storage related to all customers and PSE customers within	Lack of awareness and education Cost of participation and economic barriers

CETA Category	Indicator	Metric	Baseline data (2020)	Expected Burdens Reduced
			named communities. Please note PSE shows a count of zero as there is no current PSE program specific to net metering and battery storage.	Dependability of variable clean electricity sources like wind and solar

PSE intends to use these metrics to define the baseline data and forecast future impacts. PSE will use these metrics to describe the current snapshot for each metric related to existing PSE programs for the baseline. To forecast benefits in the future and address disparities, PSE will use the same data to project and measure the impact of future resource decisions on customers, especially highly impacted communities and vulnerable populations. Table 3-7 shows an example of this effort.

Table 3-7: Sample of Metric with Baseline Data and Future Forecast

Indicator	Metric	Baseline data (2020)	Forecasted data
Improved participation from named communities	Number of participants for energy efficiency and DER programs from highly impacted communities and vulnerable populations	**Energy Efficiency**: 2,000 participants from all customers 5% from highly impacted communities 3% from vulnerable populations **DER program**: none exists	**Energy Efficiency**: 3,000 participants 20% from highly impacted communities 20% from vulnerable populations **DER Rooftop Solar program**: 800 participants 7% from highly impacted communities 7% from vulnerable populations

Table 3-7 illustrates a sample indicator, related metric, the current baseline data, and a future forecast. In this example, to assess improved participation in energy efficiency and DER programs from highly impacted communities and vulnerable populations, PSE first looks at the existing participation by PSE customers in energy efficiency programs, 2,000. In the future, PSE will forecast the number of participants for each program and include the percentage of participants from highly impacted communities and vulnerable populations. We will use that future forecast in the 2023 biennial CEIP

update and beyond. In this example, we determined the forecast based on the size of the program. We would consider existing participation and the potential for vulnerable populations to participate.

This breakdown shows the comparison between all PSE residential customers and customers identified as highly impacted or vulnerable populations and illustrates the distribution of benefits. By showing the participation related to the overall customer mix, we gain insight into the mix of participants and where highly impacted communities and vulnerable populations may not receive benefits. Each indicator addresses how the equitable distribution of benefits will be reflected.

To define which customers fall into the vulnerable population category, PSE evaluated several metrics discussed in Appendix H. These customers were then grouped into three categories: low, medium, and highly vulnerable population, depending on the intensity of the factors that led to their vulnerable population status. We gave every PSE electric service area block group a low, medium, or high classification.

The next section discusses the baseline data for each customer benefit indicator and any applicable value. Some metrics and data sources are new and require PSE to develop new ways to track and measure them. As we begin to collect data for these new metrics, we may learn the metric will not achieve our desired outcome. Although the process may change, we describe the steps it will take to gather this information and how we will use these metrics to forecast impact. We will update these forecasts in the 2023 biennial CEIP update and improve on them in future CEIP cycles.

CETA category: Energy benefits, Non-energy benefits, and Burden Reduction

Customer Benefit Indicator: Improved participation in clean energy programs from highly impacted communities and vulnerable populations

This indicator looks at the participation of PSE residential customers, customers in highly impacted communities, and customers considered vulnerable populations in PSE's existing programs. This indicator intends to measure improved participation by:

- Tracking the inclusion of residential customers in the projects and programs PSE launches in this clean energy transition.
- Tracking the number of distributed and community renewable programs for all PSE customers and those in named communities.
- Tracking the impact of electricity generated by distributed renewable energy projects for all PSE customers and those in named communities.

PSE recognizes the burdens our customers currently face to access distributed resources, especially customers in highly impacted communities and vulnerable populations. These burdens to participation could be lack of awareness, the complexity of programs, or lack of resources to participate. This indicator illuminates the energy benefits customers receive based on the opportunities available and the increase of enrollees in these clean resource programs. Measuring and tracking participation gives PSE an understanding of who participates in which programs. This monitoring will also allow PSE to measure the equitable distribution of benefits. Table 3-8 shows the percentage of participants in energy efficiency and distributed resources programs from all PSE customers, highly impacted communities, and vulnerable populations. We show the breakdown of participation based on 2020 program enrollment in energy efficiency and distributed resources to establish the baseline data.

Table 3-8: Improved Participation, Baseline Data for 2020

Metric	Energy Efficiency[33]	Demand Response	Distributed Resources
Percentage of participation in energy efficiency, demand response and distributed resource programs or services by PSE customers within highly impacted communities and vulnerable populations	All programs	Future use	Hydro, Wind, Solar, and Solar and Batteries[34]
All PSE customers		Future use	10,792
Percentage of participation by Highly Impacted Communities	24%	Future use	1.1%
Percentage of participation by low vulnerable populations	41%	Future use	1.6%
Percentage of participation by medium vulnerable populations	29%	Future use	1.2%
Percentage of participation by high vulnerable populations	30%	Future use	0.6%

Table 3-9: Percentage of Electricity Generated by Distributed Renewable Energy Projects for Distributed Resources

Metric (nameplate capacity)	Distributed Resources[35]
Percentage of electricity generated by distributed renewable energy projects	
All PSE customers	Future use
Percentage of participation by Highly Impacted Communities	Future use

[33] To calculate this column, PSE took the Total Measure Count for that population and divided it by Total Savings kWh. Within EE, different measures have great variance. For example, the value to a customer between EE lighting and EE heat pumps would be very different.

[34] Customers with BTM batteries and no solar are not required to report that information to PSE.

[35] Green Power Grants are awarded to organizations supporting highly impacted communities and vulnerable populations. Since 2018 PSE has awarded grants to 20 organizations serving our low-income and BIPOC communities. The amount awarded during that time totals $2,436,795 and the installed capacity is 1,138 MW. Green Direct is a commercial program; the participants are governmental and commercial customers. This includes 41 customers that have fully subscribed two projects totaling 287 MW.

Metric (nameplate capacity)	Distributed Resources[35]
Percentage of participation by Low Vulnerable Populations	Future use
Percentage of participation by Medium Vulnerable Populations	Future use
Percentage of participation by High Vulnerable Populations	Future use

Reporting on this metric will depend on the technology available at the time. For example, PSE will forecast the number of customers for a specific distributed solar program and include a percentage of participating customers within highly impacted communities or vulnerable populations. This information will be based on program design and size.

To collect data on future demand response programs, PSE will establish systems to track and monitor participation for all residential customers, including highly impacted communities and vulnerable populations. In the future, PSE will forecast the number of customers who can participate in each program, with a breakdown for highly impacted communities and vulnerable populations.

CETA Category: Non-energy Benefits

Customer Benefit Indicator: Increase in quality and quantity of clean energy jobs

This indicator looks at the quantity and quality of jobs created through PSE programs for all PSE residential customers, customers in highly impacted communities and customers considered vulnerable populations. The intent of this indicator is to capture the jobs created from PSE's efforts to increase the amount of clean resources in our electric resource portfolio.

An existing burden or barrier for highly impacted communities or vulnerable populations may be unemployment, the lack of quality jobs for residents that are safe and reliable, and a lack of disposable income for improving their lives. Increasing the number of clean energy jobs and the quality of these jobs provides an opportunity for highly impacted communities and vulnerable populations to access quality jobs and a pathway to participate in the economic benefits of a clean energy future. Specifically focusing on highly impacted communities and vulnerable populations gives insight to the quantity of clean energy jobs for these customers and shows how these benefits are distributed to residents in the PSE service area. PSE does not currently have access to information related to jobs connected to upcoming PSE programs to develop baseline data, but we plan to gather it in the future. PSE also does not have the jobs created data in the previous year for existing programs. Table 3-10 gives an overview of the general categories of metrics PSE anticipates collecting for each resource pertaining to the quantity of clean energy jobs.

To track the quantity of clean energy jobs, PSE anticipates tracking metrics in three main areas:

(1) The number of jobs created in named communities.

(2) The number of local workers in jobs for projects (this could include some preference for workers residing in the area where the project is being constructed).

(3) The number of part-time and full-time jobs by project (this could include tracking temporary, seasonal, and/or permanent jobs).

Table 3-10: Increase in Quantity of Clean Energy Jobs, Baseline Data for 2020

Metric (Nameplate capacity)	Energy Efficiency	Demand Response	Utility Scale Resources	Distributed Resources
Quantity of clean energy jobs created by PSE programs based on:				
Number of jobs created for residents of highly impacted communities and vulnerable populations	Future use	Future use	Future use	Future use
Number of Local workers in jobs for programs	Future use	Future use	Future use	Future use
Number of part-time and full-time jobs by project	Future use	Future use	Future use	Future use

Table 3-11 provides an overview of the general categories of metrics PSE anticipates collecting for each resource pertaining to the quality of clean energy jobs.

To track the quality of clean energy jobs, PSE anticipates tracking metrics in three main areas:

(1) The demographic of workers; (this could include metrics tracking employment diversity programs or contracts with women, minority, or veteran-owned businesses)

(2) The range of wages paid to workers; (this could include metrics tracking of documented pay of prevailing wage rates determined by local collective bargaining as determined by the Washington State Department of Labor and Industries)

(3) Additional benefits offered; (this could include metrics tracking apprentice utilization, use of project labor and/or community workforce agreements, or other employment benefits).

We will develop more specific metrics related to the quantity and quality of clean energy jobs for the 2023 biennial CEIP update and associated data will be provided, as available.

Table 3-11: Increase in Quality of Clean Energy Jobs, Baseline Data for 2020

Metric	Energy Efficiency	Demand Response	Utility Scale Resources	Distributed Resources
Quality of clean energy jobs created by PSE programs based on:				
Demographics of workers	Future use	Future use	Future use	Future use
Range of wages	Future use	Future use	Future use	Future use
Additional benefits offered	Future use	Future use	Future use	Future use

In the future, PSE will forecast the quantity of clean energy jobs projected for each program and the amount attributed to highly impacted communities and vulnerable populations. Although there are multiple studies on the impact of clean jobs on employment, we will need to develop metrics that are PSE-specific first, and then begin collecting this information from our vendors going forward. PSE will also propose specific metrics for each project related to the quality of clean energy jobs consistent with the general categories of metrics as defined. We will coordinate with the programs' developers and contractors to collect this information. PSE will request this type of information in our contracts with vendors. PSE also received feedback on job training related to clean energy jobs and will continue to evaluate possible job training metrics to use in the future.

CETA Category: Non-energy Benefits

Customer Benefit Indicator: Improved home comfort

This indicator looks at the benefits to PSE customers in highly impacted communities and customers considered vulnerable populations in PSE's existing Energy Efficiency programs. The benefit for this metric represents the estimated lifetime value of the non-energy impacts associated with measures deployed by EE programs, calculated in Net Present Value for each of the following:[36]

- Air quality
- Lighting quality
- Thermal comfort
- Health and safety
- Noise

[36] This represents the monetized lifetime value.

The intent of this indicator is to reflect home comfort in terms of benefit to the customer over and above energy savings. We developed this metric through the energy efficiency BCP process, please see Appendix H for additional information. The metric encompasses the five elements listed above, summed for each energy efficiency program. Some PSE customers, especially those who are in highly impacted communities and vulnerable populations, may experience poor air quality in their homes, which impacts their health, and the inability to maintain a comfortable temperature in their homes. These burdens may be mitigated by an increase in energy efficiency programs that incorporate cost savings related to home comfort.

This metric measures the estimated lifetime value of the non-energy impacts associated with measures deployed by EE programs, calculated in Net Present Value, by providing an increase in benefits for customers including reduced noise, improved lighting quality, and improved indoor air quality. By tracking this metric for all customers and comparing to highly impacted and vulnerable populations, PSE can illustrate the distribution of these home comfort benefits across all customers. For the baseline data, PSE shows the breakdown of energy savings for customers, based on 2020 program enrollment for energy efficiency in Table 3-12.

Table 3-12: Improved Home Comfort, Baseline Data for 2020

Metric	Electric Service Area ($)	HICs ($)	VPs Low ($)	VPs Medium ($)	VPs High ($)
NPV for All NEIs by Number of Measures installed	1,383,776.36	453,101.17	273,761.69	335,302.49	597,212.16
Avoided illness from pollution – Societal – C&I	850.58	259.08	250.01	206.60	390.91
Thermal Comfort – Participant – C&I	32.23	11.29	3.08	13.29	15.87
Avoided illness from pollution – Societal – Residential	1,368.54	266.10	188.84	252.80	332.37
Health and safety – Participant – Residential	696,906.62	275,339.52	128,930.61	201,448.97	359,805.07
Lighting Quality and Lifetime – Participant – Residential	7,013.82	531.19	842.44	712.33	577.27
Noise – Participant – Residential	231,099.14	69,007.88	44,175.15	40,414.99	87,894.87
Thermal Comfort – Participant – Residential	446,505.43	107,686.11	99,371.57	92,253.51	148,195.80

In the future, PSE will forecast the amount of benefit for customers participating in energy efficiency programs. This information will be based on non-energy impacts (NEIs) and the Biennial Conservation Plan. Because the nature of this metric is tied to energy efficiency programming, this metric will not be tracked for other PSE programs.

CETA category: Reduction of burdens

Customer Benefit Indicator: Increase in culturally- and linguistically-accessible program communications for named communities

The purpose of this indicator is to track and monitor the number of resources PSE creates and distributes in non-English languages and culturally-specific audiences. For some PSE customers, a barrier to participation or awareness of programs is language and cultural relevance. By expanding materials and webpages developed in more languages, PSE can reach more customers, especially those who have historically been underrepresented in clean electricity participation. The benefit customers should see is increased awareness and knowledge of programs, which could lead to participation in clean energy resources that may make their homes more efficient or reduce their bills. Where available, PSE will measure the number of "impressions" for communication materials. This may be the number of materials distributed to customers, or analytics of digital materials such as webpages, emails, and social media tools.

For the baseline data, PSE is currently performing an audit of its program informational and promotional materials and availability of non-English languages for its energy efficiency programs, expected to be completed by February 28, 2022. PSE plans to collect information based on existing energy efficiency programs to compare the number and type of materials in non-English versus English languages, and update in Table 3-13.

Table 3-13: Increase Accessible Program Communications, Baseline Data for 2020

Metric	Energy Efficiency	Demand Response	Distributed Resources
Outreach material available in non-English languages	Available by Feb. 28, 2022	Future use	Future use
Outreach material available in English language	Available by Feb. 28, 2022	Future use	Future use
Outreach material impressions in non-English languages	Available by Feb. 28, 2022	Future use	Future use
Outreach material impressions in English language	Available by Feb. 28, 2022	Future use	Future use

In the future, PSE will further develop the approach for culturally- and linguistically- accessible materials that align with program audience and improved customer-focused journey for PSE's named

communities, such as customer interest in programs and material needs. PSE will initially focus on a few programs to pilot, so lessons may be applied more broadly. Long-term, PSE anticipates forecasting the number of languages that could be translated for the various programs and provide an estimate of the reach based on PSE's named communities. PSE will specifically identify the languages that would be used.

CETA Category: Cost Reduction, Burden Reduction

Customer Benefit Indicator: Improved affordability of clean energy

The purpose of this metric is to track and monitor how much of a customer's income is attributed to the electricity portion of their energy bills. This metric will utilize the data from PSE's 2020 Energy Burden Analysis and will be analyzed for the following populations: PSE residential customers in the study,[37] residential customers in highly impacted communities, and residential customers considered vulnerable populations.

For the baseline data, Table 3-14 shows the median electric bill as a percentage of customers' income for all residential customers in the energy burden study versus residential customers that are identified as energy-burdened[38] in the study. In addition, the table shows these metrics for residential customers who reside in highly impacted communities and for residential customers considered vulnerable populations.

Table 3-14: Reduced Cost Impacts, Baseline Data for 2020

Metric	All of PSE's Electric residential customers [39]	Highly impacted communities	Vulnerable populations Low	Vulnerable populations Medium	Vulnerable populations High
Median electric bill as a percentage of income for residential customers	1.4%	1.7%	1.0%	1.3%	1.8%

[37] The PSE electric residential customers here are from the study population of PSE's 2020 Energy Burden Analysis, which includes about 80 percent of all PSE's residential customers (based on 2020 10K).

[38] As defined by Commerce, the definition of an "energy-burdened" customer in PSE's Energy Burden Analysis is a customer whose energy burden is at or greater than 6 percent. Per CETA, "energy burden" means the share of annual household income used to pay annual home energy bills (electricity, natural gas, propane, heating oil, wood, etc.). Source: Washington Department of Commerce. Guidelines for RCW 19.405.120. Version 03.09.2020.

[39] See footnote 38.

Metric	All of PSE's Electric residential customers [39]	Highly impacted communities	Vulnerable populations Low	Vulnerable populations Medium	Vulnerable populations High
Median electric bill as a percentage of income for residential customers who are also energy-burdened[40]	7.0%	7.4%	6.2%	6.7%	7.6%

This metric may show how customers' electric bills, particularly those in highly impacted communities and vulnerable populations, go down as PSE moves forward with specific actions that may reduce the percent of income spent towards electric bills. However, PSE acknowledges that there are multiple exogenous factors that impact this metric outside of a customer's electric bill. For example, an economic downturn or another pandemic may have a wide impact on customer incomes. PSE will continue to refine this metric and may note any broad economic factors that impact this metric in future filings.

CETA Category: Environment

Customer Benefit Indicator: Reduced greenhouse gas emissions

This indicator looks at the metric tons of carbon dioxide ($CO_{2\,e}$) released by resources used to serve PSE's electric load. This indicator captures the amount of emissions by PSE's resources and the avoided emissions based on new clean energy resources. The metric measures how PSE contributes to reducing climate change impacts by measuring the utility's reduction in greenhouse gas emissions. The benefit in tracking this data is to show how PSE is reducing emissions over the time indicated, thus showing a reduction in greenhouse gas emissions. For the baseline data, Table 3-15 shows the amount of CO_2e from 2020 by resources within PSE's fleet and resources contracted to serve load. The CO_2e output is based on the fuel source claims reported under Chapter 19.29A RCW and the greenhouse gas content methodologies under WAC 173-444-040.

[40] See footnote 39.

Table 3-15: Reduced Greenhouse Gas Emissions, Baseline Data for 2020

Metric	Energy Efficiency	Demand Response	Utility-scale Resources (Per WAC 173-444)	Distributed Resources
PSE-owned electric operations metric tons of annual CO_{2e} emissions	Future use	Future use	4,793,992	Future use
PSE contracted electric supply metric tons of annual CO_{2e} emissions (Total – Firm and Non-firm Contract Purchases)	N/A	N/A	3,466,560	N/A

PSE currently collects this data therefore we do not need additional data sources. In the future, PSE will forecast CO_2e emissions based on our anticipated resource mix and portfolio. For new programs, PSE will forecast avoided metric tons of CO_2e for each program to include in future CEIPs. PSE will use the projected energy output and associated metric tons of CO_2e avoided by bringing on energy from these new, clean resources. We will base this information on the AURORA modeling output for metric tons of annual CO_2e emissions and the most accurate and precise emission modeling tool for all other pollutants, and possibly use the EPA's AVERT tool.

CETA Category: Environment, Risk Reduction

Customer Benefit Indicator: Reduction of climate change impacts

This indicator examines the social cost of carbon related to avoided emissions. We can understand the social cost of carbon as a quantification of the marginal cost of the impacts caused by emitting one extra ton of greenhouse gas.[41] This metric takes the published social cost of carbon and multiplies it by the avoided emissions for PSE's EE, DR, and DER programs. Table 3-16 shows the baseline data on the impact to social cost of carbon based on avoided emissions from 2020.

[41] For additional information on the social cost of carbon, please see https://www.whitehouse.gov/wp-content/uploads/2021/02/TechnicalSupportDocument_SocialCostofCarbonMethaneNitrousOxide.pdf

Table 3-16: Reduction of Climate Change Impacts, Baseline Data for 2020

Metric	Energy Efficiency	Demand Response	Utility Scale Resources	Distributed Resources
Social cost of carbon times avoided emissions	Future use	Future use	$76 per metric ton times 8,260,552 total CO_{2e} metric tons in 2020 = $627,801,952	Future use

In the future, PSE will forecast the amount of avoided emissions based on each EE, DR, DER program or resource, and multiply by the social cost of carbon for the corresponding year. We will base this information on past emissions data published on the PSE website, AURORA forecasting modeling output and the WUTC published social cost of carbon.

CETA category: Public Health

Customer Benefit Indicator: Improved outdoor air quality

This indicator looks at the emissions from NOx, SO2, and PM2.5 by PSE resources or contracts. PSE customers may experience outdoor air pollution from a variety of sources including emissions from transportation, industrial, and energy impacts. These emissions affect the outdoor air quality. These pollutants raise the risk of asthma, lung disease and other health challenges for PSE customers. By reducing PSE's portion of these pollutants, PSE customers, especially those in highly impacted communities and vulnerable populations, may see an increase in cleaner air and benefit from a healthier environment assuming other contributing sources of pollution remain relatively constant and do not increase. For the baseline data, Table 3-17 shows the amount of NOx, SO2, and PM2.5 from 2020 by owned and non-owned resources.

Table 3-17: Improved outdoor air quality, Baseline data for 2020

Metric	PM2.5 (2020)	SO2 (2020)	NOx (2020)
PSE's regulated pollutant emissions in short tons (SO2, NOx, PM2.5)	387.7	3,180.3	3,746.2

In the future, PSE will forecast the amount of NOx, SO2, and PM2.5 emissions based on its anticipated resource mix and portfolio. For new programs, PSE will forecast avoided metric tons of PM2.5, SO2, and NOx using site specific emission factors and the EPA's AVERT tool for each program in future CEIPs. PSE will use the projected energy output and associated metric tons of PM2.5, SO2, and NOx avoided by bringing on energy from these new, clean resources. We will also base this information on forecasted AURORA modeling output.

CETA Category: Public Health

Customer Benefit Indicator: Improved community health

This indicator looks at health factors like hospital admittance and work-loss days based on emissions near PSE residential customers, customers in highly impacted communities and customers considered vulnerable populations. As previously discussed, PSE customers in highly impacted communities and vulnerable populations generally experience a disproportionate amount of pollution burden. This burden may lead to increased public health issues that may have an impact on days away from work or school. This metric will help PSE better understand how customers' baseline health is affected as CETA is implemented.

For the baseline data, PSE uses hospital discharge rates as a proxy for hospital admissions.[42] PSE presents this baseline in Table 3-18 and is working to gather additional data points and refine the metric. For example, we are investigating additional metrics, such as community health measured over time and seniors' ability to stay in their homes.

Table 3-18: Improved Community Health, Baseline Data for 2020

Metric	All PSE Customers	Highly Impacted Communities As a percent of Total Hospital Discharges	Total Hospital Discharges in VPs Low	Total Hospital Discharges in VPs Medium	Total Hospital Discharges in VPs High
As a percent of Total Hospital Discharges	100%	31%	29%	32%	39%

In the future, PSE will forecast the impact to community health and the amount attributed to highly impacted communities and vulnerable populations. We may use the EPA's COBRA tool.[43] PSE will forecast the reduction in impact to community health, based on avoided emissions for new clean resources. We have not yet determined the source for this information. PSE is in the process of evaluating other metrics related to community health.

[42] Hospital discharges rates may be inflated. These metrics are reported by zip code rather than census block group. PSE used GIS software to select a value from each zip code for the census block groups that overlapped the zip code. In cases in which a census block group intercepted several zip codes, PSE biased the selection toward the high value to capture the highest level of sensitivity; however, this should be relatively uniform bias across the service area.

[43] The EPA's COBRA tool can be found here: https://www.epa.gov/cobra

CETA Category: Resilience

Customer Benefit Indicator: Decrease frequency and duration of outages

This indicator looks at the number of outages and their impact on PSE customers, customers in highly impacted communities and customers considered vulnerable populations in PSE's existing programs. For the metric PSE tracks both the System Average Interruption Duration (SAIDI) and System Average Interruption Frequency Index (SAIFI) metrics as part of the service quality index (SQI #3 and #4)[44] to highlight the number of outages on PSE's system as a whole and the duration of outages.[45] Customers currently are burdened by the impacts of weather-related outages. An improvement in these metrics aligns with a more secure system and customer reliability would benefit from a more resilient grid. To understand the distribution of benefits, a grasp of how certain populations are affected by these outages is critical. Table 3-19 shows the baseline data, PSE's 2021 Service Quality Index report includes shows the breakdown of SAIDI and SAIFI in 2020 and the associated SAIDI and SAIFI for the named communities.

Table 3-19: Decrease Frequency and Duration of Outages, Baseline Data for 2020

Metric	2020 Average customer count	2020 SQI 3 — SAIDI (minutes)	2020 SQI 4 — SAIFI (interruptions)
PSE — all customers	1,180,611	165.16	1.24
Highly Impacted Communities	454,434	144.74	0.98
Vulnerable Populations	382,824	112.99	0.82

As part of PSE's DR programs, PSE plans to measure reduction in peak demand due to the DR initiatives. A reduction in peak demand means a decrease in frequency and duration of outages because there is less stress on the grid. A reduction in peak demand also reduces the energy and capacity need on the system. PSE will track this information at three levels: all customers, highly impacted communities, and vulnerable populations. PSE will work with vendors to ensure that this information is available to PSE from the DR technology used to implement the program.

[44] As of 2020, PSE has the following benchmarks: SAIFI: <1.30 outages, SAIDI: <155 minutes

[45] "SAIDI" is the average duration (or length) of sustained interruptions per customer for the year. "SAIFI" is the average number of sustained interruptions (or outages) per customer for the year.

Table 3-20: Peak Demand Through Demand Response Programs

Metric	Demand Response
Peak demand through demand response programs	
All customers	Future use
Reduction for Highly Impacted Communities	Future use
Reduction for Vulnerable populations (Low)	Future use
Reduction for Vulnerable populations (Medium)	Future use
Reduction for Vulnerable populations (High)	Future use

In the future, PSE will define, and measure metrics related to circuit performance across our service territory and specifically in highly impacted and vulnerable communities.

