2019

Annual Report

And

2018-2019 Biennial Summary

Of

Energy Conservation Accomplishments

June 1, 2020

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PSE PUGET SOUND ENERGY

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I. EXECUTIVE SUMMARY

A. Puget Sound Energy's 2019 Annual Report and 2018-2019 Biennial Summary of Conservation Accomplishments

Puget Sound Energy's (PSE's or The Company's) Energy Efficiency department presents this Report of 2019 Conservation Accomplishments and its 2018-2019 Biennial Summary of Energy Conservation Accomplishments (Report), satisfying WAC 480-109-120(3). This report provides discussions of specific 2019 program achievements, and provides the required 2018-2019 biennial achievement information stipulated in WAC 480-109-120(4)(d).

The majority of the Report details 2019 initiatives, activities, and adaptive management steps employed to be responsive to the expectations of PSE customers and meet savings goals of Energy Efficiency programs funded by the Electric and Natural Gas Conservation Riders. Table I-1 presents the 2019 Total Utility Conservation Achievement results, and the Total Resource Cost (TRC), and Utility Cost (UC) benefit-to-cost (B/C) ratios for electric and natural gas conservation programs.

Table I-1: Energy Efficiency 2019 Electric Savings and Cost-Effectiveness Results

2019	Savings	Expenditures	Total Resource Cost	Utility Cost
Electric (MWh)	237,925 27.2 aMW	$73,398,438	1.58	2.12
Percent	*104.0%*	*87.6%*		
Goal/Budget	228,773 (26.1 aMW)	$83,793,666		
Gas (Therm)	3,228,159	$17,755,125	1.46	1.56
Percent	*102.6%*	*111.6%*		
Goal/Budget	3,147,391	$15,910,511		

237,925 MWh divided by 8,760 hours = 27.2 aMW

Savings are stated in terms of first-year annual figures, at the customer meter, without line loss.

The Report will clearly identify discussions and data that pertain specifically to 2018-2019 total biennial achievement.

This year, PSE added two new chapters to its standard Annual Report format:

- Chapter 3: 2018-2019 Energy Efficiency Biennial Results, and
- Chapter 14: 2018-2019 Biennial Adaptive Management Summary

PSE also includes brief biennial discussions in the Executive Summary, Chapter 15: *Compliance*, and other applicable points within the Report. These are clearly identified and specially formatted[1] to distinguish from the 2019-specific details, which are the primary focus of this Report. PSE presents the biennial information in a summary format, as the complete 2018 Annual Report is filed in Docket UE-171087, and is available for reference. PSE provides a summary of the Total Utility Conservation Achievement 2018-2019 key metrics in Table I-2.

Table I-2: Energy Efficiency 2018-2019 Biennial Electric Key Summary Values

2018-2019 Electric Portfolio Key Summary Values				
Conservation Savings				
Description	MWh Target *(per Table III-6)*	MWh Actual (Verified & Trued-up)	Notation	Percent Achieved
Total Utility Conservation	**520,456**	**549,115**	*Actual includes adjustments and true-ups*	**106%**
Less exclusions (NEEA, Pilots, 449s)	(48,227)	(40,830)		
EIA Penalty Target	*448,109*	*448,109*		*100%*
Decoupling Penalty Target	*23,658*	*23,658*	*Decoupling added to Target after EIA Penalty calc*	*100%*
Excess Savings Target *(Potential)*	-		*Target does not account for any excess.*	
Excess Savings (Actual)		**36,518**		
2018-2019 Total Electric Conservation Expenditures				
	Budget	Actual		Percent
Total Portfolio	$183,836,280	$ 164,485,034		89%
2018-2019 Total Portfolio Cost-Effectiveness				
	Total Resource Cost Test	Utility Cost Test		
Benefit-to-Cost Ratios	1.64	2.17		

[1] 2018-2019 biennial summary discussion headings that are not in a specific 2018-2019 chapter will be highlighted with a uniquely-colored text. For instance: 15.a. 2018-2019 Summary Discussion

PSE discusses the elements that comprise the calculation of the Total Utility Conservation Achievement results indicated above, along with additional biennial summaries, in Chapter 3: *2018-2019 Energy Efficiency Biennial Results*. It is important to distinguish that PSE references biennial achievements relative to the as-filed 2018-2019 Biennial Conservation Plan (BCP), and Commission approved Targets and Thresholds. PSE does not make comparisons to the [2018 plan-vs-actuals + 2019 Annual Conservation Plan (ACP) update-vs-actual].[2]

B. 2019 Results

In 2019, PSE's Energy Efficiency department continued its exemplary standard of meeting energy savings goals and customer expectations for energy efficiency programs, while effectively and prudently managing costs for its customers.

Overall, electric conservation exceeded the savings goal of 228,773 MegaWatt-hours (MWh) or 26.1 average MegaWatts (aMW) by 4 percent, achieving 237,925 MWh, or 27.2 aMW. Electric expenditures finished the year 12 percent lower than planned: $73.4 million, compared to a budget of $83.8 million.[3]

Natural gas programs exceeded savings goals for the year by 3 percent: 3.23 million therms against a goal of 3.15 million therms, while natural gas expenditures were 12 percent higher than planned, finishing the year at $17.75 million, compared to a budget of $15.9 million. PSE provides detailed savings and expenditure information by program in Exhibit 1: *Savings and Expenditures.*

PSE's reported Total Utility Conservation Achievement include Pilots with Uncertain Savings and Northwest Energy Efficiency Alliance (NEEA) savings.[4] PSE excludes these savings from its EIA Penalty Threshold per agreements reached with PSE's Conservation Resource Advisory Group (CRAG) and the Washington Utilities and Transportation Commission (UTC, or Commission).

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[2] All 2019-specific results in this Report are based on comparing actuals to 2019-ACP figures.

[3] Expenditures for PSE's entire electric Portfolio include Net Metering allowable expenses, which were $1.53 million in 2019.

[4] In the 2018 Annual Report and the 2019-specific data in this Report, PSE reports the savings estimated by NEEA prior to the 2018-2019 biennium. NEEA provided their verified savings in April, 2020, and PSE trued up and adjusted the Total Utility Conservation Achievement actual savings accordingly, as discussed In Chapter 3.

PSE includes complete discussions of Pilots with Uncertain Savings in Chapter 8. PSE provides a summary of NEEA's 2019 savings and expense metrics in Chapter 9: *Regional Initiatives.* NEEA also provides additional 2019 accomplishment details in Exhibit 10: *NEEA 2019 Report of Activities and Initiatives*.

Energy Efficiency's 2019 Portfolio electric TRC B/C ratio was 1.58, with a UC B/C ratio of 2.12. PSE finished the year with a natural gas TRC of 1.46, and a UC of 1.56. Both TRC figures include a 10 percent conservation credit, and exclude the Low Income Weatherization cost-effectiveness metrics.[5] Although this is not standard for natural gas cost-effectiveness reporting, it is a useful representation in light of the UTC workshops on the considerations of natural gas cost-effectiveness calculations.[6]

1) Key 2019 Results Drivers

Program reviews in Chapters 5 and 7 through 9 contain extensive discussions on the key drivers of programs' savings and expenditure results. Supporting functions, such as the Verification Team, Energy Efficient Communities, and Energy Advisors, discussed in Chapters 11 and 12, also provide important contributions to the Portfolio's savings success. PSE provides high-level summaries here, and in Chapter 2: *Introduction*.

a. Savings

A primary contributor to Energy Efficiency's notable 2019 electric savings results in both the Residential Energy Management (REM) and Business Energy Management (BEM) Sectors was customers' enthusiastic acceptance of LED lamps, and the ever-changing LED technologies. This is particularly reflected in the sales of LED multipacks in Retail Lighting, and Tubular LED (TLED) sales in the Lighting to Go and Business Lighting programs: all of which exceeded their electric savings goals.

[5] LIW cost-effectiveness is, however, calculated and presented in Exhibit 2. However, the electric figures are omitted from the overall Portfolio cost-effectiveness, consistent with WAC 480-109-100(10). For consistency, PSE omitted the natural gas LIW figures as well.

[6] In a Docket UG-121703 April 2013 workshop, participants discussed the merits of applying a conservation credit, similar to the 10 percent value applied for electric cost-effectiveness calculations. For consistency, PSE chose 10 percent for this representational value.

Program staff proactively utilized data analysis, customer surveys, and marketing intelligence to tailor their offerings, adjust incentives—including limited-time-offers—to maximize market demand, and respond to customer service expectations. Energy Efficiency program staff adaptively managed their customer offerings and maximized services in both the Residential and Business Sectors.

Several REM programs collaborated on the successful Manufactured Home Campaign that resulted in over 2,800 customers participating, and a 199 percent increase in electric savings from 2018. Additionally, PSE successfully engaged manufacturers to partner in rebate offerings, effectively doubling rebate amounts in the Home Appliances and Space Heat programs for limited timeframes, and maximizing customer participation. The Residential Showerhead program benefited by working with a major retailer and manufacturer to carry a new showerhead line.

The Low Income Weatherization (LIW) program exceeded its natural gas goal by an impressive 35 percent as a result of a large Seattle boiler project, and the Space Heat program realized continued support of its high-efficiency natural gas furnace measure. The Multifamily New Construction program established itself with developers and builders in securing a dependable pipeline of projects. The Commercial Midstream model, while a pilot in 2018, achieved significant traction in 2019, and was a unquestionable success, achieving 185 percent over its 2019 natural gas savings goal.

Some programs experienced lower-than-expected electric and natural gas savings in 2019. Drivers included implementation delays, marketplace and cost variability, product saturation, unexpected custom grant project cancellations, and lagging program engagement.

For example, the Multifamily Retrofit third-party implementer was unable to conduct direct install activities during the harsh January 2019 winter conditions. The SBDI program experienced lower-than-expected savings values on natural gas sprayheads, while its showerhead and aerator measures were saturated in the marketplace. Cancelled Commercial New Construction projects impacted both the electric (cancelled indoor agriculture lighting) and natural gas savings. The Single Family New Construction natural gas and electric programs had difficulty gaining traction with builders, while natural gas residential showerheads were impacted by the cost-ineffectiveness of its ShopPSE online store approach.

i. Pilots and Pilot-Analogous Initiatives

Throughout the year, Energy Efficiency Staff pursued several measures and program innovations that PSE classifies as pilot-analogous, including the installation of over 1,400 line voltage web-connected thermostats in the Multifamily Retrofit program, a manufactured home replacement pilot, and no-cost ductless heat pump installations for more than 150 previously-weatherized manufactured homes in the LIW program.

The Space Heat program participated in a BPA heat pump water heater demand response pilot, and the Commercial HVAC program, in collaboration with other regional utilities, created a revised prescriptive Advanced Rooftop Controller (ARC) measure. The Weatherization program implemented a limited-time bundled incentive offering for customers that installed more than one weatherization measure, and the Industrial Systems Optimization Program (ISOP) created an Industrial Strategic Energy Management (I-SEM) offering, which provides behavioral training similar to the Commercial Strategic Energy Management (CSEM) program.

ii. Program Support, Outreach and Events

The work performed by Energy Efficiency's Marketing, Programs Support, Outreach, and Energy Advisors contributed enormously to conservation savings achievements in 2019. These organizations managed several successful promotions, energy-efficiency campaigns, pop-up events, and retail store trainings. Energy Efficient Communities implemented community and business events—including those with a focus on tribal and English-as-a-second-language segment, and small business blitzes. Successful activities included the Energy Upgrades campaign, community outreach to rural segments and business without a downtown core, and social media initiatives.

PSE sponsored tabling events at food banks, energy fairs, and small business "meet & greets". Programs provided field services in 335 locations, with more than 2,600 visits. PSE tailored its Small Business blitzes to include multiple days in more than one adjoining community. These resulted in greater customer exposure, awareness, engagement, and ultimately, conservation savings.

b. Expenditures

The majority of Energy Efficiency organizations' 2019 electric and natural gas expenditures finished the year within expectations. The results reflect the commendable focus that Energy Efficiency staff put on the prudent application of PSE's customer funding. Exhibit 1, Supplement 1: *2019 Actual Expenditures Compared to Anticipated Spends*, provides a program-level comparison of costs incurred by budget category. Readers will recognize figures in the Supplement's tables that PSE discusses in the program detail reviews. 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 2019 under-budget in the electric portfolio. The natural gas expenditures exceeded planned spending as a result of higher measure costs, fewer completed projects, and market conditions.

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. One example is the Retail staff's efficient application of marketing and promotional efficiencies, which lowered planned marketing expenses. Many Outside Services costs were below their anticipated spending levels, in part, as a result of implementation delays, project holds, or efficiency gains realized by program staff.

Additional expenses were incurred in the programs that participated in the Manufactured Home Campaign, but those were mainly DBtC. A large journal entry from the Large Power User/Self-Direct program to Commercial/Industrial Retrofit also caused a significant variance in both of those programs.[7] The Contractor Alliance Network's (CAN) revision of the program's technologies and website led to an overspend for the year.

[7] At the end of the Large Power User/Self-Directed program's 4-year cycle, unused funds, allocated for 449 customers, are trued up and returned to the general Conservation fund.

Program staff achieved additional cost-savings through the continuous improvement of measure offerings and proactive management of incentives. For instance, the Lighting to Go and Business Lighting programs aligned their TLED incentives. Business Lighting also increased their Luminaires Level Lighting Control (LLLC) incentive from $50 to $75 to spur additional savings. Streamlined customer-centric processes also led to cost savings, including the continuous improvement to the New Construction Lighting Power Density (LPD) workbook, and a new training curriculum in the Commercial Strategic Energy Management (CSEM) program.

Some support organizations also realized variances from their originally-planned expenditures, which included lower staffing expenses in some Portfolio Support and Research & Compliance groups. NEEA invoice payment timing resulted in an apparent variance, although PSE has paid all NEEA invoices. The Conservation Supply Curves and Strategic Planning organization had some Outside Services costs lower than planned, due to a delay of the Commercial Building Stock Assessment field visits. The Energy-Efficiency Brochures team consolidated the assortment of literature, resulting in significant cost savings.

