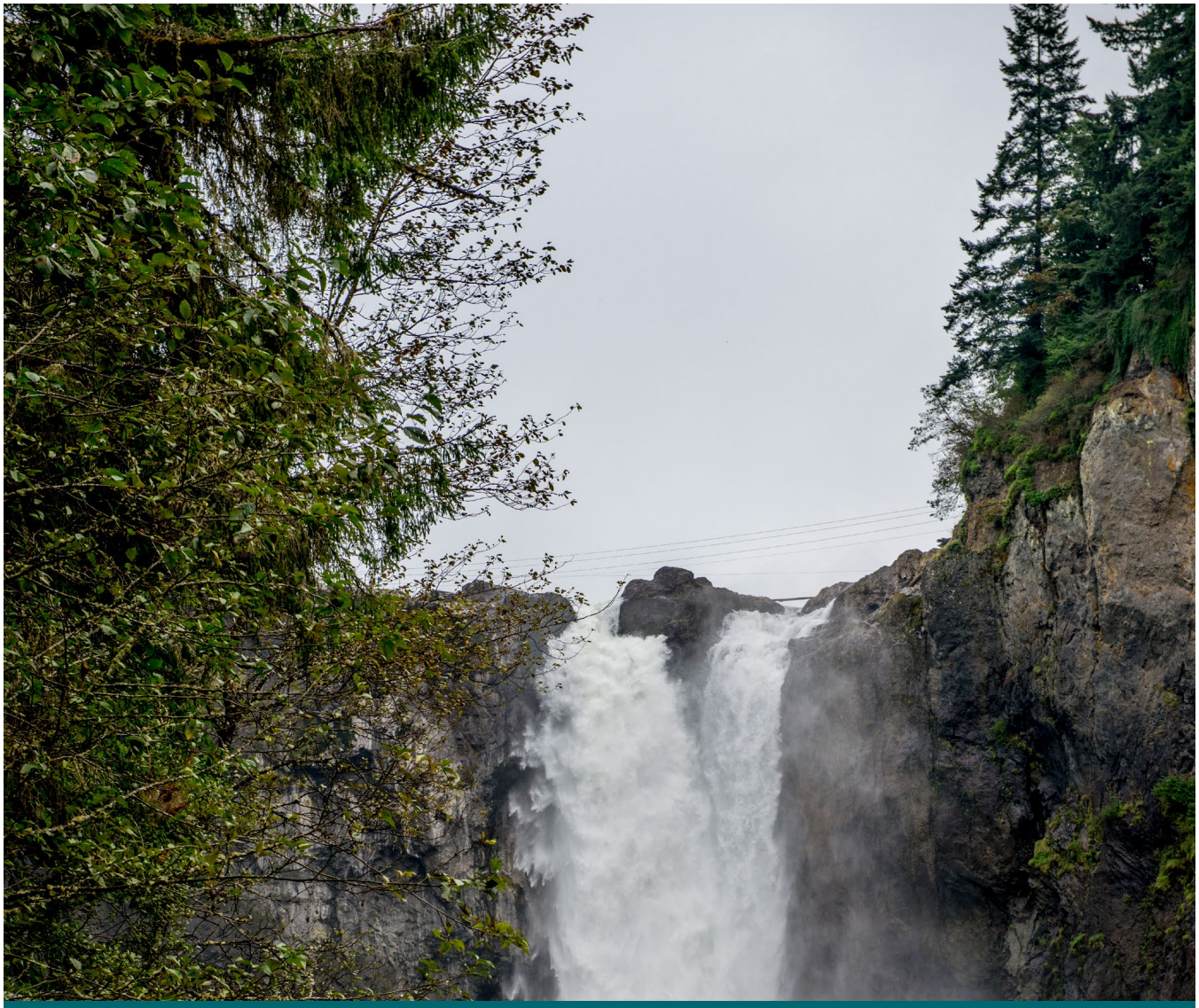


4 Specific Actions

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

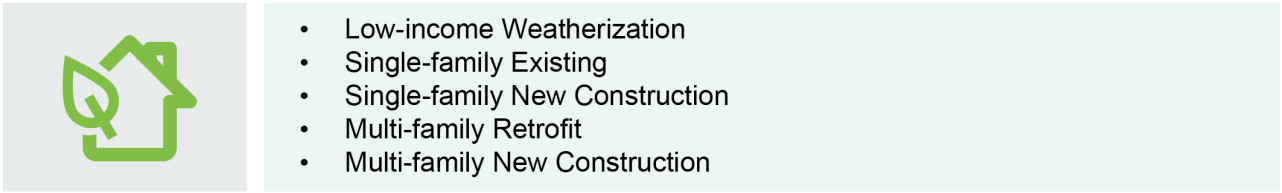
programs can also produce a decrease in frequency and duration of outages by providing solutions to distribution system constraints. Participating customers see additional benefits and burden reduction through improved home comfort, affordability of clean energy, and improved community health.