CETA Category: Risk reduction, Energy security

Customer Benefit Indicator: Improved access to reliable clean energy

This indicator looks at the number of customers with access to backup power and its impact on PSE residential customers, customers in highly impacted communities and customers considered vulnerable populations in PSE's service territory. During outages, customers sometimes do not have a backup energy option to go about their daily lives. This metric will illustrate the increase in options and opportunities for customers to gain access to secondary sources of energy. To illustrate the distribution of these benefits, PSE will show the percentage of customers within highly impacted communities and vulnerable populations as compared to all PSE customers. For the baseline data, PSE shows the breakdown of backup power sources based on 2020 data; please note that PSE shows a count of zero as there is no current PSE program specific to net metering and battery storage, although customers may decide to install net metering and battery storage systems on their own.

Table 3-21: Improved Access to Reliable Clean Energy, Baseline Data for 2020

Metric	Distributed Resources	All customers	Access for Highly Impacted Communities	Access for Vulnerable populations Low	Access for Vulnerable populations Medium	Access for Vulnerable populations High
Number of customers who have access to emergency power	Net metering and battery storage[46]	0[47]	0	0	0	0

In the future, PSE will forecast the number of customers who may benefit from facilities with backup power in their community based on the program proposed. This will also show the amount attributed to highly impacted communities and vulnerable populations. PSE will collect the information via vendors and program enrollment.

[46] PSE only has data on batteries installed with interconnected DER systems. PSE does not have data on batteries for backup power for their home without solar or another technology approved to back-feed to the PSE grid.
[47] This number is zero because although individual PSE customers have individually chosen to install batteries, this is not a specific PSE program currently.

Applying Customer Benefit Indicators in the 2021 CEIP

The 2021 Integrated Resource Plan (IRP) used an initial set of customer benefit indicators developed with only limited feedback from the IRP stakeholder group.[48] Updates to the customer benefit indicators in this CEIP benefit from the public participation processes and input as required by CETA to create this Clean Energy Implementation Plan. These updated customer benefit indicators derived from public participation processes will also inform future IRPs and 10-year Clean Energy Action Plans (CEAP).

Now that we have defined the customer benefit indicators and their metrics, we will illustrate how they will be used in the resource decisions PSE outlines in this CEIP. This section covers each specific target and illustrates how these customer benefit indicators will be applied to determine which programs and specific actions may be pursued through PSE's resource acquisition processes. PSE is using the CBIs as part of the RFP process to guide our decision-making.

In the previous section, we showed some of the metrics for these indicators. In the future, PSE can use these metrics to forecast the benefits customers, including highly impacted communities and vulnerable populations, would see in the application of these indicators. For this 2021 CEIP and in future electric resource planning and resource acquisition decisions, PSE will use the customer benefit indicators to determine the specific targets using 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 — the utility — of benefits that PSE did not include in our avoided energy or capacity costs. PSE is considering an expanded list of non-energy impacts for future conservation goals. Many of these also align with the customer benefit indicators used across the actions in the CEIP. As more NEIs are measured and used in the cost-effectiveness calculation, PSE will add them to the cost-effectiveness evaluations of different programs.

Benefits from 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 emissions to avoided cost calculations.

[48] Timing of WUTC rules and Draft IRP: The WUTC rules for the CEIP were finalized in December of 2020 during the ongoing 2021 IRP process. The 2021 IRP was filed in April 2021. Because of the short period between these two products, stakeholder engagement on customer benefit indicators was limited.

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 the 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. We used this narrow list as part of the determination of the conservation goal. In 2020, PSE and other Washington State investor-owned 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 in different categories of benefits.

The results from expanding the use of NEIs will begin to show up in our 2024–2025 BCP. Categories of NEIs that PSE adopted from this database 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. PSE adopted new NEIs in the 2022–23 BCP. PSE also plans to continue to investigate more NEIs during the 2022–23 implementation period that may add further value during the cycle. Table 3-22 shows a list of CBIs PSE proposes for this CEIP, along with a list of new NEI categories PSE will use to account for the value of energy efficiency projects in future BCPs.

Table 3-22: Mapping NEIs to CBIs

CEIP Customer Benefit Indicators	New NEIs Adopted in 2022–23 BCP
Improved outdoor air quality	Avoided illness from air pollution
Improved community health	Health and Safety
Affordability of clean energy	Quantified HVAC and insulation costs for income-eligible customers O&M Savings
Improved home comfort	Thermal comfort/lighting quality
Increased resiliency	Fires/Insurance damage reduction
Greenhouse gas reduction Increase in clean energy jobs Decrease in outages Increased accessibility Reduction of climate change impacts	These CBIs are not explicitly addressed in new NEIs but are accounted for in avoided costs of capacity and the social cost of GHG or reflect 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 identified in this 2021 CEIP. We cannot quantify all these new NEIs at this point. As a result, PSE will continue to evaluate and adopt the new NEIs in the coming years. PSE will provide a separate report to describe the monetary value as we integrate them 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.

PSE acknowledges a need for specific demonstration of how our energy efficiency programs impact low income and named communities. We are committed to exploring ways to demonstrate how energy efficiency programs affect low income and named communities in the next BCP planning cycle. We need new data collection technologies and reporting mechanisms to dissect energy efficiency programs to this level of specificity. As mentioned in PSE's 2022–2023 BCP, program staff will continue to assess program delivery against a matrix of metrics and practice adaptive management to ensure equitable delivery or programs. PSE will utilize internal and external research to develop culturally relevant outreach to bring integrated energy efficiency opportunities to highly impacted communities and vulnerable populations. Specifically, there will be a particular focus on "transcreation" of collateral and contractor training to better reach limited English proficiency customers in the residential energy management sector.

Apply Customer Benefit Indicators to Demand Response

PSE will issue a Targeted Distributed Energy Resources (DER) Request for Proposals (RFP) in early 2022 to meet the target for demand response. This Targeted DER 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 Four, Specific Actions. We will evaluate the responses based on the bids received and will consider them to create a short list and pursue contracts. The process for evaluating Demand Response bids will mimic the same process for DERs as illustrated.

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 a customer benefit 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, reduction of costs and risks, and energy security and resiliency.

For development projects, proposals must describe the respondent's labor plan. We will give preference to projects constructed with high labor standards, including family-level wages, benefits and opportunities for local workers and businesses. PSE encourages all bidders able to meet the requirements of this All-Source RFP to participate, including bidders representing minority-, women-, disabled- and veteran-owned businesses. PSE encourages bidders interested in partnering with PSE to support supplier diversity through inclusive, competitive procurement processes.

PSE prefers projects that utilize a Project Labor Agreement or Community Workforce Agreement for major construction activities associated with the construction of the project. Respondents shall make commercially reasonable efforts to ensure that such Project Labor Agreement or Community Workforce Agreement is eligible to be certified by the Washington Department of Labor and Industries under the standards of the Washington State Clean Energy Transformation Act (RCW 19.405). RFP responses shall also include any written diversity commitments, plans, or policies.[49]

In Phase 1 of the All-Source RFP evaluation, which started 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 addresses.[50] Figure 3-8 shows the rubric that will be used to score each bid based on the information provided by developers in their customer benefit plan.

Figure 3-8: All-Source RFP Evaluation Criteria and Scoring Rubric

CETA Customer Benefit Plan	35%	x	_/5
No CETA Customer Benefit plan provided			0
Plan submitted - Minimally addresses all areas			1
Strongly addresses two (2) of the five CBI areas and minimally addresses the remaining three (3) CBI areas			2
Strongly addresses three (3) of the five CBI areas and minimally addresses the remaining two (2) CBI areas			3
Strongly addresses four (4) of the five CBI areas and minimally addresses the remaining one (1) CBI area			4
Strongly addresses all five (5) CBI areas (Environmental, Economic, Health, Energy and Non-Energy Benefits, and Energy Security and Resiliency)			5

PSE will evaluate each bid by looking at the customer benefit indicator categories. For example, PSE will read a bidder's customer benefits plan and understand how and to what degree a project impacts public health. This could be through a reduction of greenhouse gases. Another example is through economics and understanding the impacts to local tax revenues or job creation. PSE will go through the plan, denoting how and to what degree bidders address the customer benefit indicator categories and how the proposals may affect highly impacted communities and vulnerable populations. A score from 0–5 will be applied based on this evaluation and represents 35 percent of the qualitative portion of the evaluation. In consultation with PSE's independent evaluator, the scores will be evaluated before moving on to Phase 2.

Respondents will have the opportunity to update their customer benefits plans in January 2022 to address the customer benefit indicators in the CEIP more specifically.[51] Giving respondents until January 2022 allows respondents to update their customer benefits plans to more specifically address

[49] PSE All-Source RFP, Exhibit B: https://www.pse.com/-/media/PDFs/001-Energy-Supply/003-Acquiring-Energy/ExB_Form_2021-06-30.xlsx?sc_lang=en&hash=9AB758ECDABA77F4EA3A197CE14355D7

[50] PSE All-Source RFP, Exhibit A: https://www.pse.com/-/media/PDFs/001-Energy-Supply/003-Acquiring-Energy/ExA2021-AllSource-RFP63021.pdf?sc_lang=en&hash=2D3F973F402D04A51B7501F269675356

[51] PSE All-Source RFP, Section 3

the updates, we made to our customer benefit indicators in the CEIP in response to stakeholder feedback.

In Phase 2 of the All-Source RFP evaluation, PSE will perform a more in-depth qualitative assessment of the customer benefit indicators as an additional due diligence step.

Distributed energy resources through the 2021 CEIP and Targeted DER RFP:

In this first CEIP, PSE uses the customer benefit indicators to evaluate and select the distributed energy resource programs and concepts that maximize benefits to customers. PSE developed a scorecard to understand how each program provides benefits to customers. Ideally, PSE would directly forecast the benefits of each program and use the magnitude of the benefits to score and determine which DER concepts to pursue.

For the 2021 CEIP, PSE does not have the data sources established to reflect the magnitude of benefit customers would see from each program. PSE will continue to develop data sources to forecast the customer benefits of each DER program, especially for highly impacted communities and vulnerable populations. Because this data was not available, PSE performed an evaluation that was qualitative and based on the degree of influence. The degree of influence is the level of impact a DER program or concept might have on a benefit. PSE used three levels to reflect the degree of influence, ranging from negative impact to no impact (typically given a 0 score), minimal impact (typically reflected in a score of 1), or a positive impact on each customer benefit indicator (typically reflected in a score of 2). Each indicator has different impacts; therefore, they are scored differently. For some indicators the lowest score represents no impact, like improved access to reliable clean energy, while for others, like greenhouse gas emissions, there could be some negative impacts. We wanted to account for those negative impacts and adapt the scoring to match the range of benefits for each customer benefit indicator, including the risk of a negative consequence.

Appendix D-3 shows how specific concepts were scored across all the indicators. For each concept, we gave a score of 0, 1, or 2 corresponding to the degree of influence by each indicator. We calculated the total score for each concept and ranked the concepts according to the score. The results showed similar impacts based on the resource type. Each column shows the score for a program based on the forecasted benefits in each customer benefit indicator. For example, when looking at the third-party customer-sited distributed battery PPA, the score for reduced greenhouse gas emissions is a 2, which means that the program will have a positive impact and reduce annual metric tons of CO_{2e}. By comparison, the C&I Battery Install Incentive only scores a 1 for this benefit, because it has a minimal impact and not likely to reduce annual metric tons of CO_{2e}. The score of 0 for reduction in greenhouse gas emissions means a program has a negative impact and may produce more annual metric tons. The basis for how each concept was scored is described in Appendix D-3. The table shows each customer benefit indicator, the scoring and associated degree of influence, and the reasoning for why different resource types received a score of 0, 1 or 2. A similar scoring process will be used in the Targeted DER RFP evaluation process. As PSE continues to develop metrics and associated data sources, the scoring systems may evolve to better capture the magnitude of the benefit for each concept. To

determine the customer benefit indicators for this 2021 CEIP, PSE circulated this table to all the advisory groups, including the EAG, for feedback on whether the list represented the benefits customers wanted to see in this transition. We also asked them if there were any gaps in the list. PSE also received proposed customer benefit indicators from a joint advocate group, some of which we have incorporated in the CEIP. We recognize that the customer benefit indicators will continue to evolve.

PSE initially prioritized the customer benefit indicators based on feedback from stakeholders. However, 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 as that would prioritize CETA-defined categories against each other.

After considering varied and differing feedback from stakeholders on how we should conduct the weighting of customer benefit indicators and our concerns that using weightings at this time might result in unintended consequences, PSE decided to use unweighted customer benefit indicators in this CEIP. PSE will continue to solicit feedback on how to best prioritize customer benefit indicators as our understanding and application of customer benefit indicators evolves and matures. Additional details of how we considered weighting can be found in Appendix D-3.

The CEIP specific actions related to distributed energy programs and concepts guide PSE on the types of programs to request in the Targeted DER RFP. PSE will issue a Targeted DER RFP in early 2022 to meet the target for distributed energy resources. This Targeted DER 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 pursue contracts. In this case, we use customer benefit indicators in both the CEIP modeling and the resource acquisition process.

Although this exercise was done to go beyond the generic assumptions from the 2021 IRP and get more granular and specific about the DER programs PSE could pursue, the Targeted DER RFP will serve as the vehicle by which programs and concepts are selected and ultimately acquired. Like the All-Source RFP, PSE will assess in the evaluation process the degree of impact to programs based on the customer benefit indicators. PSE will use the customer benefit indicators to score the potential benefits to customers, including highly impacted communities and vulnerable populations, to create a shortlist of resources. A glimpse into the scoring rubric from the draft Targeted DER RFP is found on Figure 3-9[52]. The rubric mirrors the CETA categories but more specifically ties in the actual customer benefit indicators from the CEIP. We will update in the final Targeted DER RFP before we issue it to align with the final CEIP. When evaluating DER programs, PSE will specifically address the degree to which the program provides benefits. Compared to the All-Source RFP rubric discussed earlier in this chapter, the

[52] PSE Targeted DER RFP: https://www.pse.com/-/media/PDFs/001-Energy-Supply/003-Acquiring-Energy/pdf/ExA_2022-DER-RFP_Evaluation-Criteria-and-Scoring.pdf?sc_lang=en&hash=8D58DC817C85F506322581B215A09A8C

Targeted DER RFP evaluation is more targeted on local benefits and resources and, focuses on named communities.

Figure 3-9: Targeted DER RFP Evaluation Criteria and Scoring Rubric

CETA Equity Plan *Customer Benefits from Transition to Clean Energy Plan*	**25%**	**x**	**0**	**_/ 22**
Does the project reduce air pollution by decreasing carbon emissions and deploying renewable resources?				
May produce more annual metric tons of C02				0
Not likely to reduce annual metric tons of C02				1
Reduces annual metric tons of C02				2
Does the program mitigate the impacts of climate change (e.g., Wildfires, droughts) through reduced peak demand?				0
Increases impacts of climate change				1
Does not mitigate				2
Does the program improve outdoor air quality and help abate health issues (e.g., asthma, heart disease)?				
May produce more annual metric tons NOx, SOx, and PMP2.5				0
Not likely to reduce more annual metric tons NOx, SOx, and PMP2.5				1
Reduces annual metric tons of NOx, SOx, and PMP2.5				2
Does the program help abate health and safety issues, including indoor air quality (e.g., asthma, heart disease, and heat-related illnesses) and health factors like mortality, hospital admittance, work loss days?				
% increase				0
No discemable % increase/decrease				1
% decrease				2
Does the program decrease the percentage of customers' income dedicated to energy costs?				
Non-measurable % decrease				0
Measurable % decrease, but only for targeted or participating customers				1
Measurable % decrease for all customers				2
Does the program decrease the percentage of customers' income dedicated to energy costs for highly impacted communities and vulnerable populations?				
Measurable risk of % increase				0
Non-measurable % increase/decrease				1
Measurable % decrease				2

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 Six, Public Participation for more information about the public participation we undertook to create the 2021 CEIP.

The 2021 CEIP includes customer benefit indicators informed by the broad participation required under CETA. As indicated in the Public Participation Plan, 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. Table 3-23 shows this data.

Table 3-23: 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 a benefit were 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 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 was a priority in each advisory group. 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 3-24.

Table 3-24: Advisory Groups — Input for CBIs

Proposed Customer Benefit Indicator	Advisory Group Source
Non-energy — Decreased income spent on electricity	EAG LIAC CRAG
Reduction of cost — Reduced energy bills	IRP CRAG

Proposed Customer Benefit Indicator	Advisory Group Source
Public Health — Improved air quality	EAG LIAC IRP CRAG
Public Health — Improved community wellness	EAG CRAG
Security and resiliency — Decreased time and duration of outages	EAG IRP CRAG
Economic — Increased clean energy jobs	EAG LIAC
Economic — Lower unemployment	EAG IRP
Non-energy — Improved sense of self-sufficiency	EAG
Non-energy — Increased sense of pride and shared values	EAG IRP
Accessibility — Improved awareness and education	IRP CRAG
Environment — Reduced greenhouse gas emissions	LIAC IRP
Accessibility — Renters	IRP
Accessibility — Vulnerable Populations	IRP
Environment — Decreased wildfires	IRP 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 Six, 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 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, see Chapter Six, 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 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, as shown in Table 3-25.

Table 3-25: Residential Customers — Input for CBIs

Proposed 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 Six, 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 from 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 Six on public participation.

Code and summarize input

Project staff reviewed the suggested benefits and organized them into different codes 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 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 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 3-26.

Table 3-26: Business Customers — Input for CBIs

Proposed 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.[53] We list the locations of and communities served by the organizations in Table 3-27.

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

Table 3-27: 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 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 so they could 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 3-28.

Table 3-28: Community Based Organization — Input for CBIs

Proposed 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
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

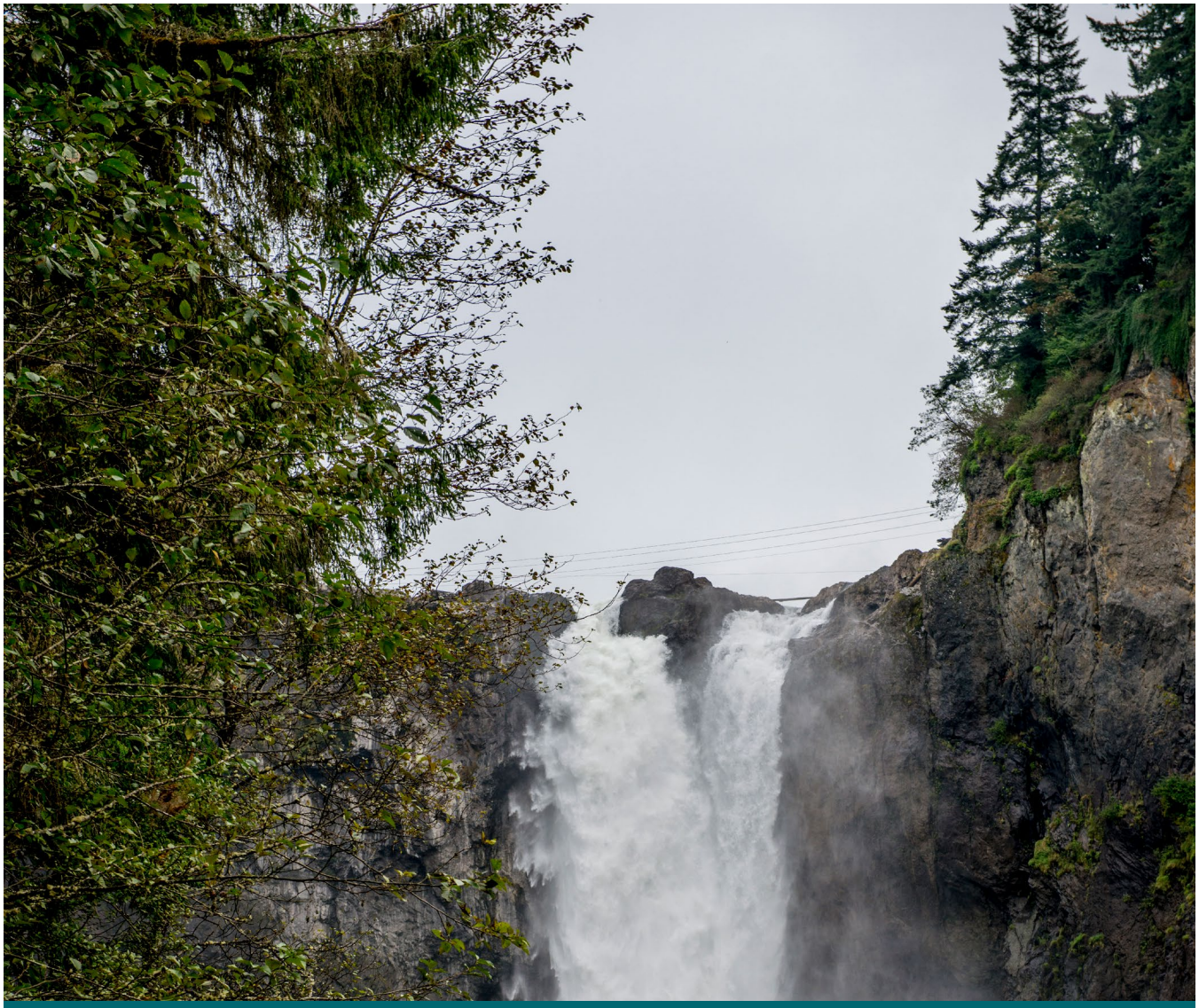
Align CBIs Among Sources

Project staff divided the CBI input identified from the advisory groups, the residential survey, and the business survey into top-third, middle-third, and bottom-third based on the previously described prioritization process. Project staff highlighted CBIs that occurred more than once among the top-third areas. They then compared this to the list of CBIs developed from meetings with CBOs. Table 3-29 shows the results of this comparison.

Table 3-29: Customer Benefit Indicator by Source

Customer Benefit Indicator	Sources
Non-energy — Decrease in income spent on electricity	Advisory Groups General Survey CBOs
Reduction of cost — Reduce energy bills	Advisory Groups Business Survey CBOs
Public Health — Improved air quality	Advisory Groups General Survey CBOs
Public Health — Improved community wellness	Advisory Groups General Survey CBOs
Economic — Increase in clean energy jobs	Advisory Groups Business Survey CBOs
Environment — Reduced greenhouse gas emissions	General Survey Business Survey
Environment — Decrease in fossil fuel extraction	General Survey Business Survey 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 2021 final CEIP, PSE circulated this table 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 advocate group, some of which have been incorporated for the final CEIP. PSE recognizes the customer benefit indicators will evolve.



4 Specific Actions

Chapter Four: Specific Actions

Specific Actions

These specific actions reflect Puget Sound Energy's (PSE's) planned progress toward meeting the Clean Energy Transformation Act (CETA) 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 100 percent of all retail sales of electricity by 2045.

The listed actions also begin to 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 feasible, PSE includes the population impacted by the distribution of benefits, although not the specific location. However, we have not solidified the data to quantify these benefits yet. PSE will continue to investigate ways to address this gap in data in the biennial 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 meets PSE's resource adequacy requirements as outlined in Chapter Two, Table 2-3. The specific actions in the CEIP are consistent with PSE's IRP as described in Chapter Two, Interim and Specific Targets.

PSE's All-Source Request for Proposal (RFP) and Targeted Distributed Energy Resources (DER) RFP are the primary solicitation vehicles for securing resources at the lowest reasonable cost while maximizing customer benefit; they constitute PSE's primary specific actions in the beginning of the CEIP period. As PSE secures resources from the two RFP processes, we will add more specific actions in the 2023 biennial CEIP update.

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 from 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

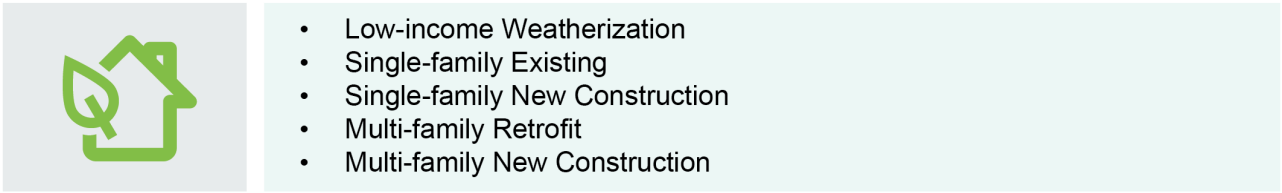
programs can also produce a decrease in frequency and duration of outages by providing solutions to distribution system constraints. Participating customers see additional benefits and burden reduction through improved home comfort, affordability of clean energy, and improved community health.

PSE will act across energy efficiency (EE) programs to mitigate risk and increase benefits to highly impacted communities and vulnerable populations. To support this work, 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 generated by 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 EE opportunities to highly-impacted communities and vulnerable populations. Related to this effort, we will particularly 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 period as primary drivers for electric savings within the residential energy management sector in Figure 4-1.

Figure 4-1: Residential Energy Management Programs



PSE is taking steps to ensure that highly impacted communities and vulnerable populations benefit from the distribution of benefits and reduced burdens from energy efficiency programs. Within these programs, PSE has taken actions to expand benefits to named communities. For example, PSE is expanding equipment and weatherization incentives and continues 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 to meet evolving customer demands, 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 the NEEA as a partner to develop market transformation for energy efficiency that results in energy savings across the region. PSE is assigned a share of those savings proportional to our 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 our 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 facilities, for example — 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, PSE implements improvements at our electric substations to manage distribution system voltage, also known as Conservation Voltage education or as technology matures Volt/Var Optimization. Although this efficiency program contributes to and is reported through energy efficiency, investments are not covered by the conservation rider nor included as incremental costs but are necessary to meet overall Energy efficiency targets.

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 thermostat 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 act 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 DR programs to meet the resource needs as presented in our Targeted DER RFP.

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. DR 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 23.7 MW of total demand response will offset peak demand needs by 2025.

DR programs also contribute benefits to all 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 or defer 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, which also improves outdoor air quality.

PSE is still evaluating how specific DR programs and actions will mitigate risks to highly impacted communities and vulnerable populations. To begin to identify and account for these risks, PSE will use customer benefit indicators, and diversity, equity, and inclusion evaluation methods throughout our procurement selection processes for all DR programs. This CEIP projects specific cost-effective DR programs for the 2022–2025 implementation period. All the programs are direct load control (DLC) programs. DLC 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 Targeted 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 2021 CEIP, PSE takes two initial actions:

1. Complete the distributed energy resource, including demand response RFP (Targeted DER RFP), and

2. Initiate the time-varying rates pilot.

We may identify additional actions based on responses to the Targeted DER RFP and the Time Varying Rate pilot program, 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 to 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 submitted a draft Targeted DER RFP to the WUTC on November 15, 2021 (Docket Number UE-210878). Once approved by the WUTC, PSE will issue the Targeted DER RFP, which we anticipate will happen in early 2022.