2) Enhancing 2019 Customer Participation in Conservation Efforts

Building on PSE's years of achievements in encouraging customer participation, Energy Efficiency program staff consistently demonstrated their commitment to exceeding customer expectations of their programs throughout 2019.

a. Maximizing Customer Awareness

PSE continued to engage customers with new and broader outreach campaigns, reaching customers in their communities, at food banks, energy fairs, trade shows, and in their businesses.

In 2019, PSE and its Outreach partners completed over 80 high-impact and "Pop-up" events in retail locations with high foot traffic. The Energy Efficient Communities team conducted 5 Small Business Direct Install blitzes in 4 communities, engaging with more than 170 small business customers. The team also conducted 10 Home Energy Assessment door-to-door blitzes, knocking on almost 10,000 doors, and securing almost 1,000 program sign-ups.

Energy Efficiency's award-winning Energy Upgrades campaign—which included transit ads, social media, emails, direct mail, radio, etc., resulted in over 41 million advertising impressions, and 6 months of limited-time-offers on select LED products. The campaign included 36 different in-store retail blitz events, with almost 15,000 Golden Tickets distributed—more than 14,000 of which were redeemed during the events.

Other Energy Efficiency retail initiatives also resulted in maximized customer awareness. The Retail staff conducted an extensive and wide-ranging effort to ensure retailers provide customers comprehensive PSE energy-efficiency information, with over 2,600 field visits to over 330 stores in 2019. Field staff verified that retailers' staff were trained on PSE offerings, including limited-time-offers, and that point-of-purchase signage and eligible product was correctly placed. In its Multifamily Retrofit program, PSE continued its initiatives to encourage multifamily tenant participation by awarding building owner/manager "Strive for Five" plaques, and participating in energy fairs.

PSE also continued its energy-efficiency focused digital media initiatives, including award-winning television advertisements, featuring characters "JoAnne", "Rocky", "Stan", "Art", and "Sally".[8] The energy-efficiency ads, generating more than 32 million impressions, provide a humorous and memorable call to action for customers to participate in Energy Efficiency programs.

PSE's Customer Awareness Tool—delivering energy-efficiency email messaging such as Unusual Usage Alerts, and Seasonal Readiness Alerts—has generated over 600,000 alerts, and up to 300,000 reports twice a year to customers. PSE's "Savings & Energy Center" web presence also provides a strong customer engagement, with over 1.2 million web page views and almost 500,000 myPSE account Energy Center accesses in 2019.

b. Enhancing the Customer Ease of Participation

In 2019, Energy Efficiency continued its focus on making participation easier for customers.

[8] A few of the newer energy-efficiency television characters are featured on this Annual Report cover page.

Residential and Business program staff streamlined a number of incentive application processes, enhanced channel and customer training, and aligned key measure (TLEDs, for instance) offerings across programs. The very successful Manufactured Home Campaign, comprised of several different REM programs, integrated program staff assignments to centralize and focus critical expertise on this Hard-to-Reach market segment.

A significant customer enhancement is the ability to input and monitor the progress of their rebate applications using Energy Efficiency's Public User Interface (PUI), which is a program within the Demand Side Management central (DSMc) system. In 2019, PSE also implemented the option for customers to apply their rebate directly to their monthly bill: an option that nearly 9 percent of customers elected.

Energy Efficiency's emphasis on providing easy participation in conservation offerings extends to its channel partners. Initiatives included an emphasis on developing an enhanced trade ally network for the Contractor Alliance Network (CAN) program, consisting of 180 members. Program staff also collaborated with NEEA staff to provide midstream training, marketing, and sales incentives. Energy Efficiency also provided direct training for many of its customers. For instance, CSEM customers had the ability to participate in 3 in-person and 10 webinar-based sessions. The Industrial Systems Optimization Program (ISOP) also applied proven CSEM techniques, creating a "cohort" program for its customers. Cohorts can network with each other, share conservation learnings and tips, and provide useful feedback to PSE on effective energy-efficiency strategies.

i. Hard-to-Reach and Potentially Underserved Customers

PSE also continued its efforts to connect with its potentially Hard-To-Reach (HTR) customers, including those in rural areas, commercial tenants, low- and moderate-income customers, and customers living in manufactured homes. In addition to its expanded small business and community blitzes, PSE also enhanced initiatives that emphasize its focus on HTR segments.

In 2019, the Low Income Weatherization program, in concert with Washington state agencies, implemented two of four scheduled manufactured home replacements.[9] Also, in collaboration with The Energy Project, the program facilitated the installation of more than 150 no-charge ductless heat pumps in manufactured homes that had been previously weatherized.

PSE also distributed targeted emails and direct mailings, offered Home Energy Assessments, and provided higher rebates for customers living in manufactured homes as part of its Manufactured Home Campaign. PSE also expended significant effort to reach its English-as-a-second-language customers. These, and other initiatives to target the hard-to-reach and proportionately underserved segments are discussed in Chapters 5, 7, 11, and 12.

3) 2019 Adaptation through Continuous Improvement

Energy Efficiency program staff continued their ongoing work to enhance processes and program offerings—especially customer-facing processes—through its consistent application of continuous improvement principles. The men and women of Energy Efficiency focused on removing barriers to effectiveness, improving productivity, optimizing their measure offerings, and creating experiences that enrich customers' lives.

Through its commitment to adaptively managing its business, PSE continued its progression toward operational excellence. The following list highlights some of the key improvements and adaptation Energy Efficiency implemented. Readers will find details in the chapters that follow. In 2019, Energy Efficiency staff:

- Updated the DSMc rebate portal design to provide program staff much better flexibility to modify existing or create new measure offerings.
- Proactively managed several funding sources and requirements in the Low Income Weatherization program to effectively exceed its electric and natural gas savings goals.

[9] By the time this Report is filed, a third family has moved into their new home, and the fourth has been delayed due to the impacts of the Covid-19 pandemic.

- Improved retail in-store customer awareness by continuing retail trainings and engaging customers in shopping aisles as they're making energy-efficiency purchasing decisions.
- Engaged manufacturers in creative rebate offerings that for some programs, effectively doubled customer incentives for limited periods.
- Added an assisted-installation smart thermostat measure to the Home Energy Assessment program, resulting in the installation of 77 measures in manufactured homes. Additionally, PSE offered instant rebates on smart thermostats at pop-up events.
- Designed a new CAN/Trade Ally Network portal and trained contractors on usage and rebate submissions. Re-branded CAN to Trade Ally Network (TAN).
- Developed a standalone smart thermostat rebate in the Single Family New Construction program to assist builders in meeting stringent energy codes.
- Reviewed and streamlined verification requirements for the HVAC Controls Protocol to encourage program participation from smaller buildings by reducing customer/contractor documentation while maintaining an appropriate level of rigor in the verification process.
- Implemented a new incentive structure for ISOP customers, which may provide up to 100 percent of the measure cost.

4) Notable 2019 Energy Efficiency Accomplishments

Highlights of various notable 2019 accomplishments, detailed in the following program-specific discussions include:

- The Retail Lighting program exceeded its electric savings goal by 26 percent, or more than 15,000 MWh.
- The Low Income Weatherization program exceeded its electric goal by 35 percent and its natural gas goal by 17 percent.
- The Commercial Midstream natural gas program exceeded its goal by 185 percent, or 380,000 therms.
- The Energy Efficient Communities organization engaged 170 small businesses and completed more than 100 upgrades as part of the small business community blitzes, engaged with more than 250 businesses as a part of small business meet-and-greets, and partnered with 24 non-profit organizations (Powerful Partnerships) that specialize in supporting vulnerable populations or environmental protection.

- Customer Awareness Tools' Unusual Usage Alerts open rates were higher than industry standards: of the more than 418,000 alerts sent, customers opened 48 percent. Although high by national standards, it is believed that northwest regional residents tend to have a higher awareness and concern with managing their energy use, which may be a driver in these open rates.
- DSMc's PUI has greatly streamlined PSE-processed rebate management for customers.
- The Energy Efficiency Events team reached out to over half a million customers through a number of diverse community events.
- SBDI established several conservation district partnerships across the PSE territory to collaboratively promote PSE services to agricultural customers.
- The ISOP program engaged with 16 customers, 12 of which completed an ISOP project.

C. 2019 Compliance

By the end of 2019, the Company had completed all 2018-2019 compliance requirements.[10] In each biennium, the majority of requirements are considered completed concurrent with the filing of the following biennium's Conservation Plan. Exhibit 9: *Requirement Compliance Checklist* provides specific condition compliance status, and Chapter 15, *Compliance* includes additional compliance discussions.

The below list outlines the primary conservation-related requirement documents[11] that govern Energy Efficiency's operations:

A. RCW 19.285 and WAC 480-109;
B. Exhibit F, the 2002 Stipulation Agreement, Docket UG-011571;[12]
C. The 2010 Electric Settlement Agreement, Docket UE-100177; and
D. Order 01, Attachment A of Dockets UE-171087 and UG-171088.

[10] Notable exceptions are only those that have a deliverable date of 2020; particularly those related to the reporting and Commission review of PSE's 2018-2019 conservation achievements.

[11] 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.

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

D. 2018-2019 Biennial Results

This is the first year that PSE has availed itself of rules outlined in WAC 480-109-120(4)(d), which allow utilities to combine the second-year specific Annual Report with the Biennial Electric Achievement Report. For maximized clarity, PSE will distinguish between 2019-specific versus 2018-2019 biennial achievement summaries.

E. Report Organization

Chapter 2: *2019 Energy Efficiency Results*, delves into the department's important areas of focus that impact the majority of its operations, and provides expanded discussions of overall 2019 accomplishments, key drivers, cost-effectiveness, and areas of customer focus. Sector-level overview tables provide a brief snapshot of each Sector's results.[13]

A new Chapter 3: *2018-2019 Energy Efficiency Biennial Results* provide summaries[14] of the biennial Targets and Thresholds, key savings achievement, and budget versus actual expenditure values. There is also additional content relative to specific operations that PSE conducts to true up, vet, adjust, and verify the various contributors to its Total Utility Conservation Achievement results. Chapter 3 will be the primary discussion of PSE's compliance with the requirements listed in WAC 480-109-120(4). A new Chapter 14: *Biennial Adaptive Management Summaries*, will provide tables listing examples of PSE's application of adaptive management principles in both 2018 and 2019.[15]

Chapters 4: *Residential Energy Management Overview*, and Chapter 6: *Business Energy Management Overview* will also provide brief 2019 accomplishment summaries. The remaining chapters provide program-detail discussions. These are Residential Energy Management (REM), Business Energy Management (BEM), Regional, Measurement & Verification, Portfolio Support, Research & Compliance, and Other Electric Programs. Each provides a business-unit and program-level reviews of adaptive steps implemented, and achievements realized in 2019.

[13] The order of these discussions corresponds with Sector headings outlined in Exhibit 1: *Savings and Budgets.*

[14] PSE assembles 2018-2019 biennial summaries from the 2018 Annual Report (filed in April, 2019 in Docket UE-171087) and the 2019 details provided in this Report.

[15] PSE formerly provided these tables, satisfying WAC 480-109-120)(4)(b)(vi), in a separate Biennial Electric Achievement Report.

PSE presents the 2019 Exhibits 1, 2, 5, 6, 9, and 10, and their associated Supplements—listed on page vii of this Report—at the conclusion of the Report. Consistent with WAC 480-109-120(3)(v), Exhibit 6, Supplement 1 provides copies of all 2019 evaluation studies conducted in 2019. PSE also provides Appendices associated specifically with the 2018-2019 biennium:

- Appendix 1: PSE's 2018-2019 BECAR (Biennial Electric Conservation Achievement Review), consistent with WAC 480-109-120(4)(v).
- Appendix 2: 2018-2019 Exhibit 2: Biennial Cost-Effectiveness,
- Appendix 3: The Department of Commerce EIA 2018-2019 Report (consistent with WAC 480-109-120(3)(c),

These contain a significant amount of additional Energy Efficiency detail.

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II. 2019 ENERGY EFFICIENCY RESULTS

The discussions in Chapter 2 provide Portfolio highlights of 2019-specific key performance areas for the Energy Efficiency Sectors: savings and expenditures; five-year trends; cost-effectiveness ratios; Direct Benefit to Customer (DBtC) results; focus on the customer; measure counts overview; memberships and sponsorships; and compliance.

PSE discusses 2018-2019 biennial result summaries in Chapter 3: *2018-2019 Biennial Results*.

A. Key 2019 Portfolio Results

PSE maximized electric and natural gas conservation savings while prudently and effectively putting its customers' Conservation Rider funding to work in 2019. Table II-1 provides Sector-level views of 2019 electric and natural gas savings results.

Table II-1: Energy Efficiency 2019 Savings Results by Sector

2019	Residential	Business	Pilots	Regional	Total
Electric (MWh)	113,937	112,018	0	11,970	237,925
Goal	100,816	114,407	750	12,800	228,773
Percent	113.0%	97.9%	0.0%	93.5%	104.0%
Natural Gas (Therm)	1,455,129	1,773,030	0	na	3,228,159
Goal	1,584,254	1,561,137	0		3,145,391
Percent	91.8%	113.6%			102.6%

In 2019, Energy Efficiency achieved Portfolio electric savings of 237,925 MegaWatt-hours (MWh), versus a goal of 228,779 MWh, and natural gas savings of 3.23 million therms, as compared to a goal of 3.15 million therms. Portfolio electric expenses were $73.4 million, versus a budget of $83.8 million. Natural gas expenses were $17.8 million, as compared to a budget of $15.9 million. As readers will note, the portfolios' savings-to-spending ratios were not directly proportional.

In the electric portfolio, program staff created significant efficiencies, with highly cost-effective savings that exceeded expectations. In the natural gas portfolio, which typically consists of higher-cost measures, customer projects that are more prone to variability, and there was a higher rate of fixed costs across some programs. PSE discusses these contributing factors in the following key driver reviews, as well as the detailed program reviews in Chapters 5, 7, 11, and 12. PSE presents electric and natural gas expenditures figures for each Sector in Table II-2.

