



4

Specific Actions



PUGET SOUND ENERGY

Chapter Four: Specific Actions

Specific Actions

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

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

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

Energy Efficiency

Energy Efficiency Specific Actions

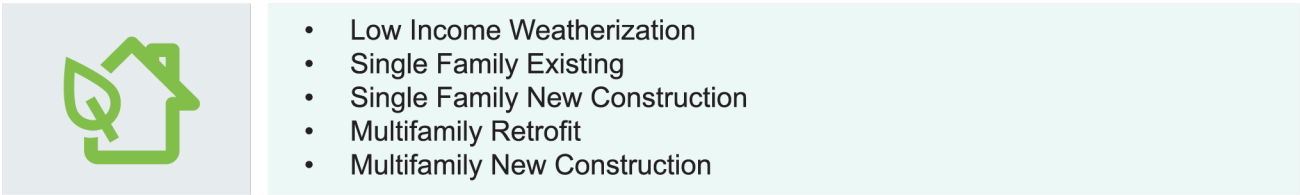
Energy efficiency programs and actions reduce the amount of electricity used by customers to meet their needs. This collective reduction in PSE's retail sales results in lower needs for new renewable and non-emitting resources to meet CETA requirements in RCW 19.405.040 and 19.405.050. As a result, both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

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

Residential Energy Management

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

Figure 4-1: Residential Energy Management Programs



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

Business Energy Management

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

Figure 4-2: Business Energy Management programs



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

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

Regional Programs

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

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

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

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

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

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

Demand Response

Demand Response Explained

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

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

Demand Response Specific Actions

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

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

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

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

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

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

Table 4-1: 2022–2025 Demand Response Programs

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

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

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

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

Demand Response Request for Proposals and Program Development

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

Annual Actions and Costs

2022

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

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

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

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

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

2023

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

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

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

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

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

2024

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

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

2025

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

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

Track and report on progress, costs, and benefits

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

Time-varying Rates Pilot Program

Time-varying Rates (TVR) Explained

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

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

How these actions move us closer to meeting CETA goals

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

Table 4-2: TOU Pilot Programs³²

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

Annual Actions and Costs

2022

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

2023

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

2024

Implement TVR and customer experience management.

2025

Conclude TVR pilot and begin impact evaluation.

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

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

Customer Benefits

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

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

Track and report on progress, costs, and benefits

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

Renewable Energy

The renewable energy target includes predictable changes in energy costs

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

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

Actions that Contribute to Renewable Energy

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

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

2021 All-Source Request for Proposals Explained

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

How these actions move us closer to meeting the CETA goals

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

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

Annual Actions and Costs

CETA Energy Need

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

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

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

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

Capacity Need

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

PSE's current transmission portfolio includes approximately 1,500 MW of firm transmission rights that deliver energy from the Mid-C trading hub to the PSE load center. Chapter 7 of the 2021 IRP³⁴ included a market risk assessment that evaluated the ongoing availability of the short-term power contracts associated with the transmission rights. As a result, PSE proposes to address market risk by gradually reducing the short-term market purchase limit associated with the transmission rights from the Mid-C trading hub from approximately 1,500 MW to about 500 MW by the year 2027. This reduction in market reliance increases the capacity need. In this All-Source RFP, PSE will seek contracts backed by CETA-compliant resources to replace those short-term contracts.

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

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

Table 4-4: Cumulative Capacity Need by Year

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

2022

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

2023

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

2024

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

2025

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

Customer Benefits

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

Track and report on progress, costs, and benefits

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

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

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

Distributed Energy Resources (DER) Solar

Solar Programs

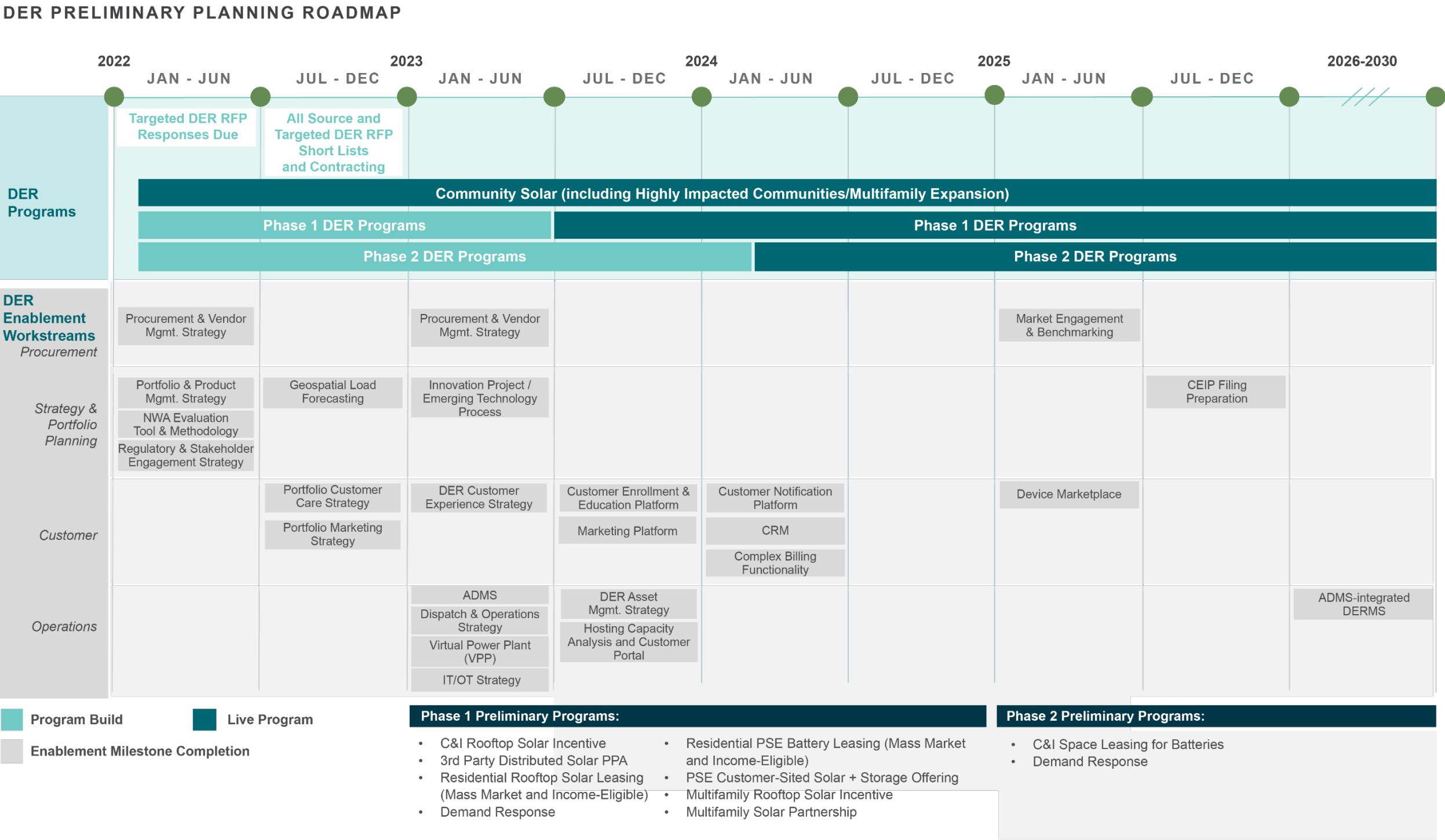
The 2021 IRP preferred portfolio identified 80 MW of distributed solar needed by 2025. PSE aims to meet this need through a diverse set of solar programs. PSE is committed to delivering distributed solar programs for our customers that are affordable, safe, and accessible to all. PSE's proposed suite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