PSE filed this draft Targeted DER RFP in response to our IRP modeling, which shows DERs as a growing part of PSE's electricity resource portfolio to achieve targets at the lowest reasonable cost, per CETA requirements. A diversified portfolio of DERs, including distributed renewable generation, distributed energy storage, and flexible DR resources, will be necessary, at scale, to effectively execute our approach. This Targeted DER RFP was developed several months after PSE's 2021 All-Source RFP to reflect more comprehensively our recent work to develop the technical and operational requirements for a virtual power plant platform. These requirements are communicated in the Draft Targeted DER RFP and are intended to help us reduce costs to PSE customers associated with individual DR and DER bids. The Targeted DER RFP includes procurement of distribution

interconnected solar photovoltaic generation (includes ground and rooftop solar PV), Battery Energy Storage Systems (BESS), and DR located within PSE's service area. The Targeted DER RFP focus on distributed resources also allows for a more tailored evaluation approach that emphasizes the customer benefits associated with distributed energy resources.

Below is the tentative schedule, which is subject to adjustment based on WUTC review and the actual pace of the evaluation process. Please see any updates online at http://www.pse.com/RFP.

2022 Targeted DER RFP Schedule

Date	Milestone
November 15, 2021	Draft Targeted DER RFP filed with WUTC
December 30, 2021	Public comment period ends
January 31, 2022	WUTC review period ends; decision anticipated
February 7, 2022	PSE issues final Targeted DER RFP
Late February 2022	PSE hosts Respondents' Conference
March 21, 2022	Offers due to PSE
April 20, 2022	PSE posts to RFP website compliance report consistent with the requirements of WAC 480-107-035(5)
Q2 2022	PSE completes Phase 1 screening process and selects Phase 2 candidates, notifies respondents
Q3 2022	PSE selects Targeted DER RFP short list, notifies respondents
To follow	Post-proposal negotiations
To follow	PSE files with compliance report with WUTC consistent with the requirements of WAC 480-107-145(2)

Customer Benefits

PSE seeks a diverse portfolio of demand response programs that benefits customers through financial awards and alleviates burdens affecting vulnerable populations and highly impacted communities. Such burdens include energy burdens, renter vs. owner burden, and pollution burdens.

By providing targeted financial rewards to diverse populations in PSE's territory, demand response programs aim to benefit our customer base in a variety of ways. The proposed water heating and

heating control concepts as described in Figure 4-1 will provide broad customer benefits using installed controllable appliances and devices that shed load at specific times of the year to balance supply and demand where system capacity constraints exist. Leveraging these devices in aggregation will contribute to energy benefits through increased resilience by decreasing the frequency or duration of outrages and increased energy security through improved access to reliable clean energy. Over time the dispatching of DR programs at scale will contribute to the environmental and public health customer benefits by reducing greenhouse gas emissions and improving outdoor air quality.

Also, through the Targeted DER RFP process, PSE anticipates program designs that will offer multiple non-energy benefits. Specifically, the distribution of financial rewards can offset ongoing energy costs for customers by providing a credit when their selected device or appliance is dispatched for a system-wide or local event and improve affordability of clean energy. Respondents to the Targeted DER RFP are also evaluated on their strategies for increasing participation in highly impacted communities and vulnerable populations, including their strategies for creating clean energy jobs in local markets. Respondents are also expected to increase awareness through accessible multilingual communications. PSE's draft Targeted DER RFP and scoring criteria as well as the vendor contracting process that will follow are set up to ensure the programs that are designed and proposed will serve the needs of our specific burdened populations identified earlier.

Annual Actions

2022

At the beginning of 2022, PSE will consider stakeholder feedback on our draft Targeted DER RFP and submit a revised Targeted 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.

By the end of 2022, PSE will begin developing a DER dispatch and operations strategy to operationalize DR peak load reduction.

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

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 2023, PSE will begin developing a DER asset management strategy to support PSE-owned DR programs (see DER Enablers — Operations Enablement).

By the middle of 2023, 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.

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 second 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.

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. Also, to support DR event transactions, enhancements and other changes to PSE's billing system and customer notification platform will be operational and support a comprehensive portfolio of DR programs.

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

2025

In early 2025, 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.

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 Seven, Tracking and Reporting. We will start reporting annually in 2023. See Appendix F 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 engagement with internal stakeholders, 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.

Over the course of 2021, PSE has engaged with external stakeholders to craft and refine the pilot rates and design. We anticipate receiving regulatory approval in the fourth quarter of 2022, after which point, we will work to implement necessary metering and billing systems upgrades and begin customer recruitment. The anticipated start date of the pilot will be the first quarter of 2024. 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 7,500 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.

PSE believes a pilot is necessary to protect customers by allowing the company to evaluate appropriate rate/price signals as it relates to a winter-peaking utility with a more limited set of volunteer participants. The preponderance of evidence regarding TVR rates at large is applicable to summer peaking utilities and considerably less information is available for winter peaking utilities. Once we have a better understanding of what price signals avail customers and the system of meaningful savings opportunities, we'd put forward to the WUTC those calibrated rates for an opt-in tariff as soon as practical. PSE has been guided by our TVR expert consultant, Brattle, to conduct a two-year pilot with a to ensure we capture a minimum of two winter seasons to attain robust results. Some of the objectives of this pilot include:

- Better understand how customers respond to and accept various pricing mechanisms including time-of-use, 3-tier time-of-use, and time-of-use plus peak time rebate
- Better understand the effectiveness of peak time duration, persistence, price elasticity and customer retention for fine-tuning full-scale program

- Ability to test the recruitment, education, and rollout in a pilot to develop best practices for full scale program
- Ability to measure customer satisfaction through the pilot to deploy best practices for successful full-scale program

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[54]

Rate	Season	Ratio *(P:OP)*[55]	Estimated Peak Demand Reduction	50% Derate for Winter Peaking System[56]
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 Electric Vehicle (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%

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

[55] Peak period ($/kWh) to Off-peak period($/kWh)

[56] Brattle recommended cutting peak reduction in half because PSE's system is winter peaking. In Brattle's experience, TOU rates are for summer peaking systems, so the impacts during the winter are expected to be lower. The pilot will help us understand how customers respond to and accept various pricing mechanisms and the effectiveness of TOU models in the winter.

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.

Annual Actions

2022

PSE will file the TVR pilot as a part of the 2022 GRC. Strategy roadmaps for the anticipated IT deployment work streams will be developed.

2023

On approval of the pilot by the WUTC, PSE will begin implementing the pilot. This will consist of performing IT upgrades to the customer metering system including AMI and MDMS. Similarly, the SAS billing system will require additional programming to accommodate time-varying rates. Also, the customer facing informational portal such as myPSE will be upgraded to display new information for customers relevant to the pilot. In parallel with these efforts, PSE will begin educational and marketing outreach to support recruitment of customers opting into the pilot rate designs. This recruitment will be done in waves until the sample sizes are achieved. The finalized evaluation, measurement, and reporting plans will be developed, and the necessary tracking mechanisms implemented.

2024

The pilot should begin operation for customers to receive service on the new tariffs in the first quarter of the year. Ongoing educational and survey outreach will be performed throughout the duration of the pilot. Near the end of the first pilot evaluation year EM&V data will start being compiled and processed for an interim pilot report.

2025

The interim pilot report will be finalized and filed with the WUTC. Any course corrections discovered through the report will inform any design adjustments. Ongoing education, marketing, and outreach will continue through the year until the official evaluation period ends after two full years of deployment. At

the conclusion of the two-year pilot evaluation period customers will have the option to continue service or revert to their respective base schedule until the WUTC has ruled on the future of time-varying rate viability. Data for the final EM&V assessment will be compiled and analyzed for the final report and recommendations on the offering of full-scale time-varying rates filed with the WUTC.

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

To make reasonable progress in this first CEIP, PSE seeks to acquire renewable resources in 2022–2025 at a pace that meets the two-percent annual average incremental cost of compliance. 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 at 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, and 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: 1,886,331 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 peak capacity and CETA compliance targets. PSE issued our 2021 All-Source Request for Proposals, for resources to meet all or part of PSE's capacity and CETA needs at the lowest reasonable cost to customers. Responses to the All-Source RFP were due from bidders on September 1, 2021.

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. 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.

PSE's analysis of the CETA requirements through our modeling, work with advisory groups, and use of CBIs demonstrates a need for a specific action. The specific action is an All-Source RFP and the selection of the resource that fits those characteristics. The selection of resources through the All-Source RFP process allows PSE to meet the identified needs.

For more information on the RFP, please see: https://www.pse.com/rfp

The Role of the Independent Evaluator

On January 19, 2021, PSE filed a petition for approval of the recommended independent evaluator (Filing UE – 210037). The independent evaluator is involved in both the All-Source and Targeted DER RFPs. This was a petition for approval of the recommended independent evaluator of PSE's requests for proposals to acquire energy resources, in accordance with WAC 480-107-023(2). This request for an independent evaluator applied to PSE's planned 2021 All-Source and Demand Response Requests for Proposals. The WUTC approved our recommended independent evaluator on January 28, 2021.

PSE works with our independent evaluator, Bates White, to ensure that the RFP process is conducted fairly, transparently, and properly. PSE is confident in the integrity of our RFP process, and as stated during PSE's public bidders' conference, stakeholders are welcome to contact the independent evaluator with any questions or concerns.

How These Actions Move Us Closer to Meeting 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 that details the customer benefit indicators addressed and 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 and further refined and prioritized in the CEIP.

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. Project related benefits of resources selected in the RFP can be significant and include increased local tax revenue, jobs, and tourism, among others. The 2021 All-Source RFP will introduce a sizable amount of renewable and CETA-compliant resources, which may include 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, and 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 traditionally underrepresented bidders, including women-, disabled-, and veteran-owned businesses.

Annual Actions

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 identified in the All-Source RFP. 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

CETA Need in GWh	2022	2023	2024	2025	2026
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 Fiscal Year 2020 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 Seven of the 2021 IRP[57] 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 prefers 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.

[57] *2021 IRP Chapter Seven: 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 and commence contract negotiations in 2022. Phase 2 of the RFP will also include an updated load forecast, which incorporates climate change, as well as updated effective load carrying capabilities of resources. This work will be conducted as part of the 2023 IRP progress report.

2023

Most proposals to the All-Source RFP are 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 we may add new resources to PSE's portfolio as early as 2023. The actual timing of new resource 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 and the CEIP 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 and 246 MW of CETA-compliant capacity resources 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 1,074 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.

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 benefit indicators 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 so PSE can measure customer benefits.

Beyond the evaluation process, PSE will internally track the progress of projects with signed PPAs 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 Solar Programs

The annual MWh associated with this program over the next four years is: 55,354 MWh

Distributed Solar Programs Explained

The 2021 IRP preferred portfolio identified 80 MW of distributed solar needed by 2025. PSE is committed to delivering distributed solar programs for our customers that are affordable, safe, and accessible to all. PSE developed a DER preferred portfolio selection process to derive a selection of distributed solar program concepts that will help PSE achieve our goals. We will establish final program designs based on the results of the Targeted DER RFP (see Chapter Four, Demand Response Specific Actions for more details). To learn more about how we selected these preferred portfolio concepts, refer to Chapter Two, Interim Targets and Specific Targets, CEIP Methodology and Appendix D.

This section focuses on new programs with solar installations that will expand access and benefits of solar energy. In addition to community solar (see Chapter Four, Community Solar), this CEIP identifies a diverse set of programs encompassing various ownership models and customer groups, which, combined, create a low-cost portfolio and significant customer benefit. In addition to offering higher incentives for named communities in mass-market programs, PSE will offer programs specifically designed to reduce barriers for vulnerable populations to access and benefit from DERs.

The solar programs described in this section will add additional renewable solar generation to PSE's service territory, contribute to an equitable distribution of energy and non-energy benefits, and reduce burdens to vulnerable populations and highly impacted communities. See the timeline for the introduction of distributed solar programs in Figure 4-1.

These distributed solar programs are:

- **Multi-family Rooftop Solar Incentive:** PSE will offer incentives to multi-family building owners to reduce their upfront cost to install and own solar in PSE’s service territory.
- **Multi-family Solar Partnership:** PSE will coordinate with technology providers and provide billing support systems to spread production across tenant units to facilitate solar photovoltaic (PV) installation on multi-family buildings.
- **Residential Rooftop Solar Leasing — mass-market and income-eligible:** PSE will lease rooftop space from residential customers to install and operate solar photovoltaic systems. This DER approach will allow customers to participate in and benefit from clean energy generation without any investment.
- **Commercial and Industrial (C&I) Rooftop Solar Incentive:** This program provides incentives that will reduce the cost barrier to solar ownership. PSE may offer higher incentives to non-profit organizations.
- **PSE Customer-sited Solar+Storage Offering:** This program provides incentives that will reduce cost barriers to solar and storage ownership. PSE may offer higher incentives to income-eligible customers.
- **Third-party Distributed Solar PPA:** PSE will procure power purchase agreements (PPAs) to support the development of distributed solar.

How These Actions Move Us Closer to Meeting CETA Goals

These DER solar 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 a renewable energy source for customers. The MWh generated by these programs count toward the CETA MWh compliance need and load reduction. PSE anticipates a

total of 53.8 MW of nameplate solar capacity and 55,354 MWh of annual solar energy generation for the complete program by the end of 2025.

Customer Benefits

PSE seeks a diverse portfolio of distributed solar programs utilizing different ownership structures and marketing and outreach strategies that alleviate burdens affecting vulnerable populations and highly impacted communities. We designed the distributed solar portfolio to have targeted solutions that specifically address key vulnerable populations burdens including, but not limited to, renter vs. owner burden, and individuals with socioeconomic burdens. Also, we intend for the portfolio to address broader energy burdens and pollution burdens felt by the highly impacted communities.

We designed the distributed solar portfolio with multiple interventions in mind to address the burdens we described. The two programs targeted at multi-family housing seek to provide incentives for owners to install solar for their complexes and create pathways for tenants to see the financial benefit of adopting solar. These interventions for multi-family owners and tenants deliver non-energy benefits to enrolled customers by improving participation in, and awareness of, clean energy programs by highly impacted communities and vulnerable populations. These programs also increase the quantity and quality of clean energy jobs and affect the affordability of clean energy. PSE also seeks to implement a Rooftop Solar Leasing program which will target the same non-energy customer benefits as the multi-family solar programs by paying customers to allow PSE to install rooftop solar on their property through a lease agreement. Finally, PSE proposes three other distributed solar programs — C&I Rooftop Solar Incentive, Customer-sited Solar+Storage, and Third-party Distributed Solar PPA — that aim to provide other non-energy and resiliency benefits. Those benefits include including improved home comfort, improved affordability of clean energy, and decreased frequency and duration of outages by offering incentives for rooftop and third-party owned solar and solar+storage solutions.

By supporting wider adoption of distributed solar and solar+storage solutions, the proposed distributed solar programs will provide critical energy and health benefits including a reduction in greenhouse gas emissions, access to reliable clean energy, and improved outdoor air quality and community health.

Annual Actions

2022

In 2022, PSE will first identify and work with community members to advise on the design process using information gathered via our Targeted DER RFP. During this community outreach, PSE will solicit input on expanding solar photovoltaic (PV) access and its 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 programs, including capital purchases. PSE, in consultation with stakeholders, like the EAG and community-based organizations, 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. 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 the year 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 identified later.

2023

In the beginning of 2023, PSE will scope 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 plans to file tariffs for Phase 1 programs to submit to the WUTC (see Figure 4-3 and DER Enablers — Strategy and Portfolio Planning).

By mid-2023, PSE will launch solar programs and implement an educational and outreach plan to educate and guide customers on how they can participate. PSE will begin registration and interconnection support for new systems. In late 2023, PSE will prioritize the minimum complex billing and CRM features required to support the roll out of the programs. PSE also will launch a customer enrollment and education portal to create a centralized landing page where customers can learn about the range of distributed solar and other programs available (see DER Enablers — Customer Enablement).

By the end of 2023, PSE plans to register 16.8 MW of nameplate distributed solar capacity. PSE will provide education through mass-market commercial and residential channels such as online, bill inserts, and partnerships with market actors. In partnership with community-based and non-profit organizations, PSE will educate targeted vulnerable populations, including income-eligible, through open houses, multilingual offerings, and bill inserts.

2024

In early 2024, PSE will launch additional CRM capabilities and billing features. PSE will continue registration and interconnection support for new systems throughout the year. 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).

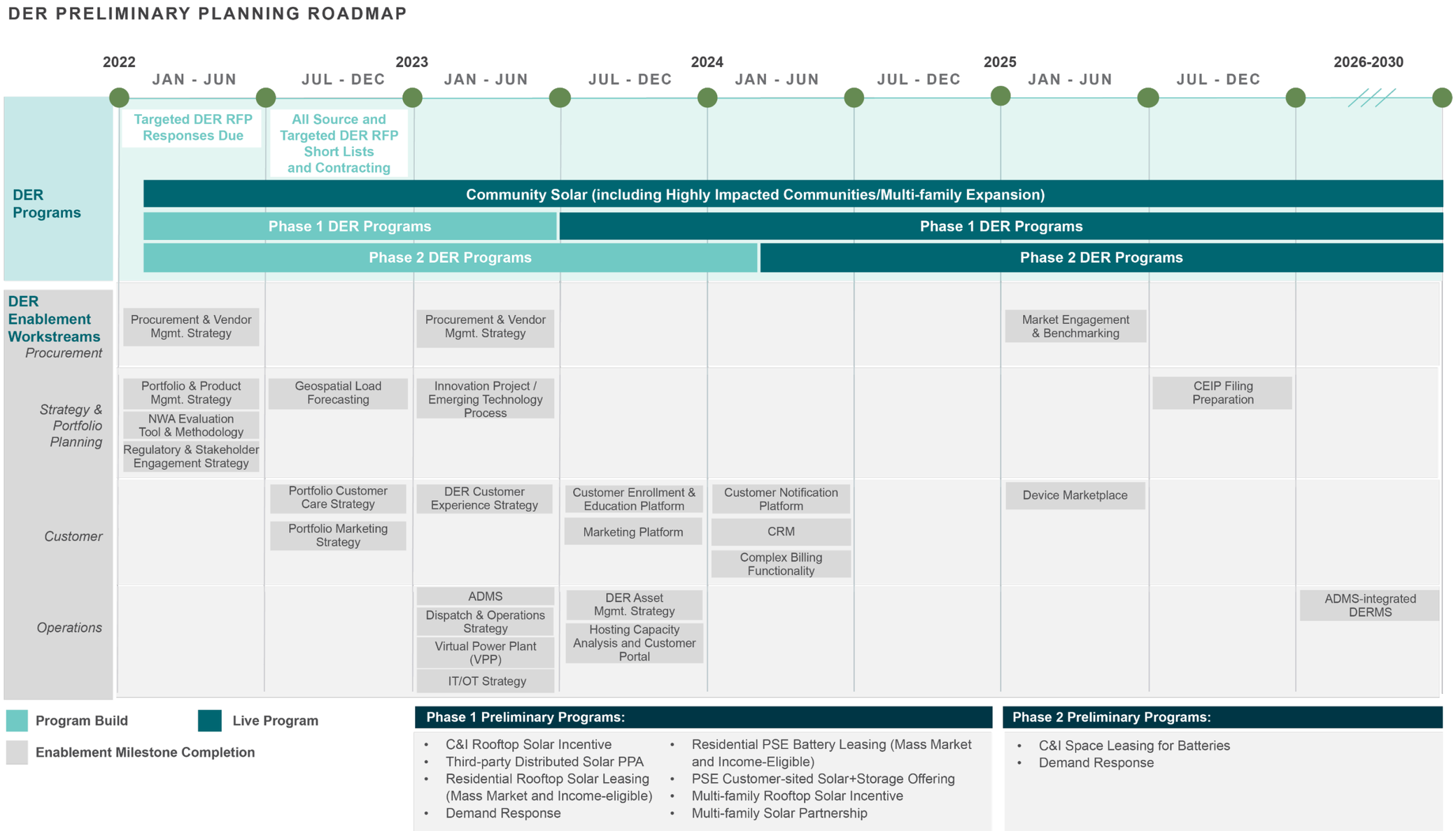
PSE plans to register 17.9 MW of nameplate distributed solar capacity in 2024. PSE will provide education through mass-market commercial and residential channels such as online, bill inserts, and partnerships with market actors. In partnership with community-based and non-profit organizations, PSE will educate targeted vulnerable populations, including income-eligible, through open houses, multilingual offerings, and bill inserts. PSE will also hold stakeholder feedback sessions with community organizations to help plan subsequent CEIP programs.

2025

PSE will continue registration and interconnection support for new systems throughout the year. PSE will launch the device marketplace in early 2025 to support more customers on their journey to adopting solar energy.

PSE plans to register 18.9 MW of nameplate distributed solar capacity in 2025. PSE will provide education through mass-market commercial and residential channels such as online, bill inserts, and partnerships with market actors. In partnership with community-based and non-profit organizations, PSE will educate targeted vulnerable populations, including income-eligible, through open houses, multilingual offerings, and bill inserts. We will conduct stakeholder feedback sessions with community organizations to help plan subsequent CEIP programs.

Figure 4-3: PSE's Preliminary DER Program Roadmap



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 Seven, Tracking and Reporting. PSE 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: 19,984 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 Two, 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 19,984 MWh of solar energy will be produced annually by project completion in 2025.

Customer Benefits

These programs provide customer benefits in energy, burden reduction, environmental, and health. The initial Community Solar Program with an income-eligible focus and 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 Licensed solar professionals. These programs will also result in reduced greenhouse gas emissions as PSE installs solar for clean energy generation, which contributes to improved air quality.

Annual Actions

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.

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-Wires Alternatives (NWA)

The total MW associated with this program over the next four years is: 22 MW

Non-Wires Alternatives Explained

The role of distributed energy resources (DER) in meeting system needs is changing, and the planning process is evolving to reflect that change. PSE now considers non-wires alternatives when developing solutions to transmission and distribution system long-term needs. The resources we study, including battery energy storage systems (BESS), solar generation, and targeted energy efficiency**,** address system deficiencies while supporting resource needs. Although we also consider demand response, it does not provide additional value since the demand response MW are system wide and are not included in the capacity studies to address local capacity concerns. We therefore excluded it from the capacity totals for the identified projects.

PSE has identified project-specific non-wires solutions to support the near-term integration of 22 MW of DERs. We will continue to validate the DER forecast to predict solutions that meet resource needs. We identified projects as NWA candidates suitable for non-wires alternatives given the magnitude of the system need, the expected cost of a traditional wired solution, and the timeframe to implement the solution before reaching the system's capacity limits. This section focuses on the projects under development that can incorporate non-wires alternatives to meet system needs, including the Bainbridge Island, the Issaquah Area Distribution Capacity, and the Sumner Area Distribution Capacity projects, as named in Attachment K.

How These Actions Move Us Closer to Meeting CETA Goals

These combined projects will bring additional battery storage and distributed solar generation to PSE's service territory to provide peak shaving and contribute to a lower system peak load through energy efficiency measures and demand response programs. These projects will defer the need for additional system upgrades, such as a new substation, for at least 10 years. These MWh from solar generation will bring PSE closer to our 80 percent goal by reducing the amount of additional generation needed to meet system load.

Customer Benefits

PSE customers benefit from battery storage, distributed solar generation, targeted energy efficiency, and demand response programs in three ways: increased resiliency, energy savings, and avoided infrastructure investment. The additional 10.1 MW of distributed energy storage in the system provides an annual benefit due to reduced purchases of frequency response energy from neighboring utilities. This benefit can save from $770,000 to $1,100,000 annually. BESS can also defer investment in a substation.

Track and Report on Progress, Costs, and Benefits

PSE will track battery operation and peak reduction benefits. PSE also will track demand response program participation and peak and energy reduction. PSE will track solar installation and customer participation rates. See Appendix L, CEIP Programs and Actions Master Table for more information.

Annual Actions

2021

For Bainbridge Island, PSE will complete an RFP process to select an Engineering, Procurement, and Construction (EPC) battery vendor. Upon executing a contract with the successful bidder, PSE will begin design of the battery energy storage system and PSE's interconnection facilities.

For Issaquah and Sumner Valley, PSE will complete the needs assessment and solutions study to determine the size, scope, and costs of the solution.

2022

For Bainbridge Island, PSE will prepare system impact and facilities studies to complete the Schedule 152 interconnection process. PSE will review and approve the battery storage system and interconnection facility designs at established milestones and start procuring long-lead or non-standard materials. PSE will submit land use and environmental permit applications and will apply to rezone the selected battery site from residential to business/industrial use. PSE will continue active public engagement throughout the project.

For Issaquah and Sumner Valley, PSE will engage in customer outreach to receive stakeholder feedback on project implementation. PSE technical leads will engage with solar and/or battery developers to develop technical specifications for the respective systems. PSE will complete an RFP to select the most cost-effective implementer. PSE will also begin scoping enhancements to the billing system to reflect monthly lease payments.

2023

For Bainbridge Island, PSE will review and approve the final engineering drawings, construction work plan, and safety plan. We will prepare the site and start equipment installation work. PSE or our consultant will participate in the factory acceptance test. We will prepare test plans and commissioning procedures.

For Issaquah and Sumner Valley, PSE will prepare system impact and facilities studies to complete the Schedule 152 interconnection process. PSE will review and approve the battery storage system and solar generation interconnection facility designs at established milestones and start procuring long-lead or non-standard materials. We will submit land use and environmental permit applications. PSE will begin implementing targeted energy efficiency measures in impacted areas and scoping demand response programs.

2024

For Bainbridge Island, PSE will complete equipment installation, on-site testing, final inspection, and connection.

For Issaquah and Sumner Valley, 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. PSE will complete equipment installation and participate in the factory acceptance test. We will prepare battery test plans and commissioning procedures. 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

For Issaquah and Sumner Valley, on-site testing, final inspection, and connection will be completed. PSE will also implement demand response programs to reduce peak demand in the impacted area.