Table II-2: Energy Efficiency 2019 Expenditures by Sector

2019	Residential	Business	Pilots	Regional	Portfolio Support	Research & Compliance	Other Electric	Total
Electric	$35,216,613	$23,482,780	$20,565	$4,052,907	$6,358,021	$2,733,257	$1,534,295	$73,398,438
Budget	$37,607,323	$29,294,509	$244,130	$5,200,000	$7,238,303	$3,117,703	$1,091,698	$83,793,666
Percent	93.6%	80.2%	8.4%	77.9%	87.8%	87.7%	140.5%	87.6%
Natural Gas	$8,865,878	$5,125,028	$0	$2,227,813	$1,168,328	$368,078	na	$17,755,125
Budget	$7,961,748	$3,929,173	$10,000	$2,434,244	$1,219,333	$356,013		$15,910,511
Percent	111.4%	130.4%	0.0%		95.8%	103.4%		111.6%

Overall total amounts may vary from those presented in Table I-1 and Exhibit 1 due to multiple rounding.

B. Conservation Savings

For both the electric and natural gas portfolios, each Energy Efficiency Sector achieved strong results, with several programs substantially exceeded their savings goals. Those that fell short in one fuel type, however, often met or exceed the savings goal in the contrasting fuel type.[16] Savings achievements reflect PSE's commitment and diligence in delivering quality energy-efficiency programs that provide customers with participation options and are easy for customers to engage in. These efforts yielded notable conservation savings and are illustrative of the forward-thinking adaptive management steps program staff developed in 2019.

[16] For instance, the Web-Enabled Thermostat program achieved 93 percent of its natural gas goal, and 58 percent of its electric goal. Similarly, Commercial Kitchens exceeded its natural gas goal by 31 percent while achieving 85 percent of its electric savings goal.

The overall Portfolio achievement of 4.0 percent above its 2019 electric target and 2.6 percent over its natural gas target are noteworthy, considering challenges that program staff encounter each year. These include, but are not limited to ever-evolving marketplace barriers, increasing efficiency code standards, regulatory and legislative requirements, and the consistent reduction of prescriptive savings value.

1) Key Drivers of Electric Savings

Residential Energy Management's (REM's) 2019 electric achievement surpassed its goal by 13 percent. Many programs exceeded, or achieved near-goal electric savings results, with only Water Heat, Retail Showerheads, Multifamily Retrofit, Web-Enabled Thermostats, and Single Family New Construction programs falling short.

Business Energy Management (BEM) nearly achieved its electric target, missing by only 2 percent in 2019. Shortfalls in the Commercial/Industrial (C/I) New Construction—which is heavily dependent on large developmental projects, Commercial Kitchens and Laundry, and Commercial HVAC were offset by superior results in the Commercial Strategic Energy Management, Lighting to Go, and Commercial Midstream programs.

a. Effective Program Staff Management

In addition to proactively managing their suite of measure offerings to provide optimal services to customers, staff employed innovative approaches to manage their market presence and influence. For instance, program staff adjusted certain incentives or distribution methods to ensure optimal customer participation and cost-effectiveness. Measures that were underperforming or were cost-ineffective were retired or put on hiatus, and new measures were added when they were viable and market-ready.

Program staff continued existing retail and manufacturer partnerships, and established new relations with major manufacturers in several programs. These often effectively doubled equipment rebates in the respective programs. Others expanded Energy Efficiency's market presence. For instance, the engagement of a major manufacturers to the Residential Showerhead program boosted customer opportunities considerably, while the program's partnership with Uninex and Goodwill provided accessibility for lower-income customers.

A number of Commercial Rebates programs started to employ the midstream model with great success, and several Residential programs contributed to Energy Efficiency's successful Manufactured Home Campaign, increasing savings in each. The Industrial Systems Optimization Program (ISOP) implemented an innovating incentive structure, which rewards customers for accelerating their project completion, and the Commercial HVAC program developed a revised prescriptive Advanced Rooftop Controller rebate, in concert with other regional utilities.

Strong uptake of TLEDs in commercial applications, along with re-alignment of the TLED incentive structure, led to noteworthy results in the Business Lighting and Lighting-to-Go programs. Program staff also pursued initiatives that are innovative and are considered analogous to pilots. These include, but are not limited to, LIW's manufactured home replacement program, bundled weatherization rebates, Multifamily Retrofit's Line Voltage Connected Thermostats, and the Commercial/Industrial Retrofit's new Monitoring-based Commissioning (MBCx).[17] The Commercial Midstream program, which was a pilot in 2018, has proven to be a conclusive success.

b. Program Support Organization Contributions

Program Support organizations also made significant contributions to the electric savings results. Several programs worked with their contractor and Contractor Alliance Network (CAN) members, other utilities, and trade allies to maximize savings in key market segments, such as customers who are tenants rather than property owners, manufactured and mobile-home residents, and low-to-medium income customers. These engagements resulted in earlier involvement in new construction projects, a higher degree of collaboration, and enhanced expectations for savings delivery.

The Contractor Alliance Network (CAN) team expanded the service's capabilities to serve a broader range of customer needs. The organization created two limited-time opportunities: one to support the Manufactured Home Campaign, and a bundled incentive offering for customers participating in the Single Family Weatherization program.

[17] The MBCx offering is planned for implementation in 2020, after significant program staff effort in 2019.

As part of its outreach efforts, PSE's community "blitzes" focused on combining geographically nearby communities during each event, while also incorporating small business "meet and greets". Energy Efficient Communities and program staff also engaged more rural and English-as-a-second-language customers, and partnered with 24 non-profit organizations that special in supporting vulnerable populations or environmental protection. The organization's efforts resulted in 10 Home Energy Assessment blitzes, with more than 950 program sign-ups.

Over 150 small business were engaged in the Seatac/Pacific Highway corridor, and the team conducted over 200 engagements in Woodinville, Tumwater, Bow-Edison, Edmonds, Kent, DuPont, Cle Elum, Bellingham, Port Orchard, Monroe, Issaquah, and Snoqualmie. PSE had over 8,000 meaningful conversations with customers.

c. Key Driver Summaries

In the following sections, *i* and *ii*, Energy Efficiency discusses highlights of several drivers to achieving 237,925 MWh versus a 2019 goal of 228,773 MWh. PSE presents these, generally sorted in order of savings magnitude. The listings are not comprehensive reviews of all programs. Rather, the discussions focus on key significant contributors to PSE's electric savings: those that exceeded goals, as well as savings shortfalls. PSE provides individual program reviews in the Residential Energy Management and Business Energy Management program chapters.

i. Contributors to Surpassing Electric Savings Goals

1) Residential Lighting: 1 Savings achieved = 75,828 MWh versus a goal of 60,073, 126 percent of goal. By far, the largest contributor to Energy Efficiency's electric portfolio is the Retail Lighting program. The program exceeded its 2019 savings target by almost 16,000 MWh, in large part by continuing successful, established marketing strategies and campaigns. The program also leveraged marketing assets from previous years with minor updates, lowering costs, conducted special promotions with a large retail partner, and shared rebates with manufacturers.
2) Commercial Strategic Energy Management (CSEM): Savings achieved = 15,350 MWh vs a goal of 13,000, 118 percent of goal. Another large contributor to Energy Efficiency's electric savings achievement is the CSEM program, which exceeded its 2019 savings goal by 2,350 MWh.

Program staff implemented the Continuous Engagement Credit system, which encourages customers to continue to engage with the CSEM program over longer intervals. The program also focused on providing customers with exceptional training opportunities and energy management initiatives.

3) Lighting to Go: Savings achieved = 11,361 MWh versus a goal of 8,970, 127 percent of goal. The Lighting to Go program exceeded its savings goal by almost 2,400 MWh in 2019. The key drivers of this performance were Tubular LED (TLED) lamps and Recessed Can Retrofit kits. These two measures made up the majority of incentives paid and resultant savings. Both are quite popular with customers.
4) Single Family Space Heat: Savings achieved = 9,293 MWh versus a goal of 7,276, 128 percent of goal. Electric Space Heat continued to see an increase in heat pump installations, partially as a result of limited-time offers on ductless heat pumps, which combined PSE incentives with manufacturer financing incentives. PSE's continued focus on the manufactured home segment, which included substantially higher incentives, also contributed to the electric savings results.
5) Multifamily New Construction: Savings achieved = 6,165 MWh versus a goal of 3,752, 164 percent of goal. PSE continued to implement its updated program design, which provided proactive customer engagement and created a uniform pipeline of projects throughout the year, and allowed staff to capitalize on the Puget Sound construction boom. The program's increased outreach and stable program offerings led to its impressive electric savings results.
6) Low Income Weatherization (LIW): Savings achieved = 2,649 MWh versus a goal of 1,956, 135 percent of goal. The program's notable electric savings results are a reflection of staff's ability to effectively manage several funding sources, project application processes, and innovative pilot initiatives for a variety of residential structure types. The program managed a 131 percent increase in customers served, a 200 percent increase in free ductless heat pump installations, and an upgraded Weatherization Assistance webpage.[18] The program's contribution to PSE's increased focus on the manufactured home segment, along with production opportunities in the Multifamily market also contributed to its remarkable electric savings results.

[18] The Weatherization Assistance page became the second-most visited site on PSE.com, with an average of 5.39 minutes spent on the page per visit.

ii. Drivers of Lower-Than Expected Electric Savings Results

While the majority of Residential and Business programs completed 2019 with electric savings that exceeded goals, there were lower-than-expected savings in a limited number of programs. This often resulted from the continuous reduction of Unit Energy Savings (UES) values, retirement of cost-ineffective measures, unforeseen market conditions, customer-cancelled projects, or lower customer demand.

1) CI New Construction: Savings achieved = 17,038 MWh versus a goal of 20,000, 85 percent of goal. The almost 3,000 MWh shortfall can be attributed to several large indoor agricultural projects, scheduled for completion in 2019 that were cancelled.
2) Small Business Direct Install (SBDI): Savings achieved = 6,667 MWh versus a goal of 8,280, 81 percent of goal. Subsequent to a clarification of program referral policies to its field forces in late 2018, direct-install measures—in particular, the very popular TLEDs—diminished in 2019.
3) Retail Showerheads: Savings achieved = 1,369 MWh versus a goal of 1,568, 87 percent of goal. In 2019, the Showerhead program lowered the incentives on 1.75 to 2.0 GPM showerheads in order to maintain cost-effectiveness. Additionally, a major manufacturer participant had persistent reporting issues, which reduced 2019 rebates.
4) Commercial HVAC: Savings achieved = 623 MWh versus a goal of 1,084, 58 percent of goal. 2019 Commercial electric HVAC Savings did not meet expectations as the program struggled to gain traction with the Advanced Rooftop Control and Commercial connected thermostat rebate.
5) Single Family Water Heat: Savings achieved = 534 MWh versus a goal of 758, 70 percent of goal. PSE increased its water heat incentives as a part of its ongoing initiative to engage manufactured home customers in 2019. The electric water heat market continues to encounter barriers, and program staff worked closely with contractors to identify and remedy these market barriers.
6) Commercial Kitchens & Laundry: Savings achieved = 383 MWh versus 452, 85 percent of goal. The program fell slightly short of its electric savings goal largely because restaurant customers make purchasing decisions on a reactive, replace-on-failure basis. This creates program planning uncertainty. Program staff implemented new and improved in-store point-of-purchase training, signage, and delivery materials to accommodate customers' needs.

7) Single Family New Construction: Savings achieved = 138 MWh versus a goal of 286, 48 percent of goal. Builders have a more difficult time offsetting the higher incremental costs associated with achieving the minimum 20 percent above the Washington State Energy Code (WSEC) standard for the whole-home incentive. In response, PSE developed a standalone Energy Star® smart thermostat measure that will help new homes meet the standard.

2) Key Drivers of Natural Gas Savings Results

Commensurate with program staff's active and adaptive management of their suite of electric measures, they exercised great care to ensure that natural gas incentives were proactively managed, contractors and trade allies remained closely engaged, and measure offerings were adjusted to compensate for market conditions.

Natural gas savings are sensitive and susceptible than electric measures to variables such as construction project timelines, contractor engagement, and channel support. As discussed below, the Commercial/Industrial New Construction fell slightly short of its savings goal due to the availability of fewer projects, leading to lower-than-planned savings. Conversely, there were many projects that were scheduled to be completed in 2018, but actually closed in 2019 in the Multifamily New Construction program, resulting in higher-than-planned savings achievement. In the Small Business Direct Install program, UES values on spray heads fell below expectations, while the remaining natural gas measures were saturated in the program.

Staff's performance resulted in the overall natural gas portfolio exceeding its 2019 goal by 2.6 percent: 3.228 million therms, as compared to a goal of 3.147 million therms. The REM Sector finished the year 8 percent short of its natural gas savings goal, while BEM achieved 14 percent more than its 2019 goal.

a. Key Driver Summaries

In the following sections, *i* and *ii*, Energy Efficiency discusses highlights of top contributors to achieving its natural gas savings results: those that exceeded goals, as well as savings shortfalls. PSE has generally sorted these in order of savings magnitude, and they are not a comprehensive review of all programs. PSE provides individual program reviews in the Residential Energy Management and Business Energy Management program chapters.

i. Contributors to Surpassing Natural Gas Savings Goals

1) Single Family Space Heat: Savings achieved = 629,030 therms versus a goal of 504,161, 125 percent of goal. The Space Heat program exceeded its anticipated 2019 savings by more than 120,000 therms, or 25 percent above goal. PSE continued to see strong performance from the Energy Star® natural gas furnace measure for the third year in a row. The program also saw increased savings as a part of its participation in PSE's focus on manufactured home customers. Redemption of the natural gas tankless water heater measure exceeded PSE's expectations due to positive contractor response.
2) Commercial Midstream: Savings achieved = 587,522 therms versus a goal of 205,898, 285 percent of goal. The Commercial Midstream program exceeded its anticipated 2019 savings by more than 380,000 therms, or 185 percent above goal. Channel partners' response was quite enthusiastic. The ease of participation, with a minimum of paperwork and an instant rebate process is very attractive, making it especially impactful in the case of emergency replacements, where efficiency upgrades might not otherwise occur in downstream models. Distributors, in consultation with program staff, developed innovative ways to apply incentives, increased their equipment stock, and provided extended warranties.
3) Multifamily New Construction: Savings achieved = 181,981 therms versus a goal of 84,000, 217 percent of goal. The Multifamily New Construction program exceeded its natural gas savings goal by more than 115 percent. Many projects that were originally scheduled to be completed in 2018 were pushed into 2019. Additionally, the attention that program staff have paid to streamlined program design, early engagement with customers and developers, resulted in a continuous pipeline of projects.
4) Commercial Kitchens: Savings achieved = 113,058 therms versus a goal of 86,464, 131 percent of goal. The program achieved natural gas savings that were 31 percent above goal in large part due to a new and improved midstream distributor offering in 2019. This redesign included an informed and coordinated distributor outreach and education plan as well as in-depth and targeted training materials and tools designed for and with the distributors themselves. This improved midstream point of purchase (POP) approach and delivery doubled the pool of participating equipment distributors.

