PUGET SOUND ENERGY

2021 ANNUAL REPORT

OF ENERGY CONSERVATION ACHIEVEMENTS

ENERGY EFFICIENCY

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Executive Summary

Puget Sound Energy's (PSE's or The Company's) Energy Efficiency department presents this Report of 2021 Conservation Accomplishments (Annual Report or Report), satisfying WAC 480-109-120(3). This Report details 2021 initiatives, activities, and adaptive management steps taken to meet the expectations of PSE customers and fulfill the savings goals of energy efficiency programs funded by the Electric and Natural Gas Conservation Riders.

The COVID-19 global pandemic continued to be a key consideration influencing every element of program performance in 2021. Readers will note the extensive adaptive management that program staff applied to address a wide variety of pandemic related issues, including construction delays, labor shortages, product shortfalls, supply chain issues, and additional significant impacts to customers.

A. 2021 Results

Table 0-1 Energy Efficiency 2021 Savings and Cost-Effectiveness Results

2021	Savings	Expenditures	Total Resource Cost	Utility Cost
Electric Actuals (MWh)	169,810 *(19.4aMW)*	$82,906,365	1.64	2.10
Percent of Goal	*81.3%*	*80.7%*		
Goal/Budget	208,965 *(23.9 aMW)*	$102,700,629		
Natural Gas Actuals (Therm)	2,364,471	$15,845,867	1.50	1.98
Percent of Goal	*69.8%*	*81.5%*		
Goal/Budget	3,389,902	$19,432,109		
Savings are stated in terms of first-year figures, at the customer meter, without line loss.				

1. Key 2021 Results Drivers

Program reviews in Chapter 1 contain extensive discussions on the key drivers of programs' savings and expenditure results. Supporting teams, such as the Verification team, Energy Efficient Communities, and Energy Advisors are discussed in Chapter 2 and provide important contributions to the Portfolio's savings and adaptive management efforts. PSE provides high-level summaries here.

a. *Extraordinary Circumstances: Impacts of COVID-19*

The COVID-19 pandemic continued to have a severe impact on operations during the 2021 program year. At the onset of the year, state restrictions and guidelines were still in place and all onsite activities continued to be severely limited. Staff had adapted program plans around initial safety guidelines and continuously adjusted program operations as guidelines rapidly evolved throughout the second year of the pandemic. As vaccines became more widely available in the first half of 2021, state restrictions started to become more relaxed. However, new COVID-19 variants continued to develop and both the Delta variant in April 2021 and the Omicron variant in November 2021 caused significant setbacks to recovery for customers, business owners, suppliers, and manufacturers.

Throughout the year, program staff continued to focus efforts on supporting customers through this extraordinary time as usage patterns remained higher than usual for residential customers and many businesses faced continued financial challenges and lower occupancy.

In June 2021, restrictions on in-home and in-business activities began to lessen. In order to resume in-person operations where possible, program staff worked alongside vendors to develop new COVID-19 safety protocols and resumed in-person trainings with retailers and distributors on a limited basis. In July 2021, state-wide reopening efforts began and, following state guidance, best practices, and thoughtful customer communication, PSE resumed the following activities:

- In-person, outdoor events.
- In-building program activity including:
    - Appliance recycling pick-ups
    - Multifamily common area assessments and installations
    - Multifamily in-unit installations (with customer notice and ability to opt-out)
    - Small Business installations with occupancy restrictions

Due to improved efficiency and positive customer feedback of virtual verifications, PSE opted to continue virtual verifications where possible. Site visits for larger commercial and industrial facilities resumed on a limited basis. Limited statewide restrictions and safety guidelines were re-enacted shortly after July 2021 due to emerging concerns regarding the new variants of COVID-19. Program staff adjusted where necessary and continued a mix of virtual and in-person activities with enhanced safety protocols.

Despite continuous adaptive measures to program operations throughout both 2020 and 2021, there were continuing impacts across all sectors and the pandemic greatly influenced the overall market. In many building sectors, construction timelines continued to be put on hold or were significantly altered throughout the year, compounded by ever-changing safety requirements, labor allocations and supply constrictions on key measures like LED lamps and deep fat fryers. And in the case of restaurants, theaters, and fitness centers, additional businesses closed permanently or went through re-openings and then experienced various levels of capacity restrictions.

Program staff continued adaptively managing programs through the end of 2021. PSE doubled marketing, outreach, and events efforts and continued to offer virtual options during the pandemic. Activities included: virtual events such as “Ask an Expert” with an Energy Advisor and “Coffee and Conversations” with subject matter experts; increased email and social media marketing; Limited Time Offers (LTOs) and increased measure incentives; and targeted contractor and partner outreach.

b. *Savings*

In the following section, PSE highlights key contributors to 2021 electric and natural gas savings in both the Residential Energy Management (REM) and Business Energy Management (BEM) Sectors. Individual and comprehensive program reviews are provided in Chapter 1.

i. Contributors to Higher Than Expected Savings

- The Single Family Existing Space Heat program exceeded its electric goal by 60 percent, or more than 6,000 MWh.
- The Lighting to Go program exceeded its electric goal by 92 percent, or more than 7,000 MWh.
- The Smart Thermostats program exceeded its natural gas savings goal by 57 percent, or more than 150,000 therms and its electric savings goal by 203 percent, or 1,600 MWh.
- The Commercial Midstream program exceeded its natural gas savings goal by 22 percent, or nearly 96,000 therms.

The Single Family Existing Space Heat program exceeded electric savings primarily due to a surge in residential retrofit and home improvement projects alongside distributors that proactively placed orders in bulk to stock equipment and circumvent delays.

The Lighting to Go program exceeded savings due to a combination of efforts. Program staff engaged an additional 15 online and 27 brick and mortar distributors while adding downlights, wraps and strips, troffers, and high bays, and four additional interior fixture measures.

The Smart Thermostat program exceeded both electric and natural gas savings targets for 2021. This was largely due to promoting instant rebates to customers via the PSE Marketplace, as well as launching the line voltage connected thermostat measure and tailored messaging to key customer segments.

The Commercial Midstream program exceeded its natural gas savings goal in large part due to increased customer adoption and participation on the water heating side of the program. Water heating installations did not face the same supply chain and contractor labor shortages as the electric HVAC side of the program. Impressively, the midstream commercial gas water heating participation continued to grow despite the pandemic.

ii. Drivers of Lower Than Expected Savings

- The Commercial Industrial Retrofit program only fell short of its electric savings goal by 27 percent but accounted for over 21,000 MWh lost.
- The Commercial Industrial New Construction program fell short of its electric savings goal by 48 percent, or over 8,000 MWh lost.
- The Multifamily New Construction program fell short of its natural gas savings goal by 76 percent, or over 48,500 MWh lost.
- The Commercial Strategic Energy Management program fell short of its natural gas goal by 38 percent, accounting for over 214,000 therms lost.
- The Commercial Kitchen and Laundry program fell short of its natural gas goal by 61 percent, or over 245,000 therms lost.

An overwhelming majority of programs experienced lower-than-expected electric and natural gas savings in 2021. Drivers included the direct impact of COVID-19 and associated variants on program operations due to restrictions and evolving safety guidelines, as well as the indirect impact of COVID-19 on the local, national and global economy and customer capacity or ability to participate. Additionally, implementation delays, marketplace and cost variability, and supply chain issues were all significant factors.

To compound supply chain issues and manufacturing delays, the market saw a high influx of home remodeling and construction projects in 2021 alongside a shortage in labor. While this influx of projects was initially positive for many programs, customers reported difficulty finding an available contractor and wait times as long as 12 months on materials or equipment, resulting in delayed projects that aren't expected to capture savings until 2022.

For safety reasons, PSE ended all in-unit activity including in-person and onsite verification for the C/I Retrofit program in 2020. For the first half of 2021, operations resumed in no contact or virtual formats and limited time offers helped boost savings. Limited in-person verifications and in-unit activity resumed in the second half of the year. However, due to severe supply chain, manufacturing, and contractor delays, a number of projects won't finish until 2022.

The C/I New Construction program ended 2021 with significantly lower than expected electric savings. Construction was delayed for several months due to COVID-19 restrictions and supply chain issues for several large projects. Additionally, some projects were cancelled due to the impacts of COVID-19 on the customer. It is worth noting that many of the projects that were delayed are expected to close in 2022.

For the Multifamily New Construction program, the close of many projects were delayed due to supply chain disruptions, which lowered savings. Additionally, the growth of midstream programs and higher code and baselines from House Bill 1444 cut into savings for various measures, causing per project savings to continue to decline from the previous year.

Within the Commercial Strategic Energy Management program, customer project completion and energy savings were impacted by changing building operation needs and capacity to appropriately document energy efficiency efforts at their respective sites. Building HVAC systems were often operated in ways that increased energy use for health and safety reasons, even when site occupancy was decreased. Additionally, many of customers faced staffing shortages which prolonged and delayed their reporting needed for project closeout.

The Commercial Kitchen and Laundry program was drastically disrupted by the continued COVID-19 pandemic. In both sectors, the pandemic and related safety protocols made normal business functions difficult to maintain. Food chain and sourcing challenges also compounded these issues. Many commercial foodservice customers were forced to permanently shut their doors, following a national trend of over 15 percent of restaurants facing permanent closures due to the continued pandemic. For those that remained open, profits continued to decline in high volumes, some customers stating losses of 40 percent or more. These circumstances directly impacted PSE's customers and their ability to participate in PSE programs which require up-front capital. Additionally, equipment supply chain issues, particularly prevalent in the technologies relevant to high efficiency components, severely debilitated participation in PSE offerings.

C. *Expenditures*

The majority of Energy Efficiency organizations' 2021 electric and natural gas expenditures finished the year under budget, with a few key exceptions. Exhibit 1, Supplement 1: *2021 Actual Expenditures Compared to Anticipated Spends*, provides a program-level comparison of costs incurred by budget category. It is notable that although some budget variances appear proportionately significant—as compared to their budgeted amounts—the overall impact was negligible, as PSE finished 2021 under-budget in both the electric and natural gas portfolios.

Nearly all savings programs that varied from their anticipated expenditures also realized a commensurate increase (or reduction) in their planned savings, resulting in Direct Benefit to Customer (DBtC) variances. Program staff continuously improved efficiencies and proactively managed expenses, resulting in lower-than-expected ancillary costs, such as the Marketing, Materials, and Miscellaneous categories.

Many costs were below their anticipated spending levels, in part, because of implementation delays and project holds due to COVID-19. For instance, the Commercial Foodservice and Laundry program was 46 percent below budget, which can be attributed to hardships and barriers to participation that many in the foodservice sector faced due to COVID-19, and was further hindered by the inability to stock deep fat fryers, a major measure in the program, later in the year. In some programs, budget spending may be slightly higher in proportion to savings captured, while still being under budget. In most cases this is due to increased

marketing in an effort to drive program participation and subsequent project delays due to labor shortages and supply chain issues. Program participation as a result of these increased efforts may not be fully realized until 2022.

Very few programs ended the year over budget. All programs that ended the year over budget report proportional over target savings. It is important to note that the Efficiency Boost program reported over 100 percent budget but does not report any savings value as all savings are attributed to other programs in the portfolio. This is due to the nature of the Efficiency Boost program providing increased rebate amounts for various measures within the Space Heat, Water Heat, and Weatherization programs in order to increase access to efficiency for moderate income customers who may not qualify for low-income programs.

d. *Pilots and Pilot-Analogous Initiatives*

Throughout the year, Energy Efficiency staff pursued several measures and program innovations that PSE classifies as pilot-analogous or pilots with uncertain savings. At the end of 2021, program staff launched the Home Energy Display (HED) pilot, PSE's first endpoint device project where customers have access to real-time AMI data and an online portal to support customer engagement. The HED pilot rebated 625 in-home energy displays by the end of 2021. PSE also launched the Virtual Commissioning pilot in late 2021 through a partnership with Power TakeOff. The goal of this pilot is to recruit 100 small and medium business customers over a two-year period of time and then, using 15-minute interval data, identify opportunities to modify schedules, set points, and more in order to save energy.

The Single Family Existing Space Heat program initiated discussions with Tacoma Power to join the regional program. The Appliance Decommissioning program partnered with two local non-profits and leveraged matching donations events to drive program awareness. The Weatherization program extended and increased its bundled rebate incentive. The Home Energy Reports program added a gas-only wave to the program for the first time. Program staff started development of a telecommunications program designed to target telecommunications, broadband, and cable providers with flexible performance based incentives. The Commercial HVAC program continued establishing an ARC data monitoring and collection pilot, a collaboration between PSE, Energy Solutions, and the National Renewable Energy Laboratory (NREL) to gather the energy monitoring data captured by Advanced Rooftop Controls (ARCs) for further analysis.

e. *Portfolio Support*

The work performed by Energy Efficiency's Program Support teams as well as Marketing, Energy Efficient Communities, Events, and Energy Advisors contributed to conservation savings achievements in 2021. These organizations managed to continually adapt to changing markets and pivot tactics between virtual and in-person formats in response to ever-changing COVID-19 restrictions and impacts to customer segments.

The Energy Efficient Communities (EEC) team delivered over 93 virtual and in-person presentations, participated in 44 events, supported the Clean Buildings Accelerator program

launch, and identified and connected with 20 local real estate agencies to promote Single Family Existing Space and Water Heat rebates.

In 2021, the Market Integration team continued a robust energy efficiency advertising campaign across its service area, designed to drive broad awareness of the solutions. The campaign highlighted PSE's rebates, incentives, and low-cost/no-cost tips, especially timely information to help customers manage the financial impacts of the COVID-19 pandemic. The team also initiated a seasonal promotional partnership with the Seattle Kraken. Overall efforts garnered more than 101 million impressions over the year.

Due to the success of the virtual events and continued restrictions due related to COVID-19, the Events team hosted virtual and/or in-person events as appropriate to drive awareness and engagement for PSE's programs and products in 2021. PSE leveraged digital channels to design events with a strong call to action and drive awareness, customer engagement and participation in energy efficiency programs for both residential and commercial programs.

f. *Customer Experience*

In 2021, customers across all segments faced unprecedented challenges due to COVID-19, whether due to the economic downturn, new restrictions, or the uncertainty posed by a global pandemic. Customer interaction with online tools remained high in response to the COVID-19 pandemic. To enhance the customer experience during this time, program staff focused on creating virtual opportunities to stay engaged while providing no/low-cost tips for energy savings and adding recommendations to help reduce the impact of rising bills. Additional efforts to enhance the customer experience and reach more customers include the following.

- After the initial launch at the end of 2020, several enhancements were made to the PSE Marketplace. For example, a chat feature was added to make it easier for customers to ask questions and resolve customer service issues resulting in increased customer satisfaction ratings.
- In 2021, Energy Advisors began screening all customers inquiring about rebates and contractor referrals by income levels to determine eligibility for enhanced incentives through the Efficiency Boost program.
- In 2021, the Energy Advisors worked closely with the rebate processing team to develop and deploy a process to proactively follow up with customers who were unable to successfully complete their rebate applications. This additional assistance has led to an increase in customer satisfaction and processed applications and incentives being paid to customers.
- A major accomplishment in 2021 was the enablement of displaying usage data from AMI metered customers at hourly intervals within the My Usage dashboard on pse.com. This gives customers a higher level of granularity to be able to measure, monitor and understand how and where their home uses energy.

g. *2021 Adaptation through Continuous Improvement*

In 2021, program staff adaptively managed offerings, customer engagements, and marketing tactics in the wake of a global pandemic prolonged by emerging variants of COVID-19. Improvements and adaptations undertaken due to COVID-19 are summarized at the beginning of the Executive Summary. The following list highlights some of the key improvements and adaptations Energy Efficiency implemented in 2021 that were not directly tied to COVID-19.

- The Low Income Weatherization program partnered with internal and external stakeholders to develop a Phase 2 Low Income Needs Assessment, releasing a final report in December 2021.
- Market feedback indicated customers planning home improvement upgrades were increasing as a side effect of spending more time at home during the pandemic. With this knowledge, the residential Space Heat program used PSE's website and Energy Advisor hotline to disseminate information relating to supply chain issues and staffing shortages, advising customer to plan ahead for home energy upgrades. Rebate requirement extensions were granted to alleviate customer concerns of delayed equipment installations and rebate submissions.
- Program staff in the residential Water Heat program worked closely with program implementation partners, manufacturer reps, NEEA, and regional utilities to understand and submit an appeal to temporarily suspend the CTA-2045-A[1] requirement for electric water heaters sold or installed in Washington State. This temporary suspension was intended to allow significant supply chain disruptions and hardships for manufacturers and distributors to be largely resolved prior to resuming the requirements established in WAC 194-24-180. This also gave customers continued access to affordable water heating appliances during global supply chain constraints.
- In 2021, PSE was able to offer customers the option to receive their Home Appliance rebate as a credit on their utility bill versus a check, a popular request from customers when offering feedback on the program.
- Rather than increasing rebates and lowering the cost effectiveness of the program, program staff in the Smart Thermostats program negotiated discounts with manufacturers on the PSE Marketplace to lower costs of the product and provide customers more affordable access to the technology.
- The Multifamily Retrofit program created a bundled Limited Time Offer for bath fans and line voltage thermostats. This approach resulted in nearly 1 million kWh in savings and helped to mitigate the loss of savings from the lack of weatherization

[1] Requirements were established in WAC 194-24- 7/180 180 that electric storage water heaters sold or installed in Washington have a modular communications port compliant with the CTA-2045-A standard which specifies a modular communications interface (MCI) to facilitate communications with residential devices for applications such as energy management.

projects. Additionally, program staff collaborated with King County Housing Authority to offer new measures for in-unit TLED replacements.

- In January 2021, the Business Lighting team launched a Project Perk to incentivize contractors to close projects. The Project Perk incentivized companies to submit a project by offering a bonus in the form of a gift card.
- Commercial New Construction program staff actively sought feedback from customers, the design community, and other utilities on the grant process and program guidelines. With this feedback, program staff streamlined both the lighting process as well as the whole building energy model approach for the program.
- The Commercial Strategic Energy Management team developed an improved method for conducting cost effectiveness calculations. Additionally, PSE lowered the whole building savings threshold for gas-only projects to 10 percent in order to alleviate a barrier to participation in neighboring electric utility service areas.

2. Compliance

In addition to PSE's reporting and planning compliance filings, Energy Efficiency's key compliance reporting vehicle is Exhibit 7: *Requirement Compliance Checklist*. Each requirement type (according to docket number) is highlighted in a different color in the Exhibit for easier reference.

Exhibit 7 contains the comprehensive list of satisfied requirements.

The below list outlines the primary conservation-related requirement documents[2] that govern Energy Efficiency's operations:

- RCW 19.285 and WAC 480-109;
- Exhibit F, the 2002 Stipulation Agreement, Docket UG-011571;[3]
- The 2010 Electric Settlement Agreement, Docket UE-100177; and
- Order 01, Attachment A of Dockets UE-190905 and UG-190913.

[2] PSE also discusses Settlements and Orders related to the 2008 Merger Agreement, the 2017 General Rate Case Agreement, and the 2018 Macquarie Settlement in specific program reviews.

[3] The electric Stipulation Agreement, Docket UE-011570, was vacated by Order 05 in Docket UE-100177.

B. Five-Year Trends

As represented in **Error! Reference source not found.**, the Portfolio's electric savings have decreased an overall 47 percent from 2017 to 2021. 2021 savings were approximately 23 percent lower than the previous year. PSE reduced the electric expenses an overall 18 percent from 2017 to 2021, with a 2021 increase of more than 23 percent from the previous year's expenditures. This trend reflects, but is not limited to: effects of the COVID-19 pandemic; the market saturation of several key measures; annual downward revisions to measure UES values; updated energy codes; administration costs associated with data management and reporting requirements; and evolving customer demand. These and other ancillary contributors drive increased costs to acquire savings. It should be noted that the 2021 line and bar would have been more similar to earlier years had savings and spending goals been achieved.

Figure 0-1 Energy Efficiency Electric 5-Year Indices

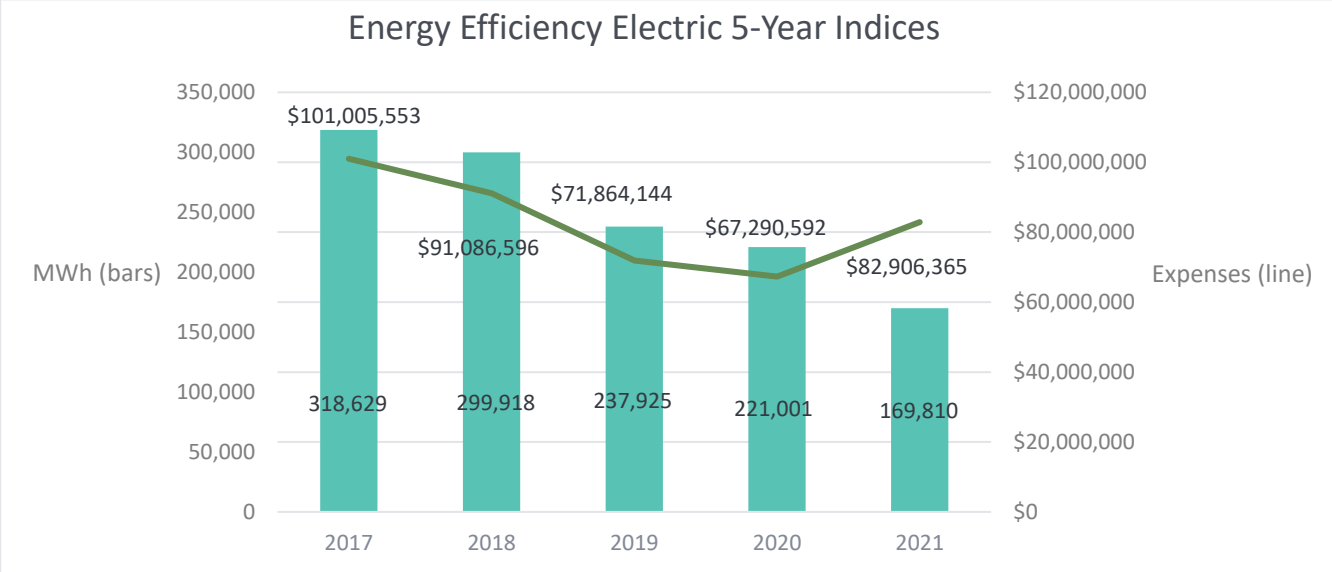
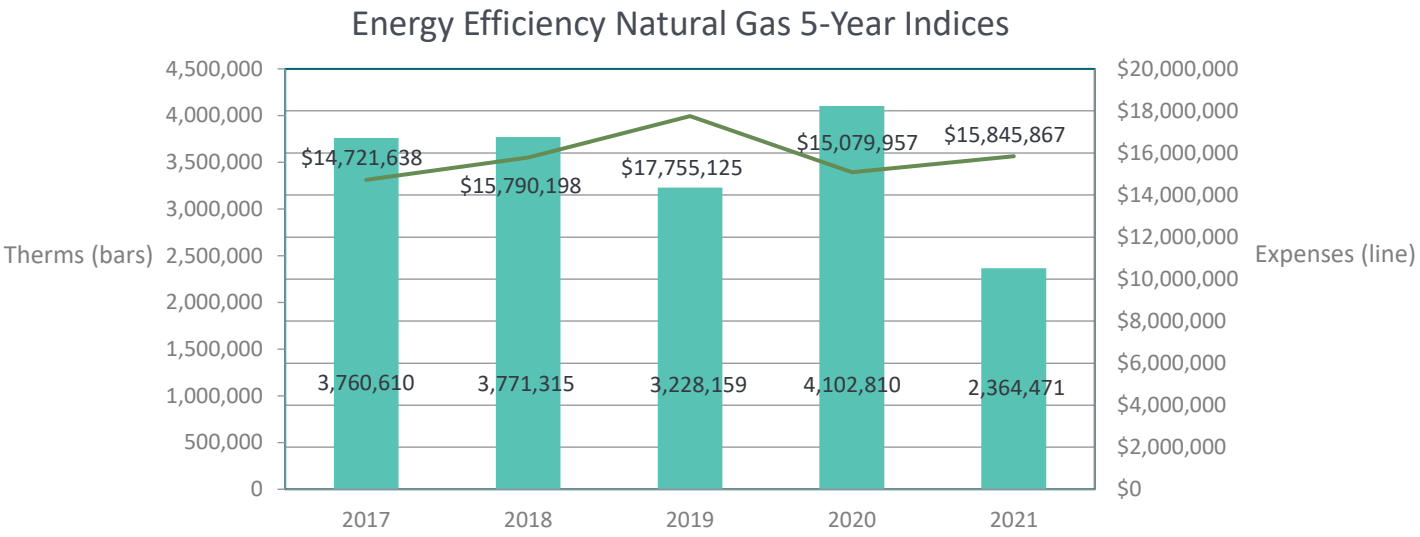


Figure 0-2 shows that natural gas savings have decreased 37 percent from 2017 to 2021. Natural gas savings in 2021 were lower than the 2020 value: a decrease of approximately 42 percent. The natural gas expenses for the 5-year timeframe have increased just over 7 percent from 2017 to 2021, while natural gas expenses increased 5 percent from 2020 to 2021.

Figure 0-2: Energy Efficiency Natural Gas Programs: Five-Year Trends



It is important to note that the significant decrease in natural gas savings in 2021 as compared to 2020 can be attributed primarily to the process for claiming savings fin the Home Energy Reports (HER) program. The HER program forecasts and claims all savings for the biennium in the first year (2020) and then conducts a true-up of first year savings in the second year (2021) which can result in large fluctuations year over year.

Overall, the five year indicators for natural gas do indicate an upward trend in cost per therm of savings. This trend reflects the significant impact of continued low natural gas avoided costs and consolidation over time of higher-cost measures within Energy Efficiency programs: more high-cost measures make up a larger proportion of the overall Portfolio as savings achieved become more costly.

I. Customer Programs

This chapter is intended to provide an overview of all PSE's customer conservation programs, presented in order of their Conservation Schedule with a brief description of the program and its specific results and achievements for the 2021 program year. As applicable, each program overview will also highlight adaptive management, pilot-like initiatives, attention to hard-to-reach and/or proportionately underserved segments, and key variance drivers.

A. Residential Energy Management

The following discussion addresses results and accomplishments in the Residential Energy Management sector.

1. Low Income Weatherization

Schedules E/G 201

The Low Income Weatherization (LIW) program assists low-income residential customers to improve the energy efficiency of single family residences, multifamily structures and manufactured/mobile homes.

In 2021, the goal of Puget Sound Energy's LIW program was to continue to lessen the energy-cost burden of lower-income customers by improving the energy efficiency of their residences and educating these consumers on routine ways to reduce their energy use and costs. Program efforts built on the existing model and continued to focus on partnerships with assistance agencies and leveraged PSE programs such as bill-payment assistance.

Key stakeholders include: low-income gas and electric customers; county and municipal low-income weatherization agencies in the PSE service area; Washington State Department of Commerce (Department of Commerce or Commerce); and participating weatherization contractors and suppliers.

a. *Low-Income Weatherization Funding*

For those projects receiving PSE funding combined with other State and Federal funding, income eligibility is determined in accordance with Department of Commerce Policies and Procedures.

Residential LIW provides funding of many cost-effective home weatherization measures for low-income customers receiving gas and/or electric heat from PSE. Some measures that do not meet standard cost-effectiveness tests may also be approved. Measures funded may include conservation measures that are cost effective consistent with the Department of Commerce's *Weatherization Manual* and those measures identified through the priority matrix in the *Weatherization Manual*.

In addition, this program provides funding for energy-related repairs and energy education. An energy-related repair is a repair that is necessary (1) to install a weatherization measure properly, (2) to protect the health and/or safety of the occupants, (3) to address an existing

problem that weatherization could aggravate or (4) to protect the integrity of the installed measure.

Examples include but are not limited to:

- Repair roof leaks;
- Electrical inspection and repairs;
- Mold/mildew remediation;
- Rodent, insect and pest extermination;
- Bath and kitchen ventilation upgrades;
- Furnace or water heater repairs or replacement.

i. Sources of funding

Sources of LIW funding include, but are not limited to, Conservation Rider, Company funds (Shareholder), BPA credits or other federal or state government programs.

Other ad-hoc funding may include, but is not limited to:

Special Contract Funding

Per stipulations outlined in the special contract between Microsoft and PSE and approved by the Commission, established as a part of the Settlement Agreement in Docket UE-161123, PSE started to accrue dollars that the LIW program will manage for energy efficiency projects, emerging technology, distributed generation, or repairs necessary to install energy-efficiency measures.

Manufactured Home Replacement Community Energy Efficiency Program (CEEP) Grant

CEEP issued a total grant for $350,000 which was leveraged with PSE and Commerce Weatherization program dollars for a total of four manufactured home replacements. The grant funding was extended through June 2021.