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).

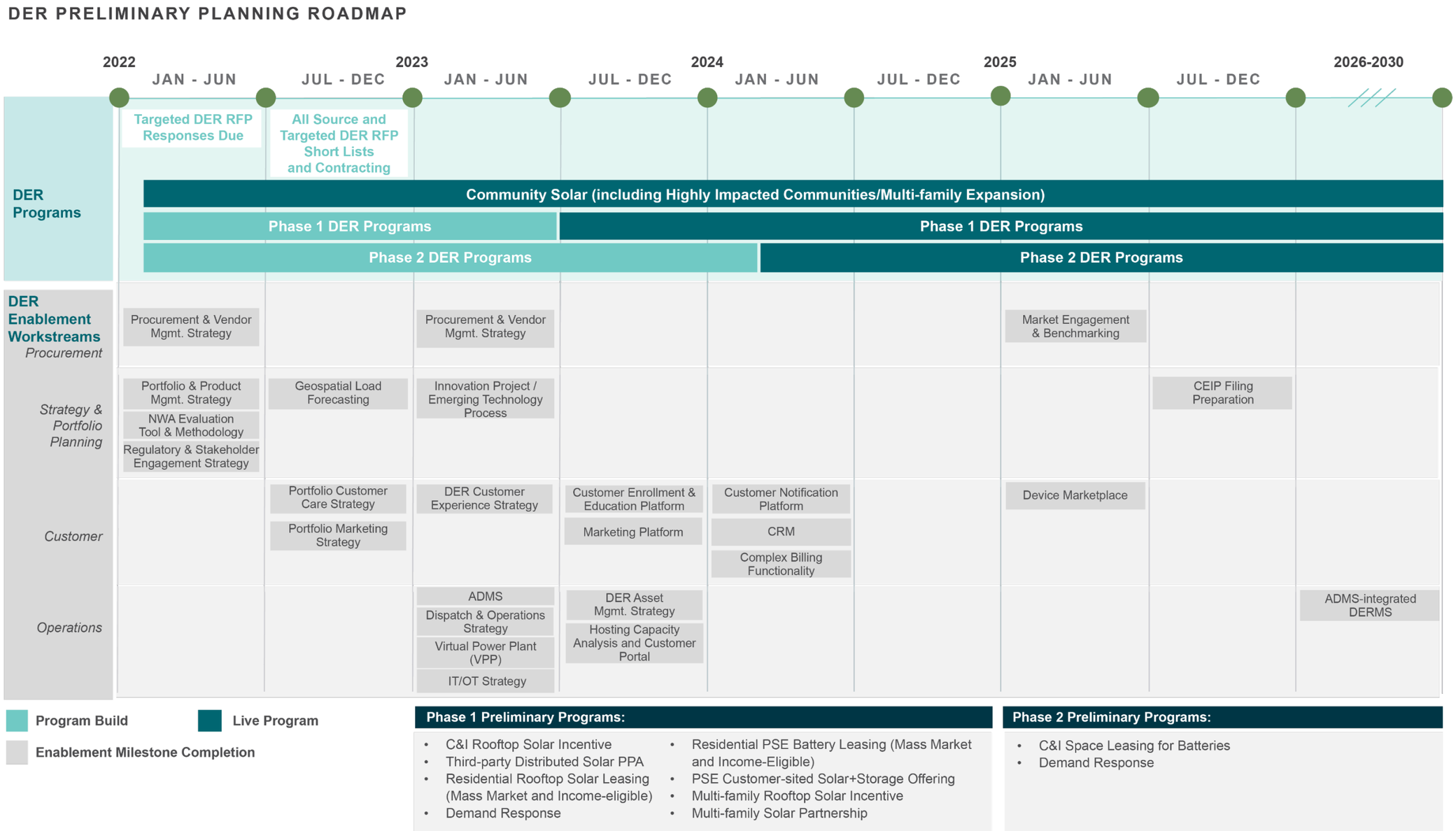
PSE plans to register 17.9 MW of nameplate distributed solar capacity in 2024. PSE will provide education through mass-market commercial and residential channels such as online, bill inserts, and partnerships with market actors. In partnership with community-based and non-profit organizations, PSE will 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.