5) Home Appliances: Savings achieved = 16,950 therms versus a goal of 12,210, 139 percent of goal. Program staff recruited manufacturing partners, and were able to offer double rebates on Energy Star® clothes washers and dryers for limited periods. Customers in PSE's dual-fuel territories participated in the Appliance Decommissioning program at a higher rate than expected, resulting in an increase in the number of natural gas measures included in leave-behind kits distributed.
6) Low Income Weatherization: Savings achieved = 18,830 therms versus a goal of 16,080, 117 percent of goal. As a result of its proactive management of a variety of funding sources, multiple channel actors, and pilot-like initiatives, the program achieved 17 percent more natural gas savings than planned. The program was highly impacted by PSE's emphasis on the manufactured home market segment, which helped increase the natural gas savings. A large boiler replacement project in the city of Seattle also contributed to better-than-expected results.

ii. Influencers of Lower-Than-Planned Natural Gas Savings Results

1) Residential Showerheads: Savings achieved = 38,765 therms versus a goal of 116,701, 33 percent of goal. In 2019, PSE made the decision to phase out its online store *ShopPSE,* which was the sole source of natural gas showerheads through PSE. The costs to manage the website became more than the benefits derived, causing it to become cost-ineffective. Thus, natural gas savings fell short of the program's original estimations.
2) Small Business Direct Install (SBDI): Savings achieved = 689 therms versus a goal of 39,300, 2 percent of goal. The SBDI natural gas offerings were severely impacted by therm savings that were more expensive than originally anticipated. Additionally, aerator UES values have significantly declined and other measures are saturated (showerheads and sprayheads) from past PSE efforts.
3) Commercial/Industrial New Construction: Savings achieved = 68,545 therms versus a goal of 105,000, 65 percent of goal. Natural Gas savings in New Construction are primarily driven by a small number of large projects. In 2019, there were fewer large projects completed, resulting in savings being 35 percent lower than expected.
4) Commercial HVAC: Savings achieved = 1,876 therms versus a goal of 29,475, 6 percent of goal. In 2019, the program struggled to gain traction with the Advanced Rooftop Control and Commercial connected thermostat rebate.

5) Single Family New Construction: Savings achieved = 987 therms versus a goal of 16,045, 6 percent of goal. The Single Family New Construction program is still relatively new, and is continuing to ramp up after being on hiatus for a number of years. Natural gas savings were impacted by builders' difficulty in meeting stringent energy code and cost-effectiveness constraints.

C. Expenditures

Overall, the Energy Efficiency electric portfolio expenditures were 87.6 percent of anticipated spending in 2019. The natural gas portfolio finished the year at 111.6 percent of planned expenditure. These results were, in the majority of programs, commensurate with savings achieved. They reflect a high degree of an effective and prudent application of ratepayer funding in achieving savings that exceeded goal. Natural gas spending reflected higher costs associated with natural gas measures.

There were few notable variances in any particular expense category, reflecting the exceptional precision with which Energy Efficiency staff manage their programs to ensure the prudent use of PSE customer funds. Expenditures in savings-generating programs in REM and BEM were, to a large degree, proportionate with their electric and natural gas savings. Actual expenditures in the Portfolio Support and Research & Compliance Sectors finished the year well within expected parameters, with some organizations coming in below their expected spending. PSE discusses notable key expenditure drivers in the following section.

Exhibit 1, Supplement 1: *2019 Actual Expenditures Compared to Anticipated Spends* provides a comprehensive review of program budgets compared to actual expenditures. Readers may note some apparent variances in certain budget categories, such as Labor, Outside Services, and notably, Direct Benefit to Customer (DBtC).

1) Key Drivers of Expenditure Variances

In considering Energy Efficiency's electric spending of $73.398 million against a budget of $83.794 million, there were very few substantial electric expenditure variances that were not directly related to program incentives.

a. Prudent Program Management

For instance, in REM, which finished the year at 94 percent of anticipated electric spending and 112 percent of natural gas spending, there were better-than-expected marketing and promotional efficiencies in the Retail Lighting and Home Appliances programs. There were additional costs incurred as a result of several programs participating in the Manufactured Home Campaign, and coincident with implementation delays and manufacturer/vendor reporting (discussed in the preceding savings section), some programs realized lower costs.

The BEM Sector completed 2019 at 80 percent of its planned electric spending, and 130 percent of its natural gas budget. In the majority of cases, costs were linked with savings achieved, primarily in the Direct Benefit to Customer category. A large end-of-cycle journal entry in the Large Power User/Self-Directed program created a variance in that program (an apparent increase in DBtC expenses), as well as the receiving program, C/I Retrofit (an apparent reduction in DBtC expenses). Implementation of new or updated measures, such as the prescriptive Advance Rooftop Controller in the Commercial HVAC program, realized up-front costs, while uptake of the measure was low in 2019.

b. Program Support Expenditures

In the Portfolio Support Sector, there were very few budget variances. Lower staffing expenses drove some organizations' variances, along with vendor deliverable or project delays. Consolidating the Energy Efficiency brochure inventory resulted in an under-spend in EE Brochures' electric and natural gas budgets.

The Northwest Energy Efficiency Alliance (NEEA) electric expenditures-versus-budget were affected by invoice payment timing. Payments at times lag behind the invoices by one month, causing apparent lower-than-expected expenses. Additionally, PSE's natural gas collaborative contribution increased in the fifth year of NEEA's first natural gas business plan (2015-2019), which also impacted invoice payment timing.

Other notable variances were in the Program Evaluation and Conservation Supply Curves organizations, which were also impacted by lower staffing expenses. Additionally, the timing of some Outside Services work for the Regional Building Stock Assessment (RBSA) was delayed, which shifted some of those costs to 2020.

Another relatively sizeable charge was attributable to the Net Metering program. Distribution system charges (associated with net metered customers' use of PSE's infrastructure, as outlined in the Commission's Accounting Order in Docket UE-990016) are entered as miscellaneous charges.

c. Key Driver Summaries

In the following sections *i* and *ii* (electric discussions) and *iii* and *iv* (natural gas discussions), and generally sorted in order of expenditure magnitude, PSE provides brief discussions on the notable contributors to Energy Efficiency's electric spending variances. These are organized according to those exceeding their planned spending as well those who under-spent. Rather than a comprehensive review of all programs, the below discussions represent highlights of key drivers. PSE provides individual program reviews in the Residential Energy Management and Business Energy Management program chapters.

i. Highlights of Electric Programs Exceeding their Anticipated Spends

1) Large Power User/Self-Directed: Actual expenditures = $2,345,441 versus a budget of $623,199, 376 percent of budget. The majority of this budget variance is the result of an end-of-cycle true-up of approximately $1.97 million[19] for Schedule 449, Retail Wheeling customers. Per Schedule 258, if there are un-used Large Power Users-Self Directed funds at the end of a 4-year cycle, those funds are returned to the general conservation account. The transferred funds can then be used by any commercial or residential project. In 2019, the funds were transferred via journal entry to Schedule 250, C/I Retrofit.
2) Low Income Weatherization: Actual expenditures = $6,732,232 versus a budget of $4,688,441, 144 percent of budget. The key driver of Low Income Weatherization's electric overspend was due to Direct Benefit to Customer incentives, which were commensurate with the program's electric savings achievement.
3) Single Family Space Heat: Actual expenditures = $4,321,206 versus a budget of $3,460,106, 125 percent of budget. Linked to program electric savings, the Space Heat program exceeded its anticipated spend by almost $900,000, almost all of which was in Direct Benefit to Customer incentives.

[19] The true-up was classified as a cost to Schedule 258, and a credit to Schedule 250.

4) Net Metering: Actual expenditures = $1,534,295 versus a budget of $1,091,698, 141 percent of budget. The majority of the program's higher-than-planned expenditures derives from system distribution charges that exceeded plans by approximately $376,000.

   Labor costs associated with program administration were also slightly higher than anticipated, as program participation was quite strong in 2019.

5) Lighting to Go: Actual expenditures = $704,086, versus a budget of $479,864, 147 percent of budget. The program exceeded its 2019 budget by approximately $230,000. The majority of this was due to higher-than-planned Direct Benefit to Customer costs, and a slight increase in labor costs.

6) Home Appliances: Actual expenditures = $1,057,619 versus a budget of $850,025, 124 percent of budget. Direct Benefit to Customer costs were proportional to increased program savings. Outside Services costs were lower than planned, due to the reliance on lower-cost marketing tactics, such as targeted email sends, social media posts, and search engine marketing to promote the program.

7) Single Family Weatherization: Actual expenditures = $1,029,315 versus a budget of $843,713, 122 percent of budget. As a primary manufactured home focus provider, the program's Direct Benefit to Customer expenses were higher than originally planned. This was also proportional with the program's electric savings achievement.

ii. Highlights of Electric Programs Finishing 2019 under Budget

1) Multifamily Retrofit: Actual expenditures = $6,015,737 versus a budget of $9,315,207, 65 percent of budget. A key driver of Multifamily Retrofit's lower-than-planned spending is linked to a shortfall of planned Direct Benefit to Customer spending. This was attributed to a harsh January winter driving conditions and adverse driving conditions for the program's Direct Installers. The program has also seen a contraction of projects. Additionally, the program received a $267,000 reimbursement[20] from Cascade Water Alliance, for sharing costs for water-savings measures, and from a BPA/WSU pass-through reimbursements for line-voltage thermostat pilot installations.

[20] PSE's accounting system, SAP, reports expenses as positive numbers. Revenue is represented as a negative. Payments or reimbursements are reported as reductions against a program's planned budget.

2) Commercial HVAC: Actual expenditures = $227,268 vs $368,480, 62 percent of budget. Linked to the program's savings performance, the actual Direct Benefit to Customer was more than 50 percent lower than the anticipated spend.
3) Pay for Performance pilot: Actual expenditures = $20,565 versus a budget of $244,130, 8 percent of budget. The program's underspend is directly linked to the lack of customer participation. The planned Direct Benefit to Customer allocation of $225,000 went unspent in 2019.
4) Web-Enabled Thermostats: Actual expenditures = $219,774 versus a budget of $423,669, 52 percent of budget. Linked to the program's savings shortfall, a major manufacturer's website updates resulted in a lower-than-planned spending in both Outside Services and Direct Benefit to Customer.
5) Single Family New Construction: Actual expenditures = $97,240 versus a budget of $187,419 52 percent of budget. The program's underspend was linked to the relative age of the program, which was continuing to ramp up in 2019. Furthermore, stringent energy code and cost-effectiveness constraints limited the number of New Construction projects paid in 2019.

iii. Highlights of Natural Gas Programs Exceeding their Anticipated Spends

1) Commercial Midstream: Actual expenditures = $2,013,049 versus a budget of $591,160, 341 percent of budget. The program's Direct Benefit to Customer expenses, directly linked to higher-than-planned natural gas savings (185 percent above goal), was the key driver of Commercial Midstream's budget variance.
2) Single Family Space Heat: Actual expenditures = $2,194,959 versus a budget of $1,513,380, 145 percent of budget. The program's Direct Benefit to Customer expenses were directly proportional to its natural gas savings achievement.
3) Multifamily New Construction: Actual expenditures = $1,064,468 versus a budget of $464,003, 229 percent of budget. Many projects that were originally scheduled to close in 2018 were pushed to 2019. This, in addition to a few large custom multifamily gas projects, caused the increase in gas savings and a commensurate Direct Benefit to Customer expenditure.
4) Low Income Weatherization: Actual expenditures = $914,253 versus a budget of $656,080, 139 percent of budget. Higher-than-planned Direct Benefit to Customer expenses tracked with the higher natural gas program savings in 2019.

5) Commercial Kitchens: Actual expenditures = $354,314 versus a budget of $268,229, 132 percent of budget. The program's Direct Benefit to Customer spending tracked commensurately with its increased natural gas savings in 2019.

iv. Highlights of Natural Gas Programs Coming in Under Budget

1) Web-Enabled Thermostats: Actual expenditures = $669,986 versus a budget of $1,057,223, 63 percent of budget. A major manufacturer's website updates resulted in a suspension of PSE's instant rebate service for most of 2019. These instant rebates made up a significant portion of rebates for the program and the loss caused the Smart Thermostat program to fall short of its 2019 Direct Benefit to Customer anticipated spend.
2) Residential Showerheads: Actual expenditures = $153,232 versus a budget of $375,962, 41 percent of budget. PSE phased out its ShopPSE online store in 2019 due to cost-ineffectiveness concerns. Since the online store was the only source of the natural gas showerhead measure, Direct Benefit to Customer payments were significantly curtailed. Outside Services costs were also substantially lower than planned due to the phase-out.
3) Small Business Direct Install: Actual expenditures = $88,675 versus a budget of $220,990, 40 percent of budget. The program's natural gas savings shortfall had a commensurate effect on its Direct Benefit to Customer expenditures, which were the leading cause of the program's natural gas expense variance.
4) Commercial HVAC: Actual expenditures = $47,033 versus a budget of $130,812, 40 percent of budget. The program's struggle to gain traction with its Advance Rooftop Controller rebate offering led to a significant incentive underspend, which comprised the majority of the program's natural gas expense variance.
5) Multifamily Retrofit: Actual expenditures = $308,937 versus a budget of $401,871, 77 percent of budget. The program's slow start in 2019 resulted in lower Outside Services and slightly lower-than-planned Direct Benefit to Customer costs.
6) Single Family New Construction: Actual Expenditures = $21,763 versus a budget of $112,972, 19 percent of budget. The program's Direct Benefit to Customer was substantially lower than planned due to the effect of the program's lower natural gas savings.