Macquarie Transfer Settlement Commitment #46

On March 7, 2019 The Washington Utilities and Transportation Commission issued a Final Order approving and adopting without condition a full multiparty settlement, of which commitment #46 states:

> *"46. Puget Holdings shall make a one-time contribution from shareholder funds in the amount of $2 million to the Low-Income Weatherization Program to be disbursed over a five-year period."*

ii. 2021 Ad Hoc Funding Disposition

In 2021, the LIW program met all funding requirements.

Special Contract Funding

PSE accumulated slightly under $65,000 in 2021 to be applied to future Energy Efficiency projects, bringing the combined total, including 2019 and 2020 funds, to $240,339. In 2021, PSE made progress with the Washington State Housing Finance Commission on a contribution agreement for a Lummi Nation loan to partially fund the acquisition and installation of solar arrays on the Lummi Reservation. Installation date of the solar arrays is expected first half of 2022.

Manufactured Home Replacement CEEP Grant

There have been four scheduled manufactured home replacements and the final of these four was completed in the summer of 2021. Delivery and installation of the final home had been delayed, primarily due to COVID-19 related factory interruptions.

Macquarie Transfer Settlement Commitment #46

By the end of 2021, the program had spent a combined total of $163,400, which includes 2019 and 2020 spending.

b. *2021 Program Review*

In 2021, the LIW program fell short of both electric and natural gas targets by over 40 percent. Both electric and natural gas savings were below target largely due to delays and production impacts caused by the COVID-19 pandemic. The LIW program served a total of 632 electric and 79 gas housing units in 2021. Of the combined 711 units, nearly a quarter were single family homes, almost half were multi-family homes, and over a quarter were manufactured home residences.

c. *Adaptive Management*

Program staff continued to adaptively manage LIW in response to COVID-19 related challenges in 2021. Challenges included program delays, production impacts, and safety protocols required by Commerce for partnering agencies.

The LIW program also demonstrated continuous improvement by partnering with internal and external stakeholders to develop a Phase 2 Low Income Needs Assessment (LINA) report, which was released in December 2021. This report was the qualitative complement to the LINA Phase 1 report that was released October 2020. PSE began developing an action plan in response to LINA Phase 2 report recommendations with a timeline for implementation and will complete the action plan in 2022 in partnership with PSE bill assistance programs, the Energy Project, and community action agencies.

Despite both program and production delays related to COVID-19, PSE demonstrated progress by launching a marketing and outreach campaign in the last quarter of the year. The campaign targeted 10 high needs census blocks in south King County, identified through the PSE LINA Phase 1 report, and consisted of targeted messaging via email and social media. Program staff were able to establish educational and awareness partnerships with 10 trusted, local community-based organizations as a result of this campaign.

d. *Pilot-like Initiatives*

Of the four scheduled manufactured home replacements, the fourth and final home was installed and completed in 2021.

e. *Hard to Reach and/or Proportionately Underserved Segments*

By design, the LIW program is focused on a hard to reach segment of PSE customers: those that meet specific income criteria. In 2021, the program continued to operate with income thresholds of 200 percent Federal Poverty Level (FPL) and 60 percent State Median Income (SMI) whichever is higher. It is worth noting that this income threshold was re-evaluated in 2021 and PSE anticipates a change to 200 percent FPL and 80 percent Area Median Income (AMI), whichever is higher and adjusted to household size, as of January 1, 2022.

f. *Key Variance Drivers*

In 2021, the LIW electric and natural gas program savings both finished the year under target. The primary drivers for both electric and gas variances, were production impacts from pandemic-related circumstances, including supply chain interruptions, workforce shortages, and continued customer concern about program implementers entering homes.

g. *Measure Summary*

Table I-1 provides a high-level summary of LIW measures installed in 2021. The figures represent unique dwelling units (homes, apartments, manufactured homes, etc.), and don't always correlate to the total number of measures installed. For instance, for each "LED Lamp" category indicated, there could be substantially more than one LED lamp installed. Indicated values also include measures approved through the agencies' application of the SIR test in certain instances.

Table I-1: Low Income Weatherization Measure Highlights

Measure Type	Measure	Electric	Dual	Natural Gas
Insulation*	Attic Insulation	105,680	2,440	35,870
	Duct Insulation	1,360		3,430
	Floor Insulation	150,160	6,790	37,430
	Wall Insulation	26,320	360	19,470
Sealing	Air Sealing	240		
	Duct Sealing	20		40
	Shell Sealing	140	-	50
Space Heat				
	Furnace Replacement			20
	Ductless Heat Pump	240	70	
Ventilation	Mechanical Ventilation	20	5	6
	Whole House Ventilation	170	4	
Water Heat	Heat Pump Water Heater	-		
	Tankless Water Heater	1	2	8
	Water Heater	1		1
	Water Heater Insulation	3		
	Water Heater Replacement		6	
Windows*	Windows	1,620		30
*Measured in sq. ft				

2. Single Family Existing

Schedules E/G 214

Single Family Existing (SFE) programs implement cost effective, targeted, residential energy savings using a menu of prescriptive and calculated efficiency measure incentives, including rebates for single family existing structures. Existing single family structures are defined as residential dwellings which include: structures with four or less units that are attached by a contiguous roofline; manufactured or factory built homes permanently affixed to a concrete foundation; and manufactured or factory built homes that are transportable. Single family existing residences exclude structures that are currently under construction. Prescriptive rebates are intended to facilitate participation by customers, contractors, manufacturers, distributors, retailers, developers, and trade allies. They also provide administrative efficiencies for PSE in meeting energy efficiency goals.

Note: Multifamily campuses which have a mixture of existing residential building types, including buildings with four attached residential units or less, are served under the Multi-Family Retrofit Program; schedules E217 & G217.

Rebates offered to eligible natural gas and/or electric PSE Single Family Existing customers include a variety of end-use classifications, but not limited to:

- Light-Emitting Diode (LED) lighting including indoor and outdoor fixtures, T8 fixtures, T8 retrofit bulbs, and string lights.
- Appliances, including: ENERGY STAR clothes washers and dryers, heat pump dryers, and others offered through PSE's partnership with NEEA.
- Retail and online distribution of LEDs and water-savings products.
- Refrigerator and Freezer Decommissioning for both secondary and primary units manufactured in 1992 or earlier.
- Home Performance activities that may include home retrofit services.
- Weatherization, including windows, insulation, air sealing, whole house ventilation and duct sealing, with targeted measures for manufactured home and moderate income customers.
- Space heating including integrated space and water heating systems, high efficiency furnaces, high efficiency boilers, heat pumps, and system controls, such as web-enabled thermostats.
- Water heating, including heat pump water heaters, natural gas tankless and storage water heaters, thermostatic valves, and efficient showerheads.

Program staff regularly review incentive amounts and savings values and base them on regionally-accepted energy savings estimates and incremental efficiency measure cost. Incentives may be subject to change in response to revisions in savings estimates, average

incremental cost, market conditions, or changes in Federal appliance efficiency standards or State codes.

a. *Retail Engagements*

In 2021, program staff focused on driving customer awareness through collaborative efforts with local retailers. Many Single Family Existing measures are already available directly to customers through local retailers, making partnerships with retailers a crucial pathway to customer engagement. The following discussions highlight some of the key 2021 retail-based engagement initiatives.

i. Field Visits

The field team filed 1,793 reports for retail store visits in 2021. While the COVID-19 pandemic continued to impact in-person field visits in 2021, the field team was able to conduct nearly all visits in-person throughout the year. Of these 1,793 field reports, less than 50 of them were conducted virtually. This represents a significant improvement from 2020 when more than 20 percent of field visits were conducted via phone, email, or Zoom.

ii. Trainings

In 2021 the field team educated retail associates and managers on multiple retail programs and products, including LED fixtures, appliances, heat pump water heaters, and thermostats. Many trainings were conducted via Zoom or over the phone, which helped prioritize safety while still educating partners on important program updates. Those that took place in person were sure to follow stringent safety protocols, which included mandatory masking, social distancing, and small gathering numbers. The field team conducted 639 trainings throughout the year, totaling 727 staff members trained. These numbers represent both in-person trainings as well as virtual trainings.

iii. Events

Many PSE retail events were suspended indefinitely to due to COVID-19 related safety protocols for customers, store associates, and field representatives. No retail events were conducted in 2021 as they remained suspended throughout the year.

b. *Program Reviews*

The following discussions provide 2021 recaps for the individual programs that comprise the Single Family Existing (SFE) suite of offerings.

i. Retail Lighting

PSE offers incentives to purchase energy efficient lighting measures through instant rebates and limited time offers. PSE continues to educate customers and sales associates on the variety of LEDs available in the market as well as the benefits of selecting an LED bulb over an incandescent or halogen bulb. PSE deploys in-store signage designed for this purpose.

2021 Program Accomplishments

In addition to partnering with manufacturers to rebate high quality LED fixtures for customers, PSE Marketplace also expanded the program's reach online. The marketplace was leveraged to offer instant rebates on lighting. In 2021, PSE sent targeted emails promoting string lights, indoor fixtures, outdoors fixtures and T8 to electric customers. There were also two limited time offers advertised to customers in which the featured product incentive increased by $5.00 and included free shipping. The increased awareness and limited offers helped drive program participation and boost sales. Additionally, PSE partnered with Costco to do an endcap featuring lighting fixtures. The higher visibility of product in stores led to increased sales and almost all end caps display sold out during the promotion.

Adaptive Management

Washington State House Bill 1444 (HB 1444) went into effect in 2020 and continues to impact the Retail Lighting program as retailers are required to sell only high-efficient lighting products in several major categories. To align with this law and PSE's Memorandum of Understanding cycle, PSE ended rebates on impacted LED bulb products in 2020. Program staff worked diligently with manufacturer and retail partners to encourage participation in the revised 2021 Retail Lighting program. PSE conducted shelf surveys in a sampling of retail locations within the service territory to stay informed of the impact to LED market share from HB 1444 and consequent program revisions. Additionally, field services for the Retail Lighting program were adapted to align with COVID-19 safety protocols by suspending in-store events and adapting sales associate training for virtual participation.

Key Variance Drivers

The Retail Lighting program completed 2021 under savings target and under budget primarily due to the reduced rebate program offerings and the impact of COVID-19 on customer retail behavior and purchasing. Furthermore, updated reduced measure savings values were implemented during the program year as they were not available when setting the 2021 savings targets. The updated unit energy savings values caused a decrease in incentives for the T8 LED fixtures. This resulted in measures recording fewer energy savings and spend than previously planned.

Hard to Reach and/or Proportionately Underserved Segments

The Retail Lighting program makes instant discounts on lighting available in a wide variety of stores that serve all customer groups and geographies within the PSE service area. Geographic coverage of retailers can be viewed at www.pse.com/retailers-map. It is worth noting that the PSE Marketplace, an online shopping platform, was launched at the end of 2020 and expanded access to all residential customers with internet access.

ii. Space Heat

The Space Heat program delivers incentives and drives installations of home heating systems, including but not limited to: integrated space and water heating systems, natural gas furnaces, boilers, and heat pumps. The program includes delivery for customers

purchasing products through contractors, as well as a midstream delivery model via distributors.

2021 Program Accomplishments

In 2021, PSE was able to implement a COVID-19 protocol for summer outdoor events and program staff were able to conduct a series of in-person outdoor engagement events for contractors and distributors. Program staff targeted distributors with sufficient inventories and invited manufacturer representatives, branch staff and contractors to learn more about high efficiency equipment and PSE's midstream and downstream programs. Details on the six events are offered below in the field services section.

Regional alignment in program offerings is a key component to success with any midstream program. It provides distributors a consistent platform to engage contractors and minimizes risks for out-of-territory rebate denials. In July 2021, PSE and Seattle City Light welcomed Snohomish Public Utility District No. 1 (SnoPUD) to the residential midstream program. Program staff worked with the other utilities and its implementation contractors to re-brand all collateral and distribute materials to participating branches.

Code changes and regional re-branding offered opportunities to meet one-on-one with many distributors and contractors for in-depth interviews on staffing models, market approaches, program implementation and sales goals; all of which helped to inform program delivery tactics and best practice engagement tools. PSE developed distributor branch profiles using this data which proved very useful during numerous field services and distributor staffing turn-overs. Below is a discussion of field services activities for 2021:

- **Field Visits**

  Program staff were able to conduct outreach both in-person and virtually during 2021. The team recorded a total of 845 interactions with space and water heating industry staff over the course of the year. Typical in-person field visits consisted of staff check-ins, program training and review, point-of-purchase placement and maintenance, general question and answer sessions, a review of potential sales for rebate opportunities, and market intelligence gathering. Virtual visits typically consisted of combined phone and email outreach and Zoom-based trainings to include the same discussions held in-person but without physical POP management.

- **Trainings**

  The field team conducted 84 program trainings with 167 market actors across the region. Both in-person and virtual trainings were considered formal trainings which involved in-depth discovery of the space and water heating programs. Field representatives used standard field visits and virtual check-ins as opportunities to train available staff to maintain a consistent level of program knowledge at distributor locations.

- **Events**

  A total of six summer outdoor events were held between July and September 2021. Attendees included manufacturers, sales staff and contractors. Content included

space and water heating program requirements, avenues of participation, product offerings, and a Q&A session. Overall, there were approximately 30 different contractors in attendance at the six events. Since stocking has continued to be an issue during COVID-19, it was a benefit to the program to connect contractors with well-inventoried distributors.

Adaptive Management

While COVID-19 continued to prevent typical in-person Trade Ally Network engagement in 2021, program staff developed recorded training modules for contractors to remain informed of programmatic changes. Program staff were available for follow-up questions and received positive feedback from contractors whose schedules were stretched thin with increased HVAC demand and staffing shortages.

Faced with shortages and supply chain issues, limited distributor bandwidth, and market wide staffing shortages related to the continued impacts of COVID-19, staff were able to pivot and increase midstream distributor engagement tactics. These tactics included: volunteering additional rebate submission support; bridging the gap between manufacturers and distributors where possible; ensuring manufacturers knew high efficiency is a regional priority and to allocate equipment accordingly; increasing formal tracking of administrative barriers; and offering support when appropriate to move past distributor administrative bandwidth issues. Program staff worked closely with reps to understand product delivery lead times for future planning. The field team queried distributors to assess stocking levels at given points in time and together the team chased stock; supporting partners with stock and coordinating contractor promotion events.

Market feedback indicated customers planning home improvement upgrades were increasing as a side effect of spending more time at home during the pandemic. With this knowledge, PSE used its website and Energy Advisor hotline to disseminate information relating to supply chain issues and staffing shortages, advising customer to plan ahead for home energy upgrade. Rebate requirement extensions were granted to alleviate customer concerns of delayed equipment installations and rebate submissions.

Pilot-like Initiatives

Program staff planned a Limited Time Offer (LTO) on natural gas furnaces in the fall of 2021 but opted not to proceed due to multiple factors, including: supply chain issues and equipment delivery delays, contractor wait lists due to skilled labor shortages, and planned increases in gas furnace rebates for 2022.

PSE initiated discussions with Tacoma Power in 2021 to join the regional program and will continue to provide information and seek opportunities to expand the program throughout the region. Program Staff also reviewed several new measures for possible inclusion in the program but determined downstream program participation remained strong, and was gaining similar savings to that projected for the midstream program.

Hard to Reach and/or Proportionately Underserved Segments

In 2021, PSE continued to offer increased space heating rebates for median income customers via its elevated manufactured homes and Efficiency Boost initiative. In coordination with other programs, PSE also provided virtual workshops for space and water heating Trade Allies and other stakeholders to better address the low and moderate income customer segments.

Midstream programs can have a higher impact on underserved communities as they affect stocking and all sales going into a region. Program staff continue to engage all distributors so that all of PSE's service area has access to discounted high efficiency equipment.

Key Variance Drivers

Downstream space heating participation was lower than anticipated for 2021, nearly achieving electric savings and missing gas savings targets by more than 15 percent. Throughout 2021, PSE received feedback from customers on long wait times for equipment installations. Bids were provided within a few weeks but installations often stretched out up to three months later. PSE continued to market its programs with caveats that the market was experiencing supply chain issues and to plan ahead for home energy upgrades. Evidence of delays continue to trickle in, with PSE receiving rebate applications for measures sold in July 2021 but not installed until January 2022.

Residential new construction remained strong throughout 2021, and when coupled with retrofit home improvements, PSE achieved over targeted savings. Distributors proactively placed orders in bulk and stocked equipment to circumvent delays.

iii. Water Heat

The Water Heating program delivers incentives and drives installations of water heating systems, including but not limited to: hydronic systems and domestic water heaters.

2021 Program Accomplishments

As part of the retail heat pump water heater efforts in 2021, PSE worked with Lowe's to relaunch an in-store instant rebate that was suspended in 2020 for four months due to processing issues. Additionally, PSE partnered with NEEA, Lowe's, and manufacturer AO Smith to launch a two and half month promotion of heat pump water heaters that provided an additional $200 incentive. This promotion was marketed through a direct mail marketing campaign. PSE also continued a similar partnership with Home Depot which launched in the 2020 program year.

A discussion of field services activities for the midstream heat pump water heater program is provided above in the space heat section of this report.

Adaptive Management

In 2021, downstream incentives for heat pump water heaters needed to be de-emphasized in order to streamline the process and reduce rebate confusion with the increased midstream and retail focus for electric water heat. PSE was able to maximize the benefit for both downstream and midstream programs by doing this.

The COVID-19 pandemic caused global supply chain constraint which created significant challenges in manufacturing and distribution. Over the course of 2020 and 2021, many manufacturers across the state faced continued challenges distributing electronic storage water heaters. These challenges were exacerbated by the requirements recently established in WAC 194-24-180 that states electric water heaters must have a modular communications port compliant with the CTA-2045-A standard to be sold or installed in Washington State. Program staff worked closely with program implementation partners, manufacturer reps, NEEA, and regional utilities to understand and submit an appeal to the Department of Commerce to temporarily suspend the Water Heater CTA-2045 requirement. In response, the effective date of the rule was suspended from January 2021 to January 2022. This temporary suspension allowed manufacturer reps to send eligible equipment from across the country to Washington in order to increase sales of hybrid tanks, which contributed to the surge in midstream program submissions at year-end.

Pilot-like Initiatives

Program staff hosted several virtual 'Ask an Expert' events in January, June and October 2021. The purpose of each event was to promote offerings and provide customers an opportunity to ask questions about how to save energy at home and receive rebates for qualifying products. Featured topics included the new PSE Marketplace, and water heating, space heating, weatherization and Efficiency Boost programs. This innovative customer platform allowed PSE to connect with customers about multiple program offerings in an innovative and thoughtful way as well as providing a safe and comfortable environment for learning.

Hard to Reach and/or Proportionately Underserved Segments

By design, the downstream program provides customers with an instant rebate for qualifying HPWH purchases at the point of sale in a wide variety of stores that serve all customer groups and geographies within the PSE service area.

Similar to the space heat program, PSE continued to offer increased downstream water heating rebates for vulnerable populations and low to moderate income customers via its elevated manufactured homes and Efficiency Boost program in 2021.

Midstream programs can have a higher impact on underserved communities as they affect stocking and all sales going into a region. Program staff continued to engage all distributors in 2021. Regular midstream outreach included consistent communication with a number of branches and store employees situated in highly impacted communities.

Key Variance Drivers

Water heat underperformed compared to electric and natural gas savings and spending targets for 2021 due to several reasons:

- Worsening supply chain issues constraining supply which increased lead times and costs resulting in decreased participation early in the year. For heat pump water heating, there was partial relief provided by the CTA-2045 requirement extension in November 2021.

- Instant rebates for heat pump water heaters were unavailable at Lowe's locations in January 2021 due to identified processing issues.
- Continued impacts of COVID-19, particularly in supply chain shortages that caused water heating distributors to sell stock without regard for manufacturer, model, or efficiency. Having severely limited supply, shipping labor shortages, and distributor and contractor staffing shortages meant branch managers were running deliveries of products that took months to arrive at a much higher cost.

iv. Home Appliances

In 2021, this program offered incentives on a variety of residential appliances for customers. These include:

- Refrigerator & Freezer Decommissioning;
- ENERGY STAR Front Loading Clothes Washers;
- ENERGY STAR Top Loading Clothes Washers;
- Heat Pump Dryers; and
- ENERGY STAR Dryers.

2021 Program Accomplishments

In 2021, PSE added ENERGY STAR top loading clothes washers back into the retail appliance portfolio, broadening product selections for customers. Additionally, PSE continued partnering with manufacturer Samsung to promote energy efficient appliances to customers. Through this partnership, PSE hosted two online sweepstakes giveaways that resulted in a total of four Samsung front loading clothes washers and heat pump dryers being given away to PSE customers.

The promotions also offered an increased rebate on select Samsung front loading clothes washers and heat pump dryers. The sweepstakes and limited time offer elevated customer awareness of and drove increased interest in ENERGY STAR or higher rated energy efficient laundry equipment. In addition, a third sweepstakes was hosted with Samsung with a giveaway of the model refrigerator with which Samsung had been awarded the Emergent Technology Award by ENERGY STAR. The giveaway was combined with PSE's Earth Day promotion coloring contest. Customers learned about the new emergent refrigerator technology, as well as other methods in which energy usage can be lowered to preserve environmental resources.

Adaptive Management

In 2021, PSE transitioned the processing of the Home Appliance program from an external third party processor to its internal rebates processing team. The transition allowed PSE more control of the customer service quality of the program, as well as the ability to reduce costs. Additionally, PSE was able to offer customers the option to receive their rebate as a credit on their utility bill versus a check, a popular request from customers when offering feedback on the program.

Pilot-like Initiatives

To raise awareness for the Appliance Decommissioning Program, PSE partnered with two local non-profits in 2021. The Hands On Recycling campaign was a partnership with the Hands On Children Museum in Thurston County. Eligible customers were encouraged by email and social media to recycle their old refrigerator or freezer and in exchange, would receive one free pass to the Children's museum. PSE also offered the option to recycle old light bulbs during their appliance pick up, as well as donate their recycling rebate to the Children's Museum that PSE would match.

PSE's second recycling campaign was with Food Lifeline. The campaign leveraged the Appliance Decommissioning program to raise money to address hunger in the community. Customers donated their appliance recycling rebate to Food Lifeline and PSE would match the donation up to $4,000. Both campaigns raised awareness of the nonprofits' causes, while promoting the program to recycle old refrigerators and freezers.

Hard to Reach and/or Proportionately Underserved Segments

The Home Appliance program was promoted in a variety of stores that serve all customer groups and geographies within the PSE service area. Geographic coverage of retailers can be viewed at www.pse.com/retailers-map. Additionally paper forms are available for customers to apply with limited technology access.

Key Variance Drivers

Despite partnerships, marketing strategies, and adding a new measure to the program, the PSE Home Appliance program completed 2021 under its savings and spend targets. Supply chain issues continued to impact the program in 2021, in addition to low participation in the Appliance Recycling program. Low appliance recycling participation indicates that the market has transformed and most refrigerators being recycled now do not meet the requirements for the program.

v. Smart Thermostats

PSE offers rebates for ENERGY STAR certified smart thermostats and PSE qualified line voltage connected thermostats. Customers must heat their homes with a PSE fuel source to be eligible to participate in the program.

2021 Program Accomplishments

In 2021, PSE reinstated instant rebates on smart thermostats to customers through the PSE Marketplace. Additionally in 2021, PSE added line voltage connected thermostats to the Smart Thermostat program. PSE successfully promoted the measure to electric customers. The number of line voltage connected thermostats rebated in 2021 was almost twice the amount originally forecasted for the measure.

Finally, PSE continued its educational email sends in 2021. Every quarter emails were sent to customers that participated in the thermostat rebate program the quarter prior. The emails provide tips to achieve maximum savings with their smart thermostat and messaging was tailored to the thermostat brand and created in conjunction with thermostat

manufacturing partners. The tailored messaging was intended to provide information as relevant as possible to the customer and have more impact on their savings.

Adaptive Management

In 2021, PSE marketing highlighted manufacturer discounts and promotions, reminding customers of PSE's rebate offerings through targeted email sends and social media. In addition, rather than increase rebates and lower the cost effectiveness of the program, PSE negotiated discounts with manufactures on the PSE Marketplace to lower costs of the product and provide customers more affordable access to the technology.

Pilot-like Initiatives

PSE negotiated special pricing with ecobee, Emerson and Nest to conduct flash sales in 2021. The sales were limited time offers that combined a special manufacturer discount with PSE's instant rebate, allowing customers the opportunity to purchase a smart thermostat for little to no cost. Many customers took advantage of the flash sale discounts and 2021 rebate redemption levels were on par with levels when the program offered instant incentives online with manufacturer Nest in prior years.

Hard to Reach and/or Proportionately Underserved Segments

The Smart Thermostat program makes discounts available in a wide variety of stores that serve all customer groups and geographies within the PSE service area. Geographic coverage of retailers can be viewed at www.pse.com/retailers-map. It is worth noting that the PSE Marketplace expanded access to all residential customers with internet access. Additionally, PSE used targeted email sends and social media to raise awareness in underserved communities about the availability of the rebate in 2021. For example, an email was sent to a senior demographic promoting the Emerson thermostat for a special price of $19.99 on the PSE Marketplace as it more closely resembles a traditional thermostat and is easier to install. Customers purchased almost 2,000 Emerson smart thermostats in three days following this email send.

Key Variance Drivers

The Smart Thermostat program exceeded both electric and natural gas savings targets for 2021. This success was largely due to promoting instant rebates to customers via the PSE Marketplace, as well as launching the line voltage connected thermostat measure.

vi. Residential Showerheads

PSE offers instant incentives on thermostatic shut-off valves (TSVs) to customers through retail stores, targeted emails, and through PSE Marketplace. PSE continued to look for ways to build and strengthen its showerhead program portfolio in 2021.

2021 Program Accomplishments

Program staff leveraged the PSE Marketplace in 2021 to make instant discounts available on thermostatic shut-off valves and targeted customers via email and social media. In addition, PSE created an educational YouTube video on how the use the valve and encouraging customer adoption of the technology. Finally, PSE collaborated with the

marketplace vendor to provide a limited time offer on the TSVs that included an additional $5 discount on top of the everyday rebate and free shipping. The limited time offer quadrupled sales on the measure for that month.

Adaptive Management

PSE ended rebates on showerheads prior to 2021 and aerator rebates were also removed from the retail program as overhead costs were greater than the measure savings potential could justify. However, PSE was able to continue offering rebates on the thermostatic shut-off valves and even expanded product offerings to include showerheads with built-in TSVs.

Hard to Reach and/or Proportionately Underserved Segments

The Retail Showerhead program makes instant discounts available in a wide variety of geographies within the PSE service area. The PSE Marketplace also expanded access to all residential customers with internet access. Additionally, PSE used targeted email sends and social media to raise awareness in underserved communities about the availability of the rebate.

Key Variance Drivers

The Retail Showerhead program underperformed in 2021 and neither forecasted savings nor spending targets were reached for the program. The only remaining measure in this program, TSVs remain relatively unfamiliar to most customers and despite educational and targeted emails, social media promotions, expanding product options, and conducting a Limited Time Offer, there was limited uptake in PSE's customer base.

vii. Weatherization

The Single Family Existing Residential Weatherization Program provides rebates for the "shell" of existing residential structures, including windows, insulation, air sealing whole house ventilation, and duct sealing. There are a wide variety of weatherization offerings, some directed specifically to mobile homes or moderate income customers, while others focus on site-built residences.

2021 Program Accomplishments

The Weatherization program continued to provide top quality weatherization services, delivered through PSE's Trade Ally Network. In 2021, PSE continued to offer increased rebates for qualified moderate income customers through the Efficiency Boost initiative, in coordination with other Single Family Existing Residential programs. PSE also evaluated and implemented opportunities to increase participation in the Weatherization program. Specifically, the customer bonus incentive was increased significantly to encourage customers to install multiple measures per project.

Adaptive Management

Due to continued COVID-19 restrictions and safety protocols, PSE refined the virtual verification process in coordination with PSE's Verification team and Trade Allies. Amid the pandemic, PSE continued to waive blower door testing requirements for the whole house air sealing measure in alignment with Washington State Department of Commerce

recommendations. Contractors were concerned that blower door testing would unnecessarily expose customers and contractors to potential disease vectors.

PSE also increased virtual promotion of the Weatherization program. Activities included several virtual events such as “Ask an Expert” events, increased email marketing, and social media marketing, as well as contractor and partner outreach. Email and social media marketing for the Weatherization program focused on the customer bonus incentive for bundling multiple measures in one project.

Pilot-like Initiatives

As mentioned previously, PSE increased the Weatherization customer bonus incentive to encourage customers to install multiple measures per project. The customer bonus incentive provided an additional $400 to customers who install three measures during a weatherization project (increased from $250) or an additional $600 to customers who install four or more measures during a weatherization project (increased from $400). PSE demonstrated that the customer bonus incentive consistently delivered more measures per project than the rebates alone.