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

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

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

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



Distributed Solar Programs with Utility-owned Assets

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

Distributed Solar Programs with Utility-owned Assets Explained

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

How these actions move us closer to meeting CETA goals

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

Annual Actions and Costs

2022

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

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

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

2023

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

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

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

2024

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

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

2025

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

Customer benefits

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

Track and report on progress, costs, and benefits

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

Distributed Solar Programs with Non-utility-owned Assets

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

Distributed Solar Programs with Non-utility-owned Assets Explained

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

How these actions move us closer to meeting CETA goals

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

Annual Actions and Costs

2022

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

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

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

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

2023

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

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

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

2024

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

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

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

2025

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

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

Customer Benefits

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

Track and report on progress, costs, and benefits

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

Distributed Solar Programs for Vulnerable Populations

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

Distributed Solar Programs for Vulnerable Populations Explained

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

How these actions move us closer to meeting CETA goals

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

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

Annual Actions and Costs

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

2022

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

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

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

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

2023

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

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

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

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

2024

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

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

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

2025

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

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

Customer Benefits

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

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

Track and report on progress, costs, and benefits

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

Community Solar

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

Community Solar Explained

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

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

How these actions move us closer to meeting CETA goals

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

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

Annual Actions and Costs

2022

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

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

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

2023

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

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

2024

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

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

2025

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

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

Customer Benefits

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

Track and report on progress, costs, and benefits?

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

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

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

Bainbridge Island Capacity/Reliability Project Explained

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

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

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

How these actions move us closer to meeting CETA goals

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

Annual Actions and Costs

2021

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

2022

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

2023

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

2024

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

Customer Benefits

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

Track and report on progress, costs, and benefits

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

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

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

The Issaquah Area Capacity and Reliability explained

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

How these actions move us closer to meeting the CETA goals

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

Annual Actions and Costs

2021

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

2022

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

2023

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

2024

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

2025

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

Customer Benefits

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

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

Track and report on progress, costs, and benefits

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

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

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

Sumner Valley Area Capacity Project Explained

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

How these actions move us closer to meeting CETA goals

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

Annual Actions and Costs

2021

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

2022

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

2023

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

2024

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

2025

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

Customer Benefits

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

Track and report on progress, costs, and benefits

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

Other PSE Programs and Actions

DER Storage

Storage Programs

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

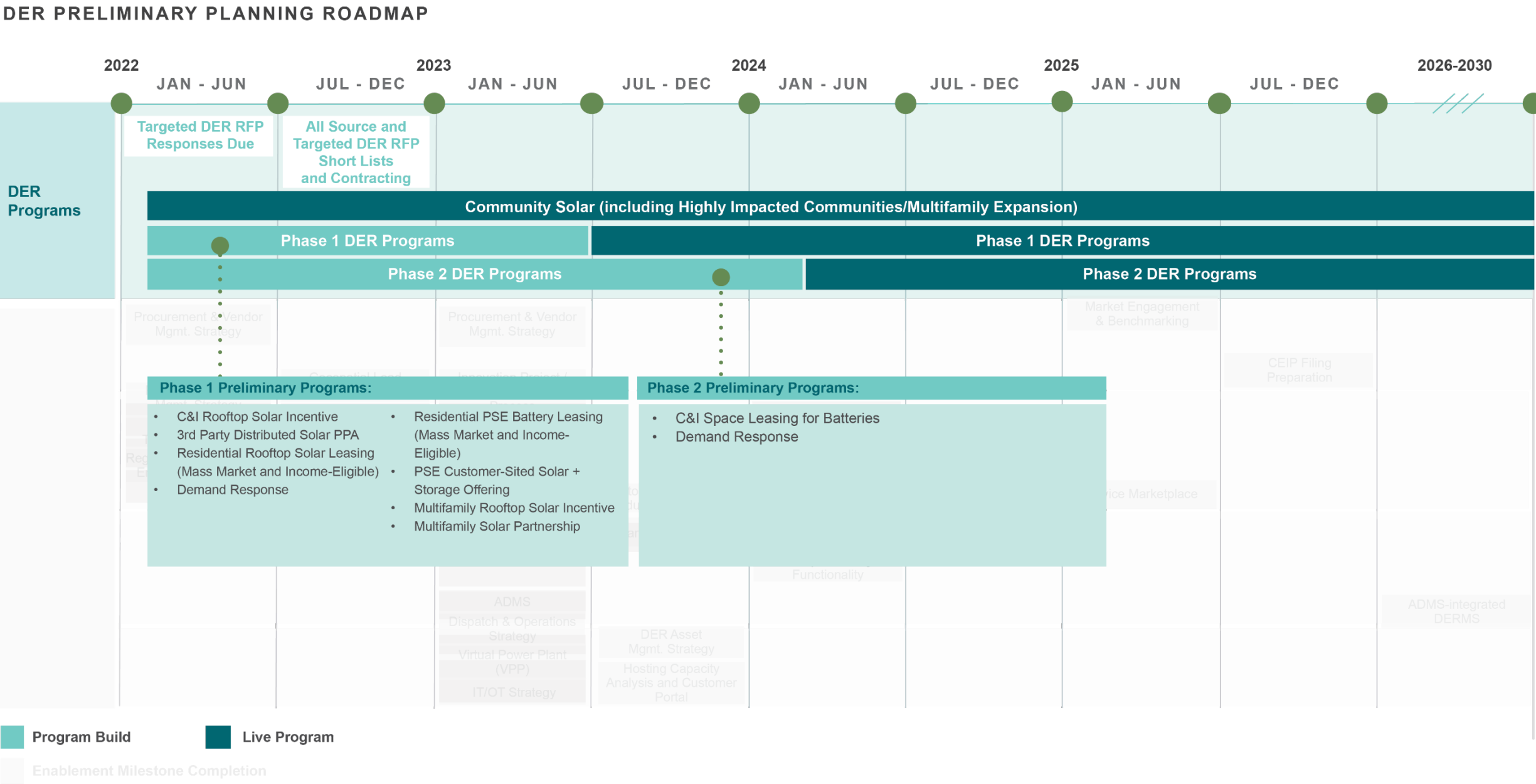
PSE proposes implementing battery storage programs that expand participation in general and in traditionally underserved populations. Through identifying mixes of distributed energy resources that have both high customer benefit and low costs (see Chapter 3: Interim and Specific Targets and CEIP Methodology),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