Other PSE Programs and Actions

Battery Energy Storage Programs

Peak Capacity Contribution: 3.3 MW

Battery Energy Storage Programs Explained

The 2021 IRP preferred portfolio identified there would be 25 MW of distributed battery storage needed by 2025. PSE is committed to delivering DER programs 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 — directly from renewables or the grid during high-renewable times of the day — and reducing generation from higher-carbon peaker plants.

This section focuses on programs with battery energy storage that expand access and benefits of storage. Although we selected these programs to meet the 25 MW need identified in the IRP, PSE will continue to explore battery storage solutions for other applications, such as non-wires alternatives (refer to Chapter Four, Non-Wires Alternatives). See Figure 4-4 for a timeline of the introduction of storage programs. We propose battery storage programs to expand participation in the general and traditionally underserved populations. By identifying combinations of distributed energy resources with high customer benefit and low costs (see Chapter Three, Highly Impacted Communities and Vulnerable Populations, and Customer Benefit Indicators), PSE created a targeted, potential mix of distributed energy resources, including energy storage. These DERs encompass various ownership models, PSE, third-party, customer, and customer groups (e.g., residential, commercial). We will determine the final set of program designs based on the outcome of the Targeted DER RFP (see Chapter Four, Demand Response Specific Actions for more details). Refer to Chapter Two, Interim Targets and Specific Targets, CEIP Methodology, and Appendix D to learn more about how we selected these preferred portfolio concepts.

The anticipated battery storage programs are:

- **Residential PSE Battery Leasing** (mass-market and income-eligible): PSE will lease battery energy storage systems to residential customers. Customers will pay a small monthly fee for backup power services. For income-eligible customers, PSE will look to further reduce or eliminate fees to increase affordability and will also identify customers located in areas with higher outages and lower reliability. PSE seeks to use the batteries to manage system and local peaks.
- **PSE Customer-sited Solar+Storage Offering:** PSE will provide incentives to reduce cost barriers to storage and solar ownership and backup power from onsite storage will benefit customers. We may offer higher incentives to income-eligible customers. PSE will design incentives to promote customer charging and dispatch that aligns with system-side troughs and peaks.

- **Commercial and Industrial (C&I) Space Leasing for Batteries:** PSE will lease space from C&I customers to deploy battery storage with an option to provide backup power for customers for a small monthly fee. This storage program 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 with excess renewable generation. Batteries can then discharge during peak demand times. Storage solutions enhance how we integrate intermittent renewable energy generation and can help avoid or defer grid capacity upgrades. PSE anticipates a total 25.6 MW of storage capacity to offset peak demand needs.

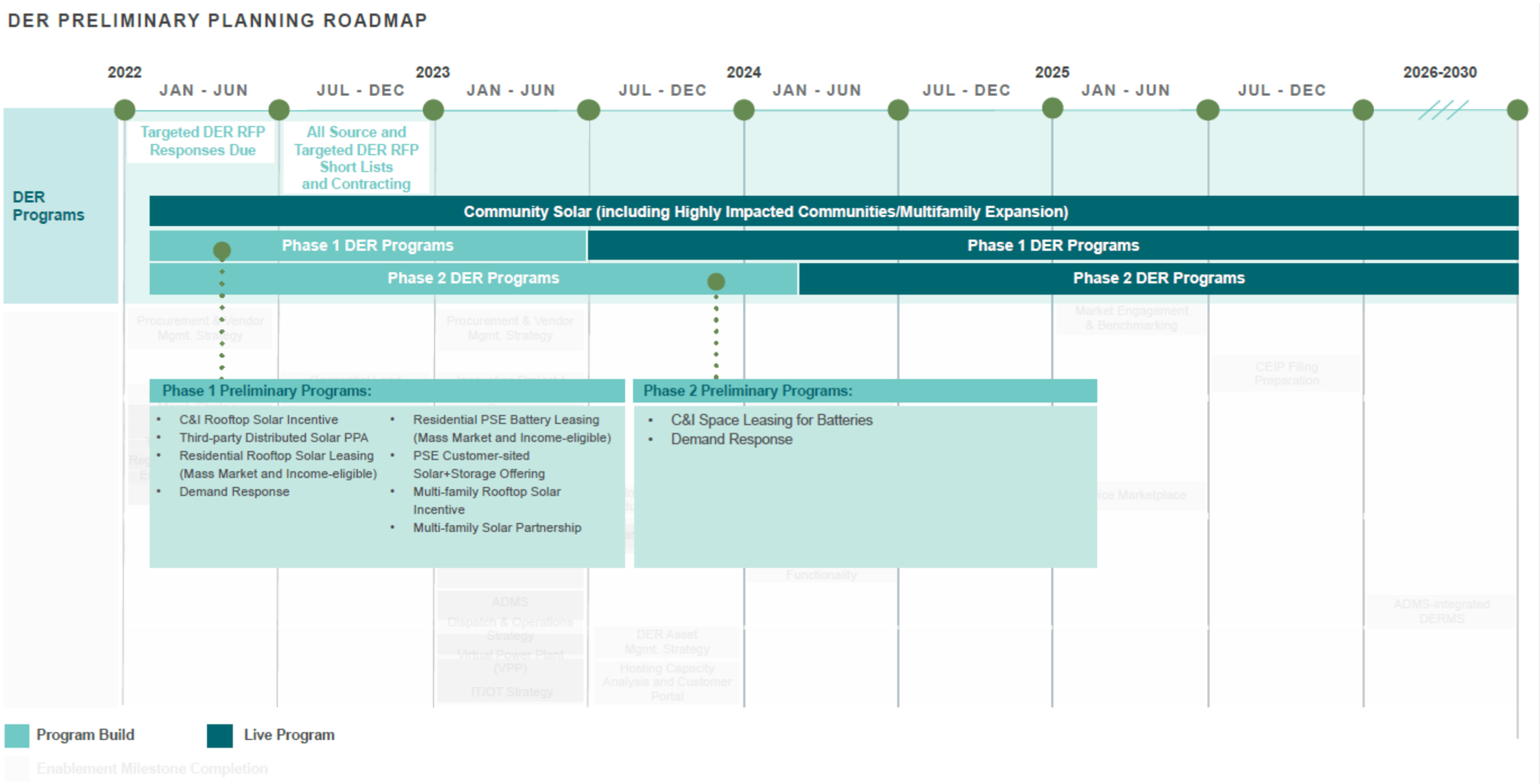
Customer Benefits

PSE seeks a diverse portfolio of distributed battery energy storage programs utilizing different ownership structures and marketing and outreach strategies that alleviate burdens affecting vulnerable populations and highly impacted communities. We designed the distributed battery energy storage portfolio to include targeted solutions that specifically address key vulnerable populations burdens including, but not limited to, energy burdens and individuals with socioeconomic burdens. Also, through PSE's enablement strategies discussed in DER Enablers — Operations Enablement, PSE intends to utilize the batteries for grid needs providing benefits to highly impacted communities where pollution burdens exist.

Behind-the-meter battery storage can provide vulnerable populations and highly impacted communities increased resiliency through backup power, which will decrease the time and duration of outages for participating customers, with sustained backup power when paired with solar. This increased resiliency mitigates risks (e.g., for medically vulnerable residents, emergency lighting and services, avoided carbon monoxide) and provides a range of benefits including minimizing food spoilage during prolonged outages and reducing interruptions to daily routines (e.g., work or childcare). The Residential PSE Battery Leasing program will seek to improve participation from income-eligible customers, along with increased levels of incentives in the PSE Customer-sited Solar+Storage Offering. In addition to increasing home comfort, these programs improve community health as an alternative to a diesel generator.

When batteries are charged by clean energy sources, they contribute to reduced greenhouse gas emissions when dispatched during peak hours, reducing the need for higher emissions peaker plants. The Solar+Battery program also contributes to reduced greenhouse gas emissions by supporting the adoption of solar for clean energy generation. Installing these devices supports an increase in clean energy jobs.

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



Annual Actions

2022

In 2022, PSE will identify and work with community members who can advise us on the programs using the results of our Targeted DER RFP. PSE will conduct community outreach and solicit input to expand battery energy storage access, address concerns about leasing programs, and seek benefits for 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.

Throughout 2022, PSE will work internally to develop the scope and costs of the programs. In consultation with stakeholders, like the EAG and community-based organizations, PSE will design a marketing and outreach plan for customer enrollment. PSE will also develop the interconnection requirements and processes to support these programs. We will establish program eligibility requirements and enrollment processes that maximize accessibility to a diverse set of customers.

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

2023

In early 2023, PSE plans to file tariffs for Phase 1 programs to submit to the WUTC (see DER Enablers — Strategy and Portfolio Planning).

PSE will develop dispatch operations and DER IT/OT strategy (see DER Enablers — Operations Enablement). PSE will implement a Virtual Power Plant (VPP) (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 incentive 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 the minimum complex billing and CRM features needed to support the roll out of these programs.

PSE will also file and submit to the WUTC Phase 2 programs including C&I space leasing for batteries (see DER Enablers — Strategy and Portfolio Planning). By the end of 2023, we plan to complete the billing enhancements and launch a customer enrollment and education portal to create a centralized landing page that helps customers learn about the range of distributed storage programs and other programs available (see DER Enablers — Customer Enablement).

PSE plans to register 4.8 MW of battery energy storage capacity from these programs in 2023. PSE will provide education through mass-market commercial and residential channels such as online, bill inserts, and partnerships with market actors. In partnership with community and non-profit organizations, PSE will educate targeted income-eligible populations through open houses, multilingual offerings, and bill inserts.

2024

In the first half of 2024, PSE will launch Phase 2 programs. PSE will add the C&I space leasing for batteries program to our customer enrollment and education portal. We will also launch additional CRM capabilities and billing features.

PSE plans to register 7.2 MW of battery energy storage capacity from these programs in 2024. PSE will provide education through mass-market commercial and residential channels such as online, bill inserts, and partnerships with market actors. In partnership with community and non-profit organizations, PSE will educate targeted income-eligible populations through open houses, multilingual offerings, and bill inserts. PSE will conduct stakeholder feedback sessions with community organizations to help plan subsequent CEIP programs.

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 battery energy storage and circulate educational material to reinforce favorable charging and dispatch behaviors.

PSE plans to register 13.6 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. In partnership with community and non-profit organizations, PSE will educate targeted income-eligible populations through open houses, multilingual offerings, and bill inserts. PSE will hold stakeholder feedback sessions with community organizations to help plan subsequent CEIP programs.

Track and Report on Progress, Costs, and Benefits

PSE 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 Seven,

Tracking and Reporting. PSE will report annually, starting in 2023 for Phase 1 programs and in 2024 for Phase 2 programs. See Appendix L, CEIP Programs and Actions Master Table.

Grid Modernization

The progress of the CEIP implementation and success of many of the programs and resources that will be implemented at the local distribution level depends on a strong modern grid. PSE has been pursuing clean energy development and DERs for many years. As far back as 2010, WUTC policy has focused on preparation and progress toward a smart grid that enabled elements outlined in this CEIP.[58] These elements include the advanced use 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, managing congestion, voltage control, operating reserves, and frequency regulation. Since 2010, further Commission policy guidance has highlighted a future cemented by CETA that encourages greater energy storage alternatives in planning processes, suggesting a future grid embrace this technology.[59] Anticipating the customers' desire in this space, PSE has been developing and advancing a modern grid, planning for, and investing in infrastructure that supports clean energy goals, and preparing for the transition.

PSE will continue to also focus on foundational tools such as advanced metering infrastructure (AMI), which are necessary to progress toward clean energy. We will make additional investments that include transmission capacity investments that comply with the North American Electric Reliability Corporation (NERC) reliability standards, which will be required to deliver the increased load and provide the flexibility and reliability that will be needed with the proliferation of DERs and electric vehicles. PSE's 2021 IRP, Chapter Eight, and Appendix M recognized the important investments in the grid to enable this transition and to avoid potentially costly and reactive expenditures to accommodate unanticipated growth in distributed energy resources, and the CEAP reaffirms the 10-year plan for the deliverability of resources. Because of PSE's proactive and programmatic approach to prepare for cleaner energy before CETA was enacted, the majority of PSE's planned grid modernization investments are not included specifically in this CEIP as incremental costs. However, it is important to note that without making these foundational grid modernization investments, the incremental cost of implementing CETA likely would be much higher with the potential for operational challenges.

We discuss investments that have been specifically accelerated or unique to progressing capabilities such as microgrids further in Chapter Four and Appendix E according to their allocation to the incremental cost.

[58] See WAC 480-100-505.

[59] See WUTC "Report and Policy Statement on Treatment of Energy Storage Technologies in Integrated Resource Planning and Resource Acquisition" UE-151069: https://www.utc.wa.gov/casedocket/2015/151069/docsets

Resource Enablement and Delivery

DER Enablers

Introduction

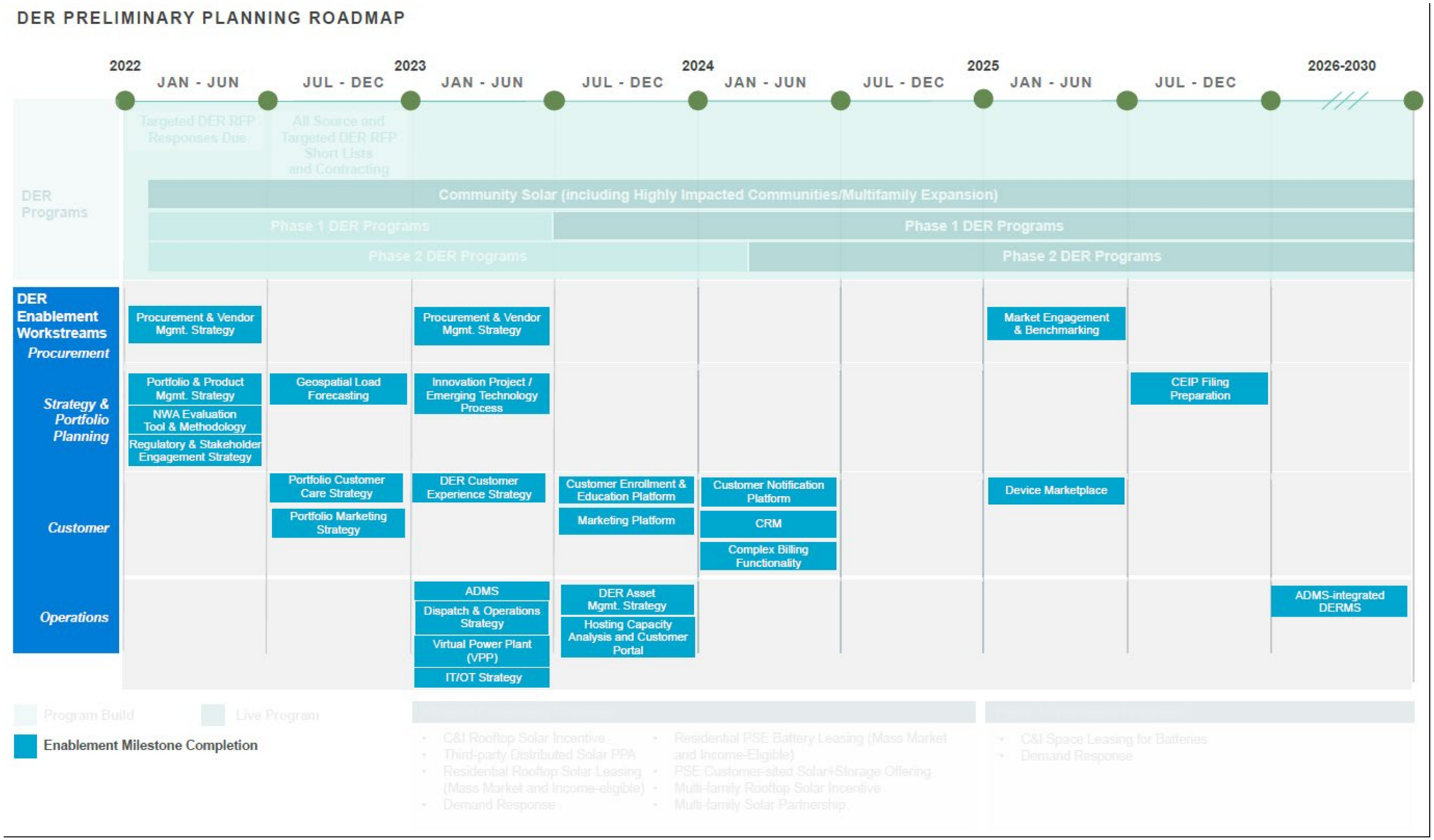
The Demand Response, Distributed Solar programs, and Battery Energy Storage programs sections describe the types of DER programs, actions, and proposed targets to support PSE's commitment to reducing emissions and meeting the Washington state mandate of 100 percent carbon-free electric supply by 2045. Achieving the proposed targets identified for the next four years requires a coordinated and highly cross-functional approach which aims to not only ensure the specific resource capacity is available when expected but also aim to scale these resources in a cost-effective way. To efficiently and effectively design, launch, and manage a portfolio of DER pilots and programs for the 2021 CEIP, PSE contracted a third-party consultant, West Monroe, to identify key enablers (e.g., activities and technologies) and construct a roadmap to support PSE in successfully meeting the DER targets. For more details on the development of this roadmap, please see Appendix D-7. A cohesive DER enablement roadmap that prioritizes a strategic foundation focused on efficient and streamlined functional processes, resources, and technological capabilities will allow us to accelerate the implementation and operation of DER programs and proactively leverage opportunities for operational efficiency that would not have been realized with a slower introduction of individual programs. Also, designing a positive customer experience where all our customers have access to and will benefit from the available distributed energy resource solutions requires a portfolio strategy and management approach to achieve the desired results. Successfully coordinating the initiatives prioritized in our DER enablement roadmap 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 efficiently.
- 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



DER Enabling Activity Set: 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 the 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.

- **Advances in technology 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

Four strategic actions 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) 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 when seeking 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 regulatory filings for specific programs to include different perspectives and feedback during program design. Representative activities addressed in this strategy will include:

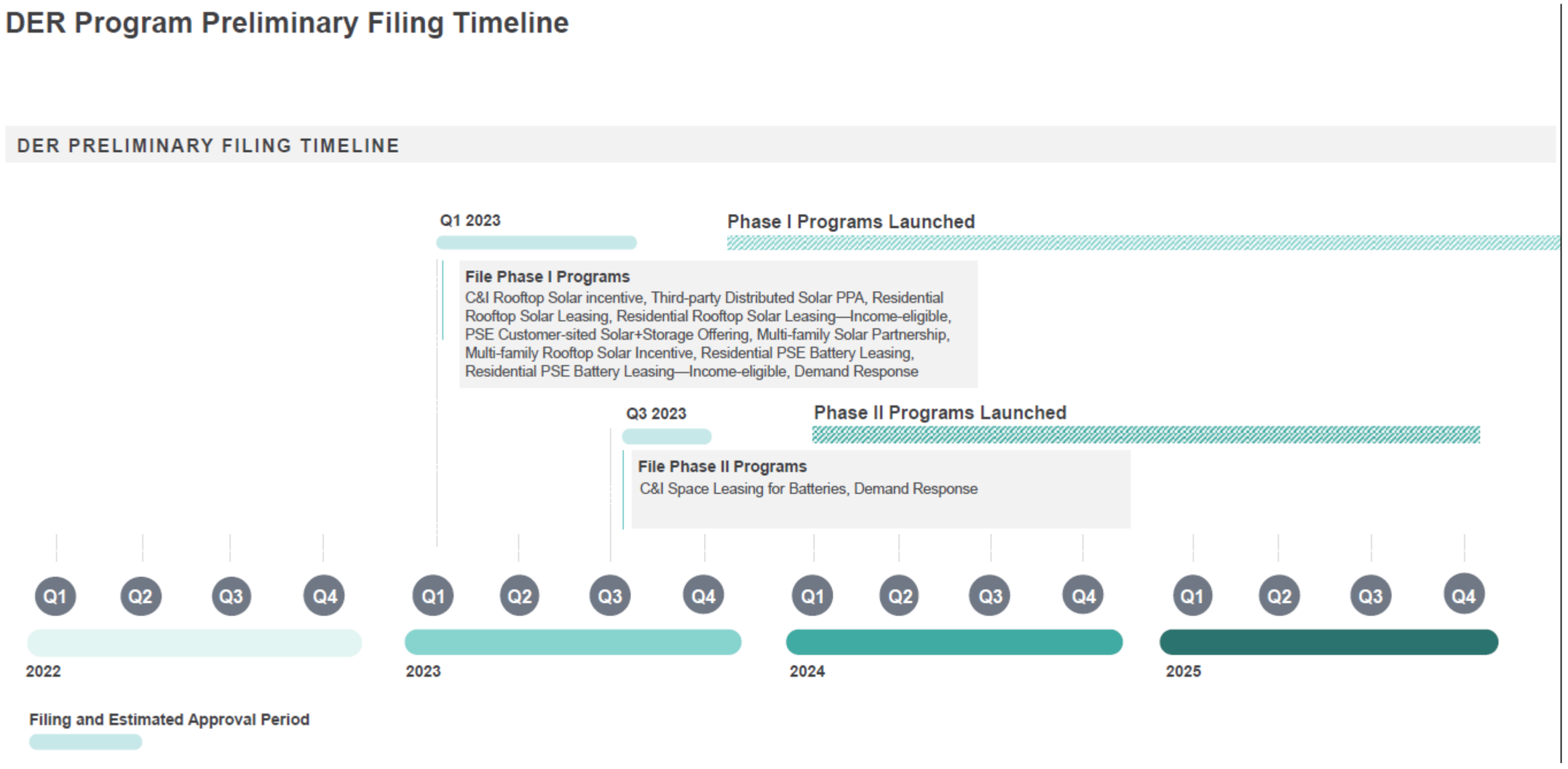
- Outline approach for stakeholder engagement, filing, and seeking approval of all CEIP DER programs. To assist with program review and engagement, we will group the filing process based on the suite of programs selected through the Targeted DER RFP process and operational dependencies as identified 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[60]



[60] Contingent upon Targeted DER RFP, vendor responses, and WUTC process and approvals.

Portfolio and Product Management Strategy: Managing an extensive portfolio of DER products and programs brings unique challenges and requires a plan. The planning process covers how PSE will organize and operate the portfolio, coordinate with vendors, and efficiently manage customer acquisition metrics, ensure the DER portfolio serves our intended purposes, and contributes to PSE energy and carbon-neutral goals. The plan will be adjusted over time to meet targets and objectives. The portfolio and product management strategy will validate that the programs and 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 for launched products.
- Seek out lessons learned as DER programs are launched and 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 must 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.

Supporting Technology, Tools, and Human Resources

PSE's DER portfolio planning approach will require the next generation of distribution planning tools to identify potential capacity constraints quickly and forecast more complex distribution load. 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 the Grid Modernization Strategy and Enablement section. These tools are summarized below.

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 business cost analysis tool to evaluate proposals effectively and quickly for non-wires 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.

Geospatial Load Forecasting: The proliferation of DERs driven by the CETA creates the need for PSE to plan systems to accommodate the upcoming DERs and decide what type of DERs we should install to replace fossil fuels and meet the CETA requirements. 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.

With the launch of multiple DER programs over the next four years, PSE also expects increased staff and additional external support will be necessary to help us define and execute the overall DER strategy and portfolio planning processes.

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.

- **Continually test and validate the effectiveness of our processes and functions to deploy and utilize available DER products and services.** PSE must be able to scale operational capabilities to install, enroll, interconnect, and otherwise acquire and activate the DER portfolio 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 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. DER solutions must be ready and able when called to meet grid 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 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 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 (planned and unplanned) and retirement processes.

- Implement and test system and data architecture needs identified by the 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 use 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 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 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 staff training. Also, determine rules of engagement with third-party vendors.
- 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 will 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 all aspects of activating, dispatching, and maintaining the DER assets (telecom, telemetry, VPP, Supervisory Control and Data Acquisition (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 in the previous section will prepare PSE to oversee a dispersed portfolio of intermittent resource solutions. These oversight processes are complex and will require complementary systematic solutions that allow easy and safe activation, quick decision-making, efficient issue monitoring and resolution, and intelligent reporting for measurement and verification settlements. PSE's solutions are described below:

Hosting Capacity Analysis, Map, and Customer Portal: Hosting capacity is the number of DERs 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 infeasible. PSE seeks to provide a snapshot of available DER capacity to customers and developers for planning purposes. 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.

Virtual Power Plant (VPP): A VPP is a software platform that provides visibility and control of DERs to help meet system peak capacity and energy needs. The VPP will enable monitoring, aggregation, forecasting, dispatch, and management of DERs.

Distributed Energy Resource Management System (DERMS): A DERMS is a platform by which DERs can be effectively monitored, managed, capabilities enabled, and optimized. When DERMS is integrated with ADMS, it allows full visibility to the system operator and allows safe and optimal dispatch to be coordinated with other operations activities.

Data Lake and Data Analytics: Data Lake and Analytics is the collection of and the accessibility to disparate data such as DER asset information, near real-time metering data, customer program participation, and detailed electric system asset information to enable new system operations and business processes that are based on analytics. Advanced operational and planning capabilities require significant enhancements to data availability and granularity. The rapid addition of DERs on the grid to support CETA targets require scaling these improvements to match pace with data tools to collect and use this information.

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 use outside services where appropriate to help us define the process, roles, responsibilities, and system requirements, build standards, engage third-party vendors, and conduct thorough testing of processes and logistics.

DER Enabling Activity Set: Procurement

PSE Work Stream Guiding Principles

Distributed energy resources, 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 learn about options available in our service territory and inform a well-designed Targeted 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 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 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 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.[61]

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

Actions to Support Launch and Operation of PSE's DER Portfolio

Creating and launching a suite of DER programs will require PSE procure goods and services to support the DER program portfolio. To accomplish this, PSE must 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

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

also seek suppliers and program designs that specifically address the needs of vulnerable populations. Developing a strategy will 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 such as performance guarantees, power purchase agreements, shared savings, and customer engagement models.
- 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 FOTM and BTM DERs (third-party PPA, third-party build, run, transfer ownership, or utility ownership from day one).
- 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.
- 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, Tools, and Human Resources

With the launch of multiple DER programs over the next four years, PSE expects an increase in staffing requirements to lead 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.