Hard to Reach and/or Proportionately Underserved Segments

As an extension of efforts started in 2019, PSE continued to offer increased weatherization rebates for manufactured home customers in 2021. In addition, PSE launched the Efficiency Boost initiative in 2020, which provides additional incentives to moderate income residential customers. In coordination with other programs, PSE also began posting training materials for Trade Allies online through PSE’s Trade Ally Portal. PSE Trade Allies and Recommended Energy Professionals may now view video trainings on their own time and at their own speed. Trainings are now available for the standard Weatherization program offerings, the Window offerings, and the Efficiency Boost offerings.

Key Variance Drivers

The Weatherization program exceeded both electric and natural gas savings targets in 2021. Program staff’s adaptive implementation and marketing played a key role in increasing participation in 2021 during the pandemic. High demand for home services is likely also a factor in increased participation, although supply chain issues may have dampened its impact. Anecdotally, Trade Allies report long wait times for supplies and equipment and wait lists for customers interested in receiving upgrades.

viii. Home Energy Reports

Home Energy Reports (HER) are customized reports sent to participating residential electric and gas customers to help them better understand their home energy consumption, motivate them to conserve, and provide targeted calls to action tailored to help each customer save money and improve energy efficiency.

2021 Program Accomplishments

The Home Energy Reports program successfully delivered 991,838 print reports and 1,546,736 email reports in 2021. PSE's Customer Engagement Tracker survey revealed that 91 percent of customers read the reports. More specifically, 97 percent from the 2008 (the first HER pilot group), 91 percent of the 2018 manufactured home group, and 92 percent of customers from the 2020 wave recall reading the reports.

Adaptive Management

In 2021, the Home Energy Report expanded by 100,000 customers, adding a new natural gas only wave of report recipients. Additionally the program updated the look and feel of the reports to all treatment participants and continued with COVID-19 related messaging as needed.

Pilot-like Initiatives

As mentioned above, PSE added a 2021 gas-only wave to the program with a focus on households in the greater Seattle, Everett and Tacoma areas. This was the first time adding a customer segment for gas-only customers.

Key Variance Drivers

The process for reporting Home Energy Report savings often results in large variations year over year. The HER program forecasts and claims savings for the biennium in the first year (2020) and conducts a true-up of first year savings in year two (2021). Any additional incremental second year savings are claimed in year two. Savings impact will be determined by PSE's third party evaluator and may reveal additional variances. As such, final 2021 savings will be reported in PSE's Biennial Conservation Report.

ix. Efficiency Boost

Efficiency Boost provides increased rebate amounts for various measures within the Space Heat, Water Heat, and Weatherization programs in order to increase access to efficiency for moderate income customers who may not qualify for low-income programs.

2021 Program Accomplishments

In 2021, the goal of the Efficiency Boost program was to continue to lessen the energy-cost burden of low-moderate income customers by improving the energy efficiency of their residences and educating these consumers on routine ways to reduce their energy use and costs. Program efforts included but were not limited to conducting focused income conversations with customers, and providing enhanced rebate offerings.

Adaptive Management

In 2021, Efficiency Boost was still in its first six months of launch and program staff continued to rely on organic marketing tactics through Energy Advisor high bill inquiries and LIW agency deferrals. PSE moved to a geo-targeted approach and conduct digital marketing campaign targeting potential Efficiency Boost customers in August 2021 to promote the program and general energy efficiency awareness. Additionally, Efficiency Boost continues to work in coordination with other programs and program staff also began

posting training materials for Trade Allies online through PSE's Trade Ally Portal. Trainings are now available for the standard Efficiency Boost eligible program offerings.

Pilot-like Initiatives

Efficiency Boost launched in mid-2020 and the design of the program continues to adapt while capturing savings. PSE continues to add more offerings to the program.

Hard to Reach and/or Proportionately Underserved Segments

By design, the Efficiency Boost program is focused on a hard to reach segment of PSE customers: those customers who apply for weatherization assistance and do not qualify but still are within the income qualification for Efficiency Boost.

Key Variance Drivers

All electric and natural gas savings captured are attributed to the individual programs tied to the specific measure type rebated. As such, specific savings targets are not set for the Efficiency Boost program.

c. *Single Family Existing Measure Highlights*

PSE presents measures, grouped by types reported in 2021, in Table I-2.

Table I-2: Overview of 2021 Single Family Existing Measure Activity

Single Family Existing Program Measure Counts					
Program Measure Type		**Measure**	**Electric**	**Dual**	**Natural Gas**
Retail Lighting		Fixtures and Lamps	157,170		
Space Heat					
	Heat Pump	Ductless Heat Pump	1,610		
		Air Source Heat Pump	940		
	Boiler	HVAC Boiler			60
	Combined	Integrated Space and Water Heat			90
	Furnace	Gas Furnace			4,230
Water Heat		Heat Pump Water Heater	1,200		
		Natural Gas Water Heater			1,360
Home Appliances		Dryers	5,130		
		Clothes Washer	3,620	4,150	
Web-Enabled Thermostats		Web-Enabled Thermostat	6,680		13,170

Single Family Existing Program Measure Counts, *continued*					
Program Measure Type		**Measure**	**Electric**	**Dual**	**Natural Gas**
Residential Showerheads		Thermostatic Restrictor	200	620	350
		Showerhead	270	800	2
Weatherization					
	Sealing	Insulation and Duct Sealing	160		1,070
		Air Sealing*	555,780		2,187,390
		Duct Sealing	50		170
	Insulation	Attic Insulation*	216,960	707,320	170,220
		Floor Insulation*	384,150	852,040	175,760
		Wall Insulation*	23,120	110,980	36,370
	Window	Single Pane to U30*	16,500		24,540
		Double Pane/Metal Frame to U30*	198,120		330
		Single/Double to U22 Triple Pane*	27,190		
Home Energy Reports			251,990		150,290
Midstream HVAC and WH					
	Heat Pump	Ductless Heat Pump	3,060		
		Air Source Heat Pump	1,240		
	Water Heat	Heat Pump Water Heater	990		
*sq. ft.					

3. Single Family New Construction

Schedules E/G 215

The following discussion applies to new construction, both "stick-built" single family homes and manufactured homes. The New Construction program acquires cost-effective energy savings from single-family new construction (single, duplex, and townhomes) and manufactured home new construction. The goal of each program is to increase the installation of energy efficient measures into new electric and natural gas-heated buildings constructed in the PSE service territory.

In the new construction marketplace, high-efficiency measures need to be specified and installed during design and construction. Otherwise, it may be many years before energy efficient changes to the buildings take place. Rebates and incentives are offered to eligible natural gas and electric PSE new construction developers, contractors, trade allies and customers (cumulatively, the program refers to these as "partners"). The program also works with these partners to market energy efficient equipment to their customers. The programs encourage the purchase and installation of energy efficient products for their construction projects.

This program provides financial incentives to the above audience for both natural gas and electric residential and commercial meters. PSE provides a single "point of contact" to development teams for all energy efficient measures and/or upgrades. This allows PSE to maximize the energy savings opportunity in each development and reduce multi-program confusion for the customer.

For all of the conservation measures installed, Energy Efficiency receives measure installation data directly from builders, developers, showrooms and distributors. It is therefore possible to precisely track measure details.

a. *2021 Program Accomplishments*

The Single Family New Construction (SFNC) program continued to utilize Northwest Energy Efficiency Alliance's (NEEA) Next Step Homes Performance Path program in 2021. Performance Path follows the Regional Technical Forum's approved standard modelling protocol, which provides a simplified method for estimating reliable whole-home savings through energy modeling.

PSE incentivized 22 Performance Path projects in 2021, compared to 18 in 2020. While participation in 2021 was improved as compared to 2020, numbers still remained low. Supply chain delays continue to delay various trades within new construction. A number of homes remain in the SFNC pipeline to be rebated in 2022 that were initially forecasted to complete construction in 2021.

The Manufactured Home New Construction (MHNC) program continued to offer two tiers of rebates in 2021: one for ENERGY STAR manufactured homes, and one for the more efficient ENERGY STAR with NEEM+ home. In 2021, field service efforts continued to see success. PSE rebated 64 ENERGY STAR manufactured homes, and 6 ENERGY STAR with

NEEM+ manufactured homes in 2021. Incidentally, there was also an increase in number of sales incentives paid to manufactured home retail staff, indicating more retailers promoting the rebates.

b. *Adaptive Management*

The SFNC program added a 10 percent above code measure. This measure saw uptake but supply chain delays have caused a number of projects to be delayed. PSE expects many of these projects to be completed and savings realized in 2022.

c. *Hard to Reach and/or Proportionately Underserved Segments*

Manufactured home customers are listed as a potentially hard-to-reach customer segment in the 7th Power Plan. The MHNC program helps increase service to this sector and prevent a lost opportunity.

d. *Key Variance Drivers*

The SFNC program nearly doubled electric savings as compared to 2021 savings targets, but saw much lower gas savings. Project completions increased in 2021 as compared to the previous year and the average savings per project were roughly 50 percent higher than 2020. However, this was only true for kWh savings, the average therms saved per project were much lower than the previous year, reflecting a general shift toward all-electric new construction. As Washington State Energy Code continues to incentivize electric space heat and water heat, PSE expects gas savings for SFNC will continue to deplete.

The MHNC program was close to target in both spending and savings. The program anticipated more uptake in 2021 due to more retailer engagement through field services and this was largely realized.

e. *Measure Highlights*

PSE provides a general overview of prescriptive measure categories reported in the 2021 Single Family and Manufactured Home New Construction programs in Table I-3 and Table I-4.

Table I-3: Single Family New Construction 2021 Measure Summary

Single Family New Construction Measure Counts				
Measure Type	**Measure**	**Electric**	**Dual**	**Natural Gas**
SFNC	Built Green - 3 Star or Equiv. - 10% above WSEC	1		
	Built Green - 4 Star or Equiv. - 20% above WSEC	3	7	
	Built Green - 5 Star or Equiv. - 30% above WSEC	10	1	

Table I-4: Manufactured Home New Construction 2021 Measure Summary

Manufactured Home New Construction Measure Counts		
Measure Type	**Measure**	**Count**
Manufactured Home	Incentive - Sales - NEEM 1.1	6
	MHNC: NEEM 1.1 Rated - Energy Star	50
	MHNC: NEEM 2.0 Rated - Energy Star	5
	MHNC: Sales Incentive - NEEM 1.1 Rated - Energy Star	20
	MHNC: Sales Incentive - NEEM 2.0 Rated - Energy Star	1

4. Multifamily Retrofit

Schedules E/G 217

The objective of the Multifamily Retrofit program is to increase the installation of cost effective energy efficient measures into existing multifamily buildings with five or more attached residential dwelling units located in PSE's electric and natural gas service areas.

The team works with property owners, managers, trade ally contractors, tenants, and condominium Home Owners Associations (HOAs) to encourage program participation. The program also serves multifamily campuses which have a mixture of building types including buildings with less than five units. Multifamily structures and campuses typically have opportunities for upgrades in the units, common areas, and building envelope.

Measures may include: windows, insulation, and air sealing enhancements; appliances, interior and exterior lighting, and HVAC upgrades; O&M improvements; behavioral modification; and calculated commercial upgrades such as central boilers, HVAC controls, and solar pool heaters. This program targets installation of energy efficient measures occurring during planned retrofit and replace upon failure. PSE updates current measures list and incentives as needed.

The program continually researches and develops new and innovative means to achieve cost effective energy savings. Examples may include behavioral based programs such as web-enabled thermostats and Strategic Energy Management (SEM).

Web-enabled thermostats empower customers with both knowledge and control of their heating costs through a simple user-interface accessed on their smart phone. SEM provides a holistic approach to multifamily property portfolios by engaging managers, maintenance staff, and residents to achieve energy cost savings through behavioral changes, operational improvements, facility maintenance, and attention to utility accounting.

Through effective customer education and implementation, PSE is continually exploring the impacts of how new technologies and energy management plans can contribute to the quantification of behavioral based energy savings.

a. *2021 Program Accomplishments*

The Multifamily Retrofit program continued to be significantly impacted by the COVID-19 pandemic, served roughly 60 percent of properties and dwelling units in 2021, as compared to pre-pandemic. Due to COVID-19 safety protocols, all in-unit direct install work remained on hold until August 2021. Once resumed, continued safety protocols meant that install work primarily consisted of common area lighting and drop-offs of advanced power strips. However, these no-cost measures could not make up for the lack of contractor installed weatherization measures as property owners continued to be concerned about eviction moratoriums and the disruption of their cash flow.

b. *Air Sealing*

The COVID-19 pandemic continued to affect the program in a number of ways that required adaptive management in 2021. PSE typically conducts blower door testing for air sealing

projects, however this practice remained on hold throughout 2021 in order to avoid concerns that pressurized buildings may cause air exchange between units. Alternatively, field staff utilized remote verification to conduct ongoing site inspections and verification via photos submitted by contractors and live stream appointments.

c. ***Adaptive Management***

To help drive savings in 2021, the Multifamily Retrofit program extended a Limited Time Offer (LTO) for window installations started in 2020. PSE also created a bundled LTO for bath fans and line voltage thermostats. This approach resulted in nearly 1 million kWh in savings and helped to mitigate the loss of savings from the lack of weatherization projects. Additionally, program staff collaborated with King County Housing Authority (KCHA) to offer new measures for in-unit TLED replacement. Working closely with low income housing agencies continued to be an important component of the Multifamily Retrofit program. It is worth noting that over 1 million kWh of savings in 2021 resulted from KCHA owned or operated sites.

d. ***Pilot-like Initiatives***

In an effort to maximize savings opportunities, program staff partnered with an electrical contractor to conduct direct install projects. While the electrical contractor replaced in-unit TLED's, bathroom fans, and/or line voltage thermostats, the program field team installed thermostatic tub starts and thermostatic shower adapters at some sites. Working in tandem reduced the disruption to the residents but was not without challenges since the electrical work takes significantly more time.

e. ***Hard to Reach and/or Proportionately Underserved Segments***

After resuming field activities in August 2021, the Multifamily program served over 700 residential units that qualified as low income customers with energy saving measures including: digital thermostats for more accurate heating control, water saving tub-spout and shower adapters (saves both water and the energy used to heat the water), and energy saving LED lighting for outdated kitchen fixtures. As noted above the sum savings from working with King County Housing Authority added over 1 million kWh savings in 2021. Not only do these measures help conserve resources, but they lowered utility bills for customers who may be experiencing other financial pressures during the challenging times of COVID-19.

f. ***Key Variance Drivers***

The Multifamily Retrofit program did not meet the electric savings target for 2021. Multiple supply chain issues dramatically slowed the anticipated projects throughout the pandemic. Historically the program has served between 300 and 500 properties per year, however PSE served just shy of 200 properties in 2021. The most notable supply chain issues include three to five month long backorders for windows as well as thermostat shortages. Despite contractors' efforts to find alternative sources for materials, they were overall unable to make up the shortages.

The program did exceed the gas savings target by over 25 percent for 2021. This was largely attributed to a specific project which garnered nearly three quarters of the total annual gas

savings. Exceeding the natural gas target directly contributed to ending the year over the targeted incentive spend. Likewise, both gas and electric budgets exceeded targets due to the LTO strategies discussed above.

g. *Measure Highlights*

Table I-5 provides a general overview of measure categories reported in the Multifamily Retrofit program in 2021.

Some measures, indicated by asterisks, are indicated in terms of square feet installed (for instance, insulation), dwelling units treated, or number of buildings.

Table I-5: Multifamily Retrofit 2021 Measures

Multifamily Retrofit Measure Counts			
Measure Type	**Measure**	**Electric**	**Natural Gas**
Appliance	Clothes Washer	160	
Lighting	LED Lamp	10,380	
	TLED Lamp	1,180	
Fan	Ventilation Fan	690	
HVAC	Gas Furnace		2
Heat Pump	Ductless Heat Pump	10	
	Heat Pump	1	
Insulation	Attic Insulation*	178,700	
	Floor Insulation*	68,000	
Power Strips	Advanced Power Strips	1,220	
Thermostat	Elect. Line Voltage Thermostat	14,170	
Ventilation	Mechanical Ventilation	690	
Water	Tub Spout	550	
	Residential Use Showerhead Restrictor	750	
Window	Double Pane*	214,610	24,870
	Triple Pane*	27,190	
*Sq. ft.			

5. Multifamily New Construction

Schedules E/G 218

Eligible customers for multifamily new construction include owners, developers, or agents acting on behalf of a responsible party of service receiving electricity or natural gas through PSE. This program provides financial incentives to the above audience for both natural gas and electric residential and commercial meters. The incentives offered are both prescriptive and calculated.

In the new construction marketplace, high-efficiency measures need to be specified and installed during design and construction. Otherwise, it may be many years before energy efficient changes to the buildings take place.

PSE offers rebates and incentives to eligible natural gas and electric PSE new construction developers, contractors, trade allies and customers constructing new multifamily buildings (cumulatively, the program refers to these entities as “partners”). The program also works with these partners to market energy efficient equipment to their customers.

PSE packages financial incentives under one grant that is structured to work in accordance with current Business Energy Management programs. PSE provides a single “point of contact” to development teams for all energy efficient measures and/or upgrades. This allows PSE to maximize the energy savings opportunity in each development and reduce multi-program confusion for the customer.

Structures include but are not limited to apartments, town homes, condominiums, dormitories, affordable housing, low-income housing, workforce housing, and assisted living residences with four or more attached units.

There may be any combination of residential and commercial meter mixes in each type of construction. Once the meter type mix is confirmed with the development team, the appropriate PSE programs are identified to serve that development. Incentives include a variety of end-use classifications, not limited to:

- Lighting: Exterior, Common area, and in-unit.
- Appliances: Clothes washers, refrigerators, dishwashers, dryers.
- Ventilation; in-unit whole-home or common area.
- HVAC equipment upgrades.

For all of the conservation Measures installed, Energy Efficiency receives measure installation data directly from partners which allows for the tracking of specific measure details.

a. *2021 Program Accomplishments*

The MFNC program experienced a number of challenges in 2021. Supply chain disruptions related to the COVID-19 pandemic continued across various industries significantly pushed back completion dates. While the MFNC pipeline remains strong, many projects that were anticipated to close in 2021 will now close in 2022. Additionally, the average savings per project decreased by about half as compared to average project savings from 2020. This

was due to the continued MFNC measure attrition from midstream crossover, increased baselines from House Bill 1444 (HB 1444), and increased baselines from 2018 Washington State Energy Code. These factors led to the MFNC program underachieving in 2021.

b. ***Adaptive Management***

A number of changes were made to the MFNC calculator in late 2020 that continued to impact the program in 2021. These included: adding connected line voltage thermostats, ENERGY STAR certified electric vehicle chargers, and an appliance bundle bonus for having all ENERGY STAR appliances. While there has been some uptake on these measures, the incremental savings they add is low in comparison to the lost savings from higher code baselines and higher baselines from HB 1444. Program staff will continue to push projects to pursue deeper savings related to envelope and centralized space and water heat.

c. ***Hard to Reach and/or Proportionately Underserved Segments***

In 2021, PSE offered an increased incentive rate for affordable multifamily projects, with both the electric and natural gas savings incentive at 50 percent higher than for market-rate projects.

d. ***Key Variance Drivers***

The MFNC project finished 2021 below both electric and natural gas savings targets. The close of many projects were delayed due to supply chain disruptions, which lowered savings. Additionally, the midstream program and HB 1444 cut into savings for various measures, causing per project savings to continue to decline from the previous year.

e. ***Measure Highlights***

MFNC incentives are packaged under one grant that is structured to work in accordance with current Business Energy Management programs. As such, a summary of each component measure is not provided for the MFNC program.

B. Business Energy Management

The following program discussions address specific results and accomplishments in the Business Energy Management Sector. Process and tactical improvements that enhance the customer's energy efficiency experience and prudently utilize Conservation Rider funding are outlined within the discussion.

The discussion flow aligns with Energy Efficiency's Exhibit 1: *Savings and Budgets*.

1. Commercial/Industrial (C/I) Retrofit

Schedules E/G 250

PSE works with commercial and industrial customers to provide incentives for cost-effective energy efficiency upgrades to lighting, equipment, building shell, industrial process, and select O&M improvements. These services are provided on the customer's behalf and, where specified by the customer, will be developed in conjunction with design engineers, contractors, and/or vendors.

PSE conducts site assessments to identify savings opportunities, verify existing equipment and system operations, and to make recommendations to customers. PSE also reviews third-party savings estimates and analyses, and when required performs in-house analyses to validate energy savings. PSE works with financial decision makers at the customer's facility to ensure the customer is aware of cost-savings opportunities, including review of energy saving projections that can help obtain favorable financing rates.

Commercial/industrial retrofit projects commonly include: lighting system upgrades, HVAC equipment upgrades, HVAC controls improvements, commercial refrigeration measures, and industrial process modifications. Additionally, incentives for building commissioning (O&M) improvements are provided through multiple building commissioning programs.

Upon the customer's decision to proceed with a project, PSE issues a standardized Conservation Grant Agreement and Grant Attachment that establishes terms and conditions for participation in PSE's Custom Grant program and also explains how the measure will be verified. After the agreement is signed by both parties, the customer is given notice to proceed with the energy efficiency project.

Following completion of the project, PSE verifies the installation and energy savings via an on-site inspection, review of equipment operation and trend log data where necessary, and collection of project invoicing and specifications of installed equipment.

a. *C/I Retrofit: Custom Grants (Non-Lighting)*

PSE provides discussions of notable C/I Retrofit program accomplishments in the following sections.

i. 2021 Program Accomplishments

In 2021, PSE partnered with Nexant to increase awareness of its commissioning programs and conducted trainings for over 30 commissioning providers. Over 30 project leads resulted from these outreach efforts.

PSE also generated its first Monitoring-based commissioning (MBCx) grant and closed out six Elevate Your Efficiency (EYE) limited time offer (LTO) grants.

ii. Adaptive Management

In 2021, PSE performed more in-person site visits than the previous year. Remote site verifications still represent the majority of project verifications and remained in place throughout the 2021 program year.

The previously mentioned Elevate Your Efficiency (EYE) LTO started in the beginning of 2021 and was intended to provide an enhanced incentive for electric and gas energy efficiency projects completed in calendar year 2021. As a result of that LTO, PSE received over 120 project applications and completed grant agreements for 46 of those proposed projects.

PSE engineers also followed up with applicants that did not qualify for a custom grant through this offer in an effort to determine if measures could qualify or other efficiency measures could potentially be incentivized.

iii. Pilot-like Initiatives

In 2021 PSE started developing a telecommunications efficiency program designed to target telecommunications, broadband, and cable providers providing them with a comprehensive and flexible program combining capital and performance based incentives. This program was developed in 2021 and is expected to launch in 2022.

iv. Hard to Reach and/or Proportionately Underserved Segments

PSE continued to evaluate projects that do not meet rebate eligibility requirements for custom grant opportunities throughout 2021. These projects typically involved small businesses with specific needs that are difficult to categorize into a specific business type.

v. Key Variance Drivers

New project intake continued at a slow pace in 2021 and the C/I Retrofit program finished the year at just under half of the electric target and just shy of the gas target. Labor and product shortages associated with the pandemic were the primary drivers for falling short of the savings targets. The difference in percentage of target between electric and gas is due to several large gas efficiency projects being completed in 2021.

The previously mentioned Elevate Your Efficiency LTO was likewise affected by these issues and many projects were either delayed or cancelled as a result. For projects that were delayed, PSE elected to honor the enhanced incentive offering until the end of 2022.

b. *Business Lighting Program*

The Business Lighting program serves customers as a part of the Commercial/Industrial Retrofit Conservation Schedule 250. To simplify the customer experience, PSE offers only one Business Lighting grant program. This single program addresses customers' needs by providing custom calculated incentives for lighting and lighting controls measures.

i. 2021 Program Accomplishments

PSE completed over 600 projects in 2021 through Business Lighting and Business Lighting Express programs, with an average project size of 80,000 kWh and 9,400 kWh respectively. Through the program planning process it was determined that lighting-only new construction and tenant improvement projects should be added to the program. The Application was redesigned and was presented to customers in December in preparation for 2022.

ii. Adaptive Management

The Business Lighting team consistently monitored lighting market trends. A significant trend in 2021 was the continued slowdown in the lighting retrofit market. In January 2021, the Business Lighting team launched a Project Perk to incentivize contractors to close projects. The Project Perk ran from January through the end of August 2021 and paid the company that submitted the project, generally the contractor a bonus incentive. Bonus incentives were given in the form of a gift card in amounts of $50 for projects less than 50,000 kWh, $100 for projects with 50-100,000 kWh, or $200 for projects with savings above 100,000 kWh. While it is difficult to quantify the impact of the Project Perk, the two months leading up to the ending of the Perk averaged over 60 projects paid compared to an average of 50 for the year.

iii. Hard to Reach and/or Proportionately Underserved Segments

Small businesses often fall into the hard-to-reach category due to their cost-flow requirements. The Business Lighting program classifies smaller projects as projects on rate schedule 24 or similar.

In 2021, the program paid over 225 of these projects, which accounted for approximately 36 percent of the total project count and nearly 20 percent of program savings. Included in the count above are 10 Relight Washington (small Washington cities) street lighting projects completed in 2021.

iv. Key Variance Drivers

The Business Lighting program fell short of savings and direct benefit to customer incentive goals in 2021, primarily as a result of the continuing COVID-19 pandemic and subsequent slowdown in the lighting retrofit market.

c. *Industrial Programs*

In addition to Commercial/Industrial Retrofit Custom Grant offerings, PSE has developed and implemented a set of offerings targeted at Industrial customers. Measure-specific incentives are provided through these programs. The Industrial Energy Management

program serves customers as a part of the Commercial/Industrial Retrofit Conservation Schedule 250. A targeted offering was developed to better serve Industrial customers by consolidating and expanding PSE's offerings available to these customers.

i. 2021 Program Accomplishments

In 2021, PSE launched the targeted sub-program Industrial Energy Management (IEM), consolidating existing offerings while allowing for more targeted offerings for Industrial customers. Offerings previously managed by third-party contractors are now managed in-house to improve program flexibility and to enable use of multiple implementers to augment PSE program capacity.

PSE's IEM programs made steady growth in total number of projects as well as in size in 2021. There are several offerings within the IEM program, including: Industrial Systems Optimization Program (ISOP), Industrial Strategic Energy Management (ISEM), Custom/Capital Project Development (Capital), and Comprehensive Small Industrial (CSI). The ISEM cohorts for both waste water treatment and manufacturing customers continued throughout 2021. Though impacted by the COVID-19 pandemic, PSE was able to achieve either completion or significant progress in several ISOP and large capital projects.

ii. Adaptive Management

Offerings that typically required site visits, such as industrial systems optimization, were converted to remote implementation in order to adjust to COVID-19 restrictions and safety protocols. Multiple successful projects were initiated in 2021 as a result.

iii. Key Variance Drivers

The IEM program fell short of savings and direct benefit to customer incentive goals in 2021, primarily as a result of the COVID-19 pandemic and subsequent slowdown in the lighting retrofit market

d. *Clean Buildings Accelerator*

The Clean Buildings Accelerator (CBA) program is designed to assist building owners to comply with the requirements of Washington State House Bill 1257, the Clean Buildings Law. This new program provides strategic energy management services through a four month program. It is targeted towards lower resourced and smaller organizations, including public organizations and non-profits, and/or customers that have less experience with energy efficiency programs.

i. 2021 Program Accomplishments

PSE launched the first cohort in the CBA program in June 2021 with eight participant organizations. Throughout the year, program content continued to be developed and the first cohort was used as a pilot group to test program assumptions and refine content for program delivery in the following program year. Initial feedback from the customers included that the CBA was helpful on their path to compliance, and appreciation of PSE's support throughout the process. Project pipeline development work will continue with this

cohort going into the next biennium, as customers understand how their buildings are performing against their energy targets.

ii. Adaptive Management

The goal of the first cohort in 2021 was to be able to test out the delivery model and program assumptions, since this is a brand new program based on a specific state law. Major learnings that captured in 2021 from this first cohort include:

- Organizational change management practices need to be discussed early and often
- Customer capacity is limited to about three buildings per cohort (rather than their whole portfolio of buildings), which will impact savings forecasts
- Executive sponsorship needs to participate from the beginning
- Customers need assistance in finding their accounts and meters
- PSE can maximize project development opportunities by pairing an engineer/project manager/account manager with each customer

iii. Hard to Reach and/or Proportionately Underserved Segments

In 2021, PSE recruited customers primarily through the Business Services team, inviting customers who were not currently participating in PSE's Commercial Strategic Energy Management (CSEM) program, in order to specifically help those who were not currently being served in an energy management program. Program staff sought out more rural customers, or those with smaller portfolios of buildings that likely would not have a very mature energy team. For example, participants included customers from cities like Concrete, Steilacoom, and Coupeville, rather than recruiting in areas like Bellevue and Seattle.

iv. Key Variance Drivers

The CBA program underspent the proposed budget by over 50 percent. Staff had originally estimated 20 participants and up to 80 buildings in the program, based on the building population size. This also assumed the ability to do virtual energy scans, which drive savings opportunity identification, for all buildings in a customer's portfolio. However, staff learned a customer only has capacity to do about 3 scans per cycle, so were only able to scan about 24 buildings.