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

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

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

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



Battery Energy Storage Programs with Utility-owned Assets

Peak Capacity Contribution: 0.7 MW

Battery Energy Storage Programs with Utility-owned Assets Explained

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

How these actions move us closer to meeting CETA goals

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

Annual Actions and Costs

2022

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

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

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

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

2023

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

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

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

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

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

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

2024

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

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

2025

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

Customer Benefits

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

Track and report on progress, costs, and benefits

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

Battery Energy Storage Programs with Non-utility-owned Assets

Peak Capacity Contribution: 2.4 MW

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

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

How these actions move us closer to meeting CETA goals

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

Annual Actions and Costs

2022

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

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

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

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

2023

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

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

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

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

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

2024

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

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

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

2025

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

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

Customer Benefits

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

Track and report on progress, costs, and benefits

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

Battery Energy Storage Programs for Vulnerable Populations

Peak Capacity Contribution: 0.2 MW

Battery Energy Storage Programs for Vulnerable Populations Explained

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

How these actions move us closer to meeting CETA goals

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

Annual Actions and Costs

2022

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

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

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

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

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

2023

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

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

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

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

2024

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

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

2025

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

Customer benefits

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

Track and report on progress, costs, and benefits

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

Resource Enablement and Delivery

DER Enablers

Introduction

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

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

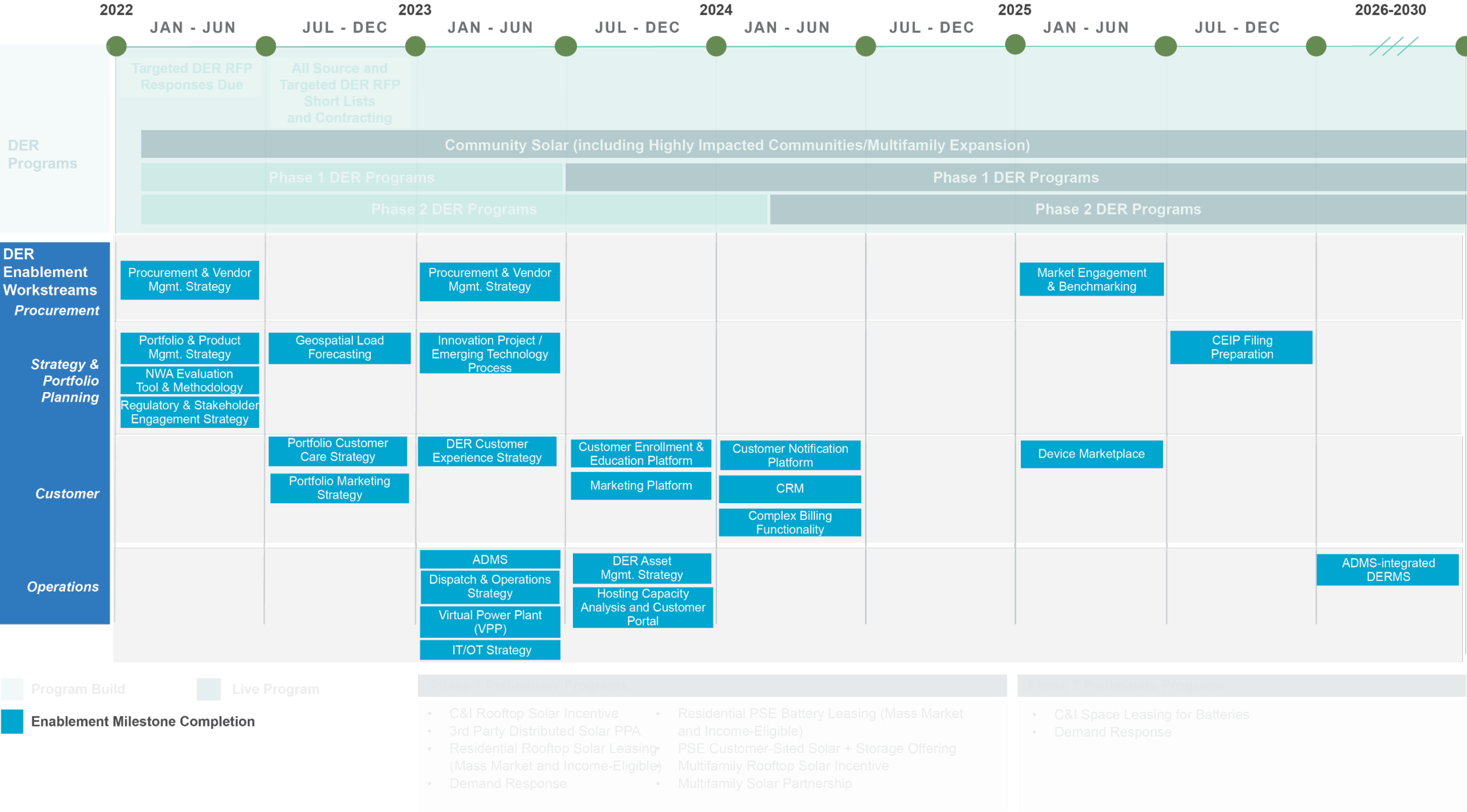
PSE has structured these cross-functional enablement activities into four major work streams: strategy and portfolio planning, operations enablement, procurement, and customer enablement. To support the creation of the DER portfolio, PSE must:

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

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

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

DER PRELIMINARY PLANNING ROADMAP



Strategy and Portfolio Planning

PSE Work stream Guiding Principles

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

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

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

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

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

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

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

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

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

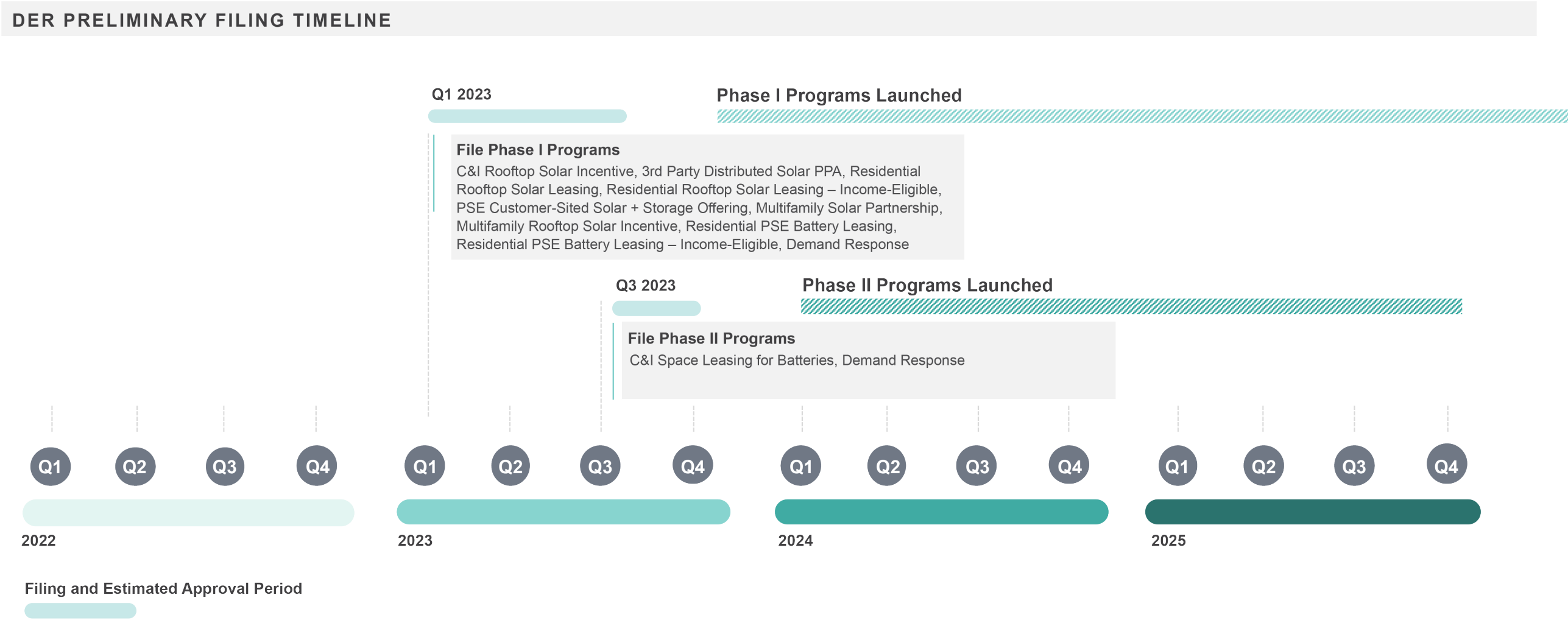
Regulatory and Stakeholder Engagement Strategy: Launching the DER programs will require approvals from WUTC and alignment with stakeholders. Based on PSE's preferred portfolio selection and the underlying capabilities needed to support certain types of programs, PSE has proposed a preliminary filing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