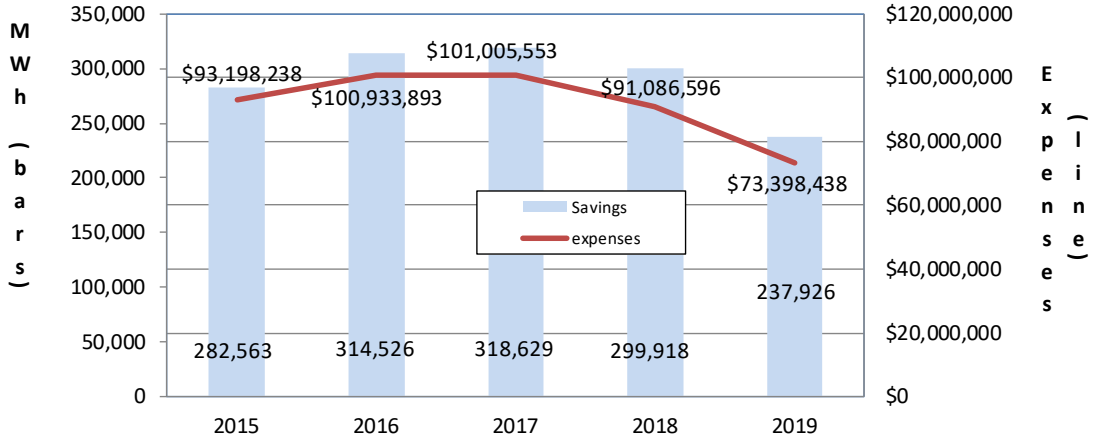
2) Revenue Balances

It is notable that some programs other than CAN may finish the year with a negative balance in the Revenue column of Exhibit 1, Supplement 1.[21] For instance, in 2019, the Single Family Water Heat program, in cooperation with the BPA's Heat Pump Water Heater Demand Response pilot, provided rebates to customers. BPA reimbursed PSE for those rebates. These revenue balances help to offset conservation expenditures, and are listed in Exhibit 1, Supplement 1: *Actual Expenditures Compared to Anticipated Spends.*

D. Five–Year Trends

As represented in Figure II-1, the Portfolio's electric savings have decreased an overall 16 percent from 2015 to 2019. 2019 savings were approximately 21 percent lower than the previous year. PSE reduced the electric expenses an overall 21 percent from 2015 to 2019, with a 2019 reduction of more than 19 percent from 2018 expenditures. This trend reflects, but is not limited to: 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.

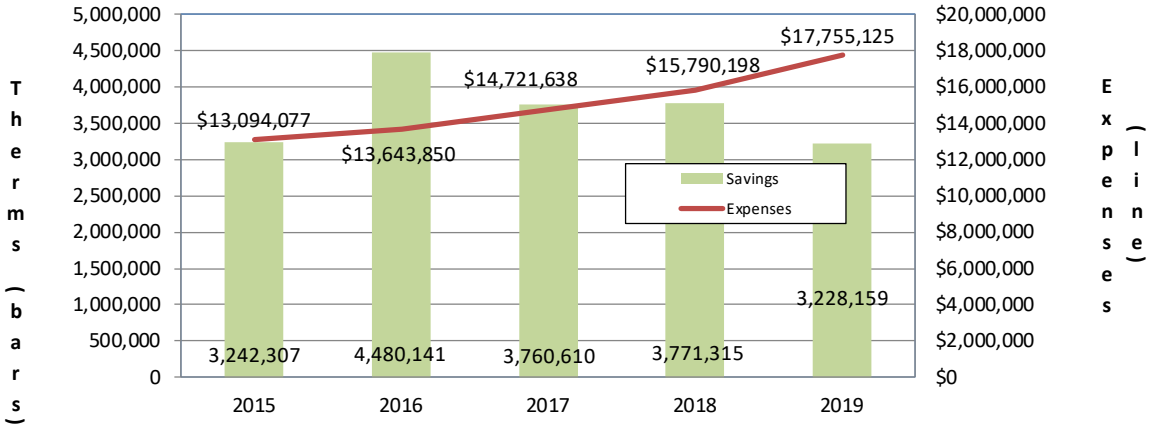
Figure II-1: Energy Efficiency Electric Programs; Savings and Expenditures – Five-Year Trends



[21] A revenue balance is indicated in Exhibit 1, Supplement 1 as a negative value, since all other noted figures, extracted from SAP, indicate expenses.

Figure II-2 shows that natural gas savings have decreased less than 1 percent from 2015 to 2019. 2019 natural gas savings were slightly lower than the 2018 value: a decrease of approximately 14 percent. The natural gas expenses for the 5-year timeframe have increased 35 percent from 2015 to 2019, while natural gas expenses increased 12 percent from 2018 to 2019.

Figure II-2: Energy Efficiency Natural Gas Programs: Savings and Expenditures - Five-Year Trends



These indicators reflect 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 measure make up a larger proportion of the overall Portfolio.

E. Cost-Effectiveness Ratios

Table II-3 provides the Portfolio view of the Total Resource Cost (TRC) and Utility Cost (UC) Benefit to Cost (B/C) results for 2019. The electric Portfolio's TRC B/C ratio was 1.58, and its natural gas TRC B/C ratio was 1.46.

Table II-3: 2019 Energy Efficiency Cost-Effectiveness Ratios

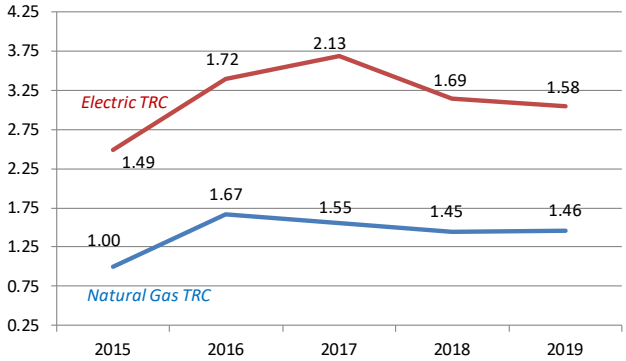
Benefit to Cost Ratios Portfolio		
	Total Resource Cost	Utility Cost
Electric	1.58	2.12
Gas	1.46	1.56

Indicated TRC includes the application of a 10 percent Conservation credit value.

The Energy Efficiency Portfolio finished 2019 with an overall electric UC B/C ratio of 2.12, and a natural gas UC of 1.56. Figure II-3 represents PSE's five-year Portfolio TRC results. All TRC figures are indicated with a 10 percent conservation credit adder included. Although such an adder is not a generally-accepted attribute of natural gas cost-effectiveness, some type of a conservation credit or risk adder was discussed between 2012 and 2013,[22] when the UTC conducted workshops to develop their Policy on natural gas programs' cost-effectiveness analyses.

Consistent with WAC 480-109-100(10), Low Income Weatherization's (LIW's) electric TRC is omitted from the overall Portfolio calculation. For consistency, PSE also calculated the overall natural gas TRC without LIW's ratio.

Figure II-3: Energy Efficiency Five-Year TRC Trend



[22] ¶ 29, page 12 of Docket UG-121207, Policy Statement on the Evaluation of the Cost-Effectiveness of Natural Gas Conservation Programs: *"(…) Stakeholders discussed the use of an across-the-board adder to the quantified benefits of conservation activities. (…)"*

F. Direct Benefit to Customer as a Percent of Energy Efficiency Expenditures

In Exhibit 1, Supplement 1: *Actual Expenditures Compared to Budgets*, PSE indicates incentives paid to customers in the Direct Benefit to Customer (DBtC) category. Customers also directly benefit from a number of services PSE provides in addition to incentive payments. Where it is possible to clearly distinguish these functions and activities, PSE denotes these expenditures as "Direct Benefit to Customer" (DBtC).

This nomenclature, established by PSE during the 2012-2013 BCP development period, is specific to PSE programs, and isn't intended to be used for comparison with other utilities. PSE maintains this metric to track the performance of its programs year-over-year.

Certain expenditures related to customer benefits that are difficult or administratively onerous to quantify are not specifically classified as DBtC, but clearly also carry an intrinsic value to the customer, beyond simply remuneration. For instance, if a customer participates in PSE's Refrigerator Decommissioning program, they derive the benefit of avoiding the need to take their old refrigerator to the transfer station—in addition to the rebate they receive.

The DBtC ratio is affected by a number of factors, including one-time expenditures, regulatory requirements, marketplace conditions, and expenses related to influencing hard-to-reach/proportionately underserved market segments. It is therefore inaccurate to conclude that the higher the DBtC ratio, the better-managed the program.

1) PSE's DBtC Calculation

PSE's returned 79 cents out of every dollar collected through the electric Conservation Rider for REM, BEM, Pilots, and Regional Programs to customers in the form of a direct benefit. This Sector-Level DBtC (comparing the DBtC of the savings-generating Sectors that provide customer incentives to the expenditures of those same Sectors) is notable.

Similarly, the Sector-level natural gas DBtC—using the same calculation methodology—was 70 percent.[23]

[23] If PSE discounted the $2.23 million expended on the NEEA natural gas collaborative, which resulted in no natural gas savings in PSE's service territory, the *Sector-level* ratio would have been 81 percent.

These figures are impressive, and reflect program staff's substantial efforts to continuously improve business operations, maximize value for PSE customers, and drive customer participation.

The Portfolio-Level DBtC is one that is more subjected to single-time charges, regulatory requirements, and outside influences. In addition to savings-generating programs, this ratio accounts for programs and functions in the Portfolio Support and Research & Compliance Sectors. Some of these functions contribute some level of DBtC, however intrinsic their value.

Using this calculation level reveals DBtC ratios that are, in spite of mitigating factors, noteworthy: the overall electric Portfolio DBtC was 69 percent in 2019, while the overall natural gas Portfolio DBtC was 64 percent.[24] These ratios excludes Other Electric Programs.

Readers will also note there is a wide range of DBtC among the programs when reviewing the budget-versus-actual expenditures listed in Exhibit 1 Supplement 1. Some programs operate with DBtC ratios that range from 90 to slightly below 20 percent.

2) Proactive and Consistent Program Management

PSE accomplished this sustained level of DBtC through its continued focus on maximizing process efficiencies, and careful attention to continuous improvement and customer satisfaction throughout the organization, as discussed in the program-specific chapters that follow.

In order to sustain this consistent level of DBtC year after year, significant effort is required on the part of every Energy Efficiency staff member to balance customer expectations with prudently and effectively applying Rider funding. In 2019, program staff cost-effectively:

- Managed increasingly complex programs, often consisting of hundreds of measures;
- Developed Conservation Plans one or more years in advance;

[24] Energy Efficiency's natural gas *Portfolio-level ratio* would finish 2019 with an overall DBtC of 73 percent by excluding the NEEA natural gas collaborative expenses.

- Created and maintained extensive measure research and documentation;
- Responded to third party and evaluation data requests;
- Met evolving regulatory requirements; and
- Reviewed and validated third-party reporting.

G. Energy Efficiency's Customer Focus

Clearly, Energy Efficiency's ultimate year-end objective was to achieve its 2019 conservation savings targets while prudently managing customer Rider funding. Program staff focused on adaptively managing against plans put in place in 2017, designed to complete PSE's overall 2018-2019 biennial electric and natural gas targets. As the year progressed, staff continuously improved the implementation of those plans, adaptively managing in a dynamic marketplace. PSE discusses specific program initiatives to attain those savings and financial objectives in chapters 5 through 9 of this Report.

This section will highlight several initiatives that were critical in driving Energy Efficiency's 2019 success and are ongoing well into the future. Among those focus areas are a continuous attention to customer needs and expectations, constantly improving and adaptively managing its customer-driven business processes, and sustaining its commitment to exceeding Regulatory Stakeholder engagement expectations.

1) Meeting Customer Expectations

PSE customers' satisfaction is the key determinant of the success of Energy Efficiency's conservation programs, and is a top priority for program staff. Throughout 2019, the dedicated men and women in the department continued their long-standing commitment to maximize customer participation in PSE energy-efficiency programs while surpassing customers' expectations at each point of customer contact.

A key element of meeting customer expectations is the adaptive management of residential and business program offerings, including dynamically tailoring specific measures—their incentive levels, availability, etc.—to customer needs, managing the scope of measure offerings, and motivating customer participation.

As a part of the specific program activities, customers expect PSE to provide pioneering conservation products and flexible avenues of accessing energy efficiency programs. Today's customers want fun and engaging information and outreach, easier rebate and grant processing with simple applications, and online tools that help them manage their energy use. Customers comprising hard-to-reach or proportionately underserved segments also must have access to Energy Efficiency's program offerings.

2) Maximizing the Ease of Participation for Customers

Energy Efficiency teams focused on creating programs that were easy for customer to participate in, with a broad array of involvement options, and provides overviews of those efforts here.

Key contributors in augmenting the ease with which customers can participate in conservation programs included broad outreach strategies and tactics. These consisted of, but weren't limited to community activities and small business blitzes, which enabled small business owners to immediately register for conservation measures. Energy Efficiency's extension of the Demand Side Management-central's (DSMc's) Public User Interface (PUI) was a significant factor in making participation easier and more effective for customers. Through the PUI, PSE provides customers the options to "Apply On-Line", "Self-Service", and "Check Status". New for 2019, customers also had the option to apply their rebate to their energy bill.