Additionally, Department of Commerce notification letters were expected to be mailed by July 2021, which were expected to drive interest in CBA. The letters did not get mailed until October 2021, setting customer awareness back by several months.

To manage this in the coming program year, staff plan for more proactive outreach and recruiting, offering more virtual energy scans outside of the original scheduling cycle, and looking to offer ASHRAE Level 2 audits with the additional budget to supplement what the CBA is able to offer.

e. *Project and Measure Highlights*

PSE provides the following Commercial/Industrial Retrofit tables to give readers a sense of programs' custom grant activity and scale of custom projects. A project may consist of a single structure or multiple structures.

Table I-6 provides a representative number of Commercial/Industrial Retrofit projects completed in 2021.

Table I-6: Commercial/Industrial Retrofit Projects

Commercial/Industrial Retrofit Custom Grants	**Number of Custom Grant Projects**		
Program **Project Classification**	**Electric**	**Natural Gas**	**Dual**
C/I Custom Grants			
Commercial & Industrial Retrofit	30	30	20
C/I Lighting Grants			
Business Lighting Grants/Express	600	0	0
Industrial Energy Management			
	20	0	0
Total Project Count	650	30	20

PSE presents a representative number of electric and natural gas measure categories installed in their respective programs in

It is important to clarify that these are measure categories, not individual measures, and it is important to note that indicated measures may include substantially more than a single unit. Furthermore, custom grants may consist of a combination of prescriptive measures, calculated measures, and efficient equipment installed following detailed engineering analyses.

Table I-7: Highlights of C/I Retrofit and Lighting Grants Measure Categories

Highlights of Measure Categories by Program	Count of Measure Categories		
Commercial & Industrial Retrofit	**Electric**	**Natural Gas**	**Total Measure Count**
(All custom grants)			
Boiler - Hot Water - Custom	0	10	10
Boiler - Steam - Custom	0	1	1
Building Tune Up - Base - Custom	1	0	1
Chiller - Custom	1	0	1
Compressor or Dryer or Receiver - Custom	3	0	3
EBCx - Assessment Phase - Custom	1	0	1
Energy Recovery System - Custom	0	1	1
Fan - VFD - Custom	2	0	2
Generic Measure - Custom	1	2	3
HVAC - Other - Custom	4	3	7
HVAC - VRF - Custom	1	0	1
HVAC Control - Base - Custom	6	5	11
HVAC Control - Only - Custom	2	7	9
HVAC Control - Performance - Custom	6	3	9
Insulation - Building Shell - Custom	0	1	1
Insulation - Exterior Roof - Custom	0	1	1
Insulation - Pool Cover - Exterior -Custom	0	2	2
Lighting - Custom	1	0	1
Process - Control - Custom	1	0	1
Process Heating System - Custom	0	1	1
Pump - VFD - Custom	1	0	1
Pumps and Vacuums - custom	4	0	4
Refrigeration - Custom	8	6	14
Unitary Equipment - Custom	9	1	10
Window - custom	0	3	3
Clean Buildings Accelerator	4	2	6
Total Measures	**56**	**49**	**105**

Highlights of Measure Categories by Program, con't	Count of Measure Categories		
Commercial & Industrial Retrofit	**Electric**	**Natural Gas**	**Total Measure Count**
(Commercial & Industrial Lighting Grants)			
Lighting - Custom	490	0	490
Lighting - Base - Custom	40	0	40
Lighting - Performance Custom	50	0	50
Lighting - Street - Custom	20	0	20
LTGO: Lamp - TLED - 2 3 or 4 foot	30	0	30
Lamp - LED 155W or less Lamp - from HID 400 W	1	0	1
Lamp - LED - 30W or less Lamp - from HID 70W - Comm	1	0	1
Lamp - LED - 90W or less Lamp - from HID 250W - Comm	1	0	1
Total Measures	**630**	**0**	**630**

Table I-8: Highlights of Industrial Energy Management Measure Categories

Highlights of Measure Categories by Program			
Industrial Energy Management	**Electric**	**Natural Gas**	**Total Measure Count**
Compressor or Dryer or Receiver - Custom	3	0	3
ISEM - Milestone Incentive 1	4	0	4
ISEM - Milestone Incentive 2	4	0	4
ISEM - Performance Incentive - Year 1	1	0	1
Optimization - Refrigeration – O&M - Custom	3	0	3
Process - Modification - Custom	1	0	1
Pump - VFD - Custom	1	0	1
Refrigeration - Custom	3	0	3
Total Measures	**20**	**0**	**20**

2. Commercial/Industrial New Construction

Schedules E/G 251

PSE works with designers and developers of any large or small new Commercial / Industrial (C/I) facilities, or major remodels, to propose cost-effective energy efficient upgrades that exceed energy codes or standard practice where minimum efficiency requirements are not prescribed by code. Four paths may be followed to qualify for assistance and/or funding for New Construction energy efficiency Measures. New Construction Post-occupancy Commissioning is also offered in addition to the building paths.

a. *Building Paths*

The first path is similar to the retrofit program where component Measures are evaluated individually and funding is based upon cost-effectiveness. Under this approach, customers may receive up to 100 percent of the incremental cost over a code-compliant baseline. There is a streamlined process for lighting projects that have lighting power density values listed in the applicable code.

The second path is a whole-building approach that utilizes building energy simulation to demonstrate improvement over energy code requirements. PSE will work with designers to incorporate measures that produce at least 10 percent overall savings beyond applicable energy code, including local jurisdiction amendments. Given the time required for planning and construction, these projects typically take several years to complete.

The third path is an energy use intensity (EUI) performance method that uses metered building usage data during a performance period to determine savings compared to an industry standard baseline EUI. Baseline EUI metrics were developed by the Washington State Department of Commerce for different building types in Western Washington. Customers submit their proposed building type and square footage so PSE can determine the baseline EUI metric and electric and natural gas usage. Once construction is complete and the building is occupied, a 12 month performance period begins during which the customer can demonstrate good building design and operation. The total usage for the performance period is used to determine the project savings and final grant amount. The building must use at least 10 percent less than the baseline EUI metric to qualify for a grant

The fourth path includes Prescriptive Basis incentives for Measures that are eligible for rebates under Schedule E/G 262, Business Rebates. The incentive amount for a Measure is the same as that which is available under Schedule E/G 262, but energy savings may be calculated based on actual Site-Specific conditions and Code Baseline adjustments, if necessary.

Customers assume full responsibility for utilizing their design teams and contractors to provide information to PSE for evaluation of grant funding. Projects must be approved for funding prior to installation/implementation to be eligible.

b. *2021 Accomplishments*

In 2021, the C/I New Construction team continued to coordinate with the Multifamily New Construction program to improve marketing and outreach. Program staff engaged directly with members of the design community, including developers, architects, and designers to improve awareness of the program. As a part of continuous improvement efforts, program staff promoted the EUI Performance Method to expand program eligibility and offer an option that captures whole building savings without requiring an energy model. Multiple customers were excited about this option and will be completing these projects in 2023.

Program staff also updated the whole building energy model approach to meet the 2018 WSEC that went into effect in 2021. The streamlined approach only requires a proposed energy model from the customer, and PSE's energy model reviewers created a baseline model that meets the 2018 WSEC. This allows for consistent modeling practices and baselines for all customers while limiting the amount of adjustments the customer needs to make to their model. The lighting calculation method was also updated in 2021, to be implemented in 2022. C/I New Construction and Business Lighting staff made updates to the Business Lighting Workbook so it will include a new construction option for 2022. This should streamline the lighting calculations for both customers and PSE staff.

c. *Adaptive Management*

In 2021, program staff continued to focus on creating a culture of collaboration and transparency with customers participating in the new construction program, and actively sought feedback from customers, the design community, and other utilities on the grant process. Staff also continued to seek feedback from energy management engineers (EMEs) to update program guidelines.

With this feedback in mind, program staff streamlined both the lighting process as well as the whole building energy model approach for the program. Rather than maintain an outdated workbook, the new construction calculation was merged into the existing Business Lighting Workbook.

The adjustments to the whole building energy model approach went into effect in 2021 to align with updates to the WSEC. The new version of the code would have required customers to update their baseline energy models to meet program requirements. Rather than put that burden on the customer, program staff decided to accept any proposed energy model (that accurately portrays the building design) and not require any adjustments to the baseline energy model. These updates were made by PSE's energy model reviewers during their review process. This procedure allows for a consistent and accurate 2018 WSEC baseline for all projects and takes the burden of updating the baseline energy model to PSE standards off of the customer. This procedural change only applies to projects permitted under the 2018 WSEC. Customers with projects permitted under the 2015 WSEC will follow PSE's standard procedure of providing a proposed energy model and a baseline model that meets the 2015 WSEC.

d. *Pilot-like Initiatives*

Program staff continued to work on marketing and recruiting customers to participate in the Early Design Assistance program in 2021. This program incentivizes developers to consider their buildings' energy consumption holistically and early in the design process.

e. *Hard to Reach and/or Proportionately Underserved Segments*

The C/I New Construction program serves small business, commercial tenant, and industrial customers. The EUI Performance Method creates another option for small new construction projects that did not qualify for the whole building energy model approach. The updates to both the new construction lighting and whole building energy model procedures will have made these options more accessible to all customers.

f. *Key Variance Drivers*

The C/I New Construction program ended 2021 with significantly lower than expected natural gas and electric savings. Multiple projects with substantial savings were delayed or cancelled due to COVID-19. Construction was delayed for several months due to COVID-19 restrictions and supply chain issues, which decreased the overall number of projects that could close in 2021. This in turn caused a decrease in overall claimed savings and spent budget. It is worth noting that many of the projects that were delayed are expected to close in 2022.

g. *Project and Measure Highlights*

The C/I New Construction representative number of projects completed in 2021 are shown in Table I-9.

Table I-9: Commercial/Industrial New Construction Projects

Commercial New Construction	Number of Custom Grant Projects		
Program Project Classification	**Electric**	**Natural Gas**	**Both Electric & Natural Gas**
Commercial/Industrial New Construction			
Commercial/Industrial New Construction	60	1	7
	60	1	7

PSE presents the number of electric and natural gas measures installed in Table I-10.

Table I-10: Commercial/Industrial New Construction Measure Categories

Highlights of Measure Categories by Program	Count of Measure Categories		
Commercial/Industrial New Construction	**Electric**	**Natural Gas**	**Total Measure Count**
(All custom grants)			
Compressor or Dryer or Receiver - Custom	1	0	1
Fan -VFD - Custom	1	0	1
HVAC - VRF - Custom	1	0	1
Lighting - Base - Custom	1	0	1
Lighting - Custom	30	0	30
Lighting Power Density Reduction - Custom	20	0	20
Process - Control - Custom	1	0	1
Refrigeration - Custom	1	0	1
Unitary Equipment - Custom	2	0	2
Water Heater - Commercial - Custom	0	1	1
Whole Building Design - Custom	9	0	9
Total Measures	70	1	70

3. Energy Performance Incentive Programs

Schedules E/G 253

Energy Performance Incentive Programs, previously named Commercial Strategic Energy Management, includes whole-building, performance based programs that achieve cost-effective electric and natural gas savings through energy management practices. This section was renamed during 2021 in order to accommodate the addition of the Pay for Performance program to the Schedule 253 offerings.

The following discussions provide 2021 recaps for two programs that comprise the Energy Performance Incentive offerings: Customer Strategic Energy Management and Pay for Performance.

a. *Commercial Strategic Energy Management*

PSE offers Commercial Strategic Energy Management Services (CSEM) to any Commercial or Industrial (C/I) customer, school district, and public-sector government agency with a minimum portfolio baseload to meet cost-effective thresholds. The CSEM program targets larger customers with multiple facilities such that the cost of implementation can be recovered through savings achieved. Schedule 448, 449, 458, and 459 customers may utilize their Schedule 258 funding allocation for CSEM Services. While the CSEM program is specific to commercial and industrial customers, PSE has offered Strategic Energy Management options for Multi-Family customers and Industrial customers through other program offerings.

Customers qualify for the CSEM program based on their annual PSE energy purchases. A typical customer baseline for maximum program funding is 20,000,000 kWh for electric only or 2,700,000 therms for gas-only service from PSE. Funding levels are prorated based on the amount of staff a customer would need to allocate in order to achieve cost-effective savings from CSEM efforts. At a minimum, the customer needs to use 1,000,000 kWh or 135,000 therms, or the equivalent to participate in the program.

A CSEM customer employs, contracts, or designates existing staff to implement CSEM responsibilities, including accounting for resource consumption, assessing facilities, recommending actions, monitoring progress, calculating savings and communicating program information to organization stakeholders.

Monetary grants include a "start-up" grant for completion of deliverables associated with building the program foundation. The start-up deliverables include identifying an Energy Manager, setting up an energy-accounting database, writing a company resource management plan, and completing facility action plans. Once start-up deliverables are complete, the customer may qualify for "performance grants" based on achieving energy savings associated with CSEM practices and “target grants” for meeting or exceeding pre-established energy-reduction targets.

The CSEM agreement is valid for three years. Over this time, PSE anticipates a 10-12 percent reduction in overall energy use. Savings are calculated using industry standard

practices and energy accounting methodologies. Reported annual savings are a variance from a fixed baseline. PSE may elect to renew a customer's CSEM agreement in three-year increments to provide continued support and additional performance incentives.

Puget Sound Energy's CSEM support program is comprised of a menu of services, which can be tailored to meet the specific needs of the customer. Typical CSEM services include, but are not limited to, the following assistance and support:

Program Start Up

- Designing and implementing a CSEM program.
- Developing baselines, policies and guidelines, and facility action plans.

Technical Assistance

- On-site walk-through audits to train customer staff to identify waste and opportunities for improved efficiency.
- Analysis and reporting of savings relative to established baseline.

Education & Training

- Training in fundamental concepts for designated RCM and support personnel such as custodial, maintenance, and facilities staff.
- Educational materials for classroom or building occupant use including checklists, fact-sheets, and calculators.
- Training stipend to support professional development in Building Operation or Energy Management.

Energy Data Services

- Review of existing databases for inclusion of all facilities, accounts, meters, and overall data integrity.
- Historical and on-going monthly PSE billing data and access to MyData Manager software.
- Energy Interval Services for internet view of facility gas interval meter data.

Cash Incentives

- "Start-up" incentive intended to share the cost of program start-up that is paid upon satisfactory completion of deliverables.
- Performance grants for customers who achieve energy savings after completing their deliverables.
- Target grants for customers who achieve a pre-established targeted amount of energy savings after completing their deliverables.

The CSEM program has also assisted customers in establishing Energy Star® Benchmarks for their facilities using EPA's Portfolio Manager. PSE will continue to help customers to identify potential targets, improve energy efficiency to meet award qualifications, coordinate the application and inspection process, and submit material to EPA for Energy Star awards.

Additionally, access to energy accounting software has allowed PSE CSEM customers to facilitate greenhouse gas accounting and other climate change and sustainability initiatives. The value of this service routinely exceeds those stated in the CSEM program scope of work.

PSE continues to explore ways to make the CSEM program cost-effective for smaller customers. PSE efforts will continue to work with CSEM consultants, customers, and other support agencies to develop this market.

i. 2021 Program Accomplishments

In 2021 the CSEM program focused on pivoting several components of the program from in-person to virtual to ensure continued customer engagement. The impacts of the COVID-19 pandemic on facility operations and site energy analyses were significant and program staff sought out methods to quantify and adapt to them. This was accomplished through the development of a non-routine event detection tool in partnership that also calculated adjustment factors based on industry best practices.

The CSEM program completed 29 projects in 2021 and achieved three quarters of both its electric and natural gas savings targets. While the rate of project completion was comparable to the previous year, energy savings claimed were greatly impacted by adjustments in building operations by customers as they adapted to COVID-19 with increased ventilation and adjusted occupancy limited, which impacted site energy use.

Customer recruitment also remained challenging due to the ongoing pandemic in 2021, however, program staff were able to recruit a large customer from the banking segment.

ii. Adaptive Management

In 2021, program staff developed a Nonrecurring Engineering tool to ensure PSE effectively analyzed savings. PSE also augmented staffing capacity with analysis support from third party engineering services and sub-metering contract to address a staffing gap and project backlog.

iii. Key Variance Drivers

Customer project completion and energy savings were impacted both in terms of how customers had to operate their buildings during the pandemic and in their ability and capacity to do the reporting work required to appropriately document energy efficiency efforts at their respective sites. Customers often had to operate their HVAC in ways that increased energy use even when site occupancy was decreased for health and safety reasons. Additionally, many of customers were short-staff which prolonged and delayed their reporting needed for project closeout. This combined with the program staff turnover made hitting CSEM program goals exceptionally difficult.

iv. 2021 Results by Customer Sector

Table I-11 below shows the number of CSEM program projects. Table I-12 presents a representative summary view of 2021 incentive and allowance categories paid.

Table I-11: Number of CSEM Projects

Project Count Per Program				
	Electric	**Gas**	**Both Electric & Gas**	**All Projects Combined**
CSEM	13	7	12	32
Total Measure Count:	**13**	**7**	**12**	**32**

Table I-12: Representative CSEM Incentives & Allowances

Measures Per Sector	
Incentive Type	**Count**
CSEM	
Performance Incentive - Year 1	11
Performance Incentive - Year 2	13
Performance Incentive - Year 3	14
Start Up Incentive - Year 1	5
Target Incentive - Year 1	11
Target Incentive - Year 2	13
Target Incentive - Year 3	13
Training Allowance - Year 1	9
Training Allowance - Year 2	14
Training Allowance - Year 3	13
Total Count:	**116**
Custom Grant projects often consist of more than a single measure	

*Custom Grant project counts often consist of more than a single measure.

b. *Pay for Performance*

Newly added to the Schedule 253 tariff as a standard program, the Pay for Performance (P4P) program transitioned from a Schedule 249 pilot during the 2021 program year. As such, the P4P program was included in Exhibit 1 under both Schedule 253 and Schedule 249 during 2021 and is also referenced in the Pilots section of this report. The P4P program

helps customers achieve energy savings through deep retrofits in commercial buildings with over 50,000 square feet. The program also supports compliance with Washington State House Bill 1257, enacted in 2019, for customers working towards compliance with the Clean Buildings Law, particularly with the early adoption incentive program.

i. 2021 Program Accomplishments

In 2021, PSE issued grants for four additional P4P projects, and four additional projects underwent project development and program consideration. Additionally, PSE made the first base year payments on five projects in 2021, which is the first time PSE has counted savings for this program, though some of that savings are counted under the pilot stage for 2021.

PSE has also integrated P4P into the Clean Buildings Accelerator (CBA) program, where it is promoted as having natural alignment with the Clean Buildings Law. The CBA team actively looks for projects that would qualify for P4P, and will include a deeper program overview as part of the Elevation Seminars in CBA.

Finally, PSE has gotten traction with repeat contractors bringing in projects. Of the 13 active or pending P4P projects in the pipeline, the contractors brought in two projects.

ii. Adaptive Management

In 2021, PSE adaptively managed the program primarily on the PSE process side. Program staff established more consistent pre- and post-inspection documentation requirements for measurement and verification. Staff also developed a method for calculating the portion of project costs to use for the measure cost in order to do cost effectiveness calculations. Additionally, PSE lowered the whole building savings threshold for gas-only projects to 10 percent, since this was a barrier to participation in neighboring electric utility service areas.

iii. Hard to Reach and/or Proportionately Underserved Segments

In conjunction with the CBA, program staff worked with the Customer Insights team to identify Highly Impacted Communities that will be subject to the Clean Buildings Law in 2021. Staff anticipate that some portion of these buildings may be good candidates for P4P. Customers may begin with CBA, but ‘graduate’ to P4P for buildings with high EUIs.

iv. Key Variance Drivers

The P4P program did not achieve any gas savings in 2021, although only 2,500 therms were targeted due to the nature of this program starting the program year as a pilot with uncertain savings. Lowering whole building savings code for gas-only customers to 10 percent is expected to help capture savings in future program years.

v. 2021 Project and Measure Type Summary

At the end of 2021, there were 13 active or in-development P4P projects. Projects are multi-measure, but often include lighting and major HVAC upgrades.

4. Large Power User/Self Directed

Schedules E/G 249

This program solicits electric energy efficiency upgrades through a Request for Proposal (RFP) process. C/I customers receiving electric service under Schedule 40, 46, 49, 448, 449, 458, or 459 receive a funding allocation based on their electric usage and are responsible for proposing cost-effective project(s) to utilize their allocation.

The Large Power User/Self-Directed (LPU) program operates in a 4-year cycle, with two phases in each cycle. The current program cycle spans from January 1, 2019 to December 31, 2022. The above-noted RFP process is the first phase, and is classified as the non-competitive phase. Customers are given until April of the third year of the cycle to propose projects that utilize their incentive allocations under the non-competitive phase. Customers who do not designate projects that fully utilize their allocation by April of the third year forfeit their remaining balance to a competitive phase, in which remaining funds are available to all program participants via competitive bid.

Proposals are evaluated by PSE Engineering staff for technical soundness, cost-effectiveness and compliance with energy code and tariff requirements. Customers sign a standard PSE Conservation Grant Agreement, defining project cost, PSE incentive amount, and verification requirements prior to installation of project Measures.

In the Competitive Phase, eligible customers respond to a new RFP in order to obtain remaining incentive funding that was unclaimed during the non-competitive phase. In this phase, eligible customers may have access to funds beyond their original allocation. The competitive phase RFP is issued in May of the third year of the cycle. PSE ranks proposals received based on cost-effectiveness and other criteria specified in the RFP. Funding is awarded in order of project ranking, until either all competitive phase funds are allocated, or all qualified proposals are funded, whichever happens first. Any remaining money is transferred to the general Energy Efficiency program budget at the end of the program cycle.

a. *2021 Program Accomplishments*

In 2021, 23 LPU projects completed, saving approximately 13,000,000 kWh/yr. Two of these projects were for Engineering Studies, a measure offered for the first time in this current program cycle (which began in 2019). An additional 35 projects were in progress at the end of 2021, representing a savings potential of approximately 19,879,000 kWh/yr.

Two competitive phase RFPs were issued in 2021 to solicit project proposals to utilize remaining individual allocation funds.

b. *Adaptive Management*

Due to a significant amount of remaining funding after the end of the initial competitive phase RFP period in July 2021, PSE offered a second competitive phase RFP period, from September through November 2021. It is worth noting that this was cleared with the CRAG before proceeding as it had never been done in prior program cycles. The second

competitive phase RFP period produced an additional 13 projects that otherwise would not have been captured in this program cycle.

Additionally, the second competitive phase included the option for no-cost energy studies to all interested program participants. The intent was to remove any barriers to the customers to participate in the program and help them identify projects for the next program cycle. Four customers submitted proposals to take advantage of this offering.

c. *Key Variance Drivers*

Program spending in 2021 was approximately $3.6 million for 449 customers, and approximately $593,000 for schedule 46 and 49 customers. It's important to note that customer allocations are adjusted annually by 7.5 percent to cover PSE program administration costs and 10 percent to support NEEA costs.

Overall program spending was significantly higher in 2021 compared to 2020 due to a higher number of completed projects (23 projects in 2021 vs 8 in 2020).

The high amount of unclaimed funding after the initial competitive phase RFP period was likely due to a combination of pandemic-related business disruptions and the fact that the Schedule 40 customers were not able to submit projects due to the rate schedule being discontinued in 2020, making those customers no longer eligible for the LPU program.

d. *2021 Project and Measure Summary Type*

Table I-13 shows the distribution of projects by customer rate schedule. Table I-14 indicates a representative number of measure types installed to provide a sense of program scale. A project may include substantially more than one measure.

Table I-13: Large Power User/Self-Directed Number of Projects

Project Count Per Program	
Program	**Electric Only**
High Voltage 449	13
High Voltage Non - 449	11

Table I-14: Large Power User/Self-Directed Measure Classifications

Program Measure Category	Count
Commissioning - Ongoing - Performance - Year 1 - Custom	1
FAN - VFD - Custom	2
Generic Measure - Custom	1
HVAC Control - Only - Custom	5
Lighting - Custom	9
Motor - Custom	1
Process - Modification - Custom	1
Pumps and Vacuums - Custom	1
Study - Engineering - Custom	3
Total Measure Count	**24**

5. Commercial Rebates

PSE offers prescriptive incentives for select, commonly-applied measures to commercial and industrial customers. These rebates have been developed for measures in which energy savings can be standardized over a wide variety of applications, and where a competitive market pricing structure exists to ensure cost-effectiveness.

PSE program staff develops program design, monitors program performance, results, and trends. Programs are coordinated closely with the electric and gas Commercial Retrofit program. Staff review program refinements and cost-effectiveness with Engineering Staff, the Evaluation Team, and the Manager of Business Energy Management as necessary on an ongoing and adaptive basis. Incentive measures, marketing and the fulfillment process may be modified, as needed, to respond to developments in technology, market conditions, customer acceptance and/or changes in supplier/contractor delivery and pricing.

These programs offer prescriptive rebates to qualifying commercial and business customers:

- Commercial Midstream Lighting – Lighting to Go
- Commercial Foodservice Equipment & Laundry
  (includes Commercial Midstream Foodservice Equipment*)
- Lodging Rebates,
- Commercial HVAC,
- Commercial Midstream HVAC and Water Heat Rebates*,
- Commercial Midstream Foodservice Equipment*, and
- Small Business Direct Install Program*
  (includes: lighting, refrigeration, basic HVAC and water saving for small businesses, small lodging and small agriculture customers).

*PSE contracts with industry experts to implement these measures, tailored to the unique needs of target markets.

e. *Commercial Midstream Customer Engagements*

In 2021 the Commercial Rebates programs developed and executed unique customer engagement campaigns focused on driving customer awareness of and participation in PSE's Commercial Midstream Rebate programs. The following discussion highlights some of the key 2021 customer awareness initiatives.

Although equipment distributors continued to be heavily impacted by the COVID-19 pandemic, some partners did allow in-person visits in 2021. Many partners maintained a curbside pick-up system as well to eliminate counter traffic and abide by public indoor capacity requirements. While some outreach was completed in-person, partners generally maintained reduced staffing levels, resulting in lower staff interactions per visit. The field team continued to adhere to strict safety protocols with regard to masking and social distancing.

In the past, the field services team was a consistent participant at in-person tabling events. Given the continuation of the COVID-19 pandemic, in-person events were slow to regain traction in 2021. As event discussions began to gain traction the Delta variant caused already hesitant partners to cancel in-person event plans. Given the longevity of this pandemic and its impact on field services engagement, each program team considered opportunities to provide virtual events in 2021.

In 2021 PSE successfully implemented field services for midstream programs in 163 locations, including corporate headquarters, online-only locations, and traditional brick and mortar distributors. From awareness of campaigns to the daily maintenance of signage, the field services team provided a connection between PSE, the rebate programs, and the PSE customer. The suite of products serviced by the field team in wholesale locations included lighting, heat pump water heaters, condensing gas water heaters, HVAC, and a wide range of commercial foodservice equipment. Overall, outreach resulted in 1,810 personal touch points over the course of the year.

Table I-15: Commercial Midstream Customer Engagements

Location Type	# of Locations	Total Number of 2021 Touch Points	Touch Points per Location	Avg. Touch Points per Month
Brick and Mortar	130	1650	16.5	137.5
Corporate	20	110	4.3	9.3
Online Only*	20	50	3.3	4.1

*Online only includes partners that have no physical storefront, out of state chains with no physical storefront in Washington, and distributors representing multiple companies. Online only partners often require more effort to engage in relationship building due to the lack of opportunity for live conversation.

Note: the table above (and subsequent tables) includes some locations that did not end up as active partners, and some locations that were added later in the year. Active and engaged partners were most often engaged on a monthly basis, and more frequently as needed.

f. *Program Reviews*

The following discussions provide 2021 recaps for the individual programs that comprise the Commercial Rebates suite of offerings.

vi. Commercial Midstream Lighting to Go

PSE's Lighting to Go program provides instant point-of-sale rebate savings to lighting contractors and commercial customers who purchase qualified equipment from approved distributors for use in commercial customers' businesses. The Lighting to Go program

covers LED replacement lamp measures including: Tubular LED (TLED) measures, CFL replacements, HID replacements, and exterior LED fixtures.