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

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

Figure 4-6: DER Program Preliminary Filing Timeline

DER Program Preliminary Filing Timeline



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

Representative activities include:

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

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

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

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

- PSE is already applying a framework to assess when NWA options are suitable to address a system need and evaluate proposed solutions against traditional solutions and approaches. This framework is necessary because there is no universal answer for all situations; each potential NWA must consider internal operations, grid configuration and conditions, and the regulatory constructs. PSE will invest in building a tool to evaluate proposals effectively and quickly for non-wire alternatives against traditional infrastructure investments. A business cost analysis tool will guide PSE's consideration of NWA in our transmission and distribution planning and operation, manage the NWA implementation, and design the appropriate rates.
- With the launch of multiple DER programs over the next four years, PSE expects increased staff and additional external service support to assist with defining and executing the overall DER strategy and portfolio planning processes. We summarize the forecasted costs to develop and operationalize the four tools described in the Grid Modernization Section below.
- **Geospatial Load Forecasting:** The proliferation of DERs driven by the CETA creates the need for PSE to plan the systems to accommodate the upcoming DERs and decide what type of DERs we should install to meet the CETA requirements as replacement of fossil fuels. To accomplish this, PSE will design a spatial load forecasting tool that will predict load and power changes, where the loads will occur on the grid, how distributed generation (DG) changes the load shape and when we must supply the load.
- Design a spatial load forecasting tool that will predict load and power changes, where the loads will occur on the grid, how distributed generation (DG) changes the load shape and when we must supply the load.

Supporting technology, tools, or people resources

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

Annual Actions and Costs

2022

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

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

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

2023

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

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

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

2024

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

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

2025

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

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

Operations Enablement

DER Enabling Activity Set: Operations Enablement

PSE Work Stream Guiding Principles

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

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

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

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

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

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

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

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

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

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

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

Supporting technology, tools, or human resources

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

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

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

Annual Actions and Costs

2022

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

2023

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

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

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

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

2024

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

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

2025

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

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

Procurement

DER Enabling Activity Set: Procurement

PSE Work stream Guiding Principles

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

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

- Encourage all suppliers and employees to follow PSE's Code of Conduct: Create a culture of ownership, accountability, honesty, integrity, and trust by encouraging everyone involved in procurement to follow the Code of Conduct.³⁵
- Continually benchmark and identify best practices. Continuously improve through industry and customer engagement to inform ongoing procurement plans.

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

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

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

- Prioritize business models that best suit the DER portfolio and operational goals (e.g., performance guarantees, power purchase agreements, shared savings, customer engagement model).
- Develop strategies to build participation by vendors that represent Black, Indigenous, and People of Color- (BIPOC), veteran-, women-, and disabled-owned businesses.
- Define preferred ownership models for different DER types.
- Define preferred operational models for utility front of meter (FOTM) or behind-the-meter (BTM) DERs (third-party PPA, third-party build, run, transfer ownership, or utility ownership from day 1).
- Identify key roles and responsibilities for procurement, operation, maintenance, and decommissioning.
- Define key requirements for enabling technologies in line with industry best practices (cybersecurity requirements, communication protocols, operations and maintenance support, Diversity, Equity, and Inclusion (DEI) best practices).
- Acquire and build DER contracting expertise.

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

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

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

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

Supporting technology or people resources

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

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

Annual Actions and Costs

2022

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

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

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

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

2023

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

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

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

2024

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

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

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

2025

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

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

Customer Enablement

DER Enabling Activity Set: Customer Enablement

PSE Work Stream Guiding Principles

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

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

Actions to Launch and Operate PSE's DER Portfolio

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

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

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

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

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

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

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

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

Supporting technology or people resources

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Annual Actions and Costs

2022

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

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

2023

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

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

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

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

2024

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

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

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

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

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

2025

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

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

Transmission Capacity Constraints

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

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

Grid Modernization

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

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

Preparing for clean energy for many years

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

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

Since 2010 there are additional policies that highlight a future cemented by CETA including the WUTC issued Report and Policy Statement on Treatment of Energy Storage Technologies in Integrated Resource Planning and Resource Acquisition³⁶ that encouraged greater energy storage alternatives in planning processes, suggesting a future grid to embrace this technology. These tea leaves were not hard to read, and PSE has been developing and advancing a modern grid, planning for and investing in infrastructure that ultimately supports clean energy goals and arguably makes the transition easier. Grid modernization requires a holistic approach for clean energy to be used by customers when they need it.

CEIP Allocation Methodology

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

³⁶ UTC Docket U-161024

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

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

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

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

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

distributed energy resources³⁷ and CEAP reaffirms the 10-year plan for the deliverability of resources³⁸. PSE's entire grid modernization investments drive progress in visibility, analysis, and control; reliability and resiliency; DER integration processes; security, cybersecurity, and privacy; and backbone infrastructure.

Visibility, Analysis, and Control

Data availability, integrity and granularity are critical aspects to planning for and operating DERs. Through PSE's ongoing investment in Advanced Metering Infrastructure (AMI) and SCADA at distribution substations, PSE will have new data and visibility that can be utilized for delivery system planning, customer program planning and operational analytics. AMI is an integrated system of smart meters, communications networks and data management systems that enables two-way communication between utilities and customers, technology that has become industry standard³⁹. AMI meters will serve to provide significant enhancements to the types and granularity of data PSE can collect to proactively plan for growth, integrate new technologies, offer services to customers, respond more quickly to system needs and operate the system safely.

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

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

³⁷ RCW 19.280.100(2)(e)

³⁸ IRP; pg 2-20

³⁹ UE-190529 and UG - 190530; PSE 2019 General Rate Case Final Order ¶ 153

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

Reliability and Resiliency

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

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

DER Integration Processes

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

Security, Cybersecurity, and Privacy

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

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

Backbone Infrastructure

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

Actions and costs 2022–2025

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

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

More generally, grid modernization investments will include important accomplishments:

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

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

Virtual Power Plant

Virtual Power Plant Explained

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

How these actions move us closer to meeting CETA goals

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

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

2022

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

2023

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

2024

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

2025

Ongoing support and maintenance to the latest software platform.

Customer Benefits

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

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

Track and report on progress, costs, and benefits

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

Distributed Energy Resource Management System (DERMS)

Distributed Energy Resource Management System (DERMS) Explained

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

How these actions move us closer to meeting CETA goals

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

2024

Develop DERMS requirements and acquisition process and begin implementation.