PSE conducted its award-winning Energy Upgrades campaign for a sixth year. Customer participation opportunities were additionally enhanced by retailer point-of-purchase rebates, streamlined rebate applications, and better training for PSE partners and contractors.

Joint utility programs, exemplified by BEM's Commercial Kitchen & Laundry's incentive process, and the updated Commercial HVAC Advanced Rooftop Controller prescriptive rebate significantly improved consistency between utilities and simplified customers' incentive application process. The Commercial Midstream approach has quickly become a standard for channel excellence, while providing various customer segments with instant rebates in locations where the customer is actively making a purchasing decision. PSE also maximized the impact of Contractor Alliance Network (CAN) members, which provided new customer participation avenues.

Program staff simplified Lighting Power Density (LPD) applications and the Energy Efficient Communities organization extended their presence in smaller communities, and conducted Home Energy Assessment "blitzes", where more than 10,000 customers learned about the no- and low-cost elements of Energy Efficiency services. Almost 1,000 of these customers signed up for Energy Efficiency services during these blitzes.

PSE provides detailed discussions of these initiatives in the program-specific discussions in Chapters 4 through 9.

3) Augmenting Energy Efficiency Awareness

Another key area of emphasis for program staff was the implementation of solutions to increase customer awareness of Energy Efficiency programs throughout the year. Staff employed propensity modelling, spatial analyses, customer surveys, promotions, advertising in a variety of media, and outreach to expand the communication and information—containing calls to action—available to customers. Program staff incorporated the findings that this work yielded into their program services and offerings to meet evolving customer expectations in 2019.

Highlights of significant Energy Efficiency awareness initiatives that are discussed in the coming chapters include:

- Now in its sixth year, PSE's Customer Awareness Tools provided customers with more targeted and timely seasonal energy-efficiency information and bill alerts, which are generated at times when customers tend to think most about their energy use. Eligible customers received alerts when their e-bill was ready, or if there was a potential for a higher-than-usual bill. And, up to 300,000 customers receive reports twice per year during the changing seasons ("Seasonal Readiness" alerts).
- Quality Assurance (QA) verification inspectors provide customers with applicable energy-efficiency information when they're in customers' homes performing verifications.

- The Multifamily Retrofit program distributed 13 "Strive for Five"[25] plaques—which are prominently displayed to maximize tenant awareness—to multifamily properties throughout the PSE service territory. Additionally, nine plates were awarded to sites that have already earned a plaque. The program also partners with housing authorities, property management companies, and condominium Home Owners Associations (HOAs) to maximize energy-efficiency awareness.
- The Single Family Existing organization continued its retail events, conduction High Impact Events (HIEs) and pop-up events in retail stores. High-impact events were eight hours, staffed by multiple field representatives, and pop-up events occurred in stores with high foot traffic. These events led to increased customer awareness of energy-efficiency offerings.
- PSE's electronic media presence—online, mobile apps, radio and television advertisements—were effective in maximizing customer awareness—and driving customer participation in Energy Efficiency programs.
- PSE continued to run energy efficiency television and digital video awareness advertising, promoting rebates and instant discounts offered by PSE. The two advertisements received more than 32.4 million impressions in PSE's service area over a 5-month period.
- Over the course of eight months, the Energy Upgrades campaign sent more than 1.8 million email offers marketing limited-time-offers. There were 36 different in-store retail blitz events, with more than 14,000 Golden Tickets redeemed.
- As a part of its retail store awareness efforts, PSE implemented field services in over 320 retailer locations, with almost 2,650 store visits. These efforts provide a connection between PSE, the retailer, and the PSE customer. Program staff services now range from lighting to thermostats.
- Energy Efficiency staff also provided program information to a variety of PSE staff in other departments that interact with customers to help them discuss Energy Efficiency programs in their own customer interactions.

[25] *Strive for Five* is a Multifamily Retrofit recognition program that indicates that a property has installed five measure groupings in their building or campus.

4) Focus on Hard-to-Reach and Proportionately Underserved Market Segments

As indicated in The Regional Power and Conservation Planning Council's (the Council) 7th Power Plan's Chapter 4: *Model Conservation Standard (MCS)-1,* low-income customers are often classified as underserved. Other customer segments may include: moderate-income customers, rural customers, small business owners who may or may not lease their offices, multifamily tenants, manufactured home owners or tenants, and industrial customers. The Plan also says:

> "Ideally, the customers in the HTR ***[ed.- Hard To Reach]*** segment should participate in similar proportion to non-HTR customers, assuming similar savings potential."[26]

PSE also believes that there may be other potential proportionately underserved segments, including English-as-a-second-language customers, for instance.[27]

Throughout 2019, PSE continued to implement successful program strategies that serve potential HTR customers, and consulted with the CRAG on the development of plans to address any access gaps. PSE continues to build future actions and program design on the results of these ongoing steps.

It is important to point out that PSE has been serving the majority of these customer segments for several years prior to the Power Plan's publication of the potential HTR segments. In fact, rules and conditions have required that PSE ensure that programs are designed to reach all customer segments since 2002. Even before that, the Low Income Weatherization (LIW), had been successfully serving the low-income and low-income multifamily segments for almost two decades. Energy Efficiency program staff consistently and carefully consider the full range of their constituents when developing their residential and commercial offerings.

Quite often, a specific program addresses more than one HTR segment.

[26] Chapter 4, page 4-10, Seventh Power Plan: https://www.nwcouncil.org/energy/powerplan/7/home/

[27] These, of course, may also be considered as sub-sets of the main eight HTR classifications.

For example, PSE designed the Small Business Direct Install (SBDI) program to reach farms and other agricultural customers who operate as small businesses—and potentially qualify as rural customers—small-to-medium lodging enterprises, and other small businesses that may be commercial tenants. PSE discusses how its programs served each segment in 2019 through its residential and business programs in the coming section.

a. Energy Efficiency Program Design Currently Address Many HTR Segments

As noted in the previous section, Energy Efficiency program staff continue to manage programs and strategies to engage all customer segments and encourage their participation.

This is also in compliance with WAC 480-109-100(7), which states:

> "A utility must offer a mix of conservation programs to ensure it is serving each customer sector, including program targeted to the low-income subset of residential customers."

Prior to regulatory requirements and regional recommendations, PSE recognized that there was a need to focus on hard-to-reach and potentially underserved customers. Energy Efficiency developed solutions that would help customers conserve energy, saving on their energy costs. This focus has been integrated with PSE's emphasis on meeting challenging savings goals each year.

To ensure that its messaging reaches all of its customers and provides them opportunities, services, and measures that enable participation, Energy Efficiency utilizes a broad variety of customer survey data, spatial analyses, feedback from trade allies, historical performance, industry studies and evaluations. It is not unusual for different Residential and Business programs to partner on initiative to reach potentially Hard-to-Reach segments. The following discussions of key customer segments highlight details that PSE provides in the program and organizational review chapters 4 through 9.

It is noteworthy that:

1) PSE designs many of its energy-efficiency programs (Home Appliances, Retail Lighting, Residential Showerheads, Commercial HVAC, for instance) on a range of efficient products that serve a broad constituency. It is safe to surmise that HTR customers also participate in those programs, although acquiring supporting data is a challenge.

Others, such as Commercial/Industrial Retrofit, Multifamily New Construction, and Single Family Weatherization, consist of an extensive range of services that—while inclusive of potential HTR segments—are designed around structure classifications.

2) As PSE discusses in the following sections, several Portfolio Support groups play a part in bringing awareness to a range of customer segments. Energy Efficient Communities, Energy Advisors, Quality Assurance Specialists, and the Energy Efficiency Events staff are critical in conveying the availability of Energy Efficiency services across the spectrum of PSE customer segments.
3) The following discussions provide information related to Energy Efficiency's 2019 program implementation. As noted earlier, Energy Efficiency has incorporated potentially hard-to-reach customer segments into its program design considerations for several years, and continually adapts them to evolving marketplace conditions.

i. Low-Income Customers

One of PSE's predominantly visible Hard-to-Reach programs is its residential Low Income Weatherization (LIW) program, which targets customers with a defined circumstance.

In order to maximize the availability of energy-efficiency measures, there are several strategies that the program employed, including but not limited to:

- Working closely with 10 Puget Sound low-income agencies throughout the PSE service territory.
- Project funding is not limited to the budgeted conservation funding for cost-effective projects.
- Conducting outreach at food banks, senior and community centers, and multicultural outreach, including tribes.
- Partnering with community organizations, including presentations, workshops, and event presence.
- LIW provides funding for health and safety, and certain repairs needed to facilitate the installation of energy-efficiency measures.

- Identifying ways to increase program participation by privately-owned multifamily properties, as identified through the application of a PSE segmentation tool. The program also coordinates with the Washington State Housing Finance Commission (WSHFC), The Energy Project, and Commerce on accessing publicly-available low-income tax credit properties to help streamline multifamily eligibility screening.
- Consistent with WAC 480-109-100(10), the LIW program processes electric projects submitted by agencies that passed the Savings-to Investment Ratio (SIR) of 1.0 in 2019.
- Established an agency referral mechanism for Energy Advisors and Home Energy Assessment specialists when engaging with potentially income-eligible single family and manufactured home customers.

PSE also offers services for customers that may be income-qualified through other Energy Efficiency programs, as discussed in the following sub-sections.

ii. Moderate-Income Customers

Moderate income customers may be considered as those whose income levels are above low-income constituents, but below median income levels. This customer segment may not qualify for higher incentives available in low-income programs, but also may be limited by up-front efficiency cost barriers for PSE's standard rebate programs. PSE's Multifamily Retrofit, with its no-cost direct install model is beneficial for these customers living in multifamily units.

Similarly, as discussed in the 2019 Manufactured Homes Market Study,[28] most manufactured home customers fall into the low- or moderate-income categories. PSE's 2019 manufactured home initiative (discussed in section vi below) provide moderate-income customers with a wide variety of free or low-cost efficiency solutions.

[28] The Cadmus Group, Manufactured Home Study, July 30, 2019, filed with this Report as Exhibit 6, Supplement 1.

iii. Rural Customers

Energy Efficiency's Small Business Direct Install (SBDI) program fulfills a need for conservation measure access in many rural communities. Many small-to-medium agricultural operations are often located in remote, rural locations. Unique to the agricultural customer classification is that their access to conservation program services is limited to participating between planting, growing, and harvest periods.

Similarly, lodging businesses are also seasonally-driven, with limited windows to consider conservation measures. Additionally, there are some business customers that do not have a downtown core storefront, as well as those operated by customers whose primary language is not English. The Energy Efficient Communities team expanded its reach to several rural cities and towns, often combining small business, agriculture, and small lodging visit "blitzes" in 2019.

The Home Energy Assessment program was another effective method of reaching this segment, as was the Multifamily Retrofit program. Energy Efficiency also considers that its Customer Awareness Tools also communicates the conservation message well. Pertinent to rural customers, and as noted in other HTR segment discussions, PSE's Energy Efficient Communities team coordinated participation in energy fairs, community groups, civic clubs, retirees, colleges, and libraries, etc. in these rural areas.

iv. Small Business Customers

Small businesses are sometimes limited in their participation in PSE's programs due to their lack of resources or their lack of building ownership; quite often, small business owners lease their offices, and may believe that they are limited to the availability of energy-efficiency measures.

PSE's SBDI program is specifically designed to address the needs of small lodging, agricultural, and a variety of other small businesses. The Commercial Kitchen and Laundry program also brings their expertise to restaurant owners/operators who may align with the small business category.

PSE's small business and community "blitzes" continued to communicate the Energy Efficiency message, with good responses during the events. The Energy Efficiency Communities organization played a significant role in conveying the conservation message to this customer segment.

As another avenue for small businesses, the Business Energy Management's (BEM's) custom grant programs continued to adjust the customer qualification standards to accommodate lower-cost measures.[29] In 2019, this enabled more small-to-medium business to participate.

v. Multifamily Tenants

In order to reach this potentially underserved customer segment, Energy Efficiency conducted Energy Fairs at five multifamily campuses throughout the PSE territory, engaging with nearly 1,300 apartments in concert with the PSE Energy Efficiency Communities organization.

The program provided brochures and information geared to multifamily tenants. Program staff also refined novel methods to communicate directly with tenants of multifamily buildings, including "Strive for Five" plaques, behavioral measures (Strategic Energy Management), and engaged multifamily contractors and commercial/industrial contractors to increase program awareness.

vi. Manufactured Home Owners or Tenants

In 2019, Energy Efficiency provided a wide range of weatherization, HVAC, space and water heat, and appliance measures to manufactured home owners and tenants. PSE provided these services by integrating the separate programs' efforts, which included but were not limited to increased incentive amounts for manufactured home rebates, focused Home Energy Assessments in the manufactured home market, and launching a manufactured home-specific version of the Home Energy Report. As indicated in the 2019 Manufactured Home Market Study by Cadmus, PSE also recognizes that this segment may overlap with its LIW program.

[29] For instance, BEM adjusted its HVAC controls protocols to include all building sizes, enabling more small business to develop lower-cost projects. ISOP also provides similar benefits for industrial customers.

Thus, program staff coordinate with low-income agencies and PSE's Recommended Energy Professionals who are a part of PSE's Contractor Alliance Network (CAN).[30] In addition to PSE's standard suite of measure offerings, the Low Income Weatherization program pursued pilot initiatives in 2019 targeted specifically to the manufactured home segment. As discussed in more detail in the Low Income Weatherization review, Energy Efficiency developed a manufactured home replacement pilot in partnership with WSU's Energy Program, and is working with the low-income agencies to provide ductless heat pump replacement on structures that have previously been weatherized.

In 2019, PSE engaged The Cadmus Group to develop a manufactured home market study, in collaboration with several regional stakeholders, including some members of the CRAG, Community Action Partner agencies, and other interested parties. PSE shared the study in its 2020-2021 BCP filing on November 1, 2019, as Exhibit 6, Supplement 1. It is also included in this Report, as Exhibit 6, Supplement 1. The study was an important step in the formation of an action plan for this segment.