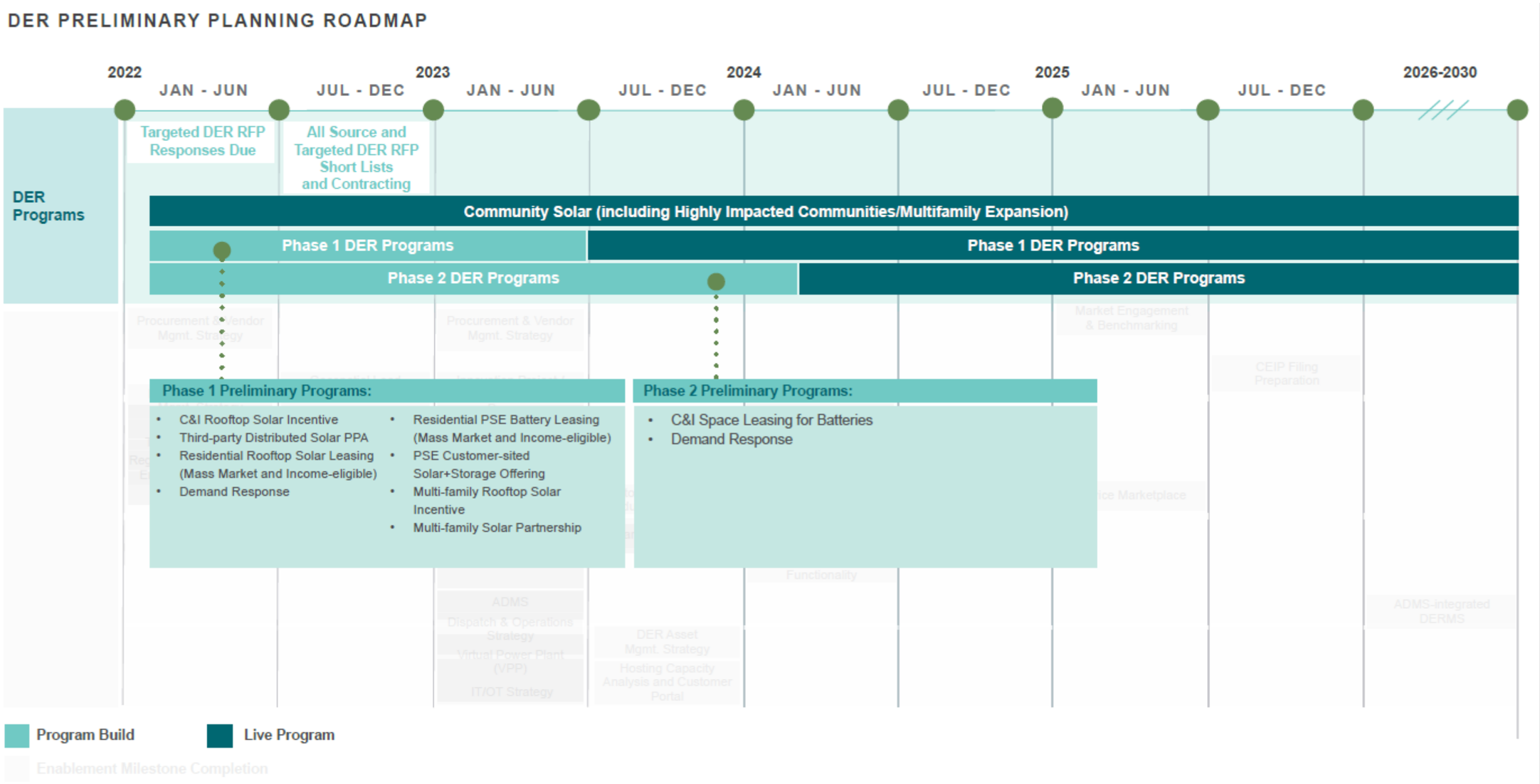
Customer Benefits

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

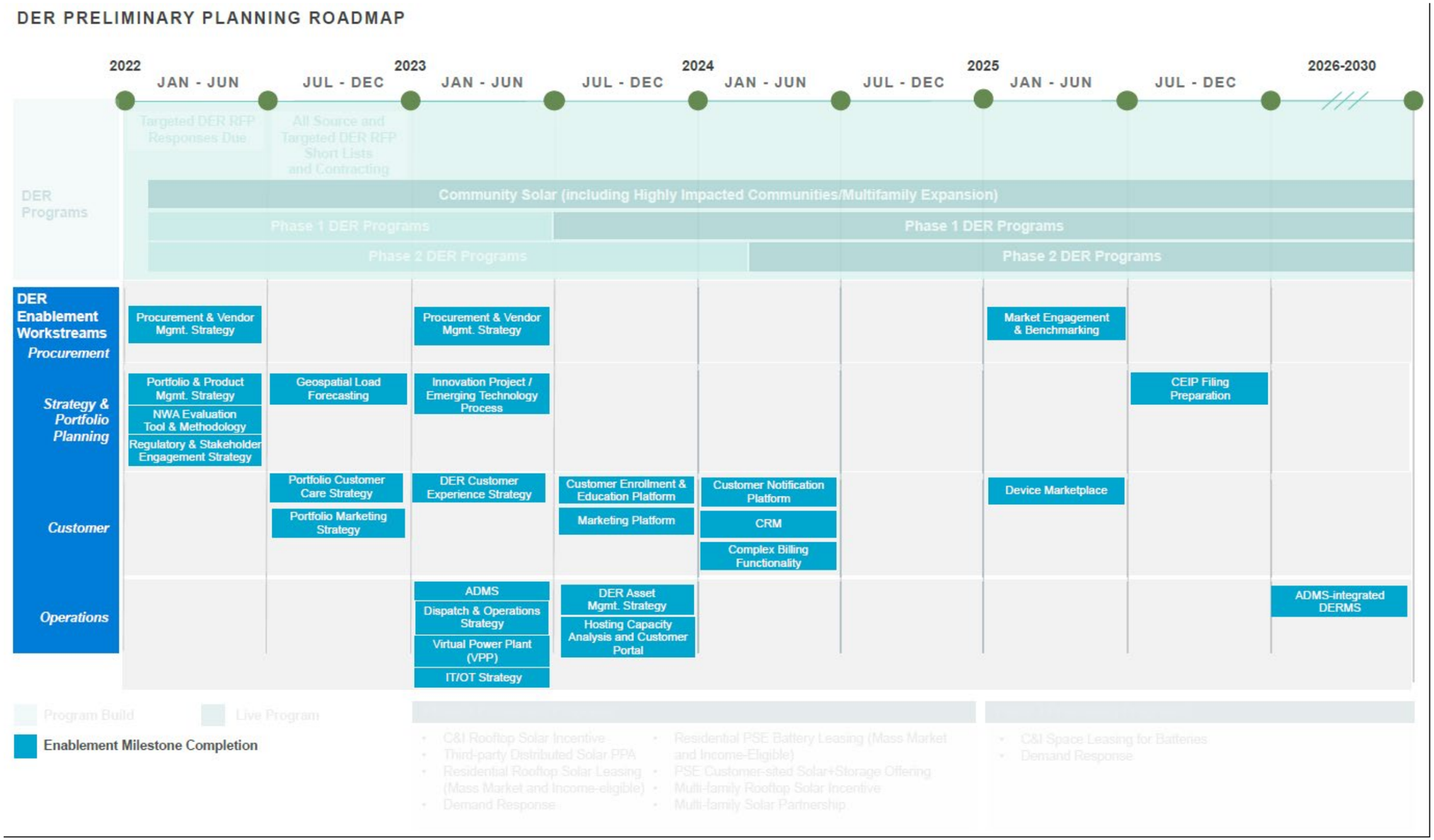
The Demand Response, Distributed Solar programs, and Battery Energy Storage programs sections describe the types of DER programs, actions, and proposed targets to support