2021 Program Accomplishments

Program staff engaged more distributors, focusing on both brick and mortar stores as well as web based stores. An additional 15 online distributors and 27 brick and mortar distributors signed on to the program in 2021. Based on distributor feedback, the program team enhanced the Lighting to Go program by adding four additional interior fixture measures. Also in 2021, downlights returned to the program after a two year hiatus, and wraps and strips, troffers, and high bays were also added. Overall, Lighting to Go had over 14,000,000 kWh in savings with a total of over 180,000 units sold.

The lighting incentives also continued to be targeted to smaller projects. This measure is particularly beneficial for small projects because the incentives are given at the point of purchase for the customer. The benefit of the program for the distributors is the quick reimbursement turnaround and ease of program participation.

- **Field Visits**: The Lighting to Go Field Services 2021 outreach activities are detailed in the table below:

County	In-Person Visit Reports	Call/Email Reports	Total Field Reports
King	130	130	260
Kitsap	20	130	150
Pierce	60	30	90
Skagit	20	40	60
Snohomish	30	20	50
Thurston	30	20	50
Whatcom	20	10	30
Online/Corporate	0	50	50
Totals	300	290	590

- **Trainings:** Training is a key component to field services engagement and program success. The field services team provides formal program trainings on an average of twice per year per partner. Each interaction is an opportunity to reinforce program messaging and engage industry partners. The metrics for 2021 trainings include:

County	Number of Staff Interactions	Number of Trainings	Number of Staff Trained
King	240	60	80
Kitsap	20	4	6
Pierce	80	10	20
Skagit	40	9	10
Snohomish	30	20	20
Thurston	50	6	8
Whatcom	30	10	10
Online/Corporate	30	5	5
Totals	520	120	160

- **Events:** Two significant obstacles faced in virtual events were technology-averse contractors and finding relevant topics to draw them in. After much feedback from valuable distributor partners, industry partners, and outreach staff, the decision was made to discontinue virtual event planning.

Adaptive Management

In alignment with the Business Lighting program, PSE kept TLEDs incentives at $4 to continue to help drive the market to replace linear fluorescent lamps with LEDs. Program staff also added interior fixture incentives to capture purchases requested by the distributors. The team also encouraged upgrade fixtures to LED as a safer project during COVID-19 restrictions due to safety protocols in interior occupied spaces.

Pilot-like Initiatives

In anticipation of the regional offering coordinated between PSE, Snohomish Public Utility District (SnoPUD), and Seattle City Light, Lighting to Go program offering, program staff worked throughout the final quarter of 2021 on creating joint marketing materials. PSE decided to adopt the regional styles for two distributor facing pieces and maintain PSE branding with the addition of SnoPUD and City Light logos on all contractor facing point-of-purchase counter mats, banners, window clings, and table tents.

Key Variance Drivers

As noted above, Lighting to Go energy savings targets (and proposal spending) was increased driven by more participating distributors and expanded rebate offerings.

vii. Commercial Foodservice & Laundry

PSE continued to offer cost-effective prescriptive Downstream and Midstream Foodservice rebate incentives to over 8,000 foodservice customers in 2021, allowing for equitable participation opportunity across the region.

PSE's historical regional shared delivery model was adjusted in 2021. As PSE streamlined the midstream subset of the Foodservice program , it proved highly beneficial to the sales base. This was, however, challenging to the regional utilities that historically participated in the previously shared delivery method of this program. The regional delivery model offers a joint utility application across all participating utilities with a single point of contact, following consistent submission processes, utilizing shared qualifying product lists, and coordinating outreach across all territories. Due to the challenge PSE's midstream offering posed to this regional approach, PSE worked with the regional utilities in 2021 investigate the potential to incorporate the new Midstream model into their programs.

The Commercial Laundry program continued to offer a fuel-specific, pro-rated option to nearly 1,500 laundromat, lodging, and multi-family customers for upgrading their washing machine equipment.

2021 Program Accomplishments

The 2021 program year was the first full implementation year for the newly implemented Commercial Foodservice (CFS) Midstream program. Historically managed in-house by, the new third party implementer brought focused expertise within the equipment manufacturing and distribution channels. This improved midstream format also added capabilities for participating distributors, including, but not limited to; a new online application portal to submit rebate reimbursement claims, upload sales invoices, verify equipment eligibility, and view rebate reimbursement status. This allowed Midstream rebate claims to transition fully online and distributors reported increased participation due to increased ease of access and visibility.

Program staff also concentrated on increasing the program's reach by adding additional dealers and distributors to the program, including local, regional, and national partners. Additionally, staff partnered with Sterling Manufacturing, a manufacturer of electric steam cookers, to coordinate participation in the program to increase direct sales. This national engagement led to nearly 300,000 kWh in additional electric savings for the program, totaling over 40 percent of the programs electric savings for the 2021 program year.

Through this new focus on manufacturing relationships, the CFS midstream program was able to garner the first measure participation efforts for the recently launched Demand Controlled Kitchen Ventilation (DCKV) measure group. The CFS Program worked to devise a pre-approval process and marketing materials. The measure was launched in partnership with Melink, a global DCKV manufacturer. With the addition of new manufacturing partnerships, the program ended 2021 with 21 active distributor locations for the Midstream program, accounting for over 100 individuals trained on the program.

The program was able to integrate instant rebates into AutoQuotes the dominant foodservice sales software used across the country. This allows dealers to look up

equipment uninterrupted in their usual sales process, making the potential for program participation even higher. Non-participating distributors can also sign up for the program through the platform.

The Commercial Laundry Program completed improvements to the website and as well as direct marketing efforts to qualifying customers.

- **Field Visits:** In 2021, the field team filed nearly 480 field reports for CFS store visits, including those done at corporate locations or with local corporate staff. Of these, over 100 occurred in-person, while 400 of them were via virtual calls/emails. This led to a total of over 500 personal interactions with staff over the course of the year. Note: the overall interaction total does not line up exactly due to some field reports containing both an in-person visit as well as a follow-up call/email.
- **Trainings:** The CFS field team conducted over 50 trainings in 2021, totaling over 100 staff members trained. These numbers represent both in-person trainings as well as virtual trainings conducted over Zoom.

  The foodservice industry was significantly impacted by the pandemic, facing either restaurant closures or decreased buying power. The continued impact of the pandemic and COVID-19 variants resulted supply chain shortages and delays that caused food service equipment providers to sell without regard for manufacturer, model, or efficiency. Though program touchpoint increases were an expected result of the implementation of improved processes, these circumstances heavily influenced the ability to continue to grow as expected.
- **Events:** The CFS program conducted a live virtual Coffee & Conversation event in 2021. The event was designed to explain the program to foodservice businesses; from specific rebates to help lower energy use to what it takes to qualify and participate in the program. After the presentation, a live Q&A was hosted on saving energy in the foodservice industry, allowing those in attendance to interact 1:1 with PSE staff. This event was pilot-like, since offering something like this to a very unique industry was done with uncertain expectations. Over 40 customers registered to attend the event which, though no metric was available to compare against, is considered a significant volume for the hard-to-reach foodservice industry.

  The event recording was posted to YouTube and a follow-up email was sent to all who received the original event invite, guiding them to learn more about the program by providing them a link to watch the recording. The YouTube recording received over 100 views as a result.

Hard to Reach and/or Proportionately Underserved Segments

A majority of restaurant customers fall within the hard-to-reach and proportionately underserved segmentation due to many factors, such as lack of upfront capital, often being renters, uncertainty as to the longevity of their business, and reduced awareness of energy efficiency. All of these circumstances can be translated to PSE's Laundry customer sectors as well. Additionally, there is a high proportion of customers who are multilingual and/or are distrustful of utilities due to lived experience in different cultural landscapes.

Due to COVID-19, door-to-door outreach, industry expo, and conference tabling continued to be put on hold in 2021. However, regional and segmental presentations as well as midstream rebate delivery through local, regional, and national equipment distributors and manufacturers continued.

To help mitigate the impacts of COVID-19, the programs each maintained a Pay Per Click (PPC, also sometimes called Search Engine Marketing/SEM) campaign. Web traffic to PSE's Foodservice program webpage continued to remain consistently high throughout 2021, with the Foodservice rebate application often being the most downloaded form within the Energy Efficiency Business Customer pages. Laundry analytics showed similar web traffic improvement due to the PPC campaign.

The Foodservice program also sent an email campaign to 4,500 restaurant customers in 2021, focused on letting foodservice customers know that PSE understands the trying times they are going through and has resources to help, showing them an example of how saving on a single piece of energy efficient equipment could impact their bottom line. The results of the campaign far exceed the industry benchmark by nearly 250 percent.

The Laundry program also sent an email campaign to 100 laundromat customers. The click-through-rate for the campaign exceeded industry standards by over 50 percent.

Adaptive Management

In 2021, the program was faced with persistent and unpredictable product availability due to equipment and component shortages, overall supply chain issues and manufacturing delays, limited distributor bandwidth, and market wide staffing shortages related to lingering COVID-19 impacts. Program staff worked to bridge the gap between manufacturers and distributors where possible; ensuring manufacturers knew high efficiency is a regional priority and to allocate equipment accordingly.

Program Staff also continued comprehensive outreach to global, national, and regional market actors to gather data and forecasts from the CFS supply chain. Throughout the year, product availability greatly varied and lead times increased as factories were still operational but equipment and parts orders from overseas were delayed. Program Staff worked with the market to understand the barriers experienced in sourcing equipment in order to provided market data that gives insight to lowered participation in the program, especially in gas fryers – which experienced lead times of over a year.

Program staff also developed and implemented an outreach plan to prepare the market for changes related to House Bill 1444 (HB 1444), with the intention of implementing HB 1444 baselines changes in 2022. The program team interviewed market actors selling affected measures and found that not only was the market was not ready for these code changes to take place, but market actors would discontinue stocking high-efficiency models and stock only units below the minimum threshold if the rebates would cease to exist.

Key Variance Drivers

The CFS industry was drastically disrupted by the continued COVID-19 pandemic, particularly in foodservice as many businesses were required to move to a takeout-only model. Later in the year, capacity and mask mandates made normal business functions difficult to maintain. Food chain and sourcing challenges also compounded these issues. Many commercial foodservice customers were forced to permanently shut their doors, following a national trend of over 15 percent of restaurants facing permanent closures due to the continued pandemic. For those that remained open, profits continued to decline in high volumes, some customers stating losses of 40 percent or more. These circumstances directly impacted PSE's customers and their ability to participate in PSE programs which require up-front capital. For those that could participate, the equipment supply chain issues, particularly prevalent in the technologies relevant to high efficiency components, forced many PSE customers to purchase what was available in the market – standard efficiency.

Deep fat fryers, historically a top performing measure, were particularly affected by supply chain issues in 2021. In late 2020 the CFS Midstream program expanded to bring on new national dealers including Restaurant Depot and their 3 locations in PSE's service territory. Deep fat fryers were expected to bring in a very high volume of sales and energy savings in 2021. Unfortunately, though their initial sales proved promising, dealers informed program staff that they were unable to stock fryers since summer 2021, and gas savings in the program were directly affected by that loss of this measure.

viii. Lodging Rebates

PSE reintroduced this program in 2021 with enhanced incentive amounts. Lodging rebates are designed to help hotel and motel customers afford the significant cost associated with making changes to their greatest energy burden – heating and cooling. This encompasses specific technologies found within guest rooms including Packaged Terminal Heat Pumps and Occupancy-Based Thermostat Controls.

This program is offered through a downstream model and rebates are set at an "up to" amount based on the individual cost of the equipment.

2021 Program Accomplishments

Work on the reintroduction of the Lodging Rebates program began in early 2021. Program Staff were able to update the Source of Savings for the measures and maximize the incentive opportunity for customers in order to drive participation toward completing more affordable whole-facility projects. Staff also significantly streamlined the process required for pre-qualification and post-verification conditions in order to make the program more accessible and give participants a better customer experience, and also to help expedite, where possible, a definitively lengthy timeline. PSE worked to connect a key historical program champions, who began submitting their customer projects to the program in the second quarter of 2021.

As a newly returned offering, the Lodging program did not perform field visits or events in 2021. Additionally, only informal trainings were held while a new webpage was added to pse.com.

Hard to Reach and/or Proportionately Underserved Segments

There is a large subset of small- to medium-sized lodging facilities in this sector, which fall within the hard-to-reach and proportionately underserved segmentation. Additionally, there is a high proportion of customers in these sectors who are multilingual and/or are distrustful of utilities due to lived experience in different cultural landscapes.

An incentive increase was specifically designed to assist these customer in more successful larger-scale projects due to the fact that much less capital investment would be needed to complete facility installs in a single phase. This showed to be very effective and the majority of 2021 projects were completed under the “Full Project” (vs “Partial”) designation.

Adaptive Management

The Lodging Rebate program market saw persistent and unpredictable product availability due to equipment and component shortages, overall supply chain issues and manufacturing delays, limited contractor bandwidth, and market wide staffing shortages related to lingering COVID-19 impacts. Throughout the year, product availability greatly varied and lead times increased as factories experienced shut-downs, and equipment and parts orders from overseas were additionally delayed. Program staff worked with the market to understand the barriers experienced in sourcing equipment in order to provide market data that would give insight to lower-than-expected participation in the program.

Key Variance Drivers

This program was not included in PSE’s 2020-2021 Biennial Conservation Plan or 2021 Annual Conservation Plan and was added during the 2021 program year. As such, the program did not have specific savings targets listed in Exhibit 1. The program did bring in a significant volume of savings for a program focusing on smaller businesses, however the pandemic-related equipment supply issues inhibited full realization of planned market success for the year. Many projects started in 2021 are expected to complete in 2022.

ix. Commercial HVAC

The Downstream Commercial HVAC program provides rebates on Advance Rooftop Controllers (ARC), web-enabled thermostats, and ductless heat pumps. Commercial HVAC retrofit rebates are designed to help PSE’s small and medium commercial customers reduce their energy usage without the requirement to upgrade costly rooftop equipment. The program is an ideal next step for small commercial customers that have participated in the SBDI or Business Lighting Grants programs.

2021 Program Accomplishments

Program staff continued to work with a joint utility group to standardize and strengthen PSE's Advanced Rooftop Control (ARC) rebate structure. These efforts simplified the application process for contractors in 2021 and provided a more customer-friendly approach in alignment with other regional utility offerings. Changes included removing the 70 percent incentive cap for project costs, restructuring incentive payments so that they are calculated on a per rooftop unit basis as opposed to a per ton basis, and including new measures for Variable Frequency Drive (VFD) and controllers. The increased rebate amount should generate more customer interest, and switching to a per-unit payment structure made the incentive calculations easier for customers to understand. Overall, ARC measures accounted for over 95 percent of 2021 energy savings for this program. PSE also developed a pilot to use data collected from ARC equipment to improve savings assumptions, discussed below.

Additionally, staff worked extensively to improve clarity and consistency across customer facing marketing to improve the customer experience. In addition to updates to all program collateral and web pages, PSE partnered with other I-5 utilities to develop a universal ARC rebate application form in order to enhance customer experiences in overlapping service areas.

Adaptive Management

Program staff worked with regional utilities to add a small unit incentive to the ARC rebate and restructured incentive payments to be calculated on a per rooftop unit basis as opposed to a per ton basis. Additionally, PSE increased the project cost cap tied to incentive levels from 70 percent to 100 percent. These changes are expected to streamline and strengthen the customer value proposition for this measure.

Pilot-like Initiatives

PSE continued work on establishing an ARC data monitoring and collection pilot. This was a collaboration between PSE, Energy Solutions, and the National Renewable Energy Laboratory (NREL) and was launched in 2020. The pilot purpose was to gather the energy monitoring data captured by Advanced Rooftop Controls (ARCs) for further analysis.

Advanced Rooftop Controls are designed by the manufacturer to collect usage data for the customer. Customers participating in the pilot were asked to allow the manufacturers to share this data with Energy Solutions, who then analyzed the data. NREL awarded Energy Solutions a grant to run this pilot and PSE participated as a utility partner. PSE helped recruit pilot participants through its ARC rebate program.

The goals of this pilot were to improve the energy savings assumptions of ARC products, demonstrate the value of device data for promoting energy efficiency, and determine whether the data generated by different manufacturers can be standardized into a common format. In 2021, findings showed that device data does promote energy efficiency but requires additional customer buy-in, and that Project Haystack can be used to standardize data from independent manufacturers into a common formant.

Key Variance Drivers

In 2021, Commercial HVAC ended the year at just over 80 percent of electric target savings and achieved well over 100 percent of natural gas target savings. The overall number of installs in 2021 compared to the past several years increased for ARC units but decreased for thermostats and heat pumps.

The COVID-19 pandemic continued to lower demand and dampened marketing opportunities. Small and medium businesses, a primary target for these rebates, struggled financially and were in a reduced position to invest in energy upgrades.

A small number of contractors generated the majority of ARC projects for primarily large commercial box stores. Thus, the majority of annual savings were generated from larger customers through ARC measures rather than the small and medium businesses who are the primary targets for heat pump and thermostat measures. However, these contractors opted to install lower efficiency ARC-Lite units as compared to higher efficiency ARC-Full DCV units due to lower install costs and simpler technical requirements. The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) specifically discouraged the use of DCV in its *Guidance for Building Operations During the COVID-19 Pandemic*. This may have also affected the market appetite for this product.

x. Commercial Midstream HVAC & Water Heat

Commercial Midstream HVAC and Water Heat is designed to influence the market by providing incentives at the distributor level for HVAC and water heat equipment, encouraging those distributors to stock high efficiency equipment that is readily available upon unplanned equipment failures.

2021 Program Accomplishments

In spite of unpredictable product availability and pricing, workforce shortages, and persistent market uncertainty, the program experienced growth in the number of branches participating and expanded its reach throughout PSE's service area. The program also experienced more stable proportions of new construction and retrofit sales suggesting broader distributor and contractor engagement. Additionally, 2021 saw improved product coverage with an increase in mid-size products coming through the program.

Regional alignment in program offerings is a key component to success with any midstream program. It provides distributors a consistent platform to engage contractors and minimizes risks for out-of-territory rebate denials. In July 2021, PSE and Seattle City Light welcomed Snohomish Public Utility District (SnoPUD) to the commercial HVAC program. Program Staff worked with the other utilities and its implementation contractors to re-brand all collateral and distribute materials to participating branches.

Adaptive Management

Faced with shortages and supply chain issues, limited distributor bandwidth, and market wide staffing shortages related to lingering COVID-19 impacts, program staff were able to pivot and increase distributor engagement tactics via: volunteering additional data submission support; bridging the gap between manufacturers and distributors where

possible; ensuring manufacturers knew high efficiency is a regional priority and to allocate equipment accordingly; increase formal tracking of administrative barriers; and offering staff time when appropriate to move past distributor administrative bandwidth issues.

Pilot-like Initiatives

In 2021, PSE initiated discussions with Tacoma Power to join the regional program and will continue to provide information. Program staff also reviewed several new measures for possible inclusion in the program but determined custom project analysis remained a better fit.

Hard to Reach and/or Proportionately Underserved Segments

Midstream programs can have a higher impact on underserved communities as they affecting stocking and all sales going into a region. Program staff continue to engage all distributors so all areas of its service area has access to discounted high efficiency equipment.

Key Variance Drivers

PSE's commercial midstream HVAC program achieved only 39 percent of the savings forecasted. Supply chain complications related to the pandemic, including: raw material shortages, labor issues, pandemic shut downs and weather events, had a significant impact in the HVAC market. Commercial market sales shifted to a focus on HVAC system components related to indoor air quality (IAQ). This focus combined with labor shortages, sales backlogs, supply chain delays, and equipment price increases led to a decline in participation for commercial HVAC efficiency programs. Due to the more simplistic nature of water heating installations (when compared to large scale HVAC projects), PSE's commercial midstream gas water heating program did not experience similar impediments to participation as on the electric side. On the contrary, gas water heat savings surpassed savings forecasts by over 20 percent.

xi. Small Business Direct Install

The Small Business Direct Install (SBDI) program is designed to encourage hard-to-reach small business customers to complete energy efficiency upgrades in their facilities and buildings through lighting, refrigeration, and HVAC retrofits. The program focuses on providing business energy assessments to identify basic and complex retrofit opportunities and facilitate participation in PSE's other commercial rebate programs, with special attention to specific segment needs, such as hospitality, grocery and agriculture. Because this customer group tends to include residential customers as well, residential rebate programs are often discussed during the business's energy assessment maximizing this in person point of contact.

2021 Program Accomplishments

During 2021, the SBDI program successfully completed one small business virtual blitz. The small business virtual blitzes are a collaborative effort with the Energy Efficient Communities (EEC) team to bring the SBDI program to a community. This is done through partnerships with City, Chambers of Commerce staff and downtown associations and offer

free and low cost energy efficiency projects to all of the small businesses in the downtown corridor over the course of one to two days. The program continued offering the option for customers to have a virtual assessment using available technologies like FaceTime and Skype. This enabled staff to stay connected with customers and manage their energy consumption during the pandemic. It also gave customers a personal connection with PSE and available resources.

Hard to Reach and/or Proportionately Underserved Segments

Staff developed a list of multilingual businesses, leveraging PSE's community based organization relationship database. The focus was on small businesses, expanding to include medium-large independent grocers. The program team collaborated with the EEC team on a multicultural pilot to find the best way to reach multilingual customers.

Previously during blitzes, it has been a challenge to explain the program to this customer segment, due to the language barriers. The team partnered with a local environmental coalition to pre-schedule and provide translation services for the free assessments and installations. The program goal was to reach 50-65 energy assessments for Spanish, Vietnamese and Chinese speaking small business customers in east and south King County. PSE has transcreational fliers in the four most prominent languages as in-language expertise is instrumental to bridge the gap and develop trust with these small businesses.

Adaptive Management

Program staff continued to generate awareness of SBDI and its benefits to a targeted audience. The targeted audience includes business parks, shopping centers and/or commercial business centers that would be good candidates for exterior lighting retrofits and/or retrofits or upgrades in vacant/unoccupied spaces.

Key Variance Drivers

The COVID-19 pandemic continued to lower demand and dampened marketing opportunities. Small and medium businesses, a primary target for these rebates, struggled financially and were in a reduced position to invest in energy upgrades. The program team adjusted to ensure PSE's most vulnerable customers were reached by offering before and after hours and virtual assessments.

g. *Commercial Rebates 2021 Measure Highlights*

PSE presents a high-level view of the Commercial Rebates projects managed in 2021 in Table I-16.

It is interesting to note that in this organization, more than one measure type may be installed in a single project.

Table I-16: Number of Commercial Rebate Projects Managed in 2021

Business Rebates	Number of Projects		
Program Project Classification	**Electric**	**Natural Gas**	**Both Electric & Natural Gas**
Commercial Kitchen/Laundry	70	80	5
Commercial HVAC	50	2	4
Commercial Lodging	20	0	0
Commercial Midstream (NEW)	150	420	1
Small Business Direct Install	2,170	0	0
Business Lighting Markdown	3,070	0	0
Total Project Count	**5,530**	**500**	**10**

Table I-17 , PSE indicates the number of measures, by category, installed in 2021 for three of the Commercial Rebates programs: Commercial Kitchen & Laundry, Commercial HVAC, and Lodging. Some measures within this organization are calculated on a per-ton, by building type, (in the case of HVAC Retrofit, many variables factor into each measure) or by individual unit (such as the familiar “per lamp” for most lighting measures).

Table I-17: Number of Commercial Rebate Measures Installed by Type

Highlights of Measure Categories by Program	Count of Measure Categories		
Commercial Kitchen/Laundry	**Electric**	**Natural Gas**	**Total Measure Count**
Dishwasher Measures	20	20	40
Food Cabinet	4	0	4
Griddle	0	2	2
Ice Maker Measures	20	0	20
Oven Measures	20	50	70
Sales Incentive Measures	70	212	272
Fryer - Kitchen	1	180	180
Steam - Kitchen	7	5	10

Total Measures	**137**	**470**	**600**
Commercial HVAC - Rebates			
Heat Pump - Ductless - Comm	25	0	25
Supply Fan VFD and Controller	121	9	130
Thermostat - Web Enabled- GP Heating - Comm	48	48	96
Thermostat - Web Enabled - HP Heating - Comm	13	0	13
Total Measures	**207**	**57**	**264**
Lodging Rebates			
Heat Pump - Packaged Terminal - Lodging	415	0	415
Thermostat Control - Occupancy Based - Setback - 5 degrees	1204	0	1204
Total Measures	**1619**	**0**	**1619**

Highlights of Measure Categories by Program, Continued	Count of Measure Categories		
Commercial Midstream Foodservice			**0**
Dishwasher Measures	10	10	20
Total Measures	**10**	**10**	**4,950**
Commercial Midstream			
Air Conditioning	70	0	70
Boiler	0	100	100
Heat Pump	60	0	60
Water Heater - Condensing - Storage	0	410	410
Water Heater - Tankless	0	100	100
Heat Pump - Ductless	70	0	70
Heat Pump - Split - Tier 1 & 2			0
Total Measures	**200**	**610**	**640**
Lighting to Go - Lighting Markdown			
Downlight LED	450	0	450
Strip Fixture - LED	70	0	70
Troffer - LED	160	0	
Lamp - LED	8,660	0	8,660
LTGO: Fixture	6,450	0	6,450
LTGO: Lamp	162,720	0	162,720
Total Measures	**178,060**	**-**	**177,900**
Total Measure Count	**235,270**	**2,140**	**242,010**

Table I-18 provides a summary of measure counts installed in 2021 for the Direct Install programs.

Table I-18: Number of Commercial Rebate Measures Installed by Type, Direct Install Programs

Business Rebates Measure Counts - Direct Install Programs	Count of Measure Categories		
Small Business Direct Install	**Electric**	**Natural Gas**	**Total Measure Count**
Case Lighting	2,190	0	2,190
Energy Audit	1,560	1450	3,000
Fixture - LED	110	0	110
Lamp - TLED Measures	3,090	0	3,090
SBDI: Fixture	10,620	0	10,620
SBDI: Lamp	36,570	0	36,570
SBDI: LED Exit Sign	90	0	90
SBDI: LED Open Sign	3	0	3
Occupancy Sensor	350	0	350
Spray head Measures	1	0	1
Thermostat - Web Enabled	30	0	30
Total Measures	**54,610**	**1450**	**56,060**

C. Pilots

Schedules E/G 249

Pilot programs and demonstration projects may be undertaken to determine whether certain strategies and Measures are cost-effective in the long run. Pilots are employed to test cost-effective ways to demonstrate market opportunities for energy efficiency. Pilots may include tests of Measure cost and performance, customer acceptance and delivery methods. In compliance with condition (7) (d), pilots will only claim energy savings that achieve energy savings sufficient to demonstrate cost-effectiveness by passing the TRC test.

PSE discusses pilots that have uncertain savings potentials in this section. PSE discusses programs or measure offerings that could be considered analogous to pilots—but have a reasonable expectation of savings achievement— in the applicable REM and BEM program sections above.

1. Commercial Pay for Performance

Newly added to the Schedule 253 tariff as a standard program, the Pay for Performance (P4P) program was transitioned from a Schedule 249 pilot during the 2021 program year. The P4P program helps customers achieve energy savings through deep retrofits in commercial buildings with over 50,000 square feet. The program also supports compliance with Washington State House Bill 1257 for customers enrolled in the Clean Buildings Law early adoption program. PSE transitioned the P4P pilot into to a full program to align with the start of the Early Adoption Incentive program which began in July 2021. This was in order to remove any uncertainty about whether this program would continue into the future.

2. Retail Choice Engine

The Efficient Product Guide (EPG) was launched in October 2020 and is designed to help PSE residential customers choose an energy efficient product. The online platform provides an “energy score” along with pricing and customer ratings that are designed to help customers:

- Find information quickly and easily about what appliances best meet their unique needs,
- Compare energy efficient products side-by-side, and make confident and informed decisions.

The EPG is currently being piloted in a test group of approximately 120,000 residential customers in order to evaluate the efficacy of market based savings approach, (i.e. customers choose a more efficient product than they would have without the platform.)

Between January and December 2021 customers visited the (EPG) over 10,000 times, resulting in almost 6,000 engaged actions.

3. Single Family AMI/Home Energy Display

The Single Family AMI pilot, also known as the Home Energy Display (HED) pilot, launched in December 2021. The goal of the pilot is to confirm that an in-home energy display along with a supporting portal, which encourages and supports customer engagement, can modify customer behavior enough to produce energy savings between 5 and 7 percent.

Customers must meet the following characteristic in order to participate in the HED Pilot:

- Residential electric or dual fuel customers
- Single-family homes (excluding renters)
- Home has had a PSE AMI electric meter for at least 12 months

Pilot participants purchase a rebated Rainforest EMU-2 in-home display unit that syncs with their AMI meter for real-time energy usage display.