In early 2019, PSE formed a committee of internal stakeholders to design and manage programs identified by the market study as key opportunities. The committee worked together to design an ideal customer journey, take inventory of the communication tools and resources that could be used to funnel customers into an appropriate program or service, and set specific metrics for each program and overarching goals for the initiative.

[30] As is discussed in the Contractor Alliance Network review, the program was re-branded in late 2019 to "Trade Ally Network".

Table II-4 provides highlights of key performance areas that program staff identified for the 2019 manufactured home campaign and the results for each. As discussed below, some of the metrics were created specifically for the manufactured home initiative. Thus, there may be no or limited data for comparisons.

Table II-4: Manufactured Home Campaign – 2019 Highlights

Goal 1 - Improved Awareness	Percentage of **customers who improved in awareness** about the program from a postcard or email:	**27%**
	Customers who have had a **PSE expert knock on their door**:	**9,694**
Goal 2 - Increased Engagement	**Number of clicks** on Manufactured Home targeted emails	**9,869**
	Customers **actions taken** towards completing a project	**6,474**
Goal 3 - Completed Projects	Customers who received a **Home Energy Assessment**	**2,831**
	Customers who **completed a rebate measure**	**1,197**
	Increase in kWh savings over the same timeframe in 2018	**199%**

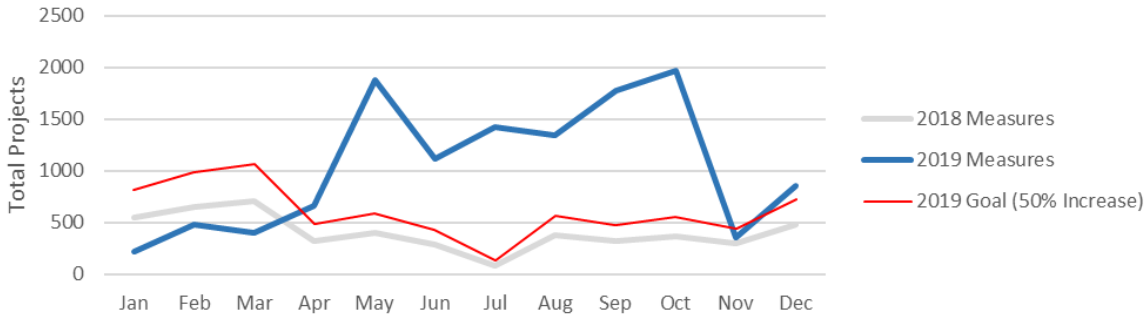
Table References

1) The percentage of **customer who improved in program awareness** Includes unique email opens (15,577) and postcard traffic (1,126). As 2019 was the beginning of this initiative, PSE bases the result of 27 percent on the ratio of 61,000 manufactured home customers who received these correspondence as compared to PSE general residential customer base who otherwise did not receive targeted emails or postcards specific to manufactured home offerings.
2) Customers who have had a **PSE expert knock on their door** is approximately 16 percent of known manufactured homes. Of those, approximately half spoke with the PSE expert. If a customer did not answer or was not home, PSE left a door hanger with energy-efficiency information and calls to action. Approximately 9 percent had already had a Home Energy Assessment, and approximately 15 percent were not interested. The remainder elected to sign up and receive a Home Energy Assessment.

4) **Number of clicks** (over 9,800) resulting from Manufactured Home-targeted emails represent a 63 percent engagement rate. The engagement rate for manufactured homes is higher than PSE's average residential engagement rate as a whole. Targeted emails were a new initiative for Energy Efficiency, and therefore, there is no 2018 data for a comparison.
5) Customers **actions taken** towards completing a project includes customers who downloaded a rebate form, requested a referral, or reviewed the Home Energy Assessment sign up form. Customer actions taken was a new metric, specifically designed for the manufactured home initiative, and therefore, there is no 2018 data for a comparison.
6) Customers who received a **Home Energy Assessment** is 2,831, an increase of 1,859, or 191 percent from the 2018 total.
7) Customers who **completed a rebate measure** reflects a 160 percent increase in measures over 2018.

As is reflected in various program discussions throughout this Report, a number of Residential programs participated in the Manufactured Home Campaign, including but not limited to: Low Income Weatherization; Home Energy Reports; Home Energy Assessments; Single Family Weatherization; and Single Family Space and Water Heat. As illustrated in Figure II-4, their combined support of this initiative, along with that of agencies and REPs, resulted in impressive gains over the number of measures installed in manufactured homes in 2018.

Figure II-4: Manufactured Home Rebate Projects (All Programs), 2019 Versus 2018



The Manufactured Home Market study also indicated that this customer segment has several barriers to participation, including limited customer attention, access to technology, and lack of trust of utility programs.

In order to address barriers to participation, PSE needed multiple channels of communication: digital (web and email), traditional (mail) and in-person engagement (door-to-door). PSE believes that this multi-faceted approach contributed to the success of the campaign overall. Additional noteworthy results from this ongoing focus include but are not limited to:

Metric	2019 Results
Increase incentives provided	More than doubled from $2.2 million in 2018 to $4.6 million in 2019
Launch a Weatherization limited-time-offer with contractors	Sent "Windows Limited Time Offer" email, 10 percent engagement
Expand Weatherization offerings for manufactured homes	Added attic insulation measure
Conduct smart thermostat direct install as part of Home Energy Assessments	Installed 77 web-enabled thermostats in MH homes
Increase LIW customers served by 50 percent from 2018	Increased 2019 LIW manufactured home customers served by 54%, from 234 dwellings in 2018 to 361 in 2019..

vii. Industrial Customers

Many industrial customers are also eligible for PSE's Large Power User/Self-Directed program, provided under Schedule 258. Program staff engaged eligible customers as a part of the program's RFP process,[31] and created a new measure that funds energy studies for companies that don't have the necessary analytical expertise. Another program that focuses on this potentially underserved segment is Energy Efficiency's Industrial Systems Optimization Program (ISOP).

[31] In the Large Power User/Self-Directed 4-year cycle, customers are encouraged to develop RFPs in order to utilize the pool of Schedule 258 available conservation funds.

By participating in the program, industrial customers potentially have the benefit of operational and maintenance improvements across each participating site. As discussed in the ISOP review, PSE also implemented a new incentive structure for ISOP customers in 2019.

viii. English as a Second Language

English-as-a-second-language customers may also be a proportionately underserved segment of PSE's customers. This PSE-identified segment may also span one or more of the above-noted segments. In 2019, PSE conducted and participated in several events in communities that have a high English-as-a-second-language population. Additionally, PSE publishes several energy-efficiency brochures in other languages, while its web pages can also be viewed in other languages such as Russian, Chinese, Spanish, and Korean.

5) Partners Must Meet PSE's Customer Satisfaction Expectations

PSE's emphasis on customer service is prominent in PSE's expectations of its trade allies, vendors, contractors, and third-party administrators. PSE holds each third-party entity that represents PSE Energy Efficiency programs when installing or servicing energy-efficiency measures to ever-increasing customer service standards. PSE also ensures adherence to strict data security requirements.

Energy Efficiency staff regularly review vendors' and contractors' performance to ensure that they also meet customer expectations.

6) Continuously Improving Customer-Centric Processes

As noted in the program discussions throughout this Report, program staff consistently focused on increasing customer participation and minimizing customer costs in energy-efficiency programs, and exploring ways to maximize the value of external, customer-facing engagements.

A key facet in the achievement of program objectives was the refinement of critical internal business processes. Energy Efficiency program staff continued to conduct business operations with a focus on adaptive management through the application of progressive continuous improvement principles.

Doing so not only ensures compliance with WAC 480-109-100(1)(a)(iv), *Adaptive Management*, it is clearly the most sensible and effective way to operate such a complex and customer-centric organization. In 2019, Energy Efficiency focused on continuously improving its internal operational processes, and implementing DSMc enhancements.

Continuous improvement is an established and engrained method of adaptive program management for Energy Efficiency program staff. Its application ensures the prudent stewardship of customer funds and enables PSE to consistently offer a superior suite of products, yielding optimal savings results while carefully managing business expenses. Staff efforts provided for prompt and innovative solutions to challenges and market opportunities, where teams were able to confidently adapt and maximize customer satisfaction and conservation savings.

In addition to conscientiously administering vendor and contractor payments, staff routinely examined processes required to manage the accurate and timely tracking of rebate and grant payments, ensuring a more positive customer experience.

Continuous improvement is a focus of not only programs in REM and BEM, but in all support organizations. Incorporating a wide range of continuous improvement principles, the skilled professionals in each organization achieved incremental progressions throughout the year, often in ways that are obscured from the public view, but critical nonetheless.

In each business consideration, PSE makes management decisions with these requirements uppermost in mind:

1. Meet customer expectations to drive continued program participation;
2. Prudently apply customer funds to cost-effective conservation;
3. Maximize staff productivity, process efficiency and effectiveness;
4. Ensure rigorous program execution and metrics, with a high degree of savings reporting accuracy, financial prudence, compliance, and transparency.

a. Highlights of 2019 Business Process Enhancements

The following list provides a brief summary of some of the Portfolio-wide business process enhancements.

PSE discusses these and others, specific to programs or functional organizations, in chapters 4 through 12.

- Low Income Weatherization staff effectively managed multiple funding sources, multiple project submission sources, and a significant number of regulatory requirements.
- As part of the Data and Systems Services team's effort to launch a new rebate portal for customers, all of Energy Efficiency's residential rebate programs were revised and enhanced to provide much more flexibility in the programs when new rebates are introduced.
- All of PSE's trade ally partners are now using the online portal to submit their rebate claims.
- The Contractor Alliance Network team implemented several improvements to the program, including the rebranding to Trade Ally Network, centralization of communications, and broadening service capabilities.
- Energy advisors are utilizing the DSMc system to check rebate status for customers and contractors. They are also promoting the Public User Interface (PUI) so customers can submit their rebate applications and check rebate statuses online.
- The Energy Efficient Communities piloted in-language small business direct install blitzes targeted to business customers with team members that speak their language to build trust and increase participation.
- The Market Research team created a dashboard that provides program staff with standardized satisfaction and performance indicators.
- As part of its field services, retail representatives conducted more than 1,300 trainings on appliances, showerheads, smart thermostats, Lighting to Go, Commercial Kitchens, and Manufactured Homes.
- Data and Systems Services implemented a process to allow customers receiving a rebate to either apply the rebate to their account or receive a rebate check.

7) Commitment to Surpass Regulatory Stakeholder Expectations

PSE provides a complete discussion of its Regulatory Stakeholder[32] 2019 activities and accomplishments in Chapter 16: *Stakeholder Relations*. Energy Efficiency staff considered sustaining the excellent relationship that PSE has with its Stakeholders as a key 2019 focus area.

The CRAG consistently demonstrates the technical, policy, customer focus, and financial expertise required to closely engage with PSE's considerable Energy Efficiency Portfolio. This is a significant achievement, as a few members had not completely experienced the Biennial Conservation Planning (BCP) process, and weren't entirely familiar with PSE processes, terminology, or program issues at the start of their tenure.

Energy Efficiency staff expended considerable energy in 2019 to ensure that Stakeholders had a suitable degree of familiarity with its operations, were comfortable communicating with Energy Efficiency staff, and were supportive of PSE's conservation programs.

PSE values the collaborative relationship that it has established with its Stakeholders over several years, and expects that its operational processes, guidelines, and regulatory training Energy Efficiency staff have developed will continue to meet the expectations of its Stakeholders.

H. Measures

Energy Efficiency discusses its Measure archival system in Chapter 10: *Measurement & Verification*, starting on page 183. Exhibit 5 presents prescriptive measures that Energy Efficiency programs used in 2019.

1) Measure Counts by Program

Exhibit 1, Supplement 4: *Portfolio Measure Category Counts* provides a condensed view of measure counts; typically, only one or two key measures per program.

[32] PSE considers its Regulatory Stakeholders to be the Conservation Resource Advisory Group (CRAG) and members of the UTC staff.

This Supplement is intended to provide a high-level impression of measures that were key to driving Energy Efficiency savings accomplishments.

PSE includes more comprehensive, program-specific measure overview tables in each program discussion, that provide more refined views—albeit general summarizations—of Energy Efficiency's programs' projects or measure installations. Program measure tables aren't comprehensive lists of measures installed, and are not intended to be used as audit tools or to reconcile actual tracking records. It is important to note that PSE provides these high-level figures to afford a sense of program scale, customer demand, key savings contributors, and interesting measure types in each program.

I. Memberships and Sponsorships

Energy Efficiency staff derives value for customers by engaging in memberships and sponsorships. For instance, PSE is a major funder of the Regional Technical Forum (RTF). Exhibit 1, Supplement 3: *Sponsorships and Memberships* lists those paid in 2019.

J. Compliance

Chapter 15: *Compliance*, provides a complete discussion of Energy Efficiency regulatory compliance, beginning on page 257. This 2019 Annual Report And 2018-2019 Biennial Summary of Conservation Accomplishments is consistent with WAC 480-109-120(3).

The Report will also reflect PSE's compliance with requirements outlined in WAC 480-109-100(1): Process for pursuing all conservation [sic]. It is noteworthy that in the interest of brevity and to avoid repetition, PSE will use the terms "condition (N)(x)" or "Section M(z)" when referencing deliverables outlined in Exhibit F to Stipulation Agreement, Docket UG-011571, the 2010 Electric Settlement Terms, Docket UE-100177,[33] and Order 01 of Docket UE-171087.

In addition to these three requirement documents, PSE also addresses additional deliverables outlined in other pertinent Settlements and Orders in applicable sections of the Report.

[33] Within the 2010 Electric Settlement Terms, "Conditions" apply specifically to Section K. There are also specific PSE deliverables in other applicable sections of the Settlement Terms. Order 05 of Docket UE-100177 vacated UE-011570.

III. 2018-2019 ENERGY EFFICIENCY BIENNIAL RESULTS

Table I-1 in Chapter 1: *Executive Summary* presents the 2019-specific overall Portfolio electric savings achievement-versus-goal (237,925 MWh versus a goal of 228,773 MWh) and natural gas savings (3.23 million therms achieved vs 3.15 million therms goal) figures.