PSE's commitment to reducing emissions and meeting the Washington state mandate of 100 percent carbon-free electric supply by 2045. 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:

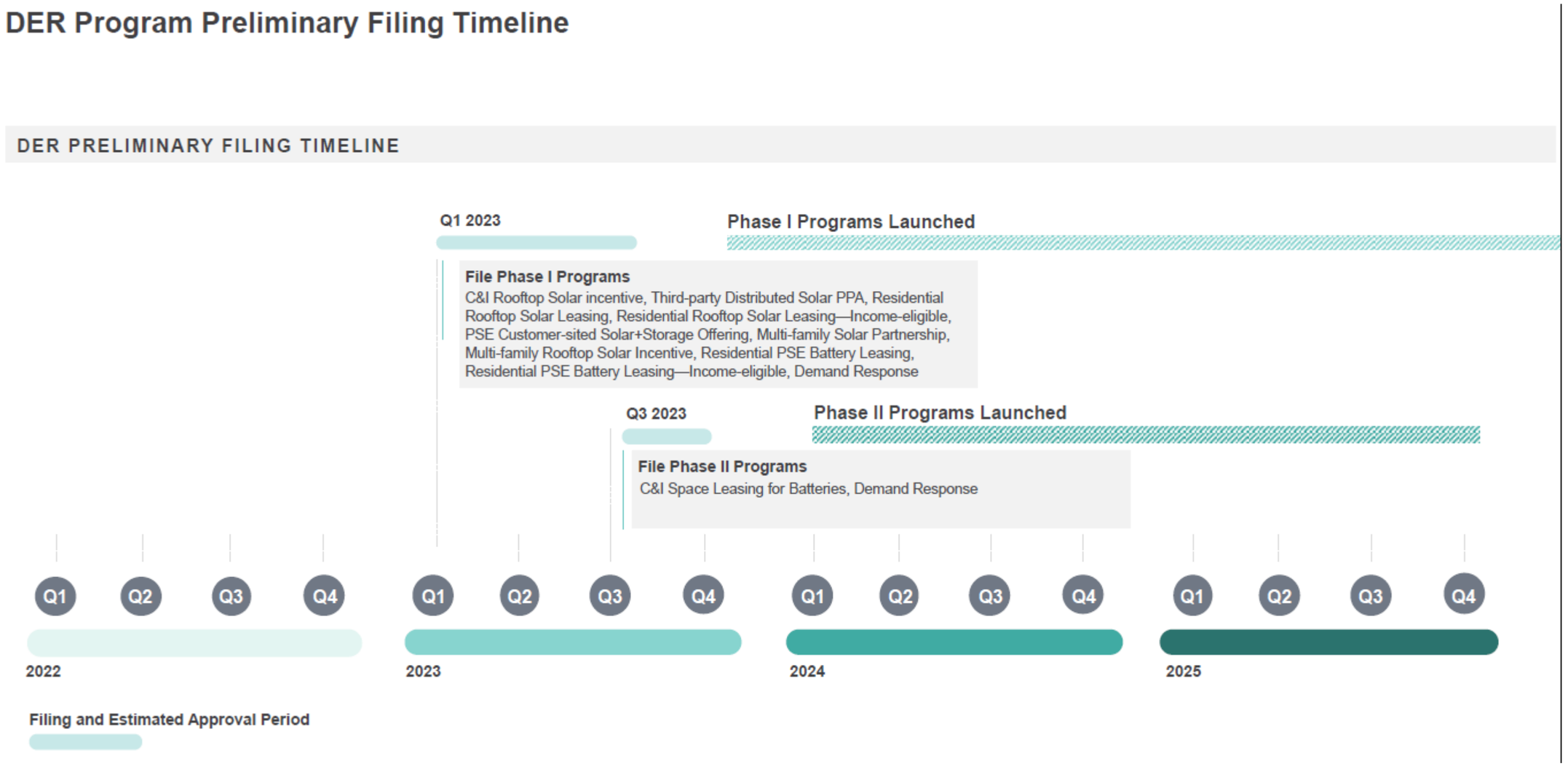
- Outline approach for stakeholder engagement, filing, and seeking approval of all CEIP DER programs. To