As part of the pilot, an online portal is available to a subset of participants. The portal has tips and challenges for customers to complete to encourage them to utilize their device and take actions to reduce their energy usage.

The intention is that all participants have displays as a baseline; the comparison will be between those with just the displays and those who have the display and access to the portal. In order get a clear sense of the potential of the pilot, getting participants to engage in the pilot is critical. In 2021, PSE increased marketing budget to produce and manage content on the portal.

This pilot is PSE's first endpoint device project where customers are using real-time AMI data to save energy. By the end of 2021, the dedicated online store had sold 625 EMU-2 units.

4. Small and Medium Business AMI/Virtual Commissioning

In 2020, PSE contracted with Power TakeOff to launch the SMB AMI pilot using virtual commissioning. The goal of this pilot is to recruit 100 customers over a two-year period of time and then, using 15-minute interval data, identify opportunities to modify schedules, set points, and more in order to save energy.

After several months of working through various IT issues, the daily data stream for all SMB commercial accounts was fully established with Power TakeOff in September 2021. The contract end date was extended accordingly, to September 2023, or two years after the start date.

Power TakeOff began outreach and implementation of no-cost energy saving recommendations at multiple sites in the final quarter of 2021. PSE expects the first invoice and verified energy savings report in the first quarter of 2022.

D. Regional Programs

This section provides an overview summary of programs that do not fit into the Residential or Business Energy Management Sectors, are of a more regional nature (consisting of sites, installations or facilities outside of PSE's service area), or are not directly managed by Energy Efficiency program staff.

1. Northwest Energy Efficiency Alliance

Schedule E254

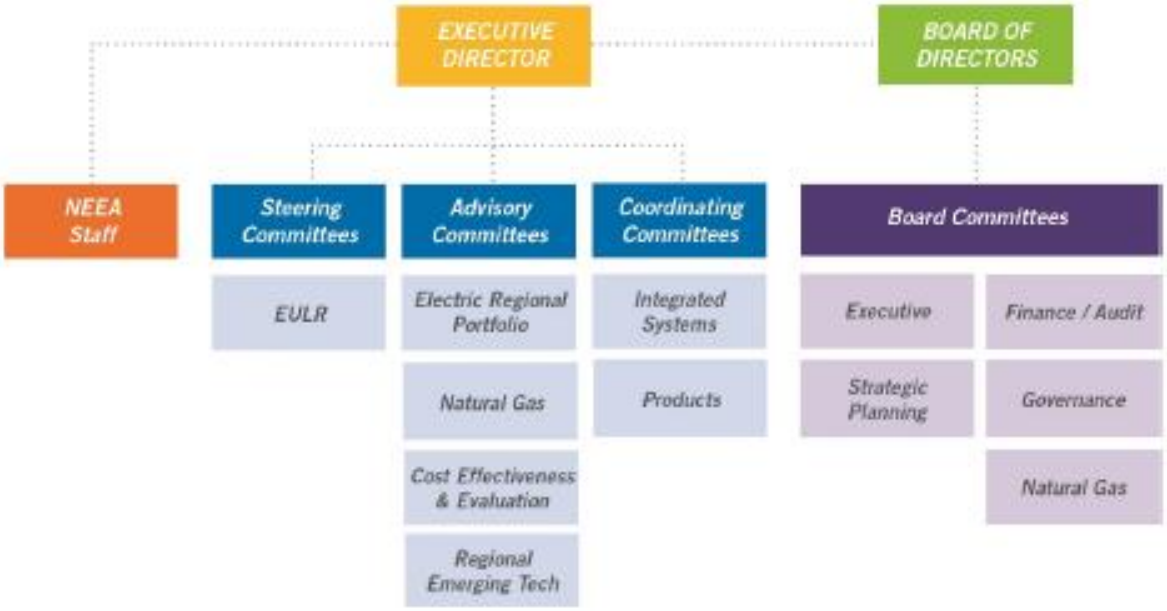
NEEA is a non-profit organization working to maximize energy efficiency to meet the future energy needs of the Northwest. NEEA is supported by, and works in collaboration with, the Bonneville Power Administration, PSE and more than 100 Northwest utilities on behalf of 12 million electric customers.

PSE and its customers benefit from NEEA's market transformation work to accelerate the market adoption of energy-efficient products, services and practices, and to fill the energy efficiency pipeline with emerging technologies. NEEA works upstream to expand the market for energy efficiency and complements utility programs. NEEA's regional advantage allows PSE and other Northwest utilities to leverage the market power of the entire region to realize economies of scale.

PSE staff represent customers and energy efficiency programs on several NEEA committees, including the following. NEEA's governance and committee structure is illustrated below in Figure 0-1.

- Products Coordinating Committee;
- Integrated Systems Coordinating Committee;
- Products Coordination Council;
- Regional Emerging Technology Advisory Committee;
- Cost Effectiveness Advisory Committee;
- Natural Gas Advisory Committee; and the
- End Use Load Research Project.

Figure I-1: NEEA Governance and Committee Structure



These committees and their respective sub-committees require a significant commitment; meetings are often all-day, and are held quarterly at a minimum. PSE staff closely engage in upstream/midstream channel partnership strategies, cost-effectiveness calculation development, and product training and technology portfolio determination. Additionally, in cooperation with other Washington State Investor Owned Utilities (IOUs), staff engage in developing improved, consistent savings reporting tenets.

In 2021, PSE staff collaborated with NEEA in ongoing efforts such as distributor training initiatives, limited-time-offers (LTOs), new construction, and a regional instant rebate offering for heat pump water heaters.

PSE Energy Management Engineers also continued support on the XMP pump initiative, which generated a case study at a PSE customer commercial office building. Program staff also helped develop a draft lighting controls program development guide and generate a lighting case study at a PSE customer school facility.

Exhibit 5 of this Report summarizes NEEA's 2021 value delivery to PSE for both its electric transformation efforts, as well as the new Natural Gas Advisory Committee. PSE extends its sincere appreciation to the NEEA staff for their extensive work to provide this level of detailed information outside of its normal reporting cycle. For additional information about NEEA's unique value to the region, history, structure and recent initiatives, please visit www.neea.org.

a. *NEEA Savings*

NEEA provided its savings forecasts during PSE's 2020-2021 Biennial Conservation Plan (BCP) development in the latter part of 2019, and updated its 2021 forecast in the 2021 Annual Conservation Plan. In consultation with the CRAG, PSE adapted the source figures provided by NEEA. The revised 2021 electric savings figure is noted in Exhibit 1. NEEA's final 2021 electric savings results include NEEA initiatives started in 2020. The results from those initiatives aren't available at the time of PSE's standard Annual Report publication, as such PSE reports the deemed savings value in the Annual Reports. NEEA incorporates policy and code changes into savings estimates, but NEEA's reporting cycles do not always line up with these changes and current year estimates may not reflect the latest bills or code changes.

b. *NEEA Expenses*

PSE payments to NEEA totaled over $4 million in 2021. Exhibit 1 shows that the NEEA electric spend went over the original forecast by approximately $300,000. Differences in spend were due to the timing misalignment of when PSE expected to start receiving the net payment reductions due to 2020 NEEA underspend. Natural gas spend is discussed in the following section.

c. *NEEA's Natural Gas Market Transformation Collaborative*

NEEA provides a more comprehensive discussion of its 2021 natural gas market transformation activities in Exhibit 5. PSE ratepayers are major funders of NEEA's collaborative, funding over 40 percent of the overall 5-year budget of $18.3 million. The NEEA Natural Gas Market Transformation 2021 expenses of $608,889 were at the budget of $608,889.

NEEA reported natural gas code savings from activities in 2021. Code savings are forecasted separately from energy efficiency potential and are also recorded outside of the PSE Energy Efficiency savings. No other natural gas savings from the Collaborative were able to be tied to PSE service territory in 2021.

NEEA works in concert with PSE, Energy Trust of Oregon, Avista Utilities, NW Natural, and Cascade Natural Gas Corporation. It coordinates the evaluation, testing, codes and standards initiatives, contacts with manufacturers, scanning for alternative measures, and developmental status of five pilot natural gas measures.

The measures that received the primary focus in 2021 included:

- Efficient Gas Water Heating
- Efficient Rooftop Units
- High Performance Windows
- Residential New Construction

The Efficient Gas Water Heating program continued to lead within the North American Gas Heat Pump Collaborative. In 2021, the decision was made to transition that initiative to a nonprofit in order to increase its effectiveness and ability to have a larger impact on bringing gas heat pump water heaters to market.

In 2021, lab testing, field demos, and positioning for the Efficient Rooftop Unit program continued preparing the program to potentially enter the market development stage in 2022.

In 2021, High Performance Windows were added to the natural gas portfolio. This initiative was previously known as Thin Triple Windows and was focused on electrically heated homes. The initiative refocused to look at both electric and natural gas heated homes.

The Residential New Construction program was integrated into the Codes & Standards group at NEEA in late 2021. With divergent codes within the region, this change allowed the program to align residential new construction work with Codes and Standards work that was happening in parallel.

d. *Exhibit 5: NEEA 2021 Report of Activities and Initiatives*

Exhibit 5 summarizes 2021 activities, regional initiatives, and outcomes in the areas of emerging technologies, residential, industrial, commercial, codes and standards, partner services and evaluation by the Northwest Energy Efficiency Alliance in PSE's service area.

2. Targeted Demand Side Management (TDSM)

Schedule 219

Targeted DSM (TDSM) is an initiative designed to identify localized conservation and demand response potential, develop plans to achieve a defined percentage of that potential, then implement those plans to deliver identified energy efficiency and capacity savings. PSE plans to reduce winter peak electrical usage on Bainbridge Island 3.3 MW and Duvall's winter peak natural gas usage 3000 MBH by 2029.

The Targeted DSM program uses avoided costs for a specific municipality to calculate the cost-effectiveness of conservation measures. This allows PSE to offer rebates and incentives to PSE customers in these locations that are higher than those in its broader service territory. These rebates and incentives are available only during the duration of the specific non-wired alternative (NWA) Project, as determined by PSE.

a. *2021 Accomplishments*

In 2021, contracts were awarded to partnered vendors to execute TDSM activities for customer acquisition, Trade Ally engagement, and demand response software management. PSE also hired a program manager to oversee the development and execution of TDSM activity in selected regional areas.

b. *Adaptive Management*

Due to extended contract negotiations, PSE committed to bifurcating program launch efforts in 2021 to prevent a delay in providing targeted energy efficiency savings to selected regions. Pivoting to this strategy allowed the Demand Response component of this program to continue contract negotiations in order to achieve a wider-reaching impact, while providing PSE the opportunity to capture savings by introducing additional energy efficiency incentives for customers in Bainbridge Island and Duvall.

c. *Hard to Reach and/or Proportionately Underserved Segments*

A psychographic analysis from PSE's Customer Insights team in 2021 revealed that both Bainbridge Island and Duvall have limited opportunities to address hard-to-reach and/or underserved segments. For example, 29 percent of Duvall's population falls into the low-income bracket, 4 percent is considered to qualify as a Highly Impacted Community, and 99 percent is classified as Low Vulnerability. Bainbridge represents similar data, with 21 percent of the population classified as low-income, 20 percent as living in a Highly Impacted Community, and 89 percent of the population classified as Low Vulnerability.

Despite this, these figures indicate that there is a potential to serve roughly a quarter of customers in Bainbridge Island and Duvall who would fall under the classification of hard-to-reach and/or underserved segments, and as such, will be a point of consideration as PSE formulates a strategy to reach these historically underserved customers.

3. Production and Distribution Efficiency

Schedule E292

The Production and Distribution Efficiency program involves implementing energy conservation measures within PSE's own production and distribution facilities that provide cost-effective, reliable, and feasible energy savings.

Within production facilities, 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, efficiency measures are implemented at PSE's electric substations. These improvements may involve reducing the energy use within the substation or the distribution of energy beyond it. Efficiency measures may include lighting and heat pumps at the substation or system improvement measures including phase balancing and conservation voltage reduction (CVR), also referred to as voltage optimization (VO).

a. *2021 Accomplishments*

In 2021, PSE achieved 2,251,863 kWh of electric savings from CVR projects and 43,014 kWh savings from lighting efficiency improvements at power generation facilities.

PSE completed construction for five CVR projects in 2021. Of those, three had full commissioning and measurement & verification reports completed and two projects were completed in late 2021 with measurement & verification activities planned for early 2022.

Savings for the two projects with measurement & verification occurring in 2022 will claim savings in 2022

PSE completed two lighting retrofit projects at generation facilities in 2021. One additional project was completed in 2021 but full commissioning is planned in early 2022. Savings for this project will be claimed in 2022.

b. ***Adaptive Management***

Completion of each generation, transmission, and generation efficiency project requires extensive collaboration between energy efficiency program staff and staff within other departments at PSE. Program staff maintained regular flow of communication across departments (from planning, permitting, substation & relay operations, system operations, generation, and construction management) to ensure implementation challenges and setbacks at various project steps were overcome.

E. Other Customer Programs

PSE separates the Other Electric Programs category from other Electric and Gas Rider programs because they are not used in calculating cost-effectiveness of the overall Portfolio.

In 2021, the only program (partially) funded by the Conservation Rider, for which conservation savings are not claimed, was Net Metering. Net Metering is for on customer-side generation, including solar, wind, anaerobic digesters (renewable natural gas, etc.) and small-scale hydro. Net Metered systems are smaller than 100 kilowatts (kW).[4] Only Other Electric Programs are excluded from Energy Efficiency's cost-effectiveness calculations.

1. Net Metering

Schedule E150

PSE's Net Energy Metering (NEM) program provides interconnection services for qualifying customer-generators in accordance with State legislation enacted into law in February 11, 1999 and most recently amended July 28, 2019 (see RCW 80.60).

PSE provides interconnection services to qualifying customer-generators who operate fuel cells, hydroelectric, solar, wind, or animal waste gas generators of no more than 100 kilowatts (kW). In accordance with 80.60 RCW, PSE offers Schedule 150 (revised July 28, 2019) on a first-come, first-served basis until cumulative generating capacity taking part in this schedule reaches 179.2 megawatts (MW). Net Metered customer-generation can be used to offset part or all of the customer-generator's electricity use under Schedules 7 through 49 of Electric Tariff G.

Energy produced by customer-generator systems directly reduces energy used in the home or business from the grid. When the energy generated exceeds home or business electrical loads, the excess energy flowing to PSE is credited against the customer's consumption. In accordance with RCW 80.60, PSE also allows net metered customers to aggregate net

[4] Larger systems fall under the considerations of PSE's Schedule 91: Cogeneration and Small Power Production.

excess generation from their net metered service to offset consumption at one other electric service meter on the same or contiguous property and in the same account holder's name.

The Net Metering program's year runs April 1 to March 31. Any excess credit each month is rolled forward to the following month. When the new program year ends on March 31 the credit is reset to zero, with no compensation to the customer.

While schedule 150 Net Metering applies to customers who generate electricity using water, wind, solar energy or biogas from animal waste as fuel; in 2021, 99.9 percent of new net metered systems were solar PV (photovoltaic) with a median size of 11.2 kW DC and 10 kW DC for residential systems alone.

No direct customer incentives are provided by PSE as a part of this program. As described in the following section, the Conservation Rider only funds administrative and applicable distribution expenses, as provided by the indicated requirements.

a. *Net Energy Metering Expenses*

The 2002 Stipulation Agreement, Exhibit F, UE-011570 and UG-011571, Section H.25 provides the authority for PSE to charge reasonable Net Metering administrative costs to its Conservation Rider:

> *"Tariff-rider funds shall only be used on programs and their associated administrative costs that result in energy savings through Energy Efficiency investments or fuel switching. This may include reasonable administration costs for PSE's net metering program."*

Additionally, in January 1999, the UTC issued an accounting order under Docket UE-990016, which requires the collection of unbilled distribution costs from all customers through Schedule 120. In 2021, the actual costs collected under that order continued to significantly outpace budget projections due to higher than anticipated growth in adoption, as well as increased system complexity.

The number of customers interconnecting on-site generation to PSE's grid has continued to grow, as has the size and complexity of their systems. Over 8 percent of new customer solar systems now include batteries. This impacts how PSE plans for and meets customer tracking, accounting, and reimbursement expectations. The Customer Connected Solar Team coordinates with other Washington State utilities and industry groups to stay informed on best practices, and to gain access to national experts to help address interconnection and net-meter billing challenges faced by a rapidly maturing market.

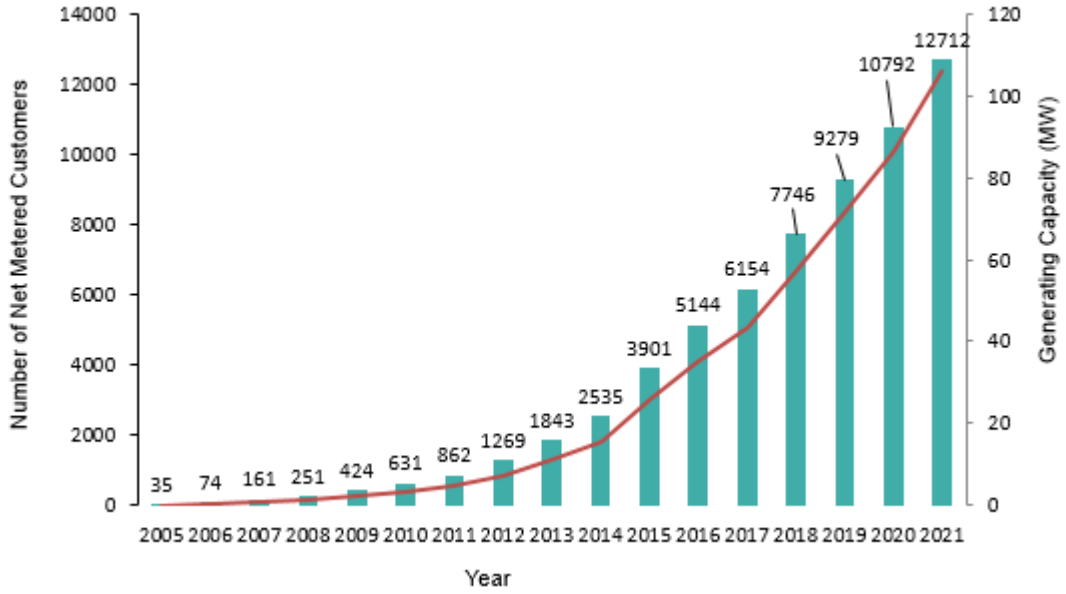
b. *2021 Accomplishments*

In 2021, 1,950 customers joined PSE's Net Metering program, with a combined 19 MW AC of added generating capacity. This is a nearly 20 percent increase in adoption over the previous record setting year.

At the close of 2021, PSE was net metering 12,712 customers for a combined generating capacity of over 105.7 MW AC. PSE also made major strides in Customer Generation data accuracy, accessibility and transparency in 2021.

Figure I-2 provides a program view of cumulative year-end number and capacity of net metered systems.

Figure I-2: Net Metering Customer-Generator System Count, 2005-2021



C. *Adaptive Management*

Interconnection and net metering processes, standards, data management, and communication are constantly evolving as PSE strives to make the solar customer experience better and more scalable.

In 2021, PSE focused on integrating the PowerClerk interconnection application portal with SAP, PSE's primary account management system. By completing integration of these systems in November 2021, PSE now has more accurate and accessible data leading to transparency and efficiency. PSE's interconnection application process now includes:

- A preliminary application form in PowerClerk that requires a valid account number, meter number and customer name which are validated by PSE prior to completion of the application and submittal. This improves efficiency for the Customer Connected Solar intake team in reviewing applications.
- Customer-Generation system data that is received and managed in PowerClerk without customer and relevant service and utility system data needing to be copied over from SAP.
- Upon completion of interconnection, the finalized Customer Generation System data is automatically transferred to the service address's record in SAP. This makes customer generation data accessible and transparent across the company, along with relevant customer, service, and grid data.

- Automated and flexible reporting is now available to bring Customer Generation data from SAP to PSE's GIS and load forecasting and planning systems.
- PSE's Customer Service and Customer Connected Renewables Intake teams no longer have to manually process net metered customers account changes. Net Metered customers can start, stop or transfer their service online or through standard call center process. Manual update of customer records in PowerClerk are no longer required.

2. Production Metering

Schedule 151

PSE administers the Washington State Renewable Energy Production Incentive Program, which provides qualifying Customer-Generators with production payments in accordance with State legislation and WAC 458-20-273. PSE receives tax credits for renewable production payments, as outlined in RCW 82.16. No direct customer incentives are provided by PSE as a part of this program. As described in the following section, the Conservation Rider only funds administrative and applicable distribution expenses, as provided by the indicated requirements. The terms of PSE's administration of payments to customers are described in Schedule 151.

Most customers enrolled in PSE's Net Metering program who have solar systems installed before June 2019 were also enrolled in the Washington State Renewable Energy Production Incentive Program. Eligibility, incentive rates, terms, and annual payments are determined by the Washington State University Energy Program. Participants with systems enrolled prior to October 2017 were in the state's RECRIP (the legacy program) for which PSE made final payments in 2020.

In 2021, PSE administered over $4.3 million to over 2,600 customer participants in the RESIP program, for the generation of more than 34.5 million kilowatt-hours. To date, PSE has issued over $95 million in Schedule 151 production incentive payments.

Since the close of the state incentive program to new PSE solar customers in 2019, PSE has continued to offer, but does not require production metering as part of an interconnected system. In 2021, fewer than 10% of new PSE solar customers included a utility-owned production meter in their system design.

3. Targeted Demand Response

Schedules E/G 249A, E/G 271

The purpose of the Targeted Demand Response (Targeted DR) pilot is to evaluate DR options applicable to identified non-wired alternative (NWA) projects in specific, targeted localities. This pilot program evaluates several attributes, including technology requirements and performance; customer behavior and preferences; impacts and integration of DR to company operations; program costs; demand reductions achieved; energy savings achieved; and localized distribution system benefits. PSE expects to gain experience with DR technologies, a greater

understanding of customer acceptance and tolerance of Demand control, the need for customer incentives (financial or other), and demand reduction effectiveness and reliability.

Targeted Demand Response efforts are also included as a component of PSE's Targeted Demand Side Management pilot for Bainbridge Island and Duvall.

a. ***2021 Accomplishments***

After a vendor was selected to provide and manage software for DR events in Bainbridge Island and Duvall, the bulk of PSE's Targeted DR efforts in 2021 were focused towards contract negotiations. However, at the end of 2021, negotiations were put on hold to explore an opportunity for incorporating PSE's Targeted DR efforts into a larger portfolio.

b. ***Adaptive Management***

In the last quarter of 2021, PSE began examining options to incorporate the Targeted DR component of TDSM with other programs. As such, Targeted DR development and implementation was limited with the intent of expanding its scope in 2022.

c. ***Hard to Reach and/or Proportionately Underserved Segments***

Psychographic analyses from PSE's Customer Insights team in 2021 showed that both populations in Bainbridge Island and Duvall are relatively high-income, with only 21 percent and 29 percent of the total population falling under the low-income bracket respectively. While this does indicate that there is opportunity to support hard-to-reach and/or underserved customers, it also shows that prospective DR customers are less likely to cite product cost as a barrier to program participation in these areas. PSE is currently in the process of formulating a strategy to reach these historically underserved customers.

II. Support & Planning

A. Portfolio Support

The organizations that comprise the Portfolio Support group play a critical role in Energy Efficiency's success of consistently achieving conservation targets within expected cost parameters. Much of what Residential Energy Management and Business Energy Management (who make up key elements of the Energy Efficiency department) implements and offers to customers depends on the work performed by these teams.

The teams' activities do not directly result in electric or natural gas savings, although the Portfolio Support activities expenses are spread over the portfolio for purposes of calculating cost effectiveness. The groups collaborate with program staff to ensure that (1) they engage and represent all customer classes, (2) incentives are properly set, and (3) program staff are targeting their efficiency communication effectively. Through market research and planning, the establishment of compelling messaging, easy-to-navigate and intuitive web content, and visible conservation presence within the communities that PSE serves and with its trade allies, the teams' contributions cannot be overstated.

1. Data and Systems Services

The Data and Systems Services organization performs the critical role of planning, development, support, and enhancement of Energy Efficiency systems and tools. The team manages the ongoing support of the department's Demand Side Management central (DSMc) system, which:

- Compiles and tracks Energy Efficiency programs, projects and measures, and
- Processes Residential, Commercial Rebates and Commercial Grants through structured workflows to provide a consistent review, approval and payment process.
- Provides a rebate submission portal for customers and contractors to submit and track residential rebates online (HVAC, Weatherization, Appliances and Smart Thermostats).
- Creates reporting, forecasting, and business performance metrics.

This group also oversees the department's EES Tracking and Forecasting system which is used to track and forecast program savings and expenses. This system allows the department to better monitor its progress towards meeting annual savings and spending targets for the entire EES portfolio of programs.

The Data and Systems Services organization also conducts analytics by understanding and presenting program data as meaningful knowledge and insights. The team is responsible for reviewing and ensuring data integrity from a wide variety of sources, including vendors, program staff, and contractors.

a. *2021 Accomplishments*

In 2021, the D&SS team added residential appliance rebates to its online submission portal. This replaced a previous online submission portal that was managed by an external vendor. Although development and testing took several months, the transition to an internally managed submission portal provides significant cost savings to the Retail Appliance program and allows PSE to directly manage these customer rebates and interact directly with customers should questions or issues arise.

The D&SS team worked throughout the year on the development and testing of a new Residential Smart Thermostat rebate program in its DSMc system so those rebates will be processed internally much like it did with the Residential Appliance Program. This new process will launch at the beginning of 2022. New commercial workflows were also developed and deployed in this system for managing projects in the Clean Buildings Accelerator program and the SMB Virtual Commissioning pilot.

Finally, the D&SS teamed developed and launched a Forecasting Dashboard for PSE program staff to easily review savings and spending forecasts throughout the year. This dashboard is now the center point of monthly staff forecasting meetings.

b. *Adaptive Management*

The D&SS team played a critical role in implementing several improvements to Energy Efficiency's annual planning processes, most notably, creating a consistent, standardized measure case process to document, review, and approve new measures, measure updates, and measure retirements throughout the year.

The team also updated several residential rebate programs to enable upcoming changes to savings tracking and incentive calculations in the residential weatherization, window, and water heating programs.

2. Rebates Processing

Functions within the Rebates Processing team include intake, qualification, payment and customer service, as well as process improvement in the customer experience. Improvements include, but are not limited to, redesigning rebate forms for clear instructions and qualifying criteria, analyzing rejection reasons for the root cause of non-qualified rebates, and simplifying the application process for customers.

The Rebates Processing budget is predominantly labor and includes training, planning and development costs projected by Rebate Processing staff.

Roles on the Rebates Processing team include:

- Intake, qualifying, data entry, and incentive payment processing;
- Communicating with customers regarding the rebate submittal, including status and payment;

- Collaborating with the Energy Advisors to provide a seamless and efficient customer experience;
- Demonstrating best practices and continuous improvement; and
- Coordinating timely customer payments with PSE Accounts Payable.

The Rebates Processing team perform a critical verification step in Energy Efficiency. While a selected sample of applications are directed for onsite inspection by the Verification team, all must go through several verification steps prior to payment authorization.

Key attributes include:

- Is the applicant a PSE customer?
- Is this the correct fuel type?
- Is the customer receiving service under the applicable Rate and Conservation Schedule?
- Did the customer submit a valid receipt (rather than one that's been used before)?
- Is the equipment eligible?
- Etc.

Table II-1 provides a summary of rebates processed by Energy Efficiency Rebate Processing staff. The totals are not inclusive of all rebates, instant point of purchase markdowns, etc. paid within the REM sector. As with program measure counts, the totals are rounded and are intended only to provide a sense of the scale of activity within the Rebates Processing group.

Table II-1: 2021 In-House Residential Rebates Paid

Program	Count	Electric Incentives Paid	Gas Incentives Paid
Commercial HVAC	50	$191,950	$1,500
Commercial Kitchens	30	$8,200	$57,450
Commercial Laundry	4	$4,400	$0
Electric Home Heating	2,550	$3,338,430	$0
Electric Water Heating	80	$36,000	$0
Lodging	20	$600,900	$0
Manufactured Home New Construction	80	$65,900	$0
Natural Gas Home Heating	4,370	$0	$1,572,300
Natural Gas Water Heating	1,360	$0	$322,400
Residential Windows	1,520	$410,170	$470,650
Retail Appliances	8,450	$895,880	$0
Single Family New Construction	20	$31,750	$6,250
Single Family Weatherization	2,710	$432,160	$1,645,450
Totals	**21,244**	**$6,015,740**	**$4,076,000**

3. Verification Team

The Verification team serves as another key element of its EM&V efforts. The Verification team provides PSE program staff with an overarching process to improve the quality of program implementation and validate energy savings with a high degree of rigor by incorporating higher levels of measurement and verification activities.