2025

DERMS implementation. Implementation to be completed in 2026.

Customer Benefits

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

Track and report on progress, costs, and benefits

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

Volt-Var Optimization

Volt-Var Optimization Explained

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

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

How these actions move us closer to meeting CETA goals

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

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

2022

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

2023

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

2024

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

2025

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

Customer Benefits

The intended benefits of VVO include:

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

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

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

Track and report on progress, costs, and benefits

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

Hosting Capacity Analysis, Map, and Customer Portal

Hosting Capacity Analysis, Map, and Customer Portal Explained

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

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

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

How these actions move us closer to meeting CETA goals

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

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

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

2023

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

2024

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

2025

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

Customer Benefits

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

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

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

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

Track and report on progress, costs, and benefits

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

Substation Control and Data Acquisition (SCADA)

Substation Control and Data Acquisition (SCADA) Explained

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

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

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

How these actions move us closer to meeting CETA goals

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

2022

Install or upgrade SCADA in 16 substations.

2023

Install or upgrade SCADA in 18 substations.

2024

Install or upgrade SCADA in 24 substations.

2025

Install or upgrade SCADA in 23 substations.

Customer Benefits

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

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

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

Track and report on progress, costs, and benefits

The Substation SCADA program costs and progress are tracked and documented by the Project Manager.

Benefits (CMI) saved are recorded per project completion and reported on by Asset Management end of year for the annual Electric reliability report.

Data Lake and Data Analytics

Data Lake and Data Analytics Explained

Advanced operational and planning capabilities require significant enhancements to data availability and granularity. Examples of required data include DER asset information, near real-time metering data, customer DER program participation, and detailed GIS and electric system asset information. The grid modernization Data Lake brings these disparate data sources together to enable new system operations, planning functions, and business processes based in analytics. Advanced operational and planning capabilities include, among others, unbalanced load flow and state estimation that support a wide range of enterprise tools. This project will also develop new business processes and tools to support analytics capabilities.

How these actions move us closer to meeting CETA goals

An architecture that enables data to be validated and utilized across the enterprise by planning and operational tools will allow PSE to scale DER deployment at the pace anticipated by the IRP. The architecture will ensure all DER operational and planning tools are utilizing the same as-built and as-operated models and normalize data exchange and model information. This will be critical as the pace of interconnection increases and DER penetration increases throughout the service territory. New business processes and tools combined with analytics will enable PSE to perform operational planning and real-time operations that maximize the potential benefits of DERs—including locational and market value—while minimizing grid disruptions.

2022

N/A

2023

Develop IT/OT architecture to support current and future DER enabling technologies including Data Lake, enterprise service bus, and operational technology/control bus. Develop business processes and tool enhancements that support timely and complete updates to GIS data as changes are made in the field. Develop business processes and tool enhancements that support timely and complete updates to DER asset information.

2024

Begin implementation of architecture and business processes/tools identified in 2023.

2025

Complete implementation and reassess ongoing data needs and gaps.

Customer Benefits

This project enables PSE to integrate DERs at the pace anticipated in a more cost-effective and efficient manner. Business processes and tool enhancements combined with data analytics will deliver actionable intelligence for optimal network performance and grid reliability as the system becomes increasingly complex.

Track and report on progress, costs, and benefits

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

Circuit Enablement – DERs and Microgrids

Circuit Enablement – DERs and Microgrids Explained

As the DER portfolio scales, the peak capacity output for DERs on a circuit will be constrained by existing grid infrastructure, as the system does not accept high amounts of reverse power flow. PSE has identified the need to enable 5 percent of circuits (~55) for high DER penetration. Voltage imbalances caused by DER production onto the grid impact reliability and power quality, which in turn limits available hosting capacity. The DER and microgrid circuit enablement program proactively improves electric infrastructure to expand DER hosting capacity equitably. Program population size and data will ultimately be determined by hosting capacity studies, the CEIP, and the DER strategy. Although a range of factors can contribute to limited hosting capacity, lightly loaded substation circuits pose as key investment areas for infrastructure upgrades.

Below are key tasks to achieve DER and Microgrid circuit enablement:

- Upsizing of assets such as conductors and service transformers to accommodate additional renewable energy capacity

- Additional line regulators and/or substation transformer upgrades for voltage regulation
- Additional reclosers and protective relays to form microgrids
- Substation upgrades such as smart circuit breakers, 115 kV circuit switchers, or communications to protect system from higher fault currents
- Improving communication networks for granular loading data

How these actions move us closer to meeting CETA goals

Current grid infrastructure limits the ability for mass DER export as anticipated in the IRP. Managing the diverse and distributed energy portfolio with intermittent resources while being able to maintain adequate utility power creates new planning and operating parameters on the grid. Close studies of the circuits with higher DER penetration shall address circuit infrastructure constraints and create a path forward to enable them for DERs and Microgrids.

2022

N/A

2023

Enable 7-8 circuits for up to 5 MW of DERs.

2024

Enable 8-9 circuits for up to 5 MW of DERs.

2025

Enable 12 circuits for up to 5 MW of DERs.

Customer Benefits

In addition to the deployment of PSE owned assets, customer, and developer interconnection requests of DERs are expected to grow to support the clean energy portfolio. This program aims to create more opportunities for customers seeking to interconnect DERs or form microgrids by proactively enabling circuits that are limited in hosting capacity/microgrid capabilities.

Track and report on progress, costs, and benefits

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

DER Property Acquisition

DER Property Acquisition Explained

The ability to implement DER on the system is dependent on the availability of land that is of sufficient size to accommodate a DER installation, is located close to areas of the system that have available capacity and has easy access to corridors needed to transport that energy to the customer.

Following a technical analysis of the system to identify areas with the available capacity to incorporate a high penetration of DER, PSE will proactively evaluate and identify properties and corridors that would allow for low-cost interconnection of these resources. Consideration will be given to existing PSE properties with the potential for expansion, which would provide lower overall interconnection costs and allow for more DER within the identified areas. Priority will be given to the incorporation of DERs in areas of the system that serve highly impacted communities and vulnerable populations.

DER property acquisition will focus not only on the purchase of land to develop into DER or substation property, but also in the acquisition of rights of way, such as easements, for delivering that energy to PSE's customers.

How these actions move us closer to meeting CETA goals

The proactive acquisition of properties and rights of way to facilitate the interconnection of DER will enable PSE to streamline the planning and implementation process for new DER projects to support PSE's strategic goals. The evaluation and development of locations for siting new infrastructure can be a significant hurdle in planning and implementation of new infrastructure. Having proactively identified sites available for development in areas of the system that are known to have the capacity available to accommodate DERs will allow for flexibility in considering solutions for system needs and ease of implementation.

2022

PSE plans to evaluate the system to identify areas of priority in 2022. This analysis will focus on areas of the system with the available capacity to accommodate DER, areas of the system that serve highly impacted communities and vulnerable populations, and existing PSE-owned locations with the ability to be expanded.

2023

PSE will focus our efforts on property acquisition utilizing the findings of the system analysis.

2024

PSE will focus our efforts on property acquisition utilizing the findings of the system analysis.

2025

PSE will focus our efforts on property acquisition utilizing the findings of the system analysis.