assist with program review and engagement, we will group the filing process based on the suite of programs selected through the Targeted DER RFP process and operational dependencies as identified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

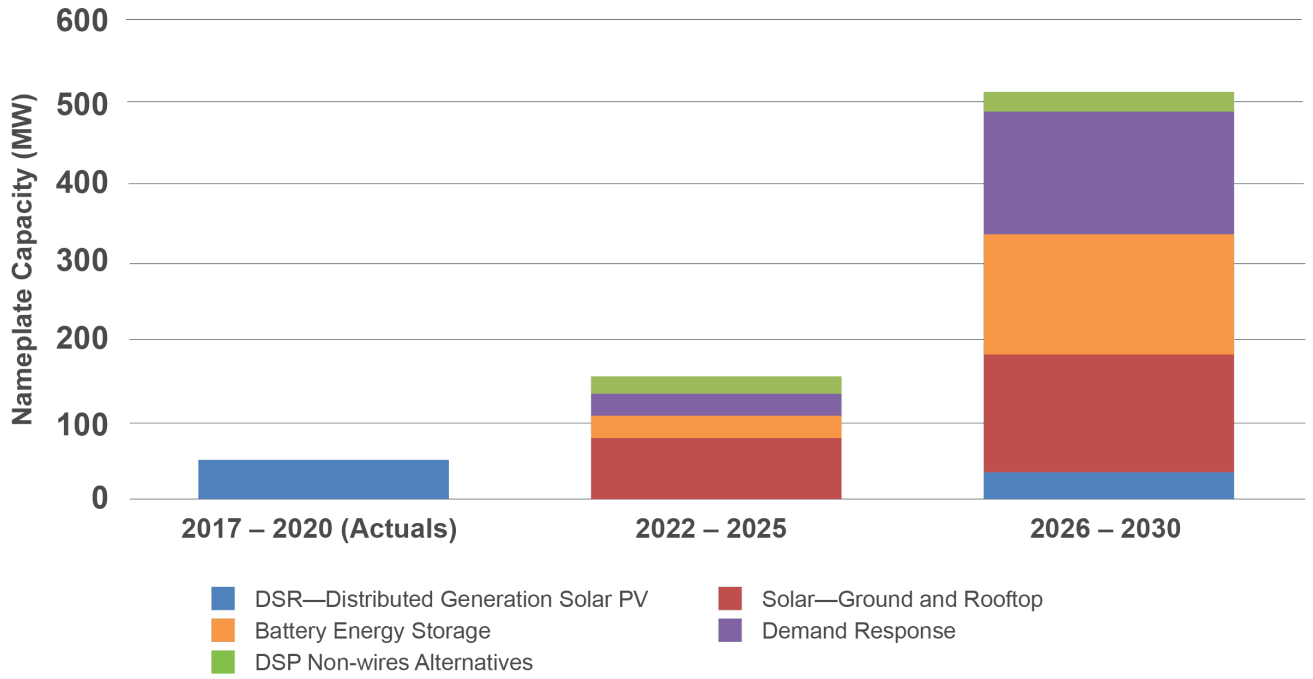
A result of this CEIP and the clean energy transformation, grid modernization has helped drive investments in the energy delivery system, including planning and operational tools, required to deliver energy to PSE's customers from the edge of PSE's territory and to support DERs within the delivery grid. 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.