As the “V” in EM&V, PSE’s Verification team performs on-site inspections and confirmations of randomly-selected participating homes and businesses to assure energy efficiency measures are properly installed. Combined with other Evaluation and Measurement functions, the Verification team seeks to secure both confidence in claimed energy savings and improvements in program quality.

a. *Composition*

The Verification team consists of quality assurance specialists and business analysts. The QA verification inspectors are responsible for conducting on-site inspections and related activities to verify installation of energy efficiency measures for rebated equipment. This team confirms installed measure quantities, model numbers, site qualifications, equipment settings, and other related installation parameters through review of primary documentation, phone surveys, and onsite inspections.

Energy efficiency measures include those installed and reported by trade allies, PSE contractors, and other third parties. The team's Business Analyst is responsible for data and systems, forecasting and working closely with program staff on a regular basis. The Business Analyst is also responsible for preparing the reporting, tracking, and communicating program findings and other related information from the field verifications to the program staff.

b. *Objective*

The team strives to positively contribute to program quality implementation and validate energy savings by combining detailed and documented statistical methods of analysis and sampling[5] with individualized field inspection protocols and documentation requirements tailored to each specific program.

Additionally, the Verification team assists with other quality assurance interests in residential and business efficiency programs; including non-random visits and reviewing retail stores' advertisements and inventory in the stores. Non-random visits, typically performed at the request of program managers for case-specific interests, are considered quality assurance reviews, and may also result in documented findings for program management follow-up.

When performing onsite inspections, QA verification inspectors routinely engage customers in several Energy Efficiency elements about which the customer may not have been aware. For instance, the QA verification inspector may provide a referral to a CAN contractor, alert the customer that they may be eligible for a weatherization rebate, etc. These efforts lead to increased customer satisfaction and raise customer awareness.

Table II-2 highlights the overall verification totals per program.

[5] Sampling methods for randomly identifying measures or projects for verification, and a sampling tool to determine sample size for verification of each program was developed in collaboration with DNV KEMA and deployed throughout 2020.

Table II-2: Summary of Verifications by Measure Type

Measure Category	Count
Commercial HVAC	2
Commercial Midstream	7
Electric Home Heating	310
Electric Water Heating	20
Low Income Weatherization	2
Natural Gas Home Heating	1,010
Natural Gas Water Heating	210
Residential Midstream Home Heating	20
Residential Midstream Water Heating	4
Residential Windows	10
Retail Appliances	100
Single-Family Weatherization	670
Web-Enabled Thermostats	40
Total Verifications	**2,405**

4. Programs Support

Programs Support functions include data management, employee engagement, communications, and integration work by Programs Support staff, and all supporting implementation of Residential and Business Energy Management customer programs. The Programs Support budget is predominantly labor and includes training, planning and development costs projected by Programs Support staff.

Program Support roles include, but aren't limited to:

- Collaboration with Energy Efficiency stakeholders on internal employee and customer communications;
- Biennial and strategic program planning support;
- Customer experience – Energy Efficiency program participation surveys;
- Operational strategy and implementation;
- Organizational change management;

- Information technology;
- Developing program manuals, policies, document control and department presentations;
- Integration liaisons with Marketing, Outreach, Digital Experience, and other PSE internal departments;
- Trade Ally support; and
- Best practices and continuous improvement.

5. Trade Ally Support

Trade Ally Support manages PSE membership costs in Energy Efficiency (EE) trade associations. These organizations stand apart from other trade memberships managed in individual Energy Efficiency programs in that they provide comparatively broad-based EE research, training and/or implementation support services.

This function is the key difference that distinguishes this organization from the next group to be discussed, the Trade Ally Network (TAN), which manages direct relationships and referral processes for the TAN.

Trade Ally Support organizations provide education, information and related services for:

- The adoption or expansion of energy-efficiency products, services, and practices; and
- Conducting research toward the development of new, or improved validation or delivery of existing conservation measures, programs and services.

The Trade Ally Support line item budgets and tracks only annual membership dues or Energy Efficiency services subscriptions PSE pays to broad-based industry trade and research organizations who perform and support ongoing development and implementation of Residential and Business Energy Management programs. PSE participates in and utilizes the services of many such organizations to support delivery, management, and promotion of energy efficiency services.

Utility, customer, and service provider benefits primarily include education and information exchange on end-use technologies, energy legislation, efficiency services, and related industry trends.

PSE budgets and tracks other Trade Ally expenses not related to dues, for example conference attendance by PSE Energy Efficiency staff, with the pertinent efficiency program(s) receiving the benefit.

a. *Memberships and Subscriptions*

As discussed in Chapter 10: *Measurement & Verification*, PSE applies a great deal of rigor to ensure that Conservation Rider customer funds are used appropriately to add value to Energy Efficiency conservation offerings when considering memberships.

Memberships paid from the Trade Ally Support account in 2021 focused mainly on local or regional conservation efforts. 2021 memberships included:

- Association of Energy Services Professionals – AESP;
- Consortium for Energy Efficiency – CEE;
- Electric League of the Pacific Northwest;
- ESource;
- Energy Solutions Center – ESC; and,
- Northwest Energy Efficiency Council – NEEC.

This extensive industry database provides an additional insight for program staff to ensure that they maintain awareness in utility and efficiency developments. 2021's subscription included additional tools for technology assessment and eliminated access to customer journey mapping tools (essentially, a process flow diagram of the customer experience with a utility).

6. Trade Ally Network

The Trade Ally Network (TAN) connects PSE customers with pre-screened, independent contractors committed to helping customers make safe, dependable and efficient energy choices. This ensures their business and home energy improvement projects are successful and handled with a high level of customer service. This customer service is the key difference that distinguishes this organization from the Trade Ally Support group, which manages memberships with industry trade organizations.

To determine if a specific contractor is participating in PSE's Trade Ally Network customers can call an Energy Advisor at 1-800-562-1482. Additionally, the Trade Ally Connect web portal assists customers with referrals to member contractors, who service their respective areas, for energy efficient equipment installations.

a. *2021 Program Accomplishments*

In 2021, the Trade Ally Network generated more customer referrals to PSE's network of Recommended Energy Professionals (REPs) than over the past four years. Customer referrals for products such as Solar Photovoltaic (PV) and Electric Vehicle (EV) Chargers which launched at the end of 2020 and saw continued growth through 2021. These referral products support other PSE programs outside of Energy Efficiency as well as providing customers with reliable contractors.

The Trade Ally Network worked in close collaboration with PSE's Multifamily Retrofit team early in 2021 to transition the delivery and generation of customer referrals to provide a more holistic customer journey. The Multifamily Retrofit implementation team gained access to the PSE Trade Ally Portal, allowing the team to generate and track referrals and provide customer & contractor follow-ups to assist in project completion.

By re-implementing the Unreported Business reporting process which was put on hold during the implementation of the Trade Ally Portal and during the COVID-19 pandemic in 2020, the

Trade Ally Network program recovered over $100,000 in referral marketing fee revenue which supports general operation of the program.

b. *Adaptive Management*

The Trade Ally Network continued to look for improvements to the program and for the Trade Allies in 2021. One enhancement to the Trade Ally Portal, which launched in late 2021, was the Learning Management System (LMS) module. The LMS module enables the program to assign & track trainings for the Trade Allies and brings more functionality to the Trade Ally Portal, eliminating additional portals/credentials for Trade Allies. By incorporating LMS in the portal, the Trade Ally Network was able to retire the use of PALMS, PSE's internal training platform.

As mentioned above regarding trainings, the program collaborated with other programs within Energy Efficiency to created recorded program trainings. These trainings were assigned to Trade Allies using the LMS module in the Trade Ally Portal to deliver important program details such as program changes, rebate information and requirements and more.

Another enhancement to the Trade Ally Portal in 2021 was the incorporation of key performance metrics related to Trade Ally company participation in the Trade Ally Network. These new features will allow the program team to track completed trainings, completed projects, and company documents to ensure Trade Allies are meeting PSE's performance standards. Performance reviews have been on hold due to COVID-19 but will look to restart beginning of 2022.

c. *Pilot-like Initiatives*

With the launch of the Trade Ally Portal in 2020, the program set to streamline & automate much of the enrollment process for new & existing contractors to join the Trade Ally Network in 2021. The program piloted continuous enrollment where new contractors could apply to become a Trade Ally at any point in the year. This was a change to the historical one month enrollment period in January of each year. Through this process the Trade Ally Network was able to identify improvements and leverage the recorded trainings to ensure new contractors receive key program information when joining. This process also alleviated staff from other program teams to hold trainings for new contractors throughout the year. The team will fully implement ongoing enrollment in 2022.

As mentioned earlier, 2021 marked the first year the Trade Ally Network and other programs recorded annual program trainings focused for Trade Allies & new contractors.

d. *Hard to Reach and/or Proportionately Underserved Segments*

Throughout 2021, the Trade Ally Network continued to support the manufactured home campaign by generating over 2,300 referrals for manufactured home customers.

The TAN team also supported the Efficiency Boost program and generated over 480 customer referrals in 2021. The Trade Ally Network has continued to work with the Efficiency Boost team to provide contractor enrollment, training and support, as well as improvements and updates to the referral process.

e. ***Key Variance Drivers***

Market and labor shortages saw a partial recovery from COVID-19 pandemic during part of 2021, which led to an increase in referrals. However, Trade Allies continues to face supply chain challenges with parts and equipment which have impacted the lead times for customer projects. By re-implementing the Unreported Business reporting process, the program generated enough revenue to fully fund the operation of the Trade Ally Network program.

7. Automated Benchmarking System: MyData

MyData was created in 2013 by PSE in order to provide PSE compliance with the City of Seattle benchmarking mandate. This free web-based tool enables users to set up automated monthly reporting of their building's usage, to track energy usage for a portfolio of buildings, develop Energy Star® ratings and comply with state regulations including required reporting in the City of Seattle via Energy Star Portfolio Manager.

In 2020 and going forward, the need for MyData software expanded with the passage of the Washington State Clean Buildings bill (House Bill 1257) into law. The HB 1257 bill requires PSE to provide energy consumption data in a format compatible for uploading to Energy Star Portfolio Manager. MyData is the only tool that can provide usage automatically to Portfolio Manager so that PSE customers can remain complaint with HB 1257.

a. ***2021 Accomplishments***

PSE continued to see an increase in the use of MyData in 2021 and fulfilled over 2,400 requests. This is nearly double the number of requests from 2020.

PSE also contracted and began development with EnergyCap to build a replacement software for MyData in 2021. This software is largely off-the-shelf, but will include some key customizations to meet PSE needs. The EnergyCap tool will also integrate the functionality of MyData Manager into this single platform which will make it easier for customers to access all of their data in one place. The EnergyCap tool is expected to launch in 2022.

b. ***Adaptive Management***

PSE continued to work with in-house and off-shore IT teams in order to resolve data problems. This has allowed PSE to maintain the service level expected of customers while still managing a huge increase in requests.

c. ***Hard to Reach and/or Proportionately Underserved Segments***

MyData is available to all customer and program staff. As the design of the EnergyCap took place in 2021, PSE discussed options for customer use for those without access to a computer to ensure they would still be able to use the tool.

8. Energy Advisors

The Energy Advisor Department is a unique, customer solution operation. This expert group brings efficiency into PSE's customer homes by guiding them in changing behaviors, understanding their energy use, and assisting them in using PSE's programs that are best suited

for the customer's individual circumstances. Energy Advisors also promote and explain PSE's renewable energy programs, energy efficiency rebates, available promotions, products and services and tax incentives. The Energy Advisors assist customers with these services over the phone, email, and in person.

Unlike transaction-based customer care departments, the Energy Advisors (EA) provide expertise and deliver solutions tailor-made for customers' homes. The Energy Advisors perform research, conduct analyses, provide resolution, and respond to customer inquiries. They follow-up on requests related to energy efficiency and conservation that inform customers, and make suggestions on how customers can reduce and manage their energy use. Energy Advisors represent PSE in an effort to promote and cross-market energy-efficiency products and services by presenting and providing educational materials to employees, organizations and community groups.

Energy Advisors receive training and instruction in departmental procedures, tools and systems, current programs, building science, and customer service. They are expected to use good judgment in independently responding to recurring customer issues and/or complaints. Unique, difficult or unusual customer service issues are referred to Senior Energy Advisors**.**

Customers have access to speak directly to an Energy Advisor through a toll-free number, **1-800-562-1482**, Monday through Friday, 8am to 5pm.

a. *2021 Accomplishments*

Table II-3 provides a summary of key Energy Advisor customer-focused metrics.

Table II-3: Key Energy Advisor Metrics

2021 Energy Advisors	
Calls Answered	38,700
Emails	5,700
Events Staffed	18
Contractor Referrals Generated	10,200

The metrics noted in Table II-3 denote:

- **Calls Answered** are both Residential Sector, and a portion of Business Sector incoming activity.
- **Events Staffed** are home shows, municipal gatherings, etc., where energy advisors are on-hand during all or a portion of the event to share a wide range of energy efficiency information directly with PSE customers. Event metrics are presented in the following section.
- **Emails** include a wide variety of actions taken by energy advisors in response to emails sent to the general energy advisor email link.

b. *Adaptive Management*

In 2021, the Energy Advisors worked closely with the rebate processing team to develop and deploy a process to proactively follow up with customers who were unable to successfully complete their rebate applications. This additional assistance has led to an increase in customer satisfaction and the number of processes applications and incentives being paid to customers.

c. *Pilot-like Initiatives*

The Energy Advisors assisted with the development and deployment of PSE's Home Energy Display pilot program. After launch the team supported customers with information and resolution of any technical issues.

d. *Hard to Reach and/or Proportionately Underserved Segments*

In 2021, Energy Advisors began screening all customers inquiring about rebates and contractor referrals by income levels to determine eligibility for enhanced incentives through the Efficiency Boost program.

9. Energy Efficient Communities

Energy Efficient Communities (EEC) is a program-support channel to deliver Energy Efficiency program information directly to residential and commercial customers and through partnerships with community organizations and municipalities at the local level. The program works to leverage community resources to connect with, educate and move customers to Energy Efficiency program participation.

Puget Sound Energy's EEC channel works to generate participation in PSE's Energy Efficiency programs through direct-to-customer outreach and through partnerships at the local level. The team works to discover locally-appropriate ways of engaging with customers by leveraging PSE's resources, community knowledge and partner support.

The EEC team works closely with the Energy Efficiency programs to determine whether a broader partnership with a community organization or a more targeted, direct-to-customer approach is needed, such as a door-to-door initiative. As an outreach team for both residential and commercial programs, the EEC team also works on cross-program promotion, where appropriate.

The following discussions provide reviews of key 2021 Energy Efficient Communities' areas of focus.

a. *2021 Accomplishments*

The EEC team's work is usually very focused on in-person engagement with communities and customers to promote residential and commercial Energy Efficiency programs. This is accomplished through in-person presentations, door to door engagement, event and community meeting presence. With COVID-19 restrictions continuing to limit engagement in

2021, the team adapted to more virtual ways of engaging with customers and more direct outreach via phone calls instead of broader in-person group presentations. Therefore many of the employee expenses such as mileage and handouts have not been needed in 2021 despite planning to do so. The team also pivoted to online training instead of in-person training and conferences. In addition, the team postponed an initiative for multilingual contractors to engage with small businesses to promote energy efficiency programs until the very end of the year as staff had to manage among the various COVID-19 variant surges.

In spite of continued challenges to engaging directly with customers presented by COVID-19, in 2021 the EEC team accomplished a variety of customer outreach initiatives in support of various energy efficiency programs, including the following:

- Delivered more than 93 presentations and participated in an additional 44 events (virtual and in-person, as appropriate) to service organizations, homeowners associations, downtown associations, non-profit organizations, etc.
- Supported the wrap up of the Small Business Makeover campaign to encourage local organizations who supported the promotion of the contest to watch the final show to advance their awareness and understanding of the incentives available to small businesses. Reached out to 24 organizations and contacts to share the information.
- Partnered with 21 non-profit organizations, through PSE's Powerful Partnerships program, that specialize in supporting vulnerable and limited-income populations or environmental protection. The team worked with the partners to promote select energy efficiency programs through their monthly digital/print/web/social outlets, as well as a few virtual presentations. These efforts resulted in over 340,000 digital impressions and 5,100 digital engagements from the voices of these trusted local organizations, helping amplify and provide additional validity to the programs.
- Created county profiles to showcase the number of residential and commercial rebates processed, as well as the total residential and commercial incentives that were paid each year. These profiles are available on pse.com and are used during presentations to a variety of audiences, such as city councils, homeowners' association meetings, and tabling events. These profiles show that customers are participating in energy efficiency programs at a local level.
- Identified completed projects that showcase energy efficiency measures for use in case studies on social media, video, web and collateral. The EEC team facilitated customer interviews and coordinated photography and video shoots.
- Supported local foodbank Food Lifeline with a matching donation for customers who donated their appliance recycling rebates with PSE's philanthropic dollars.
- Supported the Clean Buildings Accelerator program launch which included targeted strategy planning for hard to reach communities for 2022 and development of stakeholder and qualified customer program invitations.

- Conducted outbound calling and direct one on one engagement with targeted local list of qualified multifamily property owners for air sealing campaign to increase customer participation.
- Identified and connected with 20 local real estate agencies to promote Single Family Space and Water Heat rebates through presentations, individualized engagement and collateral distribution.

b. *Adaptive Management*

In 2021, in order to improve the process for marketing and outreach planning to support the Energy Efficiency programs, the EEC team hired a project manager to focus solely on the planning process to ensure adherence to the deadlines, the creation of strategic and tactical planning documents across the programs in order to ensure management of the marketing and outreach teams can focus on the deliverables for their teams.

In 2021, the team continued focus on digital outreach through professional social media, cold calls, emails, etc. Over 9,420 emails, including through third party channels, were directly put in motion over the course of the year. The team and their individual social media networks were also used to support events, limited time offers and program campaign support

Online presentations and webinars in place of in person events to continue program participation and advocacy, which included themed Coffee and Conversations, Lunch and Learns, and joint utility classes.

c. *Pilot-like Initiatives*

The EEC team initiated two pilot initiatives for reaching out to more small business customers at the end of 2021. Onboarding and training occurred in 2021 and both initiatives will be implemented in 2022 in order to capitalize on the post-holiday mindsets of small to medium businesses. This pilot includes the following activities:

- Develop list of multilingual businesses leveraging local community based organization's relationship database. The focus will be first on small businesses then expand to include medium-large independent grocers.
- Leverage list of recognized and unrecognized EnviroStars to identify customers that have not checked EE on their applications. After an SBDI lead is identified contractors will connect with nearby businesses to build a cluster for SBDI program implementer to execute on.

The EEC team also identified and propositioned electric-only customers in a targeted baseboard smart thermostat pilot utilizing community network and neighborhood associations to drive customer participation.

d. *Hard to Reach and/or Proportionately Underserved Segment*

The pilot initiative noted above for small business multilingual was also an effort to engage hard to reach customers. Other activities conducted targeted toward hard to reach segments included:

- Targeted outreach to local small and medium businesses through strategic partnerships with downtown business associations to attract program participation in the Small Business Direct Install program.
- Low-Income Weatherization efforts utilizing the Low-Income Needs Assessment to target high-need census blocks in south King County by establishing educational and awareness partnerships with trusted, local community based organizations and increase customer participation.
- Multilingual presentations and collateral distribution, in collaboration with local community based organizations, targeted towards Low Income Weatherization, Efficiency Boost, and energy saving tips for homes.
- The pilot initiative noted above for baseboard smart thermostats is also an effort to reach rural hard to reach customers.

10. Customer Digital Experience

The focus of the Customer Digital Experience initiatives is to significantly improve Energy Efficiency's ability to communicate the "how and why" of energy efficiency, using new technologies and engaging interactive methods. Ongoing work includes the design of web tools and mobile-friendly apps that are effective in delivering electricity and natural gas savings. Research has shown that PSE customers are more web-savvy than average and have high expectations when doing business on the web. Customer Digital Experience supports interactive content development, e-newsletters and other miscellaneous software applications, including online form, database and web hosting services.

PSE provides several highlights of its 2021 online metrics in Table II-4.

Table II-4: Energy Efficiency Online Metrics

Customer Online Experience Metrics	2021 Web Page Views
Savings & Energy Center *[all EE-related content pages on pse.com]*	Over 1.3 million
PSE digital account Energy Center tools *[pse.com Energy center landing page and Oracle tools]*	Over 1.2 million
Ask an Energy Advisor inquiry form page *[https://www.pse.com/rebates/ask-advisor-form]*	More than 17,000
Recommended Energy Professional information page *[https://www.pse.com/rebates/find-a-contractor]*	Over 50,000

a. *Customer Awareness Tools*

The Customer Awareness Tools category is comprised of four electronic services provided to PSE customers via a variety of media, designed to fit customers' communication expectations. The services include:

i. Unusual Usage Alerts (UUA)

- Available for residential customers with an AMR or AMI meter and 12 or more months of data at the current address.
- More than 227,000 UUA reports were delivered to customers in 2021.
- Unusual usage alerts are generated when a customer is trending to use significantly more energy than they used for the same billing cycle the year prior.

ii. My Energy Usage

- When PSE customers log onto their PSE digital account, they can view their energy usage center, which is moderated by PSE's contractor.
- Additionally, the energy usage center also allows customers to select ways to be more energy efficient to help them save energy, and perform an online assessment to learn about their home's energy usage
- A major accomplishment in 2021 was the enablement of displaying usage data from AMI metered customers at hourly intervals. This gives customers a higher level of granularity to be able to measure, monitor and understand how and where their home uses energy.
- Another major accomplishment was the implementation of Open Authentication (OAuth) which has enabled for more customers to easily access the self-service energy usage tools available through pse.com. This has positively impacted the rate of customer emails received related to accessing the online tools.

iii. Seasonal Readiness Emails (SRE)

- PSE's contractor sends up to 350,000 reports to customers twice a year during the changing seasons, once in the summer and once in the winter.

iv. Customer Engagement Tracking (CET)

The Customer Engagement Tracker (CET) survey is an instrument designed to explore utility customer reactions to the Home Energy Reports program and other related outreach. The survey aims to accomplish the following key objectives:

- Explore customer interaction with and reception of the Home Energy Reports;.
- Gauge overall impact of the program on the PSE customer relationship, both via self-reported influence and by measuring differences in engagement between program participants and non-participants (controls).
- Compare results between PSE deployments and to those of other contractor utility partners, with an eye towards potential program improvements.

b. *PSE Marketplace*

The PSE Marketplace offers instant discounts to eligible customers on smart thermostats, ShowerStart thermostatic shut-off valves, and LED products such as indoor and outdoor fixtures. The PSE marketplace provides instant rebates on products for qualifying PSE customers. Visitors to the site can quickly and easily see which rebates they are eligible for by answering a short list of questions.

i. 2021 Accomplishments

The PSE Marketplace had a successful inaugural year in 2021. Smart thermostats proved to be the most popular product on the marketplace. PSE worked with ecobee, Emerson and Nest to create limited time offers or "Flash Sales" through which, in combination with PSE's rebate, customers could obtain a smart thermostat for little to no cost. The thermostat sales from the online marketplace made up approximately 60 percent of the programs rebates in 2021. PSE leveraged the marketplace to offer limited time offers on lighting and thermostatic shut-off valves as well.

ii. Adaptive Management

After the initial launch at the end of 2020, several enhancements were made to the marketplace. A chat feature was added to make it easier for customers to ask questions and resolve customer service issues resulting in increased customer satisfaction ratings.

PSE sends an encrypted customer file monthly to the marketplace vendor. The monthly cadence can cause a delay in customer data being available or current on the marketplace. The data discrepancies in turn can lead to customers being unable to validate and enter the marketplace for instant discounts on energy savings products. PSE, devised a system in which the marketplace vendor could send PSE the customer's information, PSE would verify the customer's rebate eligibility, and the customer would then use a guest check out for their rebate. The new process allowed customers to access the rebates for which they were eligible and not either have to wait for the marketplace to update their current account information or in the case of smart thermostats, purchase the product at full price, then apply for the rebate online. The process change improved customer reviews of the marketplace shopping experience.

PSE also received feedback from customers that the thermostat they purchased was not compatible with their home heating system. Though a heating system compatibility checker was available on the product page, PSE determined it needed to be more visible to customers and the page was redesigned with the compatibility checker placed before the "add to cart" button on the screen. After the change, the complaint of the product being incompatible with customer heat equipment significantly decreased.

iii. Pilot-like Initiatives

PSE used an email send for thermostatic shut-off valves (TSVs) to test whether validating prior to entering the marketplace versus validating after items has been selected and placed in the customer's cart was more effective. Half the customers receiving the email were directed to the marketplace log in page where they would have to validate before making a purchase. PSE noted a 30 percent drop off rate by customers at the validation

portal. The other half of customers received a link to the product page and had to validate at check out.

Customers that validated prior to entering the marketplace had a higher sales conversion than those that validated at check out. Based on the results, PSE ascertained the best customer service model is to continue with validating customers prior to letting them enter the marketplace. The approach allows PSE to customize the rebate offerings and make only those rebates for which the customer is eligible visible during the shopping experience. This ensures customers receive the best possible customer service as it limits rebates being promoted to them for which they are not eligible.

iv. Hard to Reach and/or Proportionately Underserved Segments

The PSE Marketplace leveraged demographic information provided by the Customer Insights team to target hard-to-reach and underserved customers with email promotion sends. In particular, an email send was sent to a senior demographic promoting the Emerson thermostat for a special price of $19.99 on the PSE Marketplace as it more closely resembles a traditional thermostat and is easier to install. Customers purchased almost 2,000 Emerson smart thermostats in three days.

11. Market Integration

Market Integration consists of salary costs of employees and contractors working on energy efficiency marketing and promotional support activities, which makes marketing efforts more transparent. Tasks include the enhancement of online energy-efficiency tools and features social media, digital content creation, and email communications. Other tasks include traditional marketing that centers on awareness-based promotional channels used across all programs, such as advertising, collateral, and websites.

a. *2021 Accomplishments*

In 2021, PSE continued a robust energy efficiency advertising campaign across its service area, designed to drive broad awareness of the solutions PSE provides to help residential and commercial customers save on their energy costs. The campaign highlighted PSE's rebates, incentives and low-cost/no-cost tips—much needed information to help customers manage the ongoing financial impacts of the COVID-19 pandemic.

Tactics included television, digital display banners and video, social media, email, print, radio, streaming audio, and an inaugural-season promotional partnership with the Seattle Kraken. These efforts garnered more than 101 million impressions over 12 months and included:

- 89,986,413 total residential campaign impressions and 327,906 visits to pse.com/rebates
- 11,741,890 total commercial campaign impressions and 12,911 visits to pse.com/mybusiness

b. *Adaptive Management*

Due to continuing limitations from the COVID-19 pandemic in 2021, PSE maintained its high use of digital content to engage and educate customers—using connections through email, social media and pse.com to replace what were formerly in-person engagements, including events.

12. Events

The Energy Efficiency team participates in community, local, and regional events, including home shows, trade shows, seminars, corporate events and community events. The event audience consists of general public, businesses, builder/contractors, multifamily property owners, city leaders, homeowner associations, and students/teachers. PSE's event strategy serves as one piece of a robust communications strategy for educating and engaging residential and commercial customers about energy efficiency programs offerings. Events provide a unique opportunity for staff to interact directly with customers, discussing a variety of products, programs and services and acting as the face of PSE to answer questions and provide resources. Events staff match customer interests and needs with energy efficiency programs, and gather customer feedback to inform and influence future programs.

PSE employs a third party vendor to augment its dedicated events staff and in order to ensure maximum energy efficiency exposure. The purpose of this is to increase awareness and uptake of PSE energy efficiency programs, drive energy savings, and reach a broad and diverse audience base through community events, conferences, home shows, and virtual events.

a. *2021 Accomplishments*

The Events team pivoted to digital platforms and shifted to PSE-owned virtual events for both residential and business customers in 2020. Due to the success of the virtual events and the continued restrictions due to COVID-19, the Events team planned to host virtual and/or in-person events as appropriate to drive awareness and engagement for PSE's programs and products in 2021. PSE leveraged digital channels to design events with a strong call to action and drive awareness, customer engagement and participation in energy efficiency programs for both residential and commercial programs.

Due to COVID-19 and the continued restrictions limiting in-person events in 2021, PSE used only a portion of the allocated budget for staffing services resulting in a variance in outside services.

Table II-5 provides a summary of 2021 events in which PSE presented energy-efficiency information.