Customer Benefits

The proactive acquisition of property by PSE will enable interconnections and minimize costly upgrades paid by the customer. The interconnection process will be simplified by proactively identifying the areas of need on the system and focusing on the expansion of existing PSE properties. It will also facilitate the implementation of DER for highly impacted communities and vulnerable populations which may not otherwise have access to new technologies such as DER.

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

- Reduced system upgrades needed to incorporate DER
- Reduced interconnection costs
- Increased application success rate
- Avoided application fees for infeasible projects

Track and report on progress, costs, and benefits

PSE will track and report on the number and size of the properties and/or easements acquired as well as the estimated MW of DER the property will accommodate.

Resilience Enhancement

Resilience Enhancement Explained

PSE's resilience efforts are focused on low probability, high consequence risks that take significant efforts to understand and mitigate along with ongoing system-wide asset health issues that make the electrical system more susceptible to destabilization. Included in these programs are wildfire mitigation, earthquake preparedness, drone-based LiDAR and IR scanning, and microgrid systems that can serve customers during widespread interruptions.

How these actions move us closer to meeting CETA goals

Building a robust asset management strategy is an underlying need for DER enablement and system improvements on the edge of the electrical grid drive system resilience. Resilience enhancements include microgrid enablement for radial fed areas which enhance the effective use of DERs and improve customer reliability and resiliency.

Customer Benefits

Microgrids improve both reliability and resiliency by reducing the impact of interruptions to customers by providing alternate sources of energy, whether under normal conditions or during large scale disruptive events. Asset monitoring and management programs improve both as well by reducing the risk of failed or failing equipment from causing interruptions or preventing microgrids from offering an alternate source of power during interruptions.

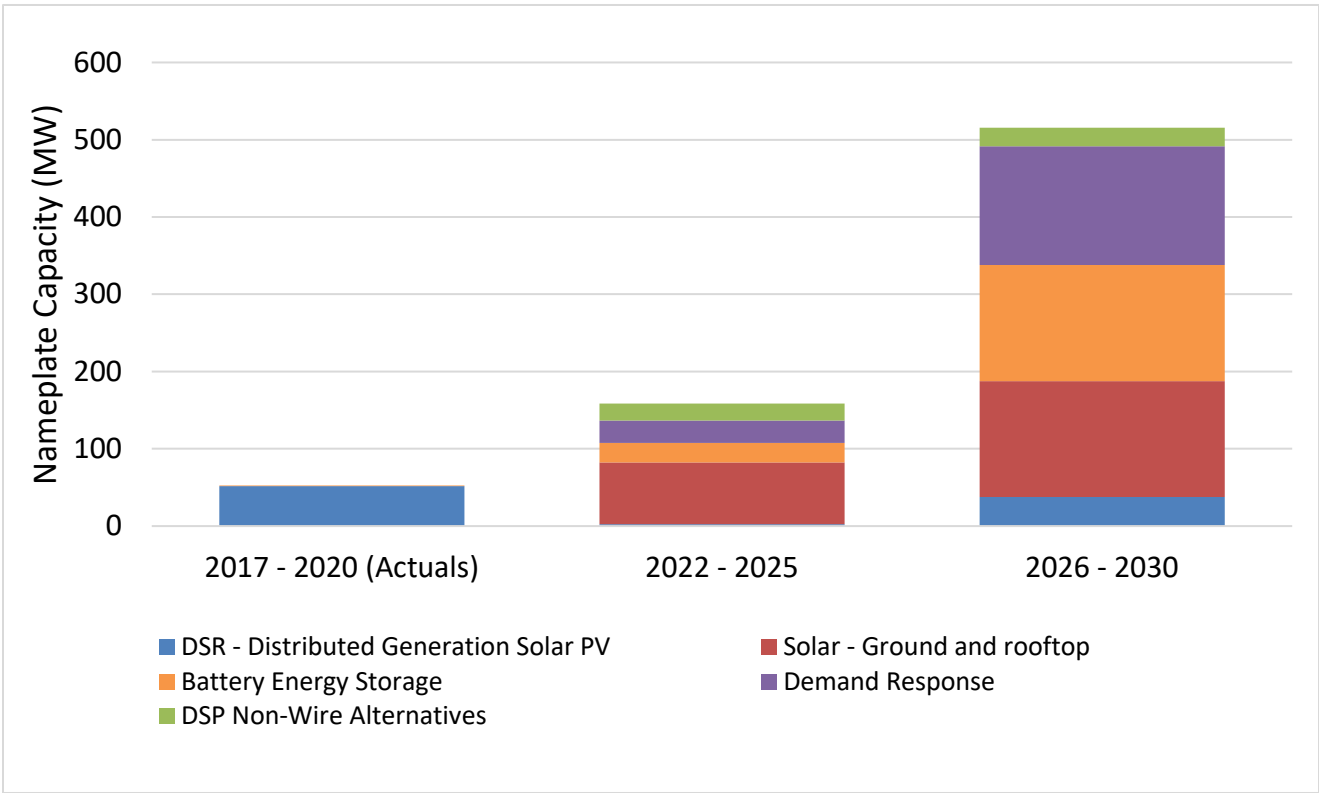
Track and report on progress, costs, and benefits

PSE tracks progress on projects, costs, and benefits in corporate database (SAP) and will communicate results in the Grid Mod report.

Grid Modernization CEIP Investment Impacts

PSE continues to implement a robust grid modernization strategy which includes several investments to enhance the delivery infrastructure. One part of the objective is to further DER integration on the grid. The clean energy action plan based on the 2021 IRP preferred portfolio identified a significant number of DERs needed by 2030. In total, 634 MW of distributed batteries, solar and demand response with PSE’s service territory by 2030. This is more than 10 times the amount of DERs than the grid has accommodated over the last 4 years as shown in figure 4-6.

Figure 4-7: Incremental DER Resource Additions per CEAP



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

- Enhancing the SCADA system equipment at substations supporting DER high penetration circuits.
- Enhancing circuit visibility and control by installing additional voltage regulation and automated circuit switching equipment on DER high penetration circuits.
- Enhancing resilience focused on proactive high risk grid monitoring and associated DER microgrid installations to enable alternate sources of power for customers experiencing limited grid flexibility.
- Proactive DER property acquisition adjacent to existing substation facilities that can enable lower cost interconnection for DERs while maximizing benefits to the system while incorporating equity considerations.
- Accelerated implementation of operational platforms such as Virtual Power Plant (VPP) and Distributed Energy Resource System (DERMS)

While grid modernization investments were keeping pace with the economic driven customer adoption of DERs across the grid, the pace of DERs driven specifically by the CETA law and resulting policies have necessitated a 10-fold increase in DERs than originally anticipated. Adding DERs to the grid while maintaining operational flexibility, to ensure no degradation of customer reliability and enhancing resiliency will take additional investment and, for many programs, faster investment to ensure the grid can fully meet the CEAP targets.

Other Actions that reduce retail sales

Public Utility Regulatory Policies Act (PURPA) / Schedule 91 Resources

PURPA explained

The Public Utility Regulatory Policies Act of 1978 (PURPA) created a new class of generating resources known as qualifying facilities. Per Washington Administrative Code (WAC) chapter 480-106, PSE provides qualifying facilities with a long-term—up to 15 years—power purchase agreement for projects up to 5 MW that connect to PSE’s system. Under WAC chapter 480-106, “The rates for purchases from qualifying facilities include any energy and capacity that is made available from a qualifying facility: (a) directly to the utility; or (b) indirectly to the utility in accordance with subsection (4) of this section.” The Washington Administrative Code defines a qualifying facility in WAC 480-106-007

as a “cogeneration facility or small power production facility that is a qualifying facility under 18 C.F.R. Part 292 Subpart B.”