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 customer care strategy 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 Energy Advisors and Customer Service Representatives.
- Create a framework for identifying and offering program recommendations to customers such as digitally and through the 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 enrollment volume needed to meet our CEIP DER 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, identify opportunities for cross-promotion.
- Develop centralized source for vital DER program customer data, such as leads, interests, enrolled customers.

DER 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 up PSE 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, Tools, and Human 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.
- Analytics to support customer participation and product recommendations.

PSE has an existing customer relation management system, but it cannot provide the support necessary to support DER devices. PSE is allocating 50 percent of the cost of the CRM platform as incremental to CETA because we are replacing this system three to four years earlier than we otherwise would have to directly support these DERs on the system.

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 IT billing system upgrades 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 to benefit. 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 the existing device marketplaces currently available for energy efficiency to promote qualified DER solutions and contracting services. 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 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

2022

In the first half of 2022, PSE will execute various activities to develop the functional strategies identified in the DER Enablement Roadmap including defining holistic portfolio management, procurement, and vendor management approaches, establishing important requirements for testing and operating dispatch functions related to prioritized dispatch use cases, and a coordinated regulatory and stakeholder engagement strategy. PSE will finalize the VPP vendor selection and move forward with the design and execution of the VPP software platform.

In the middle of 2022, PSE expects to identify selected bidders from the Targeted DER RFP and begin necessary filing and implementation steps. During the same period, PSE will establish guidance on the preferred customer experience which will inform key expectations during vendor contract execution, specifically how to engage vulnerable populations. We will also consider guidance from the portfolio management, vendor management, asset, dispatch operations, and IT/OT strategies throughout the vendor contracting process.

By the end of 2022, PSE will evaluate and enhance current customer care processes and structures to prepare for the launch of DER programs in 2023–2024. PSE will also define key coordinated marketing strategies and customer acquisition goals for the coming program launches. During this period, PSE expects to have important planning tools enabled to support program and planning teams as they work with vendors on locational needs and constraints in program outreach, evaluating NWA, and methodology and geospatial load forecasting.

2023

At the beginning of 2023, PSE will file and seek approval of the Phase 1 DER programs as described in Figure 4-6. Throughout the first half of 2023, PSE will start enrollment for most of the proposed Distributed Solar, Distributed Storage, and Demand Response program concepts. PSE will also

coordinate the minimum CRM, complex billing, and customer notification platform features needed to support the roll out of the respective programs; initial capabilities will be live by the end of the year.

While PSE and the selected DER vendors are implementing enrollment processes and recruiting customers for the programs, PSE operations will implement identified processes, establish roles and responsibilities, test protocols, and standards to support asset maintenance and dispatch requirements. PSE will continue to execute the VPP platform and close out the project. PSE will plan, design, and execute the Hosting Capacity Analysis project. The HCA platform will consist of three deliverables: the hosting capacity analysis tool, hosting capacity map, and enhanced interconnection portal. We will also enhance and implement data management requirements for IT/OT systems to support the selected programs and important systems like the VPP.

By the end of 2023, PSE will engage an innovative project and emerging technology process to evaluate new forms of DER solutions and inform future enhancements to the DER portfolio. PSE will also file the Phase 2 DER programs as described in Figure 4-6 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

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. Key customer engagement technologies will be fully operational for ongoing program enrollment and education, lead management, and customer billing and notification operations. Augmented processes and training to support customer service functions will also be executed.

In the first half of the year, PSE will launch Phase 2 programs which includes C&I space leasing for batteries and additional DR programs based on the outcomes of the Targeted DER RFP. As the rest of the program portfolio is launched, PSE will refine processes and implement system improvements. We will apply continuous improvement methods to create efficiencies in operations and update responsibilities.

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.

Finally, PSE will perform a gap analysis and define appropriate enhancements to our current device marketplace solutions and include devices that support the DER portfolio. PSE 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. PSE will evaluate requirements and use cases for an ADMS-integrated DERMS solution to prepare for the next CEIP cycle. Throughout the year, PSE will 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, PSE will prepare the next CEIP using the outcomes of these significant strategic functions around portfolio management and stakeholder engagement. PSE 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 in 2025.

Enablement from Grid Modernization

Introduction

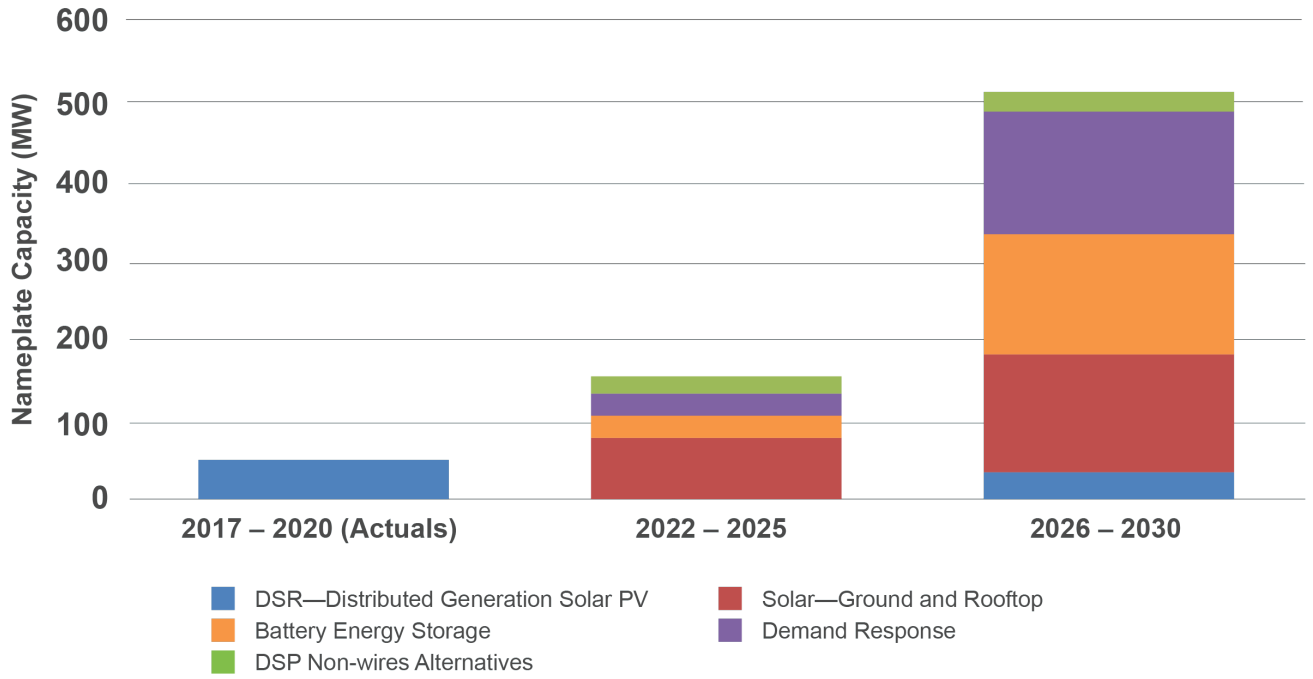
A result of this CEIP and the clean energy transformation, grid modernization has helped drive investments in the energy delivery system, including planning and operational tools, required to deliver energy to PSE's customers from the edge of PSE's territory and to support DERs within the delivery grid. PSE's Grid Modernization Strategy (Appendix G) identifies work needed to ensure we deliver safe, clean, reliable, resilient, smart, and flexible energy to customers. A grid and customers ready for DER integration will decrease the cost for interconnection and increase the number of viable DER sites. Proactive and foundational investments in grid modernization are critical to support integrating this clean resource and maximizing its benefits.

CEIP Allocation Methodology

There are a handful of tools and programs that PSE will use 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 will be needed by 2030. In total, 634 MW of distributed batteries, solar, and demand response will be needed in PSE's service territory by 2030. This is over 10 times the amount of DERs than the grid has accommodated over the last four years, a total of 52 MW as shown in Figure 4-7. PSE's grid modernization investments kept pace with the economic-driven customer adoption of DERs across the grid, however the pace of DERs driven specifically by the CETA law and resulting policies require acceleration to match the new pace. With a target of about 150 MW by 2025, we estimate this equates to about five percent (~55) of distribution circuits need to be ready to support high penetrations of DERs in the range of 2–5 MW per circuit. To ensure the grid can support this and continue to deliver reliable and resilient power to customers, PSE accelerated specific

investments: substation SCADA on DER high penetration circuits and more granular data analytics. We also identified new investments: resilience enhancement and circuit enablement that leads to microgrid effectiveness.

Figure 4-7: DER Resource Additions per CEAP



PSE Grid Modernization Guiding Principles

PSE's grid modernization investments drive capabilities that enable DERs including visibility, analysis, control, reliability, and resiliency, DER integration processes, security, cybersecurity and privacy, and grid sustainment.

- Visibility, analysis, and control is essential to maximize operational success
    - Data availability, integrity and granularity are critical aspects to planning for and operating DERs. Adding intelligence to the electric system allows for more automation and technology to save energy and improve customer experience. This added knowledge also increases the electric system and business flexibility which empowers customers to control their energy choices based on cost, carbon, or other preferences, and enables advanced operational options.
- Tolerance for an unreliable or less resilient grid will decrease with the localize resources due to growing dependency
    - PSE continues to prioritize and invest in the reliability and resiliency of the electric system. These objectives have become more important with customer's increasing dependence on

the electric system, growing needs for enhanced functions, and our drive to provide quality service.

- Integrate DER and processes will be expected to be easy and cost less over time
  - 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 will streamline the interconnection process for both customers and developers by prescreening applications.
- Security, cybersecurity, and privacy will require greater focus with increasing complexity of the grid and users.
  - While we pursue 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 that allow 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.
- Infrastructure alternatives will become more viable to meet core needs and sustain the grid
  - 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.

These capabilities are driven by guiding principles that encourage:

- Forward thinking —– Anticipate and drive solutions that enable a future where new sources of energy are renewable, and many are distributed.
- Customer focused —– Deliver flexible, segmented, and tailored value propositions that meet our customers' unique needs.
- Proactive —– Proactively identify trends, and influence regulatory and legislative policy such as performance-based rate making

- Flexible —– Be prepared for and deliver service through a variety of operating models for behind-the-meter assets.
- Transparent —– Be transparent about decision-making and processes in collaborations with external stakeholders and customers.
- Equitable —– Prioritize the principles of energy equity to enhance and align accessibility, affordability, and accountability in planning, design, decision-making, and implementation.

Actions to Support PSE's DER Portfolio: Grid Modernization Strategy

PSE worked on grid modernization strategies prior to the initiation of CETA in 2020. As a result, prior grid modernization efforts have helped establish momentum to support this and future CEIP targeted efforts.

Specific grid modernization investments that directly enable or support the brief listing of actions is provided below, including what actions were accelerated because of CETA and are reflected as incremental costs.

Accelerated Grid modernization investments:

Substation Supervisory Control and Data Acquisition (SCADA): Substation SCADA is a means of monitoring, protecting, and controlling various 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 hubs along with the smart breakers in the substation. There are several benefits of Substation SCADA, which include increasing use of distribution automation for improved reliability and resiliency, a customer benefit indicator desired by CETA, and the ability to operate and respond effectively to DER operations and the complexity that increases as more are added to a particular circuit or substation. Substation SCADA is also needed to advance the combination of these two benefits when we deploy microgrids. These capabilities are not possible without Substation SCADA.

Substation SCADA is an established proactive grid modernization program with a 14-year time frame anticipated to complete improvements on approximately 145 substations, paced by historical DER progress. This work will enhance the remaining substations that currently have no supervisory control, or voltage visibility to modern equipment including the functionality to support an increasing penetration of system devices to support DERs. The improvements include improved visibility to real and reactive power at the substation breaker equipment and enhanced protection equipment that will support reverse power flow protection at the substation and transfer trip capability.

Due to the high DER targets identified in the CEAP, the substation SCADA program was accelerated by six years from planned completion in 2035 to completion in 2029, allowing enough time to achieve the 2030 CETA requirements with higher DER penetration and demand response. To move completion up six years, PSE will need to upgrade 51 additional substations beyond the 30 that was originally

planned to be completed during the CEIP period, targeting upgrades to 81 substations. Consideration and priority of areas identified as named communities, about 35 percent of PSE's circuits are within these named communities, are included in this accelerated plan. Of the total 81 total substations improved in the 2022–2025 period, this includes 35 substations affecting named communities where PSE anticipates emphasis on resiliency, equity, and microgrids will be prioritized. If PSE focused solely on named communities and didn't accelerate this program, we may not be able to address needs across the remaining 65 percent of our circuits where significant DER penetration may occur, and reactive unplanned investments would be necessary.

Additional Grid Modernization Investments

Circuit Enablement — DERs and Microgrids: As the DER portfolio scales, the peak capacity output for DERs on a circuit will be constrained by existing grid infrastructure because the system does not accept high amounts of reverse power flow. PSE has identified the need to enable five percent of circuits (~55) for high DER penetration over the next five years. Voltage imbalances caused by DER production onto the grid impact reliability and power quality, which in turn limits available hosting capacity. Circuits were identified based on the available hosting capacity analysis and existing areas of higher DER penetration and resource potential and interest. The list of circuits will be refined after we complete the Targeted DER RFP process with the intent of enabling DERs where they maximize benefits as identified in the RFP and to minimize or avoid DER curtailment.

The DER and microgrid circuit enablement program 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. Aligned with CETA goals, there will be a focus on enabling DERs and microgrids in areas identified as Highly Impacted Communities and Vulnerable Populations (approximately 400 circuits identified). Of the 44 circuits planned for improvement in the 2022–2025 period, this includes enabling 11 circuits in Highly Impacted Communities and Vulnerable Populations.

Resilience Enhancement: The resilience enhancement program aims to implement proactive monitoring of the electric system to limit outage consequences and better manage the electrical system and improve radial feeder resilience with end-of-line generation. Efforts will include drone inspections to proactively identify high risk line assets needing replacement, distributed generation, and storage to support radial feeder improvements, and next generation transformer monitoring equipment. We will aim to fill the largest gaps in system monitoring to address the consequences of system outages – which improves- improving reliability. This effort directly supports the CETA goals and considers Highly Impacted Communities and Vulnerable Populations areas in its prioritizing with the express intent to improve resiliency to those areas. The 16 higher risk transformers identified based on this year's assessment includes upgrading 10 substation transformers in Highly Impacted Communities and Vulnerable Populations with next generation monitoring equipment.

Annual Actions

2022

PSE will continue community collaboration and design efforts on our Tenino High School microgrid project that includes integration of new grant work for solar and battery storage. Resilience enhancement efforts will focus on monitoring line assets, improving radial feeders (with the potential to support distributed generation), and transformer health monitoring. PSE will enhance SCADA capabilities at 8 substations.

2023

PSE will launch the Data Lake and Data Analytics program with IT/OT architecture to support current and future DER enabling technologies including Data Lake, enterprise service bus, and operational technology/control bus. PSE will develop business processes and tool enhancements that support timely and complete updates to GIS data as changes are made in the field and DER asset information becomes available. PSE will enable seven or eight circuits for up to 5 MW of DERs. Resilience enhancement efforts will monitor the electric system, with a specific focus on line assets, radial feeder improvements, and transformer health. PSE will enhance SCADA capabilities at 19 substations.

2024

PSE will implement the architecture and business processes and tools identified for the Data Lake and Data Analytics program. PSE will enable eight or nine circuits for up to 5 MW of DERs. Resilience enhancement efforts will continue to monitor the electric system to limit outage consequences and track the ongoing benefits to determine the effectiveness of the program. PSE will enhance SCADA capabilities at 27 substations.

2025

PSE will complete implementation of our Data Lake and Data Analytics architecture, processes, and tools. PSE will enable 12 circuits for up to 5 MW of DERs. Resilience enhancement efforts will continue to monitor the electric system to limit outage consequences and track the ongoing benefits to determine the effectiveness of the program. PSE will enhance SCADA capabilities at 27 substations.

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 and specifically modeled whether there is enough transmission capacity available to carry power from remote renewable resources to PSE's service territory (2021 IRP, Chapter Five and Appendix J). The IRP recognized that we would need to work to optimize use of our 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. PSE's 2021 IRP 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. The IRP 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 Eight, Sensitivity C).

Delivery system transmission improvements are discussed in 2021 IRP, Chapter Eight and Appendix M and in the Grid Modernization section.

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[62], 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. The MWh 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 MW of solar will be added by mid-2022.

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 to meet system load, which decreases the amount of greenhouse gas emitted by PSE resources. A decrease in greenhouse gas emissions is also linked to improving the outdoor air quality for customers.

Annual Actions

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 from a PSE energy advisor. Where applicable, PSE may enter an agreement to purchase the RECs from the project to contribute to our voluntary renewable 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.

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, 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

[62] RCW 19.405.020(36)

providing 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). PSE began receiving renewable energy delivered to our system from the Lund Hill Solar PPA on March 1, 2021. We expect the 150 MW Lund Hill Solar project to achieve full commercial operation in 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 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[63]. 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 delivered to PSE's system. Future phases of the program will depend on the costs and benefits to 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.

Customer Benefits

The Green Direct program reduces greenhouse gas emissions by deploying new, additional renewable energy resources that deliver energy and renewable energy credits (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.

[63] RCW 19.405.020(36)

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.

Annual Actions

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 a Request for Information (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.

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). Customers 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 our 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. Excess monthly credit is rolled forward to the following month until March 31 annually, when "banked" net metering credit is reset to zero.

PSE will file a successor tariff with the WUTC before PSE's net metered systems reach the cumulative capacity of 179 MW, or June 30, 2029, whichever comes first.

How These Actions Move Us Closer to Meeting CETA Goals

This program brings additional renewable solar generation to PSE's service territory. This new solar power reduces the load required to meet peak capacity need and 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 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.

Customer Benefits

This program provides environmental customer benefits. 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 and provides jobs and an economic benefit to the community.

Annual Actions

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 from an Energy Advisor. PSE also provides referrals to qualified solar installation contractors.

PSE anticipates interconnecting an additional 15–20 MW of customer-owned, net-metered systems in 2022–2023.

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 from an Energy Advisor. PSE also provides referrals to qualified solar installation contractors. PSE anticipates connecting an additional 15–20 MW of customer-owned, net-metered systems in 2024.

PSE will enroll new customer-owned systems into a WUTC approved successor tariff if we reach the four percent of 1996 electric loads net metering threshold, or 179 MW of cumulative capacity.

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 will 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 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 up to $750,000, in amounts up to $100,000 per project.

More than 75,000 PSE customers chose to support renewable energy by participating in PSE's Green Power and Solar Choice programs. These programs now support 590,000 MWh of renewable energy generated annually in Washington, Oregon, and Idaho through the purchase of Green-e Certified 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 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 reduce the energy burden for low-income and BIPOC customers and the organizations that serve them.

Customer Benefits

This program provides customer benefits in the areas of burden reduction in named communities and 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. The program also allows highly impacted communities and vulnerable populations to actively participate in clean energy.

Annual Actions

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 reach out to eligible organizations and tribal governments to choose grant recipients. In addition, PSE will alert licensed solar professionals in PSE's Contractor Alliance Network. Customers and organizations can learn more at PSE.com/greenpowergrant.

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 Cost

Chapter Five: Cost

To shift electric supply to clean generation by 2045, PSE needs to acquire significant resources in the near term to meet our obligations to provide affordable electricity, and an electric supply that benefits customers and reduces burdens on vulnerable customers. Achieving the specific targets and other requirements to meet the Clean Energy Transformation Act's (CETA) 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. Building a carbon-neutral direction for PSE's portfolio comes at a cost. The forecasted cost of the actions in this plan are $450 million 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 two-percent average annual rate increase.

PSE considers the costs of achieving CETA's targets as groupings of related investments; each supports 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. Given PSE's electric supply today, PSE anticipates needing to make significant investments in clean energy activities in this implementation period equal to approximately a two-percent rate increase per year to meet the specific and interim targets in this CEIP.

Table 5-1 lists the primary investment categories and examples of the kind of specific investments PSE needs 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 Demand Response Program development, operation, and customer incentives Power Purchase Agreements for renewable energy or emissions-free capacity Purchase renewable resources of emission-free capacity sources Operation of energy resources, including large scale and distributed resources
Resource Enablement and Delivery	Distributed Energy Resource design actions and tools Transmission capacity to deliver new resources Grid modernization to support distributed energy resources Grid operations to incorporate distributed energy resources Operations of distributed energy resources
Customer Education and Engagement	Detailed program design and customer enrollment Customer education and engagement on the clean energy transition

Investment Category	Examples of Specific Investments
Administration and Monitoring	Measuring customer benefit indicators Tracking and reporting

The investment profile 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 may change in future CEIPs.

Directly Attributable Activities

We identify activities directly attributable to pursuing the 2030 and 2045 standards based on those necessary to support the 2022–2025 CEIP. These activities are consistent with the conditions described in WAC 480-100-660.

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 amounts or implementation timing due to CETA; an example of this is energy efficiency. The portfolio without CETA included energy efficiency, but when we added the requirements of CETA, we gained significantly more energy efficiency, which is reflected in our 2022–2023 Biennial Conservation Plan.

To identify incremental activities, PSE compared the energy resource portfolios included in this CEIP to a generic resource portfolio that AURORA selected without CETA. We included the social cost of greenhouse gas emissions in both portfolios, and explain the methodology and additional details later in this chapter. We provide the four-year summary of these portfolios below.

Incremental Cost

This section describes how we calculated the incremental cost for each CETA-related investment contributing to the incremental cost.

This section uses the terminology “baseline portfolio” and “CEIP portfolio.” The baseline portfolio[64] is the portfolio of generic resources selected by the model in a lowest reasonable cost analysis that does not include the requirement to comply with the clean energy standards set forth in RCW 19.405.040 or 19.405.050. The CEIP portfolio is the portfolio in this plan that considers the need to meet RCW 19.405.040 or 19.405.050. Both portfolios include the social cost of greenhouse gas emissions in the modeling analysis, as described below.

Incorporating the Social Cost of Carbon

[64] 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)]

CETA requires utilities incorporate the social cost of greenhouse gas emissions (SCGHG) as a cost adder when developing IRPs and clean energy action plans and when evaluating and selecting intermediate-term and long-term resource options[65]. PSE applies the cost adder by first estimating the amount of pollution a power plant will emit, then multiplying by the SCGHG as specified by the WUTC. This means the total cost of a resource has two components. First are the direct costs, including capital to build the plant, fuel to run it, and operations and maintenance expense to keep it operating. The second component of total cost is the externality cost of pollution — it is called an externality because it is not internal to the utility's cost structure. When we develop a lowest reasonable cost portfolio, PSE includes both the direct and externality costs to estimate the cost of all fossil fuel generation.

Figure 5-1: Total Cost Equation

Total Cost = Direct Cost + Externality Cost

CETA requires utilities to consider SCGHG when deciding whether to acquire a resource, not as a variable cost in deciding whether to run a unit once it has been acquired. PSE's portfolio modeling relies on a total cost of a resource to meet both hourly loads and peaks and does not rely on the levelized cost of energy (LCOE) for modeling resource additions and retirements. A full explanation of how the portfolio evaluates total resource costs is included in the 2021 IRP, Appendix G. Therefore, PSE forecasts the total cost of fossil fuel generation under CETA which requires a two-step approach:

1. Estimate Direct Costs: Forecast fixed and variable operating costs based on economic dispatch of the fossil fuel plant. This must be based on how the unit is expected to dispatch. The analysis reflects all internal costs. It also provides a forecast of greenhouse gas pollution that will be emitted (in tons) by that expected operation.

2. Estimate Externality Costs: From step 1, apply the SCGHG to the tons of emissions, based on how we expect the plant operate.

During development of the 2021 IRP, stakeholders requested PSE examine the implications of reflecting the SCGHG as a dispatch cost, rather than as an externality adder. Doing so understates the amount of greenhouse gas pollution that will be emitted. This bias will make fossil fuel plants appear more cost effective than appropriate, i.e., this methodology encourages utilities to acquire fossil fuel plants. Table 5-2 compares the total cost of a combined cycle gas plant under two scenarios. The first scenario uses the two-step process, where the gas plant is economically dispatched as it will be, without the SCGHG as a variable cost. We add the externality costs of the resulting pollution based on expected consumption of fossil fuel. Scenario 2 includes the social cost of carbon as a dispatch cost, or cost penalty to dispatch. The costs are from the portfolio model and used for the resource evaluations. Table 5-2 compares the results of the two scenarios. Scenario 1 is how the plant would operate.

[65] See RCW 19.280.030

Scenario 2 shows a much lower dispatch, which means lower fuel costs and lower pollution cost. Logically, these are not equally valid cases — Scenario 1 represents how the plant will operate. This example illustrates if PSE incorporated the SCGHG in economic dispatch for making resource decisions — but not in operation — natural gas plants would look lower cost than they will in operation. Incorrectly applying the SCGHG as a dispatch cost understates greenhouse gas emissions by nearly 60 percent. In total, this approach makes base load gas plants appear 20 percent less expensive than they will in actual operation. PSE believes such an artificial bias toward fossil fuel plants is clearly inconsistent with the need to reduce GHG emissions and contrary to the intent of CETA.

Table 5-2: SCGHG as a Dispatch Cost Artificially Makes Gas Plants Appear More Cost Effective

	Scenario 1	Scenario 2	Comparisons	
Direct Costs	Cost and Emission Forecasts based on Expected Operation	Cost and Emission treating SCGHG as Dispatch Cost	Direct Cost Understated	%
Levelized Capital $ (Gas CCCT)	$85,511,000	$85,511,000	$ -	0%
Fuel Cost	$22,406,810	$10,277,184	$(12,129,626)	-54%
All Other O&M	$ 83,172,706	$78,799,839	$(4,372,867)	-5%
(a) Direct Cost of Operation	$191,090,516	$ 174,588,023	$(16,502,494)	-9%

Externality Costs			Externality Understated	%
Emissions (tons)	637,920 Tons	272,455 Tons	(365,465)	-57%
SCGHG ($/ton)	$89.17/Ton	$89.17/Ton		
(b) Externality Costs	$56,883,799	$24,295,000	$(32,588,799)	-57%

			Total Cost Understated	%
Total Costs (a) + (b)	$247,974,316	$198,883,023	$(49,091,293)	-20%

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.