Table II-5: Total Events

2021 Event	Count
REM	23
BEM	10

Residential Door-to-Door	0
Total	**33**

b. *Highlights of Residential Events*

The Events team created robust, integrated virtual events, leveraging event opportunities to connect with community stakeholders, increasing energy efficiency awareness, education, and participation. Customer data and segment based approach was used to target audiences and tailor messaging, making events high impact. These virtual events included:

- Ask an Expert (launched a new series of events); Live PSE webinar series with PSE's Energy Efficiency experts with live Q&A and chat with residential customers.
- Take a Spin
- Earth week
- My PSE Energy Efficiency Pledge
- Virtual Presentations

In addition, the Events team eased back into in-person events as COVID-19 safety protocols allowed in the last half of 2021. Some of these events included:

- Samoa Cultural Day
- Olympia Home Show
- Farmer's Markets
- Seattle PRIDE
- Small Business Saturday

c. *Highlights of Commercial and Business Events*

In 2021, the Events team continued the ongoing practice of engaging PSE employees, vendor partners, and businesses to educate them on PSE's energy efficiency programs and services aimed to drive participation and investment in energy efficiency. These efforts included:

- Hosting Coffee & Conversations (PSE virtual event series); Live PSE webinars with PSE's Energy Efficiency experts with live Q&A and chat with business customers. Featured IEM, Foodservice, & Building Commissioning.
- Hosting a PSE Business Lighting Application Training (live virtual event with PSE experts).
- Attending the TRENDS virtual conference to reach large and small property owners, multifamily property owners and managers, personnel and representatives.
- Attending and presenting at the Smart Building Exchange virtual event.

- Attending and presenting at BOMA events.

d. *Hard to Reach and/or Proportionately Underserved Segments*

Due to COVID-19 and continuing safety protocols, tabling events were cancelled in 2021. However, the team shifted to virtual platforms in order to engage with this vulnerable community segment. In partnership with program and outreach staff, the team reached out to foodbanks and provided awareness, education and resources for accessing energy savings through PSE's low income and weatherization programs.

B. Research and Planning

Functions of this group include:

- Conservation Supply Curves,
- Strategic Planning,
- Market Research,
- Program Evaluations and
- Biennial Electric Conservation Achievement Review (BECAR).

In addition to playing a critical role in Energy Efficiency's overall measurement and verification functions, the work of these teams assists Energy Efficiency program staff in designing innovative conservation offerings, evaluating processes and savings calculations, verifying cost-effectiveness, and building the Company's biennial IRP. They ensure that there is a regular schedule of program performance review, consistent with applicable requirements.

1. Conservation Supply Curves and Strategic Planning

Although separately listed in PSE's Exhibit 1: *Savings and Budgets*, the Conservation Supply Curves and Strategic Planning functions are managed in the same Energy Efficiency organization, and tend to have overlapping goals and focus.

a. *Conservation Supply Curves Description*

The purpose of the Conservation Supply Curve function is to complete a Conservation Potential Assessment (CPA) or the company's Integrated Resource Plan (IRP). The Conservation Potential Assessment, conducted by a third-party consultant, identifies the amount of energy savings potential that is technically available, and of that, what portion is achievable over the 20-year planning horizon of PSE's IRP. PSE then determines the amount of conservation potential that is economic (that is, cost effective) relative to supply-side options in its overall resource portfolio analysis for the IRP. The IRP, which is filed every two years, is the basis for PSE's electric and natural gas energy resource acquisition strategy, as well as the targets for its energy efficiency programs. The IRP analysis is also used to derive the ten-year conservation potential and two year electric conservation target required to comply with the Washington Energy Independence Act. Development of the natural gas conservation target follows a similar process.

b. *Strategic Planning Description*

The Strategic Planning function is responsible for providing support and guidance to a variety of regulatory and other strategic initiatives. Responsibilities include regulatory compliance filings, federal and state legislative review, policy analysis, end-use research, or other strategic efforts related to energy efficiency.

Strategic Planning roles include, but are not limited to:

- Internal and external research, planning and development,
- Biennial and strategic program planning support,
- Development and maintenance of avoided costs and cost-effectiveness models,
- Legislative and regulatory policy analysis,
- Coordination with regional organizations including NEEA and RTF,
- Supporting energy efficiency third-party program bidding activities.

c. *Cost-Effectiveness*

Cost-effectiveness modeling and calculations are also conducted within the Strategic Planning team. PSE comprehensively addresses program-level detailed views of electric and natural gas cost-effectiveness results for 2021 in Exhibit 2.

d. *2021 Accomplishments*

A primary deliverable for the year was setting the biennial conservation targets for the 2022-2023 program cycle. Working alongside PSE's Resource Planning group, the Energy Efficiency Strategic Planning team leveraged the output from the 2021 Integrated Resource Plan to determine the cost effective conservation savings which required adjustments to remove intra year ramping, which effectively putts savings into annualized blocks to align with reporting and tracking of conservation. The team also worked to include the distribution efficiency potential, a function of the Distributed System Planning analysis. In addition, transmission cost updates late in the 2022-2023 BCP planning process required an additional cost effective bundle being included in the program targets because reducing certain costs with respect to other supply-side options can drive inclusion of more savings measures in the portfolio modeling.

Other notable accomplishments in 2021 include:

- Formulated a hybrid heating pilot plan for 2022-2023 to analyze energy, peak, and market information for the potential of a full-fledged program.
- Supported PSE's effort to build its 2030 Decarbonization plan which includes both energy efficiency and potentially hybrid heating (dual fuel heating).
- Added new Non-Energy Impact values to a variety of measures. This work built a framework for ongoing NEI analysis and inclusion of additional value to PSE measures. NEI's also are part of the tracking/reporting in the PSE Clean Energy Implementation Plan, which required much coordination as the first plan was developed in 2021.
- Performed rough order of magnitude analysis of the savings potential at natural gas transportation customer facilities.

2. Market Research

Market Research conducts a variety of research studies and analyses to support program design, marketing strategies, and development of effective program promotion and customer communications for Energy Efficiency.

a. *Overview*

The focus of the Market Research function is on acquiring information about customers that is relevant for the development of energy-efficiency programs, educational materials, and promotional campaigns that will be effective in encouraging program participation.

Through various techniques such as surveys, focus groups, and analysis of existing databases, Market Research provides understanding of customer perceptions, motivations and barriers to adoption of energy-efficient applications and behavior, as well as tracking customer awareness of program offerings and satisfaction with non-program specific education and information services. Market Research is also called upon for analysis of localized characteristics, attitudes, behavior, and energy usage trends, necessitating more geographically targeted research. Market Research expenses are driven by the customized nature of the work and the large sample sizes required in quantitative studies for results to be valid for multiple market segments and geographic areas.

The Market Research staff works closely with program evaluation, marketing communications, and program implementation staff to identify research needs that support the effective development, delivery, and evaluation of energy efficiency programs.

These research needs are then coordinated and leveraged to result in a slate of research projects that are responsive to internal client needs, eliminate duplication of effort, and are cost-efficient.

PSE's conservation market research activities are divided into two basic components:

- **Baseline Research with Broad Applications:** This type of research provides foundational information about PSE customers that will be a common source of knowledge for the general planning and design of all energy efficiency programs and promotional campaigns.
- **Application-Specific Research:** This research is focused on specific programs or promotional initiatives. It includes research that supports specific energy efficiency program promotion and communications campaigns, such as message testing, target markets, and campaign effectiveness studies. Other research efforts will be focused on tracking customer satisfaction with information services, such as the Energy Advisors. Finally, research may be conducted to provide customer input on the design and implementation of specific programs, primarily using qualitative methods such as focus groups.

b. *2021 Accomplishments*

Market Research continued to build on its new digital platforms integrating customer, program, and research data into analyses that support Energy Efficiency programs.

Market Research improved its Energy Efficiency program tracking dashboard to include:

- Survey feedback on program performance
- Named community geographies
- Additional marketing elements such as building type, vintage, and estimated square footage.

In 2021, Market Research also developed an energy burden analysis estimating the energy burden for its residential customers. This will help PSE refine its EES program targeting in concert with its energy assistance programs to reduce energy burden across its customer base.

Market Research also developed models predicting customer thermal and load profiling that will improve its ability to target programs in the future.

Market Research ended 2021 slightly under its budget due to nominal variances between labor cost estimates and actual labor costs.

c. *Adaptive Management*

The Market Research team continued to build on the architecture of its data systems integrating multiple resources. This in turn enabled the development of resources that can be automated to provide real time updates on program performance and metrics for its customer base as identified by initiatives like the 2020 Low Income Needs Assessment (LINA) and Clean Energy Transformation Act (CETA).

d. *Hard to Reach and/or Proportionately Underserved Segments*

In 2021, PSE worked with its Equity Advisory Group to identify named communities within its electric service area as a requirement for CETA. PSE used both highly impacted communities (HIC) identified by the Washington Department of Health at the census tract level and built on the work informing the 2020 LINA classified all the census block groups across multiple socio-economic factors of vulnerability.

Each census block was scored for the individual factors and then ranked across the levels high, medium, and low for overall level of vulnerability. PSE will now be able to track its geographically attributable program accomplishments in named communities.

PSE also developed dynamic maps for its partner low income agencies identifying the results from the LINA study within their unique service footprints to facilitate improved coordination in low income weatherization initiatives.

3. Program Evaluation

The Program Evaluation function is focused on implementing PSE's overall Evaluation, Measurement & Verification (EM&V) function in compliance with applicable regulatory conditions to achieve the continual improvement of energy-efficiency service delivery to customers.

PSE Evaluation staff are committed to the evaluation of energy savings and the continual improvement of energy-efficiency service delivery to customers. PSE program implementation teams work together with the Evaluation team to inform the development of evaluation scopes of work. The Evaluation team then develops and maintains a strategic Evaluation Plan (Exhibit 6), in accordance with the guiding Evaluation Framework (Exhibit 6, Supplement 1), ensuring that all programs receive review on a maximum four-year cyclic basis.

Evaluations are conducted by third-party evaluation consultants that are selected by a competitive Request for Proposals (RFP) process. For 2020-2021, PSE contracted with one third-party evaluator, DNV GL, to conduct evaluations across the program portfolio. This approach facilitates greater efficiency and integration of data and results than would evaluations conducted by multiple firms.

In 2021, evaluation resources focused on commercial and residential programs. The level of detail at which each program is evaluated was determined by prioritizing each program into evaluation tiers. All levels of rigor were consistent with the principles, objective, and metrics prescribed in the guiding Evaluation Framework (Exhibit 8) in PSE's 2020-21 Biennial Conservation Plan. In prioritizing programs for evaluation, PSE considers the regulatory timing requirements, level of energy savings, significant program changes, results of prior evaluations and whether a program is new or never been evaluated before.

Several 2021 programs (listed under Evaluated Studies below) received comprehensive evaluations, consistent with regulatory requirements and CRAG guidance. Other programs received various levels of market and process evaluations and engineering reviews of energy savings.

After an evaluation deliverable is completed, members of the EES program team participate in the Evaluation Report Response (ERR) process to ensure that evaluation results are implemented in the program. The Program Team completes the ERR, indicating what actions will be taken in response to evaluation findings and recommendations. This ensures a closed-loop system with Evaluation findings and Implementation responses and adjustments being documented in the Source of Savings database.

Final evaluation reports with appended ERRs are posted to the Conduit Northwest website (https://conduitnw.org).

PSE frequently shares the results of its evaluations with the RTF to support continuous improvement of measure energy savings values widely used in the region. In addition, PSE monitors the Regional Technical Forum (RTF), NEEA, and the Northwest Research Group (NWRG), as well as directly reaching out to neighboring utilities, for opportunities to collaborate on common evaluation needs.

a. *Evaluation Studies*

The Evaluation team completed the following impact evaluations in 2021, which are included in this Report as Exhibit 6, Supplement 1:

- Commercial New Construction Evaluation,
- Commercial Kitchens,
- Lighting to Go,
- Small Business Direct Install,
- 2020 Home Energy Reports Evaluation,
- Single Family Retrofit, and
- Low Income Weatherization.

b. *2021 Accomplishments*

In addition to the activities listed above, PSE also accomplished the following in 2021.

- Continued support of regional committees and advisory groups include NEEA Gas and Emerging Technology, the End Use Load Study project, and the Regional Technical Forum.
- Joined the Regional Technical Forum as a voting member (three year commitment).
- Connected with the Gas Technology Institute to better understand emerging technology and equipment, as well as hybrid heating efforts around the country and Canada.
- Hired three new team members and had two veteran employee retire.

c. *Adaptive Management*

In 2021, evaluations completed for Single Family Retrofit, Low Income Weatherization, Home Energy Reports, Commercial Rebates and Commercial New Construction programs examined performance based on program theories, program goals, and deemed and measured savings values; and identified opportunities to update and improve these programs.

Programs have committed to undertaking specific improvement actions in response to evaluation findings. Ongoing challenges due to the COVID-19 pandemic eliminated some typical evaluation protocols such as on-site verification, so evaluation staff adopted different industry protocols that included virtual verification, online interviews and surveys, and billing analysis using different-in-difference randomized control trial.

d. *Key Variance Drivers*

For Conservation Supply Curves, guidance from the Resource Planning team was high and ultimately their contracted work with Cadmus was lower than originally anticipated.

For Strategic Planning, the NEEA End Use Load Study payment used a different NEEA order number so it is showing as a large under-spend in Strategic Planning.

For Evaluation, the delivered work took more effort/hours than were anticipated going into 2021, but both residential and non-residential contracts remain under budget with respect to the contracted amounts and scope of work.

III. Stakeholder Relations

PSE, along with its primary constituents, the Commission Staff and the Conservation Resource Advisory Group (CRAG) sustained its emphasis on continuously maximizing the value, clarity, impact, and transparency of information provided to Commission Staff and the CRAG. PSE received feedback from CRAG members, both directly and through casual reference, that its efforts were recognized and appreciated. PSE also recognizes and appreciates that Commission Staff and the CRAG expended significant effort to understand, become involved with, and help resolve strategic and policy issues in 2021.

A. Washington Utilities and Transportation Commission

Energy Efficiency values its working relationship with Commission staff and appreciates their level of thoroughness, thoughtfulness, and adaptability. PSE was able to complete its 2021 initiatives as a result of the cooperation between its Energy Efficiency staff and Commission Staff. The following discussion outlines the key conservation-related UTC filings that PSE made in 2021. In the list, PSE presents the date and description of each filing the UTC Docket number for straightforward reference.

All conservation-specific filings complied with WAC 480-109-110(3): CRAG members received draft copies of each of the filings.[6]

1. Energy Efficiency-Specific Filings

- **March 1, 2021: Filed electric Schedule 120, UE-210140**. Effective May 1, 2021, the updated Schedule 120 represents an average decrease of the electric Conservation Rider portion of affected customer bills by 0.8 percent.
- **March 1, 2021: Filed natural gas Schedule 120, UG-210141**. Effective May 1, 2021, the updated Schedule 120 represents an average decrease of the natural gas Conservation Rider portion of affected customer bills by 0.1 percent.
- **April 9, 2021: Filed 2020 Annual Report of Conservation Accomplishments, UE-190905.** Consistent with requirements in WAC 480-109-120(3), this report represented the evolution and continuous improvement in providing Energy Efficiency program accomplishments, activities, and value-add information for PSE's Stakeholders.
- **October 29, 2021: Filed 2022-2023 Biennial Conservation Plan, UE-210822 and UG-210823.**

[6] Schedule 120, PSE's cost-recover adjustment filing, is the exception, as also noted in WAC 480-109-110(3).

B. Conservation Resource Advisory Group

PSE acknowledges and is very appreciative for the work and committed engagement demonstrated by the Conservation Resource Advisory Group (CRAG) throughout 2021. Many members of the CRAG demonstrated considerable engagement and a thorough understanding of PSE programs and implementation strategies through the year.

CRAG members brought to bear a considerable understanding of technical elements associated with some of Energy Efficiency's more complicated conservation measures and offerings, and a thorough understanding of the impact and implications of how those would affect potential savings and costs. CRAG members provided valuable consideration and insights of State policy goals and initiatives, along with their constituents' expectations.

The CRAG's perspective on the region's dynamic marketplace was also invaluable. As a result, PSE adaptively managed its Portfolio throughout the year with these considerations in mind.

Through PSE's collaborative process, it achieved significant milestones during the past year, as discussed throughout the Report and in the following sections.

2. Background

PSE formed the CRAG in response to Section D of Exhibit F in the 2001 General Rate Case Stipulation Agreement, Dockets UE-011570 and UG-011571. The CRAG consists of approximately 12 Stakeholders and represents a wide variety of interests, including consumers, industry, and regional concerns. It also includes a member of the Commission Staff. The CRAG works closely with Energy Efficiency on a variety of conservation initiatives, most notably conservation tariff filings, savings goal setting and long-term conservation strategies.

In order to ensure its applicability and value, PSE and the CRAG reviewed the Vision Statement at the first CRAG meeting of the year, March 16, 2021.

3. CRAG Meetings

In 2021, PSE met the requirements of WAC 480-109-110(2) and condition (3) (e) by convening six CRAG meetings during the year. PSE places emphasis on ensuring that it maintains an accurate meeting record, where meeting attendees can reference agreements, action items, and issue resolutions. PSE also provides a very long lead time for meeting schedules to avoid potential scheduling conflicts. Every CRAG meeting includes several standing agenda items, including:

- Activities that have occurred since the previous meeting;
- CRAG meeting action item status;
- Marketing and program updates; and
- PSE emails meeting materials to attendees participating via conference call prior to the meeting call to order.

The following discussions are very high-level "snapshots" of the six 2021 CRAG meetings. They are intended only to provide a general sense of the meeting topics. CRAG members received a meeting summary document, along with all handout material and the slide deck shortly after each CRAG meeting.

- **March 16 Meeting**
  This meeting was convened to provide CRAG members with a preview of the BCP planning process, share Schedule 120 filing information, and provide program updates.

- **June 2 Meeting**
  The June CRAG meeting's intent was to provide a look at the upcoming BCP target setting, share the ongoing Non Energy Impacts research, and provide program updates.

- **June 29 Public Participation Meeting**
  This meeting was a new format for Energy Efficiency. PSE offered this open forum to interested parties where program operation and planning activities were discussed. Energy Efficiency managers shared detailed program information and marketing strategies. There was opportunity for open comment as well as an online area to participate following the meeting.

- **July 28 Meeting**
  This primary focus of this meeting was to discuss the 2022-23 draft Conditions and to debut programs being planned for the BCP.

- **August 25 Meeting**
  The August meetings intent was to share the proposed BCP program details and budgets.

- **September 29 Meeting**
  October's CRAG meeting was intended to share revisions since the previous meeting to the BCP plan. NEEA was invited to share a presentation on the Natural Gas Market Transformation activities. PSE also provided updates on tariff revisions and proposed BCP Conditions.

- **October 20 Meeting**
  The final CRAG meeting of the year focused on 2022-2023 BCP target adjustments as well as final BCP program updates since the last share out.

Glossary

This section provides descriptions of commonly-used Energy Efficiency terms and acronyms.

Commonly-Used Terms

Term	Definition
Calculated Savings	This savings type is different from deemed values (described below). This term indicates that there is a pre-approved, stipulated input savings value (or cost) per measure. This value (or cost) is then multiplied by site-specific input values to arrive at the overall savings value (or cost).
Conditions	Specific deliverables and stipulations with which the Company must adhere through the course of operating and managing energy efficiency programs. In addition to compliance requirements outlined in the Settlement Terms Sections A through J and L in Docket No. 100177, 2018-2019 conditions are listed in Appendix A of Order 01 in Docket UE-171087. Conditions are typically included in Commission Orders approving PSE's biennial conservation targets.
Custom Savings	This savings type applies to conservation projects where a PSE EME performs specific evaluation and review of a unique customer site to determine savings values—therms or kWh—that apply only for that site. For this type of measure, there is insufficient information, the occurrence is too infrequent, or it cannot be specifically defined to justify development of a Calculated or Deemed protocol.
Deemed Measure	As in a measure's deemed savings value; a savings (or cost) value that applies to a unit of specific measure, regardless of where or how the measure is installed. Measures for which it is possible to "deem" per-unit energy savings, cost, and load shape based on program evaluation data and engineering estimates. (For instance, one residential interior CFL lamp may have a deemed value of 24 kilowatt-hours per year.) This classification applies to both RTF and PSE Deemed (noted on the following page). This term has been supplanted by "UES", defined below.
Direct Benefit to Customer (DBtC)	A PSE-specific term, indicating rebates, grants, credits or services that are of value to customers. Services can include, but aren't limited to, credits on a monthly bill, upstream incentive provided to channel partners or trade allies—either within the PSE service territory or regionally—and free energy efficient devices available by mail.
Direct-Install Measure	A conservation measure that is installed by a PSE representative—rather than a PSE customer—into a qualifying structure.
Distribution	For the purposes of Schedule 292, means electrical facilities within the State of Washington that the Company owns or operates to convey electricity from the point of generation or purchase to the point of use by a Customer. Distribution includes transmission and distribution lines related substations and transformers.
EIA	Energy Independence Act. A reference to the 2006 voter initiative, The Washington Clean Energy Initiative. The vote resulted in the creation of RCW 19.285 and WAC 480-109, which is now referred to as the Energy Independence Act. The EIA was also sometimes colloquially referred to as "I-937".
Measure	A product, device, piece of equipment, system or building design or operational practice used to achieve greater energy efficiency or to promote Fuel Conversion and Fuel Switching. Unless specifically enumerated in a

	specific Energy Efficiency Program, all Measures, proposed by Customers or otherwise, shall meet or exceed the efficiency standards set forth in the applicable energy codes, or, where none exists, "standard industry practice" as determined by the Company. Measures will meet common construction practices, and meet industry standards for quality and energy efficiency.[7] Measures should also meet cost-effectiveness standards.
Orders (see also Conditions)	Overarching instructions to an entity under the purview of the Washington Utilities and Transportation Commission (UTC or Commission). Orders may be made at the conclusion of a Docket proceeding or throughout the course of a Docket's existence. At the time of the publication of this BCP, PSE is operating under Order 01 of Docket UE-171087, along with other Orders in various Settlement Stipulations or Agreements.
Program	Programs may consist of a single measure, an assortment of related measures or a suite of measures that are related strictly by delivery type or customer segment.
PSE Deemed	Relative to measure savings types (Custom, Calculated, PSE Deemed or RTF Deemed), these measures are supported by PSE engineering calculations or evaluation studies, in compliance with WAC 480-109-100(5).
RTF Deemed (see also UES)	A legacy term, only used in the Source of Savings database. Relative to PSE savings types (Custom, Calculated, PSE Deemed or RTF Deemed), supported by RTF analyses, in compliance with WAC 480-109-100(5).
Savings	Savings (both natural gas and electric) are defined and reported as those recognized in the first year of a measure's total expected life. PSE reports the total savings for the year that the measure was implemented, regardless of when it is installed. Electric savings are counted at the customer meter, not the busbar. Gas savings are counted at the customer natural gas meter. It is important to note that all measures have an associated life, during which the noted annual savings accumulate. Each measure has a different life, as determined by rigorous evaluation. The average measure life per program can be found in the Energy Efficiency Cost-Effectiveness tables in Exhibit 2 of this report. As noted above, measures have associated savings beyond the first year; those savings continue to accrue to the benefit of PSE.
System	In this document, System may have the following meanings: 1) Any software program—supported by PSE's IT department or otherwise—or physical apparatus used to record, track, compile, report, archive, audit energy savings claims or financial data. Electrical, and/or natural gas equipment that is either attached together or works in concert to provide space conditioning, plumbing functions or other end-uses associated with structures, such as HVAC systems, pumping systems, etc.

[7] Schedule 83, section 4, Definitions, #m. Schedule 183, section 4, #l.

Savings Terminology

Terms	Definition
CPA Pro-Rata Share	Pro-rata share of the utilities IRP's Conservation Potential Assessment's 10-year potential. Includes NEEA.
EIA Target	Equals the CPA Pro-Rata Share, applicable to electric savings
Decoupling Threshold	[EIA Target (electric) CPA Pro-Rata Share (gas) * 0.05]
Total Utility Conservation Goal/Achievement	All savings programs funded by Conservation Riders [EIA Target + Pilots + NEEA + 449/Special Contracts + Decoupling Threshold]
Adjusted Programs	Programs approved by the Commission to be excluded from a Penalty Threshold. For last three biennia, these included NEEA and Pilots with Uncertain Savings.
Utility-Specific Conservation Goal/Achievement	[Total Utility Conservation Goal/Achievement – (Excluded programs (for instance, NEEA, Pilots with uncertain savings, retail wheeling accounts, etc.) + adjustments)]
EIA Penalty Threshold	[Utility-Specific Conservation - Decoupling Threshold]
Excess Savings for Carbon (Dept. of Commerce driven)	(Referencing results, rather than targets) The difference of [Total Utility-Conservation Achievement – Total Utility Conservation Goal]
PSE Excess Savings for Penalty Thresholds (UTC Driven)	(Referencing results, rather than targets) The difference of [(Total Utility-Specific Conservation Achievement) - (EIA Penalty Threshold + Decoupling Penalty Threshold)]

Acronyms

Acronym	Definition
ACP	Annual Conservation Plan
aMW	Average MegaWatt. An expression of energy (versus "power"). It is used to express very large amounts of energy. The term represents an average of power (Megawatts [MW]) used over time (the standard term being one year or 8,760 hours). Thus, 1 aMW = 8,760 MWh.
BCP	Biennial Conservation Plan
BEM	Business Energy Management
BOMA	Building Owner and Managers Association
CFL	Compact Fluorescent Lamp
C/I	Commercial/Industrial. References programs in the Business Energy Management sector.
CRAG	Conservation Resource Advisory Group
DSMc	Demand Side Management central. A comprehensive project management system, developed and maintained by Nexant.
EES	Energy Efficiency Services; a PSE legacy acronym that is still associated with some tracking and reporting systems and databases, referencing Energy Efficiency's former name. (Eliminating this reference would cause severe disruption of queries and reports in some systems and filing structures.)
EE	Energy Efficiency
EME	Energy Management Engineer
EM&V	Evaluation, Measurement and Verification
HVAC	Heating, Ventilation and Air Conditioning
IRP	Integrated Resource Plan
IRPAG	Integrated Resource Planning Advisory Group
kWh	Kilowatt Hour. 1,000 watt-hours = 1 kWh, which is equivalent to 10 100-watt incandescent lamps being turned on for one hour.
LED	Light Emitting Diode (typically, a lamp type)
MWh	Megawatt-hour. 1,000 kWh = 1 MWh
NEIs	Non-Energy Impact, Quantifiable. Formerly known as Non-Energy Benefit, or NEB. Attributes having a direct cost-effectiveness correlation applicable to the Total Resource Cost test. It is important to note that any reference to NEIs in any PSE document refers to those that are quantifiable. Any non-quantifiable benefits will be specifically noted.
NEEA	Northwest Energy Efficiency Alliance
RCW	Revised Code of Washington.
REM	Residential Energy Management

RTF	Regional Technical Forum, an advisory committee and a part of the Northwest Power and Conservation Council. The RTF develops standardized protocols for verifying and evaluating conservation.
SBDI	Small Business Direct Install (program within the BEM Sector, Commercial Rebates).
TRC	Total Resource Cost. The cost to the customer and/or other party costs to install or have installed approved Measures plus Utility Costs and minus Quantifiable Benefits (or Costs).[8]
UC	Utility Cost: The Company's costs of administering programs included, but not limited to, costs associated with incentives, audits, analysis, technical review and funding specific to the Measure or program and evaluation.[9]
UES	Unit Energy Savings. Formerly "Deemed", the RTF updated the term in 2011.
WAC	Washington Administrative Code
WUTC, or UTC	Washington Utilities and Transportation Commission

[8] Schedule 83, section 4, Definitions, #z. Schedule 183, section 4, #x.

[9] Schedule 83, section 4, Definitions, #bb. Schedule 183, section 4, #z.

Conclusion

This concludes the Energy Efficiency 2021 Annual Report.

Please refer to the Report's Exhibits and Supplements for additional Energy Efficiency details:

A. Exhibits Included in the 2021 Report of Conservation Accomplishments

- Exhibit 1: Savings Goals & Expenditures
- Exhibit 2: Cost-Effectiveness Calculations
- Exhibit 4: Prescriptive Measures Offered in 2021
- Exhibit 5: NEEA 2021 Report of Activities and Initiatives
- Exhibit 7: Requirements Compliance Checklist

B. Supplements

- Exhibit 1 (Table of savings and expenditures)
  - Supplement 1: 2021 Actual Expenditures Compared to Actual Spends
  - Supplement 2: Portfolio Measure Category Counts
- Exhibit 2
  - Supplement 1: Cost-Effectiveness Overview
  - Supplement 2: Non-Energy Impact Developments
- Exhibit 6 (The Evaluation Plan is excluded from this report)
  - Supplement 1: Evaluation Studies and Evaluation Report Responses Performed in 2021

Energy Efficiency looks forward to a productive and successful 2022.

Respectfully submitted,

PUGET SOUND ENERGY

Puget Sound Energy
Energy Efficiency