The rates, or avoided costs, offered under Schedule 91 are updated annually in Q4 and filed with the WUTC for approval. Approved rates apply to any new agreements signed after the updated rates go into effect. The project owner retains any renewable energy credits (RECs) associated with energy generated by the project unless PSE and the project owner formally agree to PSE’s purchase of the renewable energy credits.

PSE currently has Schedule 91 Agreements with 17 active projects, ranging from a 26-kilowatt solar installation to a 4.5-MW landfill gas facility. In addition, PSE has Schedule 91 Agreements in place with three 4.99-MW solar projects that anticipate being operational in late 2021 and 2022. PSE must acquire all electricity generated by these Schedule 91 projects delivered to PSE’s system.

How these actions move us closer to meeting CETA goals

The PURPA/Schedule 91 program provides additional renewable energy to PSE’s electric supply. Per the requirements for calculating PSE’s percentage of renewable energy, PURPA resources are subtracted from PSE’s retail electric load for the purposes of CETA compliance calculations⁴⁰, but still provide renewable energy to PSE’s system.

This program brings additional renewable energy generation to PSE’s service territory, reduces the load needed to meet peak capacity, and is a renewable energy source. The MWh generated by this program contribute to load and thus reduces the CETA MWh compliance need. These MWhs generated by PURPA projects bring PSE closer to our 80 percent target by reducing the load and thus reducing the amount of generation needed to meet system load. Today PSE has a total of 23 MW of nameplate capacity and anticipates an additional 15 MWs of solar will be added by mid-2022.

Annual Actions and Costs

2022–2025

PSE will continue to update Schedule 91 rates in Q4, per WAC 480-106-007. Interested customers can learn more on PSE’s Distributed Renewables webpage at www.pse.com/distributedrenewables, or they can reach out to a PSE energy advisor for additional guidance. Where applicable, PSE may enter an agreement to purchase the RECs from the project to contribute to our voluntary renewables programs such as Green Power, Solar Choice, or Community Solar.

Ten MW of new solar energy will come online in Kittitas County by mid- to late- 2022.

⁴⁰ RCW 19.405.020(36)

Customer Benefits

The PURPA/Schedule 91 program provides environmental benefits to PSE customers by deploying renewable energy within our service area. With the development of these renewable resources, less energy is needed from PSE resources to meet system load, and therefore decreases the amount of greenhouse gas emissions by PSE resources. A decrease in greenhouse gas emissions is linked to improving the outdoor air quality for customers as well.

Track and report on progress, costs, and benefits

The PURPA/Schedule 91 program will track the total MW of renewable energy installed, the energy output of each site, and customer benefit indicators by type of resource deployed and the carbon intensity and carbon avoided because of each project. See Appendix L, CEIP Programs and Actions Master Table

Green Direct

Green Direct Explained

Green Direct is a voluntary program that gives PSE corporate and government customers the ability to buy 100 percent of their energy from a new, dedicated, local, renewable energy resource while providing them with a stable, cost-efficient solution. The program was first approved in 2016 and fully subscribed by 21 customers in mid-2017. The first project to serve Green Direct customers was Skookumchuck Wind, a 136.8 MW wind resource located in Lewis County, which achieved commercial operation on November 7, 2020. A second phase of the program was approved in 2018 and will serve an additional 20 customers with the addition of the Lund Hill Solar Power Purchase Agreement (PPA), under which PSE began receiving renewable energy delivered to our system on March 1, 2021. We expect the 150 MW Lund Hill Solar project to achieve full commercial operation at the end of mid-2022. Customers in both phases of Green Direct receive a blend of Skookumchuck Wind and renewable energy under the Lund Hill PPA.

How these actions move us closer to meeting CETA goals

The Green Direct program will decrease PSE's electric supply portfolio load to contribute to our renewable energy target.

The Green Direct product brings new, additional renewable energy generation to PSE's service territory. The output from Green Direct resources, including both the energy and renewable energy credits (RECs), is purchased by participating customers to meet their enrolled loads. Like PURPA contracts, Green Direct resources reduce PSE's retail electric load used for CETA compliance calculations⁴¹. The Skookumchuck Wind and Lund Hill Solar projects have a combined nameplate capacity of 287 MW for a total expected annual output of 773,546 MWh of renewable energy production

⁴¹ RCW 19.405.020(36)

delivered to PSE's system. Future phases of the program will depend on the costs and benefits working out economically for interested and qualifying customers. Assuming new projects costs are favorable, PSE anticipates adding a third project for an additional 40 aMW or approximately 350,000 MWh of annual output by 2025. The addition of this third project would bring the total yearly renewable energy production from Green Direct resources to more than 1,100,000 MWh when completed.

Annual Actions and Costs

2022

PSE will purchase the entire output of Skookumchuck Wind and Lund Hill Solar on behalf of the 41 existing Green Direct customers. Customers will pay the Green Direct charge on their enrolled accounts to cover the costs of the power purchase agreements (PPAs), administrative expenses, and reporting fees. Customers will receive a Green Direct credit on their enrolled accounts for the WUTC approved value of the energy replaced by the two designated Green Direct projects. Green Direct customers will also receive the renewable energy credits (RECs) associated with their share of the Green Direct resources output, retired, and reported on annually.

To advance the third phase of Green Direct, PSE will review the results of an “RFI” for Washington Renewable Energy to Serve PSE Green Direct, issued in 2021. PSE may choose to release an RFP to better assess resources for viability and cost. We will use the selected resource solution to file a requested expansion and update to the Green Direct tariff, Schedule 139, with the new option and pricing. Eligible customers can enroll during the open enrollment period, 30 business days following tariff approval, anticipated in Q3 2022. Once the project is fully subscribed, PSE will execute the PPA for the selected resource.

2023–2025

PSE will purchase the entire output of Skookumchuck Wind and Lund Hill Solar on behalf of the 41 existing Green Direct customers. Customers will pay the Green Direct charge on their enrolled accounts to cover the costs of the PPAs, administrative expenses, and reporting fees. Customers will receive a Green Direct credit on their enrolled accounts for the WUTC approved value of the energy replaced from the two designated Green Direct projects. Green Direct customers will also receive the renewable energy credits (RECs) associated with their share of the Green Direct resources output, retired, and reported on annually.

PSE will continue to monitor the development and construction of the selected resource to supply the third phase of Green Direct customers. Once the project has achieved commercial operation, PSE will begin billing the enrolled customers and retiring the RECs on their behalf.

Customer Benefits

The Green Direct program reduces greenhouse gas emissions by deploying new, additional renewable energy resources that deliver energy and RECs to our system on behalf of Green Direct customers.

The power generated from these resources allows participating customers to reduce their carbon footprint from electricity use within PSE's service area and meet sustainability goals ahead of state targets.

Green Direct brings new, clean energy jobs to rural Washington communities. In the case of Lund Hill Solar, the developer and the Engineering, procurement and construction (EPC) contractor agreed to use union labor to construct the project in line with rules set out by the state. PSE will require that future projects include union labor provisions in their agreements.