Energy Efficiency: Energy efficiency has a four-year incremental cost of $150,279,000. We calculated incremental costs based on the average cost of savings in the 2022–2023 Biennial Conservation Plan (BCP) and multiplied them by the increased amount of energy efficiency in the CEIP portfolio vs. the baseline portfolio. For example, assuming that the unit cost per savings from the BCP is $100/MWh,

and the energy efficiency level in the CEIP portfolio is 10,000 MWh above that of the baseline portfolio, then the incremental cost in this scenario will be $100 times 10,000, which equals $1,000,000. We allocated the amount of energy efficiency based on the EIA target setting method, which took 20 percent of the total 10-year savings in IRP plus five percent decoupling commitment. We provide more information on energy efficiency costs in Appendix E.

Demand Response: Demand response has a four-year incremental cost of $4,080,003. We based these costs on the generic program costs included in PSE's most recent conservation potential assessment. We calculated incremental costs based on the difference between program costs for the demand response amounts in the baseline and CEIP portfolios. The program costs were prorated based on the forecast demand response targets in the baseline and CEIP portfolios, which represented the total energy level of all the active demand response programs selected in each portfolio. For example, assuming that the target of the baseline is 30 percent of that in the CEIP portfolio, and the cost of the CEIP portfolio is $10 million based on Aurora output, then the cost of the baseline portfolio will be 30 percent of $10 million. The incremental cost in this scenario will be $10 million minus $3 million ($10 million times 30 percent), which equals $7 million. We provide more information on demand response costs in Appendix E and Appendix F.

We will identify updated costs when we choose specific resources and programs from the 2021 All-Source, and the 2022 Targeted DER RFPs. We will incorporate these selected resources and their associated resource and program costs in the 2023 IRP progress report and 2023 biennial CEIP update.

Energy Supply Portfolio, including Generation Resources and Storage: Energy Supply Portfolio has a four-year incremental cost of $200,840,460. 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. The approach for specific resources is described in the following sections.

Renewable Energy: A wide range of activities contribute renewable energy to PSE’s energy supply portfolio, as we discuss in Chapter Four.

PSE used several sources of cost data for renewable energy programs to develop this CEIP. For large-scale generating resources, we used NREL’s most recent Annual Technology Baseline (ATB) report cost assumptions, which are included in Appendix A.

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. 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.

We will identify updated costs when we choose specific resources and programs from the 2021 All-Source, and the 2022 Targeted DER RFPs. We will incorporate these selected resources and their associated resource and program costs in the 2023 IRP progress report and 2023 biennial CEIP update.

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 K and Appendix E.

We will identify updated costs when we select specific resources and programs from the responses to our 2021 All-Source, and the 2022 Targeted DER RFPs. We will incorporate these selected resources and their associated resource and program costs in the 2023 IRP progress report and 2023 biennial CEIP updates.

Resource Enablement and Delivery

DER Enabling Systems: In Chapter Four 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 the time covered by this 2021 CEIP, 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 relies on the transmission costs used in the 2021 IRP. 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. As we select specific resources through the 2021 All-Source and 2022 Targeted DER RFPs process, we will detail revised enablement and transmission costs in the 2023 IRP progress report and biennial CEIP update.

Grid Modernization Costs: The CEAP, based on the 2021 IRP preferred portfolio, identified a significant number of DERs needed by 2030 to cost-effectively implement the goals of CETA. In total, 634 MW of distributed batteries, solar, and demand response are needed within PSE's service territory by 2030. In the CEIP, we set a target of 105 MW of distributed resources; this is over two times the 52 MW of DERs that PSE has integrated into the grid over the last four years. PSE's grid modernization investments were keeping pace with the economic driven customer adoption of DERs across the grid,

but the pace of DERs driven specifically by the CETA law and policies necessitate an acceleration of some programs.

This CEIP sets specific distributed energy resource targets in Chapter Two and outlines related grid modernization activities in Chapter Four. These related grid modernization activities are 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 will need to support over the next 10 years, PSE must accelerate portions of grid modernization investments to match that pace. The overall target over the next five years is to enable five percent of distribution circuits (~55) to be ready to support high penetrations of DERs in the range of 2–5 MW 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 substation control and data acquisition (SCADA) system equipment at substations to support DER high penetration circuits, increasing work plan by over 60 percent over the historical pace.
- Enhancing circuit visibility and control by installing additional voltage regulation and automated circuit switching equipment on DER high penetration circuits; we added 100 percent of this work plan to address the consequences of this penetration.
- Enhancing access to gathered data to drive analysis and process for many operational tools and investment decisions, increasing focus by 50 percent. Enhancing resilience focused on proactive, high-risk grid monitoring and associated DER microgrid installations to enable alternate sources of power for customers with limited grid flexibility, increasing work plan by 70 percent to focus more aggressively on these valuable customer benefits.

There are grid modernization tools and associated costs that are critical to CEIP implementation but are not included as incremental costs because they are investments that PSE will make to improve systems regardless of CETA requirements. For example, transmission capacity investments in compliance with the North American Electric Reliability Corporation (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.

PSE's 2021 IRP, Chapter Eight 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[66]. The CEAP reaffirms the 10-year plan for the deliverability of

[66] RCW 19.280.100(2)(e)

resources[67]. 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 2021 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 actual incremental costs for this CEIP.

Customer Management Costs

Implementation of CETA requires a range of customer programs and administrative functions.

Customer Education and Engagement. CETA creates significant new requirements for customer education and engagement to support customer benefit indicators[68], in the development of the CEIP[69], implementation of the plan[70], and through customer notices[71]. 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 include it in Appendix E.

Summary of Incremental Cost Projection

We summarize the incremental cost of the actions in this plan compared to the baseline portfolio in Table 5-3. 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.

[67] 2021 IRP; pg. 2-20
[68] WAC 480-100-640(4)(c)
[69] WAC 480-100-655(2)
[70] WAC 480-100-655(2)
[71] WAC 480-100-655(3)

Table 5-3: Incremental Cost Summary

			2022	2023	2024	2025	2022–25 Incremental Cost	Percent Forecast
Estimated Incremental Cost Calculation ($000)								
Energy Efficiency								
No CETA Requirements	662,048	MWh through 2025	$64,352	$64,352	$64,352	$64,352		
With CETA Requirements	*1,048,831*	MWh through 2025	$101,922	$101,922	$101,922	$101,922		
Incremental Cost			$37,570	$37,570	$37,570	$37,570	$150,279	33%
Demand Response								
No CETA Requirements	7	MW by 2025	$100	$296	$365	$915		
With CETA Requirements	24	MW by 2025	$342	$1,018	$1,253	$3,142		
Incremental Cost			$242	$722	$888	$2,228	$4,080	1%
Energy Supply Portfolio								
No CETA Requirements	1081	aMW in 2025	$561,731	$588,959	$586,771	$585,728		
With CETA Requirements	1316	aMW in 2025	$562,142	$600,124	$661,577	$700,186		
Incremental Cost			$412	$11,165	$74,806	$114,458	$200,840	45%
Technology and Enabling Costs for Distributed Energy Resources								
No CETA Requirements			$135,957	$258,264	$307,597	$320,903		
With CETA Requirements			$146,728	$305,044	$358,249	$376,526		
Incremental Cost[72]			$4,075	$10,785	$16,969	$23,321	$55,150	12%
Customer Education and Outreach								
No CETA Requirements								
With CETA Requirements			$960	$9,830	$10,215	$10,406	$31,410	
Incremental Cost			$960	$9,830	$10,215	$10,406	$31,410	7%
Administration and Reporting								
No CETA Requirements								

[72] The incremental cost of DER enablements and Grid Mod is not calculated as the delta between No-CETA and With-CETA requirements. These two requirements capture the capital costs from a budget view, while the incremental cost is in revenue requirement view. The values can be seen in Appendix E.

With CETA Requirements			$2,058	$2,110	$2,162	$2,162	$8,547	
Incremental Cost			$2,058	$2,110	$2,162	$2,162	$8,547	2%
Total Cost			**$814,151**	**$1,020,048**	**$1,135,379**	**$1,194,399**		
Total Incremental Cost Forecast			**$45,317**	**$72,182**	**$142,611**	**$190,198**	$450,306	100%

Calculation of Annual Threshold Amount

WAC 480-100-660 (2) specifies the means to identify the annual threshold amount, which is used to determine 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:

$$Annual\ Threshold\ Amount = \frac{(WASR_0 \times 2\% \times 4) + (WASR_1 \times 2\% \times 3) + (WASR_2 \times 2\% \times 2) + (WASR_3 \times 2\%)}{4}$$

This calculation shows the annual threshold amount increases two percent above the previous year's spending and compounds over the four-year period. 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, we assume weather-adjusted sales revenue will rise at an inflation rate of 2.5 percent per year.

Many factors affect weather-adjusted sales revenue, including changes in sales volumes unrelated 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 variations. PSE does not control these factors, so it is impossible to forecast weather-adjusted sales revenue accurately. PSE will track actual costs and weather-adjusted sales revenues during the implementation period.

Table 5-4: Calculation of Annual Threshold Amount and Comparison to Incremental Cost

		2021	2022	2023	2024	2025
Calculation of Estimated 2 Percent in Weather-adjusted Sales Revenue ($000)						
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 2 percent Annual Increase in Weather-Adjusted Sales Revenue			--	$815	$1,651	$2,507
Estimated 2% Annual Increase in Weather-adjusted Sales Revenue			$40,761	$42,595	$44,475	$46.402
Cumulative Estimated 2% Annual Increase in Weather-adjusted Sales Revenue			$40,761	$83,356	$127,832	$174,234
Comparison of Forecast Incremental Cost and Estimated 2% Increase in Weather-adjusted Sales Revenue						
Estimated Incremental Cost			**$45,3117**	**$72,182**	**$142,611**	**$190,198**
Annual Comparison to 2% threshold value			**$4,556**	**-$11,174**	**$14,779**	**$15,964**
Cumulative			**$4,556**	**-$6,619**	**$8,160**	**$24,124**

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 increased public engagement, performed it quickly, and all during the COVID19 pandemic. PSE broadened outreach to include:

- Engaging and consulting with 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 Overview

Goals for CEIP development

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 describes the phases and public participation activities for development of the CEIP and Figure 6-2 highlights the roadmap PSE used to engage stakeholders to develop the 2021 draft CEIP.

The public participation goals and objectives related to developing the CEIP 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 (referred to as Named Communities[73])
- Analysis of actions, targets, programs, and expected outcomes
- Implementation approach

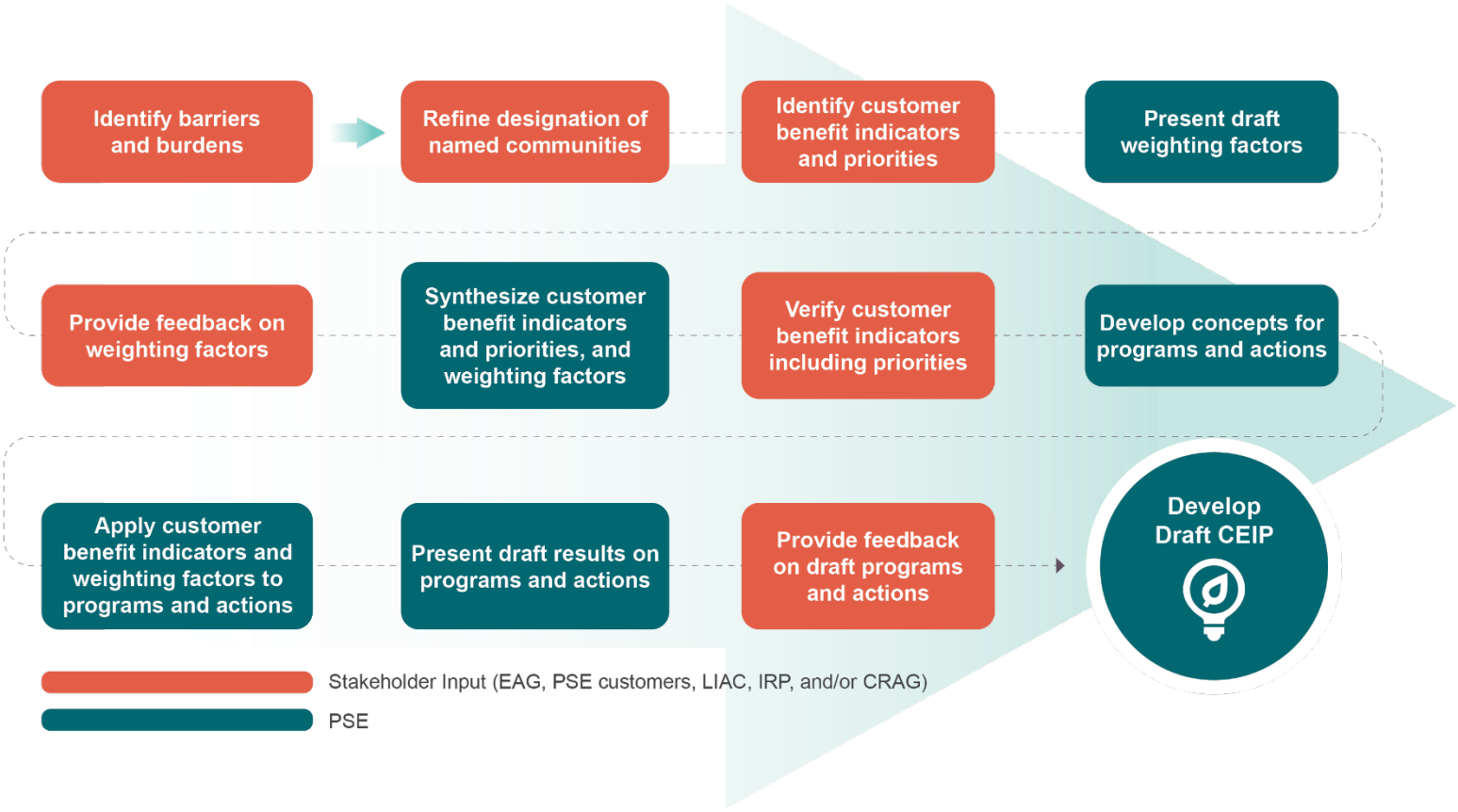
- Be clear and transparent about:
  - Comments heard and how they affected the outcome
- Build relationships with:
  - Community-based organizations (CBO) with emphasis on vulnerable populations and highly impacted communities
- Engage expertise of:
  - Equity Advisory Group (EAG) and other PSE advisory groups
- Evaluate:
  - Public participation process

[73]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 Three, Highly Impacted Communities and Vulnerable Populations, and Customer Benefit Indicators.

Figure 6-1: Public Participation Phases and Activities for Developing the Draft and Final CEIP

Apr-Sept 2021	Oct-Dec 2021
Develop CEIP with public participation focused on equity	**Solicit comments on draft CEIP**
Public participation objectives	
Collect input on: • Clean energy values • Customer benefit interests and priorities • Ideas to advance equity	**Compile and respond to feedback on CEIP, including:** • Analysis of actions, targets, and expected outcomes • Proposed approach to clean electricity implementation
Comment collection activities	
• Survey • Project website • Bill inserts (May) • Go-to-you meetings with CBOs • Multilingual sessions	• Online open house with a survey to collect feedback on the draft CEIP* • Continued outreach to CBOs • Bill inserts (October)
PSE Advisory Group activities	
• Convene Equity Advisory Group (EAG) • Engage with EAG on draft CEIP components, including vulnerable population factors, customer benefit indicators, inclusive outreach activities, and program design guidance • Engage other advisory groups on customer benefit indicators and draft CEIP components	• Solicit input from advisory groups on draft CEIP • Encourage participation in the online open house
Information sharing tools* (throughout project)	
• Project website • Fact sheet and flyers • E-newsletters • Social media • Targeted advertising • Targeted emails	• Bill inserts • Briefings • Responding to inquiries via website, email, phone • Employee communications • Partner toolkit • Press releases

Figure 6-2: CEIP Stakeholder Engagement Process



Audiences

PSE engaged customers, advisory groups, tribal governments, and others to develop the CEIP. PSE engaged the audiences outlined in Table 6-1 in the public participation process based on their role for the CEIP.

Table 6-1: Audiences and Roles

Audiences	Focus/Role	Role for CEIP
Equity Advisory Group (EAG)	New advisory group as defined by CETA planning regulations	Provide input to shape: Understanding of burdens, barriers, and opportunities for clean energy transition Public participation, specifically for outreach to named communities Customer benefit indicators, specifically on energy and non-energy benefits and burden reductions to named communities Defining vulnerable population factors Draft programs and actions to help ensure equitable distribution of benefits and burden reduction Implementation: — Program design, specifically related to equity — Outreach and education, specifically related to named communities — Progress reports — Evaluation of new resources
Integrated Resource Plan (IRP) stakeholders	Resource planning for IRP Typically weighs in on modeling scenarios, sensitivities, and assumptions	Provide input to shape CBIs Draft programs and actions IRP participation in implementation Implementation: — Progress reports — 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: CBIs Draft programs and actions Opportunities to reduce barriers and provide support for low-income customers LIAC participation in implementation Implementation: — Progress reports
Conservation Resources Advisory Group (CRAG)	Energy efficiency programs and development of PSE's Biennial Conservation Plan	Provide input to shape: CBIs Draft programs and actions CRAG participation in implementation Implementation: — Progress reports

Audiences	Focus/Role	Role for CEIP
Named communities (Customers and Community-based organizations)	Traditionally members of named communities have not participated in energy resource planning processes	Provide input to shape: CBIs, specifically for energy and non-energy benefits and burden reductions Draft CEIP Public participation, including barriers to participation Implementation
Customers and community members, including cities and counties	Traditionally customers and community members have had limited participation in energy resource planning processes	Provide input to shape: Public participation CBIs Draft CEIP
Tribes	PSE engages tribal governments through appropriate channels on various PSE topics	Provide input to shape: • Tribal participation • Customer benefit indicators • Final CEIP

Equity Advisory Group

Formation of Equity Advisory Group

In spring 2021, PSE convened an inaugural Equity Advisory Group (EAG) 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 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 March 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 6-2 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 6-2: 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

2021 EAG Member	Organization/Role
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

Input to inform Draft CEIP

PSE engaged the EAG, PSE's three other advisory groups, and customers to develop the draft CEIP – specifically educating on CETA and the CEIP process, seeking input on clean electricity values and benefits to develop customer benefit indicators, and engaging the advisory groups on specific components of the CEIP (as outlined in Table 6-1).

Table 6-3 summarizes the public input activities PSE completed to inform the draft CEIP.

Table 6-3: Audience, Format, and Input to Inform the Draft CEIP

Audience	Input format	Quantity
Residential customers	Residential customer survey submissions	921
Business customers	Business customer survey submissions	194
Vulnerable populations	CBO meetings	7
	Multi-lingual session	1
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

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 EAG 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.

Notes from PSE's Equity Advisory Group discussion on members' vision of a clean and equitable energy future.

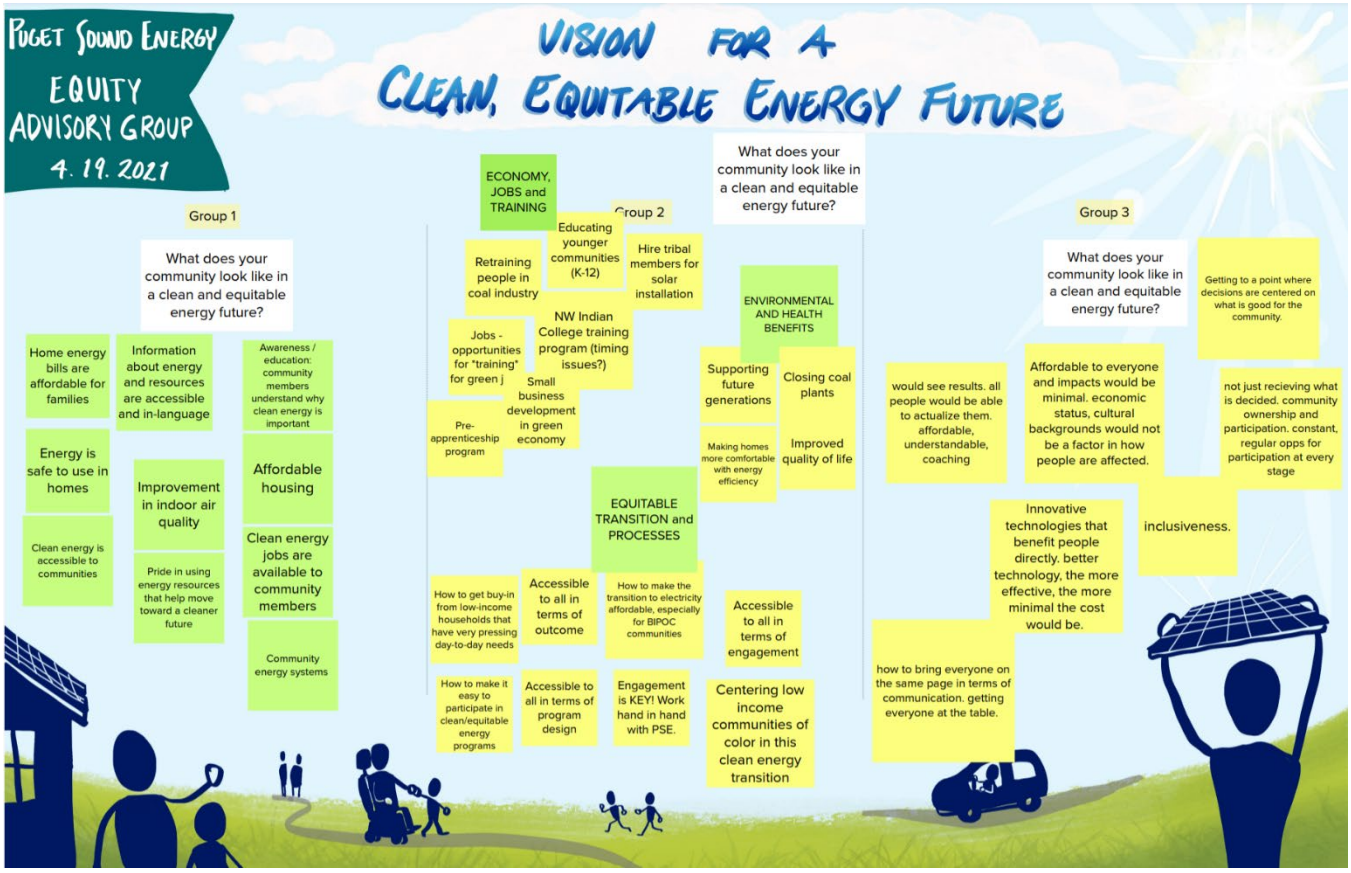


Table 6-4: EAG Meetings

EAG Meeting	Date	Meeting Objectives
Meeting 1	April 19, 2021	Provide context on EAG purpose, role, and charter Provide an overview of PSE and clean energy Discuss EAG interests and clean energy values
Meeting 2	May 3, 2021	Shared understanding around the CETA and the CEIP Connect how the EAG's discussions will help shape the CEIP 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 Shared understanding on the CETA and highly impacted communities and vulnerable populations Consult on refining the definition of vulnerable populations EAG determination of recorded meetings, and next steps regarding charter
Meeting 4	May 24, 2021	Advance discussion on vulnerable populations definition Shared understanding on customer benefit indicators and how they shape the CEIP Engage EAG in developing customer benefit indicators
Meeting 5	June 21, 2021	Seek EAG member feedback on customer benefit indicators and weightings Shared understanding of next steps in developing the draft CEIP Reflect on how EAG input was incorporated into vulnerable populations' definition
Meeting 6	July 26, 2021	Refresh on EAG's role, the electric resource planning process, and our work goals for this four-year CEIP Seek input on revised customer benefit indicators and path forward
Meeting 7	Sept. 13, 2021	Recap on EAG governance Shared understanding of PSE's draft CEIP targets, programs, actions, and cost Engage EAG on their initial impressions, questions, and input
Meeting 8	Sept. 27, 2021	Share approach for Named Communities and draft principles for implementation Engage EAG on their initial impressions, questions, and input on approach for Named Communities and program implementation principles. 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	Seek EAG's input on draft CEIP, outreach and implementation principles Share about equity considerations for Targeted DER RFP and seek EAG input

Other Advisory Groups Meetings

As part of the CEIP process, PSE engaged with our 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, and meeting materials and documentation for each advisory group are available in Appendix C.

Table 6-5: Other Advisory Group and Stakeholder 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 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 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 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. Shared understanding of CBIs. 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. Shared understanding of CBIs. Sought input on CBIs related to each CBI category, prioritization of benefits, and potential ways to measure each CBI.

Advisory Group	Date	Meeting Objectives
CRAG Meeting 2	June 2, 2021	Reviewed the new energy planning and CEIP process, and update on EAG and public participation efforts. Shared understanding of CBIs. 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, provided an update on CBIs, and previewed potential distributed energy resource concepts under consideration. 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, provided an update on CBIs, and previewed potential distributed energy resource concepts under consideration. Gathered input into CBI metrics, prioritization, and scoring. Asked for CRAG members to share DER program concepts they're aware of.
IRP Stakeholders Meeting 3	July 29, 2021	Refreshed on the energy resource planning process, answered IRP/CEIP process questions, provided an update on CBIs, and previewed potential distributed energy resource concepts under consideration. 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 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 Sought feedback on draft CEIP components and LIAC participation
CRAG Meeting 4	Sept. 29, 2021	Briefed on draft CEIP targets, programs, actions, and cost Gathered input on draft CEIP components and CRAG participation
IRP Stakeholders Meeting 5	Oct. 6, 2021	Shared about draft CEIP Sought input on draft DER concept scorecard and IRP participation
CRAG Meeting 5	Oct. 20, 2021	Shared about draft CEIP, sought feedback, and encouraged providing comments to PSE via online open house, comment form or email
IRP Stakeholder Meeting 6	Nov. 3, 2021	Shared about draft CEIP, sought feedback, and encouraged providing comments to PSE via online open house, comment form or email
LIAC Meeting 5	Nov. 9, 2021	Shared about draft CEIP, sought feedback, and encouraged providing comments to PSE via online open house, comment form or email

Engaging Customers, Including Named Communities

In addition to engaging the new EAG and PSE's other advisory groups, PSE also worked to engage residential and business customers, and focusing on highly impacted communities and vulnerable populations. PSE did so through tactics designed to reach customers and provide simple ways to engage and stay informed, like surveys, an online open house, and email newsletters.