In addition to creating new clean energy jobs, the renewable energy resources used to supply the Green Direct customers help support the local economies through lease revenue for the landowners and new tax revenue for the host communities.

Track and report on progress, costs, and benefits

PSE will track and identify all costs and benefits of Schedule 139 separately in our power cost adjustment (PCA) mechanism to seek a prudence determination for and recovery of the costs associated with acquiring any PPA.

PSE will track all energy used by enrolled accounts and the power generated by the assigned resources. Renewable energy credits will be tracked and retired on the customers' behalf through the Western Renewable Energy Generation Information System (WREGIS). In the first quarter of each year, PSE will provide each customer with a WREGIS REC retirement report and attestation to show the total RECs retired on their behalf, equal to their prior year's energy consumption under Green Direct. PSE will also participate in an annual third-party audit of Green Direct sales and REC retirements that follows the Center for Resource Solutions' green-e® energy audit protocols. See Appendix L, CEIP Programs and Actions Master Table

Net Metering (Schedule 150)

Net Metering Explained

PSE's Net Metering program, also referred to as Customer Connected solar, provides interconnection, metering, and billing to qualifying customer-generators in accordance with State legislation enacted into law on February 11, 1999, and most recently amended July 28, 2019 (see RCW 80.60). Customer-generators who operate fuel cells, hydroelectric, solar, wind, or biogas generators of no more than 100 kW AC are eligible to participate. This service is required under RCW 80.60 and outlined in Electric Schedule 150 on a first-come, first-served basis until the total of cumulative nameplate generating capacity reaches four percent of PSE's peak 1996 load, or 179.2 MW. As of July 2021, PSE has a total of 95 MW of net metered generation operating in its service territory.

No direct customer incentives are provided under the Net Metering tariff. Energy produced by customer-generator systems directly reduce the energy used in the home or business. When energy generated exceeds home or business electrical loads, the excess energy flowing to PSE is metered

and credited to the customer at the retail rate for future use. Any excess credit each month is rolled forward to the following month until March 31 annually, when “banked” net metering credit is reset to zero.

In advance of PSE net metered systems reaching the cumulative capacity of 179 MW, or June 30, 2029, whichever comes first, PSE will file a successor tariff with the WUTC.

How these actions move us closer to meeting CETA goals

This program brings additional renewable solar generation to PSE’s service territory. This reduces the load needed to meet peak capacity need and it is a renewable energy source for customers. The MWh generated by this program contribute to load reduction and thus reduce the CETA MWh compliance need. These MWh’s will bring PSE closer to 80 percent by reducing the load and thus reducing the amount of generation needed to meet system load. Today, PSE’s net-metered customers account for more than 95 MW of nameplate capacity. We anticipate an additional 15-20 MW of capacity each year from 2022-2025.

Annual Actions and Costs

2022–2024

PSE will continue to offer net metering to eligible customers under Schedule 150. Interested customers can learn more by visiting the PSE website at <https://www.pse.com/pages/customer-connected-solar>; or they can reach out to an Energy Advisor for additional guidance. PSE also provides referrals to qualified contractors who can install solar at their home or businesses.

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

2024

In 2024, PSE plans to file a successor tariff with the WUTC in early 2024 in anticipation of reaching the net metering threshold of 4 percent of 1996 electric loads, or 179 MW in cumulative capacity.

2025

PSE will continue to offer net metering to eligible customers under Schedule 150. Interested customers can learn more by visiting the PSE website at <https://www.pse.com/pages/customer-connected-solar> or they can reach out to an Energy Advisor for additional guidance. PSE also provides referrals to qualified contractors who can install solar at customer’s’ homes or businesses. PSE anticipates connecting an additional 15 – 20 MW of customer-owned, net-metered systems in 2024.

If PSE reaches the four percent of 1996 electric loads net metering threshold, or 179 MW of cumulative capacity, the Company will enroll any new customer-owned system into a WUTC approved successor tariff.

Customer Benefits

This program provides customer benefits in the areas of environment through the deployment of renewable energy within PSE's service area. With an increase in renewable energy, less carbon emitting resources are used, thus reducing greenhouse gas emissions from the energy portfolio. From an economic perspective, this program positively impacts solar installation companies within the area, providing jobs and an economic benefit to the community.

Track and report on progress, costs, and benefits

PSE will track the total MW of renewable energy installed and enrolled in the program, and total energy exported to the grid. PSE can also track customer benefit indicators by type of resource deployed and the carbon intensity and carbon avoided because of cumulative projects. See Appendix L, CEIP Programs and Actions Master Table

Green Power Solar Grants

Green Power Solar Grants Explained

Starting in 2017, PSE has offered competitive funding awards to local non-profits, public housing authorities, and tribal entities to install solar on their facilities. This grant is funded through PSE's Green Power and Solar Choice customers to bring local, community-oriented solar projects to PSE's electric service area, while providing vital support to those in need through lower utility bills for our low-income or Black, Indigenous, and People of Color (BIPOC) customers and the organizations that serve them. To date, PSE has awarded \$2,400,000 in total grant funding to 30 local organizations to install new solar projects. In 2021, PSE issued a fifth round of funding for a total of up to \$750,000, in amounts up to \$100,000 per project.

Over 75,000 PSE customers chose to support renewable energy by participating in PSE's Green Power and Solar Choice programs. These programs now support the generation of 590,000 MWh annually of renewable energy in Washington, Oregon, and Idaho through the purchase of Green-e Certified Renewable Energy Credits (RECs). The Green Power Solar Grants are additional to the purchase of RECs to match customer purchases.

How these actions move us closer to meeting the CETA goals

The Green Power Solar Grants result in additional renewable solar generation on PSE's system, at the distribution level. The projects reduce loads, by generating renewable energy behind the customer meter, thus reducing the CETA MWh compliance need. These MWh will bring PSE closer to 80 percent by reducing the load and thus reducing the amount of generation needed to meet system load. In addition, the MWh generated by these projects help to reduce the energy burden for low-income and BIPOC customers and the organizations that serve them.

Annual Actions and Costs

2022–2025

PSE will distribute \$750,000 in funding from the 2021–2025 Green Power Solar Grant solicitation for projects to be installed in 2022.

PSE anticipates issuing a similar RFP for \$750,000 in funding to be awarded at the end of each year for projects to be installed in the following year. PSE will work with the Community Outreach and Community Engagement teams to reach out to eligible organizations and Tribal Governments. In addition, PSE will alert solar installers in PSE's Contractor Alliance Network. Customers and organizations can learn more at [PSE.com/greenpowergrant](https://pse.com/greenpowergrant).

Customer Benefits

This program provides customer benefits in the areas of burden reduction in named communities, as well as environmental benefits through the deployment of renewable energy within PSE's service area. The program reduces a barrier of financial resources and provides an opportunity for organizations to invest in localized renewable energy. This localized renewable energy reduces the overall system need from emitting resources and thus reduces greenhouse gas emissions. Furthermore, highly impacted communities and vulnerable populations can actively participate in clean energy.

Track and report on progress, costs, and benefits

PSE will track the total dollars awarded, the number of organizations served, and the number of MW of renewable energy installed annually and in aggregate. PSE will also track the carbon intensity and carbon avoided because of cumulative projects.