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.

PSE's approach for reaching CBOs was to arrange "go to you" meetings, which are interactive presentations to share information, build trust and provide space for input while maximizing CBO time and simplifying their involvement. The purpose of these meetings was to raise awareness about the CEIP, collect input on clean electricity values to develop CBIs, and discuss potential barriers and burdens to participation in the clean electricity transition. Given the compressed schedule for developing CBIs, PSE prioritized this effort from April through July 2021. The CEIP team contacted 22 CBOs in PSE's electric service area to offer go-to-you meetings, with an approximate 74 percent response rate. By July 2021, PSE completed a total of seven go-to-you meetings with CBOs representing six counties serving youth, LGBTQIA+, seniors, people with disabilities, university students, and BIPOC populations. A total of 46 people attended the seven go-to-you meetings.

Some themes heard during this outreach include:

- Reduce the amount of income vulnerable populations spend on electricity.
- There is interest in using technologies like rooftop solar to increase the resiliency and self-sufficiency of vulnerable populations.
- Economic benefits of the clean electricity transition need to be accessible to the people who need them.
- Value clean air and community health.

All go-to-you meetings were held virtually due to the COVID-19 pandemic. The team used interactive online tools such as Mural and MentiMeter to engage participants and capture feedback. The list of community-based organizations is in Table 6-6. To view the summary of CBO outreach, review Appendix C.

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

The CEIP team continued CBO outreach activities 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. We are pursuing meetings with groups connected to the Mandarin-speaking and Asian American/Pacific Islander communities in our service territory and will seek ways to incorporate their comments during the implementation process.

Online survey to engage customers

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. This input informed the development of PSE's first CEIP. Because 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. We collected demographics to provide PSE the data to understand if we are reaching all our customer communities. 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 to improve 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 customers. 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**

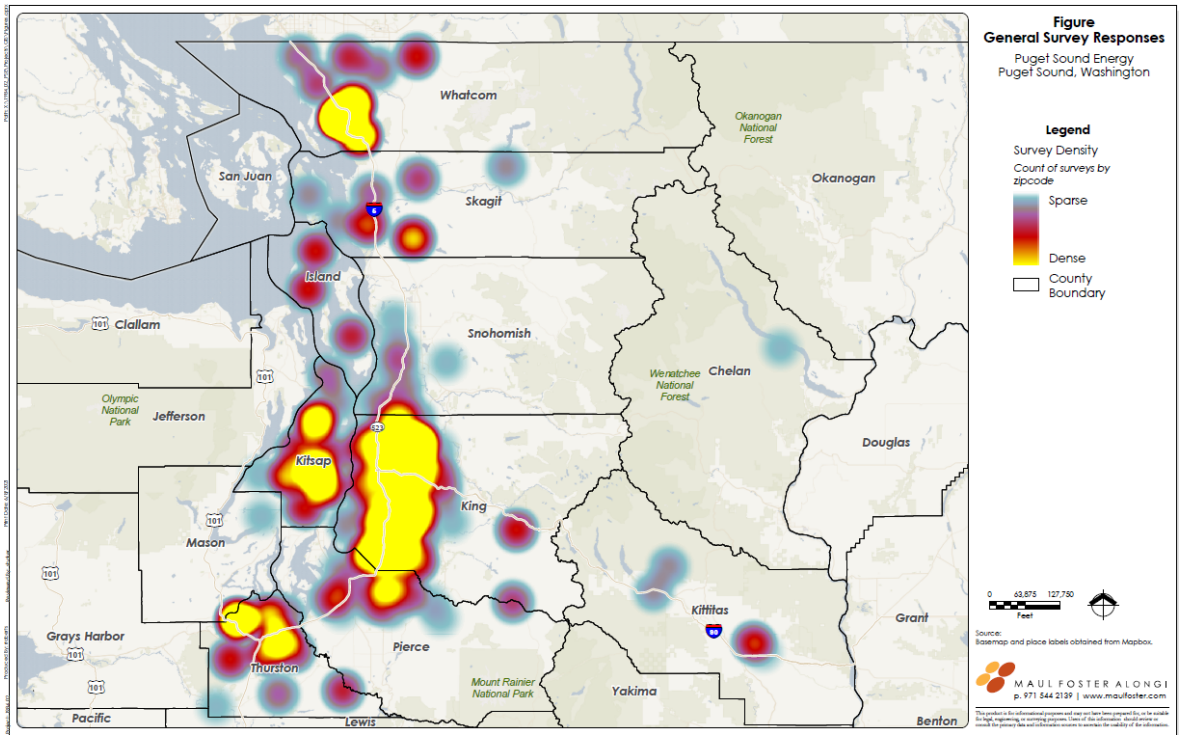


Figure
General Survey Responses
Puget Sound Energy
Puget Sound, Washington
Legend
Survey Density
Count of surveys by zipcode
Sparse
Dense
County Boundary
Whatcom
Skagit
San Juan
Island
Clallam
Snohomish
Okanogan National Forest
Okanogan
Wenatchee National Forest
Chelan
Douglas
Olympic National Park
Jefferson
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.
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Table 6-9: Business Survey Responses

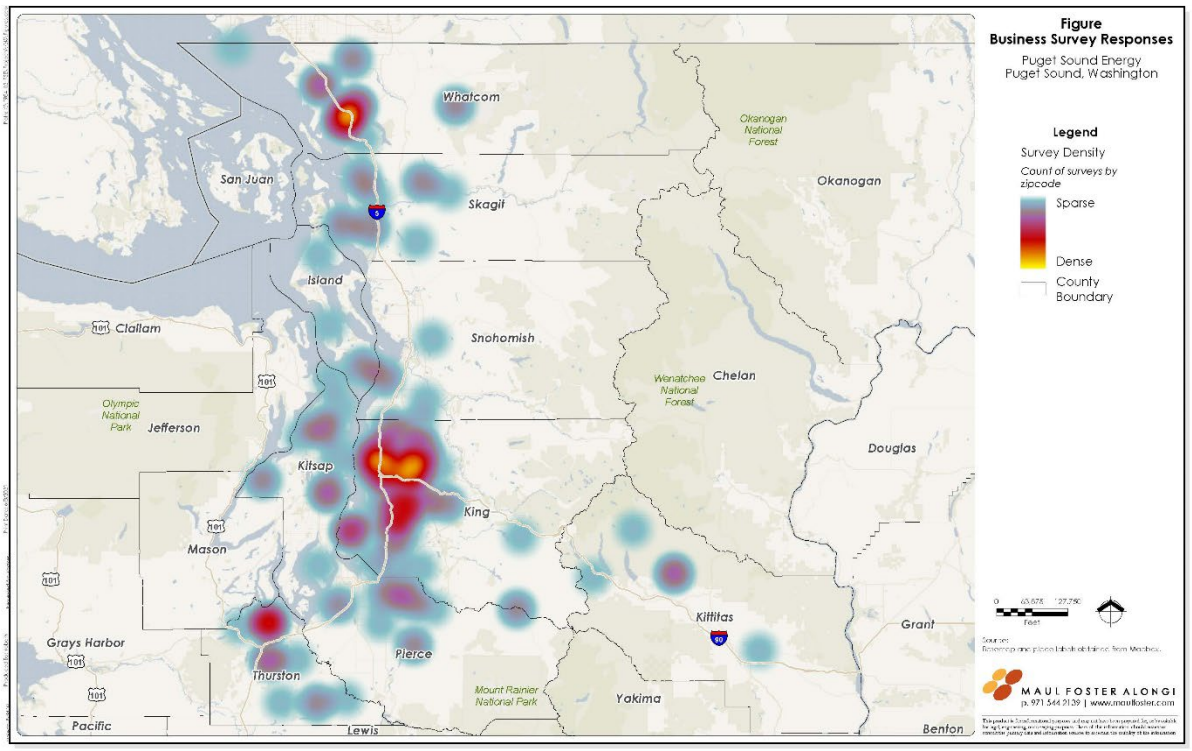
Business Size	Responses
Small/medium businesses	114
Large businesses	80
Total Business Responses	**194**

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**



Multilingual Session

In addition to engaging community-based organizations with our consultant Triangle Associates, PSE planned to host two multilingual sessions (see note about limitations). We held the first multilingual session in August 2021 with Spanish-speaking participants from El Centro de la Raza. These participants 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.

Themes heard during this session include:

- There is a need for more inclusive education around clean energy.
- Make outreach and program information accessible and easy to understand.
- Consider programs for homeowners, renters, and low-income populations

To review the summary from this multi-lingual session, review Appendix C-4. PSE continues work to host another multilingual session focused on clean electricity with a partner organization.

Public Participation Outcomes that Shaped the Draft CEIP

In spring and summer 2021, PSE engaged customers, advisory groups, and others to develop the draft CEIP. The input received helped shape the CEIP, with the key subject areas summarized below.

Customer Benefit Indicator Development

In May and June 2021, PSE gathered input from 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.

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 offering low-income households and other vulnerable populations the ability to generate their electricity through solar panels 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.

See Chapter Three for a detailed account of how PSE used public participation to develop the customer benefit indicators.

Customer Benefit Indicator Metrics and Methodology

At meetings in June and July 2021, PSE asked the four advisory groups — EAG, LIAC, CRAG and IRP stakeholders — to help refine the CBIs, provide feedback on CBI metrics, and PSE's proposed scoring and weighting methodology when using CBIs to evaluate potential clean electricity programs.

For refining the CBIs, PSE received feedback from the EAG that indoor air quality should be considered as part of the improve home comfort CBI. PSE also received feedback in late July from a group of advocates on other potential metrics to consider.

For the weighting methodology, PSE initially proposed adding a 2x weighting factor to the CBIs that are a high priority, and a score of 0, 1, or 2 corresponding to the degree of influence by each indicator

(described in Chapter Three). PSE received a range of feedback from individual advisory group members on the EAG, LIAC, and IRP stakeholder group. The CRAG did not provide specific feedback on this topic.

The range of feedback included:

- Maximize benefits for all CBIs by giving them equal priority/weight.
- It is puzzling to weight between CBI categories, though it might work to prioritize between metrics within a category.
- Continue with PSE's suggested method of a 2x weighting factor.
- Question on how to prioritize the CBIs when the benefits conflict.
- Have customers/stakeholders weight the CBIs.
- Consider the potential outcomes of the current method and consult advisory groups again to determine if the method needs to be changed to produce more desired outcomes.
- Consider a more complex (mathematical) weighting method to produce desired outcomes.
- Some priority CBIs should be a higher priority than other priority CBIs.
- Suggest increasing priority of CBIs related to greenhouse gas emissions, air quality, climate change and economic benefits.
- Mixed feedback on whether to include zero as a score to show negative impacts

See Chapter Three, Highly Impacted Communities and Vulnerable Populations, and Customer Benefit Indicators for a detailed account of how PSE used advisory group feedback and stakeholder feedback on CBI metrics and weighting of the CBIs.

Definition of vulnerable populations

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. See description in Chapter Three and Table 3-1.

Reducing barriers and burdens

Reducing barriers and burdens is important for ensuring all customers benefit from the clean electricity transition. During meetings with the LIAC, EAG, CBOs and multilingual sessions, PSE engaged stakeholders in conversations on barriers and burdens, with the resulting themes heard.

- Renters face barriers for participation in programs
- Lack of awareness and education on clean energy
- Program accessibility and awareness
- Return on investment, cost of participation and other economic barriers
- Trust and politics
- Other barriers and burdens like siting infrastructure and disruption of rural areas.

In addition, PSE heard from customer surveys that the expected challenges from the clean electricity transformation include:

- Costs and potential bill increase
- Potential environmental impact of source material for clean energy technology
- Dependability of variable clean electricity sources like wind and solar
- Construction impacts for new electric infrastructure

See Chapter Three for a detailed account of how PSE anticipates addressing these burdens, and the public participation plan for addressing burdens and barriers related to engaging on the CEIP and broadening education efforts.

Implementation Approach: Guiding Principles

When we engaged with the EAG, PSE received feedback on a variety of topics which didn't always fit into customer benefit indicators or barriers and burdens. PSE summarized comments heard from EAG members through the CEIP development process to formalize this feedback into draft preliminary guiding principles for CEIP implementation. PSE sought EAG feedback to further develop the draft guiding principles included in the draft CEIP.

See Chapter Eight for the updated guiding principles.

Draft targets and actions

PSE shared early highlights of the draft programs and actions with the advisory groups and IRP stakeholders at their September and October 2021 meetings. PSE responded to many questions during the September meetings and addressed some of those topics in the draft CEIP. Comments included:

- Suggestions to increase the clean electricity interim target.
- Ensuring that customer benefits are applied to all resource decisions.

- Suggestions to adjust the total amount of distributed solar and battery storage actions.
- Concerns about lease-to-own programs for distributed energy resources.

See Appendix C-2 for more details on advisory group feedback on draft programs and actions

In addition, PSE heard from IRP stakeholders on questions and concerns they had on the 2021 IRP. PSE responded to questions on the 2021 IRP during briefings with IRP stakeholders and in feedback forms available on the CEIP website. PSE also committed to addressing specific feedback related to the 2021 IRP, which is documented in Chapter Eight.

Feedback Resulting in CEIP Process Adjustments

During advisory group meetings, PSE received feedback on ways to make the CEIP public participation process more helpful to stakeholders. PSE worked to address this feedback in the following ways.

- Provide more time for stakeholder feedback on CEIP topics: PSE successfully petitioned to extend the CEIP process to allow more time for advisory group discussions.
- Add acronym list to presentations: PSE added acronym lists to all CEIP-related presentations.
- Add breakout group questions to the posted presentation ahead of the meeting: PSE added breakout group questions in the posted presentations.
- Address feedback heard and how it was used at the start of meetings: PSE addressed feedback at the start of meetings.
- Facilitate feedback reports in meeting materials: PSE added links or copies of feedback reports to meeting materials.
- Interest in cross-advisory group meetings: PSE tailors meeting information based on the advisory group and their role in the CEIP process. For this first CEIP, there was not a clear opportunity for such a meeting. PSE continues to consider this feedback for opportunities during the implementation process.
- Request to post final meeting materials earlier: PSE posts materials three business days in advance of the meeting, and we continue to work to hone and/or address stakeholder feedback up until the meeting time. PSE adjusted the final presentation format to use the “added” and “updated” notes to help identify presentation slides that changed.

Stakeholder Feedback to Inform Final CEIP

Upon filing the draft CEIP with the WUTC on October 15, 2021, PSE sought feedback from customers, advisory groups, tribal governments, and other community members on the draft plan. Stakeholders had the opportunity to provide feedback via the online open house, advisory group meetings, briefings,

comment form, and email. PSE used stakeholder input on the draft CEIP to revise the final CEIP. The summary below outlines the various tools PSE used to collect feedback and key themes heard during this phase of the public participation effort. Table 6-10 summarizes the public feedback activities PSE completed to inform the final CEIP.

To review how PSE addressed public comments on the draft CEIP, review Appendix C-2.

Table 6-10: Audience, Format, and Input to Inform the Final CEIP

Audience	Input format	Quantity
Residential and business customers	Residential customer survey, web form, and email submissions	364
	Paper surveys pilot	12
Vulnerable populations	CBO stakeholder sessions	2
Equity Advisory Group	EAG meeting	1
Integrated Resource Plan Stakeholders	IRP meeting	1
Low Income Advisory Committee	LIAC meeting	1
Conservation Resource Advisory Group	CRAG meeting	1
Community groups	Briefings by request from community groups and local governments	2

Equity Advisory Group meeting

PSE met with the Equity Advisory Group during the draft CEIP comment period to discuss the draft CEIP, continue collaborating on the guiding principles for CEIP implementation, and to seek input into PSE's draft Targeted DER RFP (see schedule and objectives in Table 6-4).

On the draft CEIP, members had questions on data gathering and metrics for the final CEIP, the overall cost of CEIP, and whether CETA is advancing clean energy targets and investments. In addition, one member suggested that PSE design DER programs to transfer more control to customers and low-barrier, low/no cost ownership options for DER programs.

PSE shared the revised guiding principles that used the EAG's equity framework of accessibility, affordability, and accountability. EAG members provided feedback on the principles and the majority of EAG members agreed that the guiding principles were appropriate to include in the CEIP, with the knowledge that PSE would revise the principles and share the updates with the EAG. The final guiding principles are listed in Chapter Eight.

PSE's Other Advisory Groups

PSE provided overviews of the draft CEIP to CRAG, IRP stakeholders, and LIAC in October and November (see schedule and objectives of meetings in Table 6-6). In general, advisory group members had questions about the draft CEIP and some said they were still reviewing the plan. PSE addressed questions during the advisory group meetings and encouraged advisory group members to comment via the online open house, comment form, and/or email.

Some feedback heard during these meetings include:

- Feedback to speed up the clean electricity transition.
- Suggestions to increase renewable energy target, the DER target, and deployment of time-varying rates.
- Request for more details on specific actions.
- Suggestion to update the generic costs in the CEIP.
- Lingering concerns about leasing programs and acknowledgement of draft CEIP including this input in program design.
- Suggestions for designing subsidized battery storage programs for rural, low-income customers in low-reliability areas.
- Questions on EAG feedback on CBI weightings, technology and enabling costs, tools that could help speed up the transition (e.g., eminent domain), demand response programs, and whether PSE is considering other models similar to community solar.

See Appendix C-2 for more details on advisory group feedback on the draft CEIP.

Stakeholder Sessions

During the CEIP comment period, the PSE CEIP team held two lunch-and-learn learn style stakeholder sessions for CBOs and other stakeholders on October 27 and November 8. PSE sent direct invitations to CBOs that had participated earlier in the process and offered a stipend to these CBOs to compensate for their participation. The stakeholder sessions were also advertised through the CEIP email list and on the CEIP website.

During the stakeholder sessions, PSE shared information about CETA, the Draft CEIP, outreach and public participation, and answered questions from participants. Table 6-11 summarizes the sessions and interests represented.

Table 6-11: Stakeholder Sessions

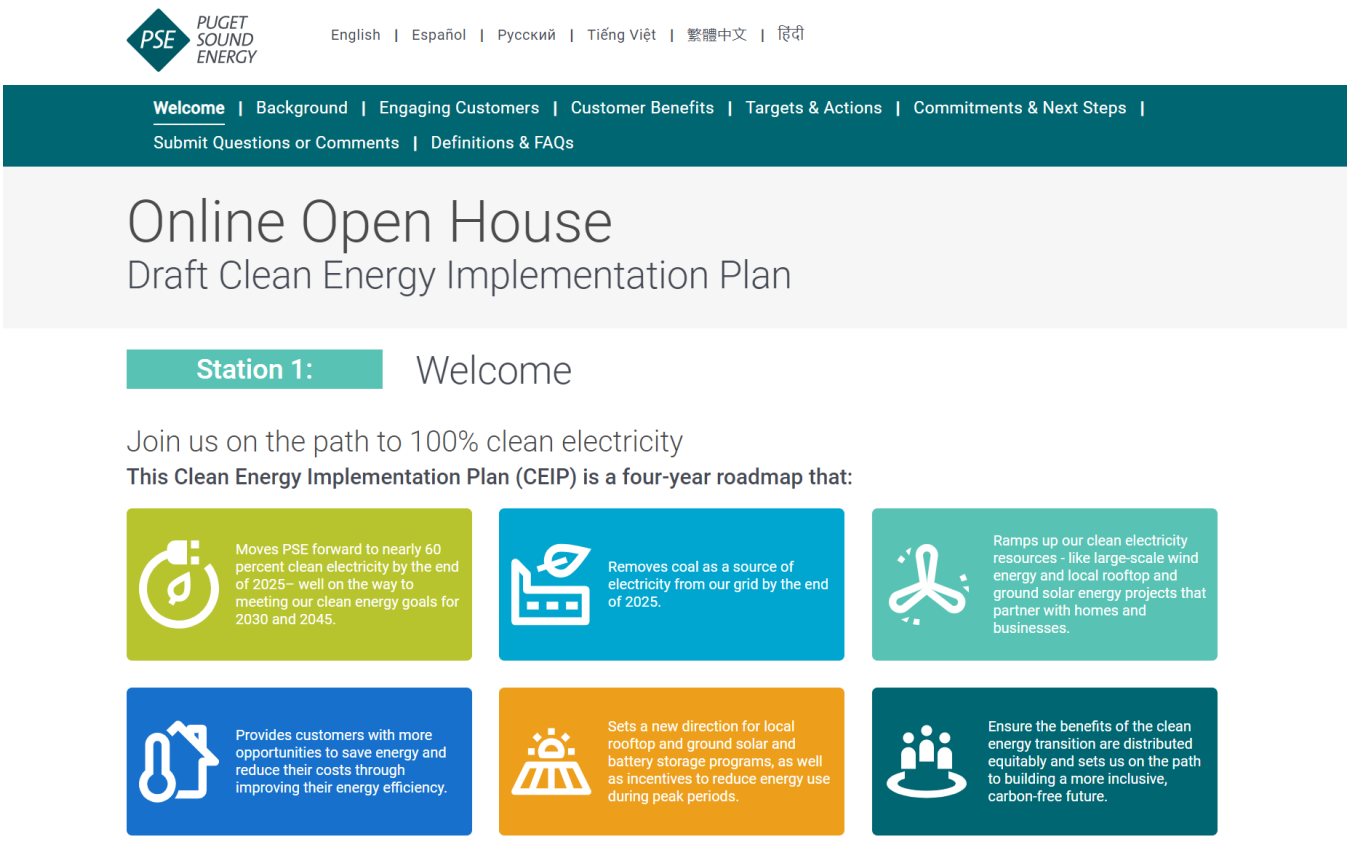
Stakeholder session date	Interests represented by participants
Oct. 27, 2021 11–12 p.m.	• Low-income populations • Seniors and seniors with disabilities • Latino/a/x populations and Spanish-speakers
Nov. 8, 2021 5–6 p.m.	• Low-income populations • Seniors • Resource conservation

Online Open-House Website

PSE prepared an online open-house website to help customers and stakeholders learn about the draft CEIP and submit comments at their own pace. The multilingual online open house summarized important pieces of the draft CEIP in six languages and included an online survey that prompted feedback. Online open house visitors were offered a chance to win a $100 gift card as an incentive to complete the survey. Additionally, PSE tested a pilot program to work with a community-based organization to distribute paper surveys to customers that could be returned via mail.

Table 6-12: Online Open House Visitation and Survey Analytics

Online open house language page	Unique page views
Overall	6,757
English	3,052
Spanish	1628
Russian	519
Vietnamese	572
Traditional Chinese	480
Hindi	464
Survey language	**Submissions**
Overall	301
English	250
Spanish	26
Russian	3
Vietnamese	2
Traditional Chinese	8
Hindi	0
Paper surveys	12



Comments on the Draft CEIP

PSE held a public comment period for draft CEIP feedback between October 15 and November 12, 2021. Comments were accepted and considered after November 12 with the understanding that comments were less likely to be reflected in the final CEIP as the final CEIP filing date of December 17 drew closer.

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
- Press release

- Targeted emails to:
    - 51,542 PSE residential electric customers identified as more likely to be low-income, limited English speaking, and/or BIPOC residents in PSE's service area
    - 10,054 PSE business customers randomly selected from highly impacted communities and PSE's service area
    - Additional targeting of customers from counties with lower response rates:
        - 29,829 PSE residential electric customers randomly selected from highly impacted communities, Skagit, Kittitas, Pierce, Thurston, and Kitsap counties, and Whidbey Island not previously emailed
        - 8,678 PSE electric business customers randomly selected in Skagit, Kittitas, Pierce, Thurston, and Kitsap counties, as well as Whidbey Island nor previously emailed
    - Approximately 600 of PSE's largest and most complex commercial, industrial, and business customers
    - Local governments, other project stakeholders and community-based organizations
- Partner toolkit: Provided resources in multiple languages to help project partners share the survey, including:
    - Draft CEIP fact sheet
    - Content for newsletters
    - Content for social media
- Paid and organic social media posts:
    - PSE's Twitter and Facebook accounts
    - Digital banner ads in Spanish, Chinese, Hindi, Russian and Vietnamese
- Newspaper advertising: print and digital advertisements with local newspapers, including ads in Chinese Times, Seattle Chinese Post, NW Vietnamese News
- Radio promotion:
    - KXPA-AM 1540 AM radio ads in Russian, Cantonese and/or Mandarin, and Vietnamese.
    - KKNW-AM 1050 AM radio ads in Russian and Mandarin.
    - Spanish-speaking radio ads aired on KDDS-FM La Grande 99.3 and KZTM-FM La Zeta 102.9

- Spanish-speaking radio show: PSE collaborated with El Centro de la Raza to attend and share information in Spanish about the draft CEIP on El Rey 1360's on November 2

- Non-digital options: PSE worked with a local CBO to design a pilot project to distribute paper resources and surveys to audiences who were less likely to engage with the project online. PSE was also prepared to provide a printed survey by request. We acknowledge this is an area of improvement for future surveys.

Table 6-13: Online Open House Survey Respondent Demographics

Source	Responses
Survey respondents — English	250
Survey respondents — Spanish	26
Survey respondents — Russian	3
Survey respondents — Vietnamese	2
Survey respondents — Traditional Chinese	8
Survey respondents — Hindi	0
Paper survey respondents — English	12
Web form comments	37
Email comments	38
Total comments	**376**

PSE customer status	Responses (Total / %)
Electricity and natural gas	114 / 38.2%
Electricity only	169 / 57.7%
Natural gas only	4 / 1.4%
No	6 / 2.1%
Total respondents	**293**

Language spoken at home	Responses (Total / %)
Mandarin	4 / 1.43%
English	255/ 91.1%
Russian	4 / 1.43%
Spanish	36 / 12.86%
Vietnamese	3 / 1.07%
Hindi	1 / 0.36%
Other (please specify)	22 / 7.86%
Total respondents	**280**

How did you learn about the survey	Responses (Total / %)
Email	216 / 74.0%
Social media	29 / 10.0%
Utility bill insert	27 / 9.3%
Presentation	1 / 0.3%
News source	4 / 1.37%
Word of mouth	10 / 3.42%
Other	17 / 5.82%
Total respondents	**292**

Gender	Responses (Total / %)
Female	134 / 47.0%
Male	134 / 47.0%
Non-binary	3 / 1.1%
Self-describe	14 / 4.91%
Total respondents	**285**

Sexual Orientation	Responses (Total / %)
Lesbian or gay	6 / 2.4%
Bisexual	9 / 3.6%
Queer	3 / 1.2%
Heterosexual/Straight	188 / 75.2%
Pansexual	0 / 0.0%
Prefer not to answer	0 / 0.0%
Self-describe	44 / 17.6%
Total respondents	**250**

Age	Responses (Total / %)
17 or younger	0 / 0.0%
18-25	2 / 0.72%
26-35	25 / 8.96%
36-45	40 / 14.34%
46-65	99 / 35.48%
66 +	113 / 40.5%
Total respondents	**279**

Household Income	Responses (Total / %)
Less than $10,000	10 / 3.91%
$10,000 - $14,999	11 / 4.3%
$15,000 - $19,999	8 / 3.13%
$20,000 - $24,999	9 / 3.52%
$25,000 - $29,999	6 / 2.34%
$30,000 - $34,999	4 / 1.56%
$35,000 - $39,999	6 / 2.34%
$40,000 - $44,999	16 / 6.25%
$45,000 - $49,999	9 / 3.52%
$50,000 - $59,999	24 / 9.38%
$60,000 - $74,999	35 / 13.67%
$75,000 - $99,999	34 / 13.28%
$100,000 - $124,999	23 / 8.98%
$125,000 - $149,999	9 / 3.52%
$150,000 - $199,999	9 / 3.52%
$200,000 or more	18 / 7.03%
Don't know	1 / 0.4%
Prefer not to answer	24 / 9.38%
Total respondents	**256**

Race / Ethnicity	Responses (Total / %)
Black or African American	7 / 2.5%
Hispanic, Latino, Latina or Latinx	31 / 11.07%
Asian or Asian American	14 / 5.0%
American Indian or Alaska Native	7 / 2.5%
Biracial or Multiethnic	14/ 5.0%
Middle Eastern or North African	2 / 0.71%
White	192 / 68.5%
Self-describe:	32 / 11.42%
Total respondents	**280**

Rent or own home	Responses (Total / %)
Own	237 / 82.6%
Rent	42 / 14.63%
Not applicable	8 / 2.79%
Total respondents	**287**

Resident or business	Responses (Total / %)
Resident	258 / 96.9%
Business	17 / 6.39%
Other	9 / 3.38%
Total respondents	**284**

Tribal Government Outreach and Participation

PSE reached out to all tribes in PSE's electric service about the draft CEIP area, first via letters and emails to the tribal chairs and followed up by outreach to tribal staff. Tribal staff and chairpersons were offered additional information via presentation or by phone or email. Early feedback from tribal staff members indicated that the original timeline was insufficient to allow for review and response. In response, PSE developed new links to the online open house and response survey and provided those links to staff. Several tribal staff members highlighted their tribe's commitment to clean energy but expressed that more time was needed for comprehensive review and to develop meaningful input. We also heard that the timing of the comment period, near the end of the year, made engagement difficult due to competing deadlines.

PSE will continue to use original and newly identified channels with tribal governments and staff, consistent with the public participation plan. PSE's tribal liaison will follow up with each tribe in PSE's electric service area to encourage participation in the WUTC's public comment period and identify opportunities for participation in implementation activities, consistent with each tribe's interests and capacity. We will use the information gathered to inform broader company-wide tribal engagement activities.

Stakeholder Feedback Themes

A summary of key concepts on the draft CEIP are listed below.

Quantitative Survey Questions

Balancing benefits, climate change, and cost: Most survey respondents agreed the draft CEIP addresses the clean electricity benefits they want while acting on climate change and maintaining affordability. BIPOC, ESL and income qualified participants were more likely to agree compared to overall survey responses. Business participants were more likely to feel unsure compared to overall survey responses.

Program interests: Survey respondents were most interested in energy efficiency, local solar programs and programs that combine solar and energy storage. BIPOC and ESL participants were more likely to be interested in programs that increase access for vulnerable populations.

Affordability and accessibility: Survey respondents agreed the draft CEIP increases access and affordability of clean electricity, particularly for vulnerable populations, but they need more information

to be sure. Senior and business participants were more likely to feel unsure compared to overall survey responses.

Increasing participation: Most survey respondents said it would be most helpful to receive a financial incentive and reduce or remove up-front costs related to clean electricity programs. They also said they would like help learning if they qualify for programs. Income-qualified participants were more likely to say they needed help understanding the benefits of participating compared to overall survey responses. Participants who rent their homes were much more likely to express interest in programs designed for renters compared to overall survey responses.

Substantive Comments

Interim Targets

Many respondents were pleased to know their utility was taking action to reduce greenhouse gas emissions on the proposed schedule. Some respondents wanted to understand the challenges and resources necessary to reduce greenhouse gas emissions on a faster timeline, siting the urgent need to act on climate change.

Specific comments said the interim targets for demand response and distributed energy resources should be increased for the current CEIP timeframe. These commenters cited the specific benefits these programs would provide customers in the form of energy bill savings and avoiding the siting impacts of larger centralized infrastructure projects. A few commenters were concerned DER and DR technologies are not yet cost effective for broad implementation.

Methodology

A few comments requested PSE account for the expected effects of climate change in customer energy use forecasts.

Customer Benefit Indicators

Commenters described environmental benefits they would like to see during the clean energy transition. These comments asked PSE to conduct an analysis of the environmental impacts of different kinds of clean energy and choose actions that have smaller siting impacts and create fewer overall environmental impacts in the supply chain and lifecycle of the technology. Many of these comments suggested DER actions like rooftop solar and batteries would have fewer environmental impacts and more customer benefits compared to large scale wind facilities.

Commenters were interested in the local economic benefits that could be generated by the clean electricity transition, especially if labor and manufacturing was sourced locally, and asked that “job quality” be added to the list of CBIs.

Commenters also emphasized the importance of benefits included in the CEIP’s list of CBIs, including improved air quality, improved community health, affordable clean energy, and increased resiliency.

A few respondents wanted more information about how PSE used the CBIs in the CEIP and asked for a rationale to be included with CBI scores for potential actions. These comments questioned the choice to give all CBIs equal weighting and advocated for a wider scoring scale.

Highly Impacted Communities and Vulnerable Populations

Many respondents supported addressing specific needs of vulnerable populations and highly impacted communities through clean electricity benefits and emphasized the need to name the ways specific communities will benefit. Some of these commenters pointed out that PSE needs to actively engage communities that have less time and fewer resources to empower them to participate in clean electricity programs.

A few commenters wanted to be sure that all customers will experience clean electricity benefits and cautioned that the cost of the transition should not be overly burdensome to any customers.

Actions — General

It was important to many respondents that PSE take actions to remove fossil fuels from the electricity supply as quickly as possible, expressing concerns about climate change-related impacts.

Energy efficiency Actions

Respondents who commented on energy efficiency actions emphasized the potential for energy efficiency to reduce the amount of income vulnerable populations spend on electricity costs. Some respondents asked PSE to share more information about upcoming plans for residential energy efficiency actions.

Large-scale Renewable Energy Actions

Many respondents were pleased to see that PSE is planning to increase use of large-scale wind and solar in our non-emitting electricity supply as we described in the draft CEIP. Some respondents expressed concerns about the reliability of solar as an intermittent electricity resource, particularly in western Washington. A few respondents also shared concerns about the environmental hazards associated with wind and solar resources, specifically highlighting impacts to wildlife and the waste produced during manufacturing and disposal of materials.

Some commenters requested PSE discuss the role or future potential of resources that were not included in the draft CEIP, including hydroelectric power, nuclear power, geothermal power, and tidal power.

Demand Response Actions

Some respondents specifically recommended that PSE consider implementing demand response programs with varying rates.

Distributed Energy Resources Actions

Many respondents expressed support and excitement about the prospect of accessing community and residential solar and battery storage programs and were interested in potential affordability benefits. Some requested more information about incentives or leasing programs. Other commenters wanted to see more emphasis on distributed energy resources, in many cases siting the potential benefits they could bring vulnerable populations in the form of reduced energy bills and improved self-sufficiency.

Like concerns associated with large-scale renewable resources, a few respondents questioned the reliability and environmental benefits of solar panels, specifically related to the waste produced during manufacturing and disposal of materials. Some comments suggested including residential wind as an additional resource.

Specific comments suggested that PSE design solar/wind programs to include installation and maintenance services as part of their electricity bill.

New/Other Action Suggestions

Commenters asked PSE to consider actions not included in the draft CEIP, naming nuclear facilities, hydroelectric projects, waste-to-fuel thermal plants and carbon-capture technology. Many commenters emphasized the importance of considering impacts to the environment and wildlife when considering clean electricity resources like hydroelectric or nuclear power.

Incremental Cost and Rates

People who commented on the cost of actions in the draft CEIP worried the cost for ratepayers may be too high, particularly for people with fixed income and low-income communities. Some commenters suggested the cost be mitigated through rate design, or through clean energy actions like net-metering benefits or energy efficiency.

Many commenters expressed that access and cost of clean electricity programs should be equitable and fair to all customers. Some commenters suggested that utility bills could be scaled based on household income to support equity. A few commenters suggested all clean electricity programs should be elective and only affect rates of participants.

Some commenters said energy affordability was more important than clean electricity goals.

Public Participation

Commenters made suggestions for how to share information and involve communities in the clean electricity transition. They gave examples like working with local faith communities, food banks and labor organizations in addition to community-based organizations.

Commenters said more outreach and education was needed to help seniors, low-income and immigrant communities understand how they could benefit from clean electricity. They suggested PSE provide tours of clean electricity facilities to help people see and understand the benefits.

A few commenters asked PSE to make as much data available and easily accessible as possible to promote transparency and accountability.

Integrated Resource Plan (IRP)

Several comments included concerns about PSE investing in a peaking plant to meet 2026 electric capacity needs identified by the 2021 IRP, with concerns centering about the possibility of that plant using natural gas.

Program Implementation

Specific comments suggested PSE act as a clearing house of customer resources for clean electricity installations.

Implementation — Resource Acquisition/Supplier

Some respondents requested that PSE prioritize acquiring diverse clean electricity resources. They also shared that PSE should encourage customers to personally invest and utilize residential clean electricity facilities that could contribute to the power supply.

Natural Gas and Electrification

Many respondents wanted to understand how PSE's natural gas rebates co-function with the carbon reduction emissions goals of the draft CEIP. Some respondents suggested that electrification of facilities and vehicles that use fossil fuels be incorporated in the CEIP and contribute to the carbon reduction emissions goal.

Project Need

A few respondents questioned the need for a transition to clean electricity. They shared a belief that climate change is not a priority and that existing electricity resources resulted in more affordable rates and reliable electricity for customers.

Length of Comment Period

PSE also heard from stakeholders and tribal governments that PSE's comment period was too short, especially given staff capacity and competing demands to review other plans.

To the extent feasible, PSE addressed the comments in this final CEIP. To review how PSE addressed public feedback, review the public comment summary in Appendix C-2.

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 goals during implementation include:

- Building trust and relationships with named communities
- Educating and building customer awareness about the clean electricity transition
- Sharing information and being transparent about progress toward CEIP targets
- Continuing to work 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
- Supporting clean electricity program design and action
- Aligning tribal outreach efforts with CEIP communications

Audiences and CEIP Implementation Activities

During implementation, PSE will continue to engage the audiences shown in Table 6-1, as well as additional audiences based on feedback from stakeholders, including working to engage labor and trade allies, and broadening our reach for community-based organizations. In addition, PSE will work to recruit a member representing public health interests for the EAG, as well as work with the inaugural EAG to develop a process for recruiting future members.

Table 6-14 provides a high-level overview of our public participation objectives and advisory group activities for 2022–mid-2023. The 2022–2023 public participation plan is included in Appendix C-1.

This CEIP is the first of many, and we know we'll need to learn and adjust as we move ahead. We outlined public participation for the CEIP through mid-2023, but we know public participation requires listening, learning, flexibility, and adjustments. We look forward to continuing to engage with customers, advisory groups, tribal governments, and others on CEIP components, program design, and clean electricity education.

Table 6-14: Summary of Public Participation Activities for CEIP Implementation in 2022–mid-2023

Q1/Q2 2022	Q3/Q4 2022	Q1/Q2 2023
Educate on CEIP and keep the conversation going	**Implement CEIP** **Educate about clean electricity and CEIP**	**Implement CEIP** **Engage on development of 2023 biennial CEIP update**
Public participation objectives		
• Inform about CEIP and how to get involved in WUTC process • Reflect on how we can improve future CEIP processes • Conduct survey on understanding around clean electricity	• Educate on clean electricity and CEIP • Share updates • Continue relationships with CBOs • Engage customers on program design	• Educate on clean electricity and CEIP • Share updates on CEIP progress to date • Seek input into 2023 biennial CEIP update process planning • Engage customers on program design • Continue relationships with CBOs
PSE advisory group activities*		
• Brief each advisory group about CEIP, and seek feedback to shape future CEIP process • EAG hosts Equity Forum • Ongoing EAG meetings	• Regularly engage EAG on CEIP and equity topics • Provide CEIP update to other advisory groups	• Engage all Advisory Groups on biennial CEIP update
Information sharing tools		
• Project website • Fact sheet and flyers • E-newsletters • Press releases • Social media • Partner toolkit		• Bill inserts • Briefings • Responding to inquiries via website, email, phone • Employee communications • Targeted emails
Feedback gathering tools		
• Surveys • Focus groups • Online open house • Community meetings		• Comment forms / email • Briefings • “Go to you” meetings • Pilot new tools, like potential ambassador program
Mitigating barriers		
• Translated/transcreated CEIP materials and website • Host in-language CEIP events • Distribute paper materials to CBOs • Provide phone option to receive info and submit comments to CEIP team		• Partner with CBOs • Compensate low-income/under-resourced people for participation (need to further define) • Ask partner organizations to use their communication channels

** PSE will include CEIP-related EAG and IRP stakeholder meeting dates, times, and materials on the CEIP website*

7 Tracking and Reporting

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, we will also report on and track the customer benefit indicators (CBI) described in Chapter Three 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 in each CBI as PSE moves through the four-year CEIP cycle.

Table 7-1: Conservation

Energy	Program Enrollment	Program Costs
Annual MW Annual MWh savings Projected cumulative lifetime MWh savings	Number of potential Participants by All Customers, Highly Impacted Communities, and Vulnerable Populations	Costs (through Annual Compliance Report)

Table 7-2: Demand Response

Energy	Program Enrollment	Costs
Annual MW and MWh in DR capacity enrolled MW peak shift per program (median/maximum/minimum per program) Annual program achievement in MW and MWh	Number of Enrolled Participants by All Customers, Highly Impacted Communities, and Vulnerable Populations) Number of Participants unenrolling Number of DR Events (Total/by Month) 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) Total Renewable Energy generation or purchase (MWh) (usage) Percentage of electricity supplied by renewable resources	Number of Enrolled Participants in DER customer programs by All Customers, Highly Impacted Communities, and Vulnerable Populations 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) 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 CBI 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 metrics for these customer benefit indicators. With the help and guidance of the third-party consultant DNV, PSE developed metrics for each customer benefit indicator. PSE is still in the process of evaluating data availability for some of the 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, Customer Benefit Indicator metrics, and Chapter Three.

Table 7-5: Customer Benefit Indicators and Metrics

CETA Category	Indicator	Metric	Baseline data (2020)
Energy Benefits Non-energy Benefits Burden Reduction	Improved participation in clean energy programs from highly impacted communities and vulnerable populations	Increase number and percentage of participation in energy efficiency, demand response, and distributed resource programs or services by PSE customers within highly impacted communities and vulnerable populations Increase percentage of electricity generated by distributed renewable energy projects	Yes, PSE internal data in which PSE measures the number of programs related to all customers, and PSE customers within named communities. Please see Appendix H.
Non-energy Benefits	Increase in quality and quantity of clean energy jobs	Increase quantity of jobs based on: • Number of jobs created by PSE programs for residents of highly impacted and vulnerable populations • Number of local workers in jobs for programs • Number of part-time and full-time jobs by project Increase quality of jobs based on: • Range of wages paid to workers • Additional benefits offered • Demographics of workers	Unavailable currently. This information will be available in the future as PSE contracts with vendors and collects this information.
Non-energy Benefits	Improved home comfort	Increased dollar in net present value (NPV) in NEI benefits for EE programs.	Yes, internal PSE data that is calculated as non-energy impacts within the BCP process; please see Appendix H
Reduction of burdens	Increase in culturally- and linguistically-accessible program communications for named communities	Increase outreach material available in non-English languages	Yes, we will have internal PSE data that quantifies the number of non-English language materials used by PSE in 2022
Cost Reduction Burden Reduction	Improved affordability of clean energy	Reduce median electric bill as a percentage of income for residential customers Reduce median electric bill as a percentage of income for residential customers who are also energy-burdened	Yes, PSE internal data in which PSE measures the affordability of clean energy related to all customers, and PSE customers within named communities. PSE may also use the Department of Energy's Lead tool can be

			found here: https://www.energy.gov/eere/slsc/maps/lead-tool. Please see Appendix H.
Environment	Reduced greenhouse gas emissions	Reduce PSE-owned electric operations metric tons of annual CO_{2e} emissions Reduce PSE contracted electric supply metric tons of annual CO_{2e} emissions	Yes, PSE shares publicly available data on its CO_{2e} emissions at https://www.pse.com/pages/greenhouse-gas-policy
Environment Risk Reduction	Reduction of climate change impacts	Increase in avoided emissions times the social cost of carbon	Yes, publicly available data on the social cost of carbon as defined by the WUTC is available at https://www.utc.wa.gov/regulated-industries/utilities/energy/conservation-and-renewable-energy-overview/clean-energy-transformation-act/social-cost-carbon, and data on PSE's emissions is available at https://www.pse.com/pages/greenhouse-gas-policy
Public Health	Improved outdoor air quality	Reduce regulated pollutant emissions (SO2, NOx, PM2.5)	Yes, internal PSE data on emissions.
Public Health	Improved community health	Reduce the occurrence of health factors like hospital admittance, and work loss days	Yes, based on Washington Department of Health hospital discharge rates, available here: Hospital Discharge Data (CHARS): Washington State Department of Health
Resilience	Decrease frequency and duration of outages	Decrease number of outages, total hours of outages, and total backup load served during outages using System Average Interruption Duration Index (SAIDI) and System Average Interruption Frequency Index (SAIFI) Reduction in peak demand through demand response programs	Yes, internal data on named communities and publicly available data regarding PSE's current SAIDI and SAIFI metrics are available at: https://www.utc.wa.gov/regulated-industries/utilities/energy/infrastructure-and-energy-planning/annual-reliability-reports-electric-companies Internal PSE data provided the analysis on named communities.

Risk Reduction Energy Security	Improved access to reliable, clean energy	Increase number of customers who have access to emergency power	Yes, PSE internal data in which PSE measures the number of customers with storage related to all customers and PSE customers within named communities. Please note PSE shows a count of zero as there is no current PSE program specific to net metering and battery storage.

Actions

In the annual CEIP progress report, PSE will report on progress on planned actions. This will include:

- A summary of actions,
- 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 the 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 customers, advisory groups, tribal governments, and others. 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 (RECs) 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 (CETA). 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 CETA.

Emissions

As part of the annual reporting, PSE will report:

- Total greenhouse gas emissions in metrics tons of CO_{2e}, and
- Annual greenhouse gas content calculation[74].

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 part of our 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 the company's most recent fuel mix disclosure report.

[74] 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.

- 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 PSE Commitments

Chapter Eight: Future Work and PSE Commitments

This chapter, focused on challenges and our path forward, includes an anticipated timeline and is based on current topics identified by stakeholders that are not fully addressed in the CEIP.

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 several essential areas of work ahead in 2022 that will continue to shape the work outlined in this CEIP. These are:

- Evaluating the results of the 2021 All-Source RFP and 2022 Distributed Energy Resource and Demand Response RFP.
- Establishing baseline data and measurements for customer benefit indicators not already included in this CEIP.
- Designing Distributed Energy Resource and Demand Response programs, including engagement with highly impacted communities and vulnerable populations.
- Implementing and learning from implementation of energy efficiency programs in 2022–2023.

PSE Commitments

As new information becomes available, PSE will continue to engage with our stakeholders through the public participation process. Some information will be incorporated into the RFP evaluation process in 2022, and some will be incorporated in the 2023 IRP progress report and 2023 biennial CEIP update.

Specifically:

1. PSE will include the following in the 2023 IRP progress report consistent with WAC 480-100-625:
    - Load Forecast
        - Incorporate temperature data that reflects climate change.
        - The temperature data will be shared with the IRP stakeholders in early 2022.
    - Demand-side resource assessment, including conservation potential assessment consistent with the load forecast.

- Changes to PSE's resource adequacy modeling as outlined in the PSE response to public comments on ELCC calculations and use filed under WUTC Docket UE-210220[75].
- Updated generic resource costs and operating characteristics with the most up to date information.
- Any updates to short-term market reliance.

2. PSE will incorporate the following in the Phase 2 evaluation of the 2021 All-Source RFP and 2022 Targeted DER RFP analysis[76]:
   - Temperature data that reflects climate change into the load forecast consistent with the 2023 IRP progress report.
   - Updated effective load carrying capability (ELCCs) as part of PSE's update to our resource adequacy modeling consistent with the 2023 IRP progress report.
   - Updated resource needs and portfolio modeling consistent with the 2023 IRP Progress report.
   - Any updates to short-term market reliance as part of PSE's update to our resource adequacy modeling consistent with the 2023 IRP progress report.

3. PSE will incorporate the following in the 2023 biennial CEIP update:
   - The analysis contained in the 2023 IRP progress report described in #1 above,
   - The results of the 2021 All-Source RFP,
   - The results of the 2022 Targeted DER RFP.

4. PSE will begin developing the building blocks for an equity assessment for the 2023 biennial CEIP update, including:
   - PSE will continue to develop data sources for metrics related to customer benefit indicators and any baseline data not already included in this CEIP by the end of Q2 2022.
   - PSE will continue to work with stakeholders to identify and develop future customer benefit indicators, including the potential for measuring fish and wildlife impacts, wildfire

[75] https://www.pse.com/-/media/PDFs/001-Energy-Supply/003-Acquiring-Energy/210220ELCCDRAFT-PSE-Resp-to-Pub-Comments120321.pdf?sc_lang=en&modified=20211203234257&hash=1671F391F3273487C6186AD12F29FC85

[76]] See the ELCC Workshop and Market Reliance Workshop presentations here: https://www.pse.com/en/pages/energysupply/acquiring-energy#2021all

impacts, sense of pride and self-sufficiency, and indoor air quality through the end of 2023 to inform the potential collection of baseline data for the next CEIP and will provide an update on this work in the 2023 biennial CEIP update.

- PSE will continue working on methodology for scoring and weighting customer benefit indicators for the next CEIP and provide an update on this work in the 2023 biennial CEIP update.
- PSE will continue to assess and measure the disparities within its existing programs and work with customers and stakeholders to begin to understand root factors causing disparities by the end of Q4 2022.
- PSE will engage with highly impacted communities and vulnerable populations in Q4 2022 to begin designing programs that mitigate existing disparities, are accessible and affordable and bring benefits directly to these customers that can be measured through the customer benefit indicators.

Guiding Principles for Implementation

As we work to create a new clean energy future and consider 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, guiding principles arose. PSE will use these principles to help guide CEIP implementation.

PSE and the Equity Advisory Group met multiple times and worked together to develop the following guiding implementation principles to help ensure accessibility, accountability, and affordability to accelerate equity in the clean electricity transition.[77]

Overarching principles

- Equity requires we ensure all customers benefit from clean electricity through an intentional effort to engage and advance the interests of vulnerable communities.
- Vulnerable communities bear a disproportionate burden of environmental risk and have historically faced barriers to clean electricity benefits, particularly low-income, senior, immigrant and Black, Indigenous, and People of Color (BIPOC) communities.[78]
- In this work, we seek to increase equity in electricity for vulnerable communities by addressing accessibility, affordability, and accountability during the clean electricity transition and beyond.

Accessibility principles

- **Increase community participation and sense of ownership in the clean electricity transition** by broadening customer awareness, education, and understanding of clean electricity technology and benefits.
- **Meet people where they are using education and outreach strategies that remove barriers and are intentional, multidimensional, flexible, and continuous**. Educational materials must be simple, accessible, visually engaging, and culturally, generationally, and linguistically relevant using conventional and emerging technologies.
- **Create a reciprocal process to build community capacity** by strengthening and expanding our relationships and sharing knowledge and resources with non-traditional organizations. This creates benefits for vulnerable communities such as job creation, training, recruitment, small business opportunities, supplier diversity, and community economic development.

[77] These are living principles, and PSE and the EAG may adjust these further during implementation.
[78] Our understanding of vulnerable communities is consistent with Washington's Clean Energy Transformation Act WAC 480-100-605 definitions for highly impacted communities and vulnerable populations, and we will continually update our understanding of these communities as we work to broaden and deepen our relationships with our customers.

Affordability principles

- **Create, evaluate, and continuously improve programs that increase vulnerable communities' ability to afford the resources they nee**d while providing additional opportunities for renters, multi-family residents, small businesses, and low-income households to participate.

- **Factor the unique socioeconomic considerations of vulnerable communities into program design** to advance the interests of these communities.

Accountability principles

- **Design programs that produce the outcomes desired by vulnerable communities** by creating an iterative process that prioritizes input from these communities and explains how we used their ideas.

- **Commit to a future that reduces or eliminates harmful impacts to vulnerable communities by continually** working together to understand historic, systemic, and environmental burdens and addressing those harms through program design, implementation, and reporting.

- **Consistently review and reflect upon practices that could potentially harm vulnerable communities** during and beyond the planning and implementation stages of the clean electricity transition.

- **Diligently and transparently measure, track, refine, and communicate results-driven metrics** for vulnerable communities, including customer benefit indicators, clean electricity costs, and delivery on clean electricity targets and programs.

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 customers, advisory groups, stakeholders, and tribal governments on these issues as part of the public participation process.