It is important to note that those savings figures do not represent: final verified NEEA-reported savings; any Biennial Electric Conservation Achievement Review (BECAR) potential adjustment; or verified and updated Home Energy Report (HER) 2018-2019 savings. Table III-1 provides a 2018-2019 Portfolio view of PSE's key electric savings and budget-vs-actual expenditure performance, as adjusted for the above-noted true-ups.

Table III-1: 2018-2019 Biennial Electric Savings Summary

2018-2019 Electric Portfolio Key Summary Values				
Conservation Savings				
Description	MWh Target *(per Table III-6)*	MWh Actual (Verified & Trued-up)	Notation	Percent Achieved
Total Utility Conservation	**520,456**	**549,115**	*Actual includes adjustments and true-ups*	**106%**
Less exclusions (NEEA, Pilots, 449s)	(48,227)	(40,830)		
EIA Penalty Target	*448,109*	*448,109*		*100%*
Decoupling Penalty Target	*23,658*	*23,658*	*Decoupling added to Target after EIA Penalty calc*	*100%*
Excess Savings Target *(Potential)*	-		*Target does not account for any excess.*	
Excess Savings (Actual)		**36,518**		
2018-2019 Total Electric Conservation Expenditures				
	Budget	Actual		Percent
Total Portfolio	$183,836,280	$ 164,485,034		89%
2018-2019 Total Portfolio Cost-Effectiveness				
	Total Resource Cost Test	Utility Cost Test		
Benefit-to-Cost Ratios	1.64	2.17		

A. Verifying 2018-2019 Savings and Making Final Adjustments

The saving values that PSE presents in its 2018 and 2019 Annual Reports are derived from data collected and reported in its DSMc and EES Tracking and Forecasting systems. This data reflects savings reported, and any adjustments requested by program staff when necessary,[34] as corrections that are noted throughout each program year. PSE details savings corrections made by Energy Efficiency staff in Exhibit 1, Supplement 2: *Savings Adjustments,* which is included in this Report.

There is potential for additional adjustments, based on true-ups, verification, and evaluations of a number of savings contributors. These include:

- Home Energy Reports (true-up of deemed savings to verified savings),
- NEEA--Northwest Energy Efficiency Alliance. (Verify savings.)
- BECAR--Biennial Electric Conservation Achievement Review. (Savings adjustments, based on independent recommendations.)

Table III-2 provides a summary of the adjustments PSE made to the cumulative electric savings totals indicated in the 2018 and 2019 Annual Reports.

Table III-2: Electric Savings adjustments

Source	Program	Originally-Reported MWh	Adjustment	Final MWh	Program Savings Adjustment %
Applicable to 2018-2019 Savings					
NEEA	Confirmed NEEA savings for PSE Territory	22,075	5,124	27,199	23.2%
Evergreen Economics	BECAR	497,772	0	497,772	0.0%
DNV-GL Evaluation	Home Energy Reports	17,996	6,148	24,144	34.2%
TOTAL	Portfolio Totals	537,843	11,272	549,115	2.10%

[34] There are infrequent occasions when a service provider may inadvertently duplicate measure counts, rebates may be paid for incorrect measures, etc. Although extensive systems are established in Energy Efficiency (as described in Chapter 10) to identify and prevent erroneous reporting, it is sometimes necessary to request corrections.

1) Electric Savings Adjustments

In this section, PSE discusses adjustments made to its reported electric savings.

a. Home Energy Reports

PSE facilitates an annual evaluation of the Home Energy Reports (HER) program savings, per a 2008 agreement with the CRAG. PSE then applies the results of the evaluations (2018 and 2019) to the HER savings reported in the Annual Reports, which are deemed values. PSE bases those values on its originally-reported HER savings from the most recent evaluation and trends from the program's historical performance. In 2018, PSE reported savings of 24,107,000 kWh. The annual independent evaluation for 2018 reported verified savings of 17,996,000 kWh, however.

Consistent with the HER 2-year measure life, PSE originally planned on reporting zero savings for 2019, reflected in PSE's 2019 Annual Conservation Plan (ACP), which is submitted prior to the current-year's HER evaluation. To account for the 2018 reporting findings, PSE reported the difference (-6,110,933 kWh) in the 2019 Annual Report's Exhibit 1: *Savings and Expenditures*. Also consistent with the measure's 2-year measure life, PSE reports incremental savings for the second year only if the second-year evaluation verifies those savings. The 2019 evaluation reported savings of 21,253,091 kWh, resulting in claiming the net incremental savings of 3,257,091 kWh (21,253,091 – 17,996,000 = 3,257,091) in this Report, reflected in Table III-3.

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Table III-3 provides the steps PSE employs to true up the two-year HER cumulative savings.

Table III-3: Home Energy Report Electric True-up

2018 -2019 Home Energy Reports Electric Savings Adjustments			
Index	True-up Savings Steps	Savings, kWh	Computation
a	Reported savings in 2018 Annual Report	24,107,000	
b	True-up savings reported in 2019 Annual Report	-6,111,000	
c	**Total reported saving for the biennium**	**17,996,000**	= a + b
d	2018-2019 verified savings per DNV GL evaluation	24,144,218	
e	Difference, incremental	6,148,218	= d - c
f	Adjustment to 2018 -2019 Biennial Electric Conservation Report.	6,148,218	Compare: (1) if d > c, = e. (2) if d < c, = 0 for 2nd year.
		Included in EIA Penalty Target	

b. NEEA Reported Savings

NEEA provides its savings projections for the upcoming biennium in the planning year prior. In this case, NEEA provided its 2018-2019 savings estimate in the third quarter of 2017. PSE reports NEEA savings based on NEEA-deemed values, which are routinely updated mid-biennium. NEEA's initial, 2017 savings calculation was 25,054 MWh. NEEA subsequently lowered this figure, and the reduction was reflected in PSE's 2019 Annual Conservation Plan (ACP). Based on data provided by NEEA, PSE reported 2018 savings of 10,775 MWh, and 2019 savings of 11,300 MWh, for a biennial total of 22,075.

NEEA provides its updated, final estimates of savings achieved in the second quarter of the year following a completed biennium. For 2018-2019, NEEA provided PSE its actual biennial savings of 27,199 MWh in April 2020. Table III-4 provides the results of NEEA's final savings report, indicating that savings exceeded its original projection by 9 percent. The final reported savings exceed PSE's reported figure by 23 percent.

Table III-4: NEEA 2018-2019 Savings True-up

Northwest Energy Efficiency Alliance 2018-2019 Electric Savings Results (aMW)			
Savings Applied to PSE Service Territory	Actuals	Goals	Percent
Residential	2.33	1.98	118%
Industrial	0.07	0.19	37%
Commercial	0.70	0.69	101%
Agricultural	0.00	0.00	
TOTAL	**3.10**	**2.86**	Difference
Convert to MWh	27,199	25,054	2,145 **109%** (Overachieved)
PSE Reported (2018 +2019)		22,075	5,124 **123%**

c. BECAR Results

The Biennial Electric Conservation Achievement Review (BECAR) is a two-year review, with preliminary results, reflecting the first-year of the biennium review, being presented to the CRAG early in the second year of the biennium. The second year of the biennium—in this case, 2019—is presented in the April-May timeframe of the year subsequent to the completion of the biennium. PSE has included the 2018-2019 BECAR, executed by Evergreen Economics, and attached the final Review to this Report as Appendix 1.

For the 2018-2019 period, the BECAR recommended no adjustments to PSE's reported electric savings.

PSE extracted the following conclusions from the final BECAR:[35]

Unit Energy Savings Review
Overall, we found that the UES values in use by PSE were applied correctly and were based on reasonable assumptions. Specific recommendations were made in an interim memo and PSE has since responded to those recommendations. There are no additional recommendations at this time for updating the measure-specific UES values.

Portfolio Savings Audit
The Evergreen team conducted an audit of PSE's portfolio savings as they appeared in the PSE 2018 Annual Report compared to a year-end extract of PSE's tracking data. This process was repeated for 2019 using PSE's tracking data and comparing it against the portfolio savings in the final savings tables that will be used in PSE's 2019 Annual Report. We were able to confirm the total kWh values matched those reported by PSE for both years.

Previous BECAR Recommendation Response Review
The Evergreen team found that all recommendations made in the 2016-2017 BECAR Final Report have since been addressed or PSE has adequately explained their reasoning for not pursuing follow-up to those recommendations.

And:[36]

> "We have no recommended changes to reported savings for either year."

2) PSE's 2018-2019 Electric Savings Plan

PSE provides a recap of its 2018-2019 "Building the Electric Savings Targets" table, Extracted from its 2018-2019 Exhibit 1, on the following page. PSE also added reported savings for each category, along with an adjustment summary to illustrate PSE's performance against each Target and Threshold.

[35] Source: Biennial Electric Conservation Achievement Review (BECAR) of the Puget Sound Energy 2018-2019 Electric Conservation Program Portfolio, Final Report, May 11, 2020, pgs 2, 3.

[36] Ibid, Section 2.2, page 13.

PSE presents the table here in a landscape orientation to enhance its legibility.

Table III-5: 2018-2019 Electric Portfolio: Sub Total Targets versus Actuals

2018-2019 Electric Portfolio Savings							
Index	Description	MWh Target	MWh Reported*	Difference	Achieved	Comment	Calculation
a	Total Biennial Potential	473,163				Potential = Bundle D + DE from 2017 IRP	Adjustments based on evaluations, internal/external reviews. NEEA savings difference accounted for in "Total Adjustments" total and Table III-7.
b	**EIA Target**	**473,163**	**525,457**	**52,294**		Indicated Reported MWh includes adjustments & True-ups	
c	Plus Decoupling Commitment (5% add)	23,658	23,658	-		All programs contribute to the decoupling commitment savings. 5% is calculated on the "base" total savings.	= a * 0.05
d	Add 449 Customers	18,693	-	(18,693)			
e	Plus Pilots With Uncertain Savings	4,480	-	(4,480)		MWh Reported = 2016 - 2017 Annual Reports.	
f	**Total 2018-2019 Electric Total Utility Conservation Goal**	**519,994**	**549,115**	**29,121**		This is the total savings value, including decoupling, that PSE is managing to. This is the total savings reported to Dept. of Commerce.	= b + c + d + e + f
	Exclude:		**MWh Verified**				
g	NEEA	-25,054	-27,199	2,145		NEEA reports actual savings in May of year following program year.	
h	Pilots With Uncertain Savings	-4,480	0	-4,480		Verified MWh based on 2016 and 2017 DNV-GL evaluations.	
i	449s Excluded from CPA	-18,693	-13,631	-5,062			
j	**Total Exclusions**	**-48,227**	**-40,830**				**= h + i + j**
k	**Adjusted Total Electric Total Utility Conservation**		**508,286**				**= g + k**
l	**Targets**						
m	EIA Penalty Target	448,109	508,286	60,177	✓	Penalty: $50/MWh shortfal, adjusted for inflation	Target = (f + j) - c ["Target"] Actual = (f + j) - c ["Reported" + "Verified"] Remainder = Use to compute Excess
n	Decoupling Penalty Target	23,658	23,658	-	✓	Penalty: $50/MWh shortfal, adjusted for inflation Difference = excess savings	Target = c Actual = c[Reported]
o	Total Utility Savings	471,767	508,286	36,519		Total Utility Conservation Achievement - (EIA Target + Decoupling) = Total Utility Savings Remainder = Excess	Target = m + n Actual = f + j

3) Final 2018-2019 Verified Electric Savings

After PSE makes all applicable adjustments, the final electric verified savings can be reported. Table III-6 represents a summary of all true-up and adjustment values that are used to derive PSE's final, verified electric 2018-2019 savings.

Table III-6: Final Verified 2018-2019 Total Utility Conservation Achievement Results

Index		Source	Megawatt-Hours	Discussion
a		2018 Annual Report	299,918	From 2018 Annual Report Exhibit 1
b		2019 Annual Report	237,925	From 2019 Annual Report Exhibit 1
c		**Subtotal**	**537,843**	= a + b
	Adjustments to Reported Savings	*NEEA Savings*		
d			22,075	2018-2019 Deemed value, as represented in Annual Reports.
e			27,199	2018-2019 trued-up value, as reported by NEEA
f		NEEA 2018-2019 Savings Adjustment	5,124	= e - d
		Home Energy Reports		
g			17,996	2018-2019 Deemed value, as represented in Annual Reports.
h			24,144	2018-2019 trued-up value, as evaluated by DNV-GL
i		DNV-GL ex-post Home Energy Reports True-up	6,148	= h - g
		Verified Pilots with Uncertain savings		
j			0	Deemed value: P4P, as reported
k			0	Verified value: P4P
l		Pilots with Uncertain Savings	0	= j - k
		Biennial Electric Conservation Achievement Review		
m			0	Measure 1
n			0	Measure 2
o		Evergreen Economics' recommended adjustment in BECAR	0	= m - n
p		**Total Electric Savings Adjustments**	**11,272**	= f + i + l + o
q		**FINAL VERIFIED ELECTRIC CONSERVATION—PORTFOLIO, MWh**	**549,115**	= c + p
r		Less savings that were excluded from Penalty Thresholds		
s		NEEA Savings	27,199	= e
t		Pilots Savings	0	= k
		449 Savings	13,631	
u		**Final Electric Savings Applicable to Penalties**	**508,285**	= q - (s + t)
v		2018-2019 EIA Penalty Target	448,109	2018 -2019 Exhibit 1, line "bg" and Order 01, Docket UE-152058
w		**Difference**	**60,176**	= u - v
x		Decoupling Penalty Target	23,658	
y		**Remainder (Excess Savings)**	**36,518**	= x - w Available MWh for 20% of potential shortfall of 2020-2021 or 2022-2023 achieved savings

4) Excess Electric Savings

As indicated in Table III-6, PSE has earned an excess of 33,627 MWh from its 2018-2019 achievement. Consistent with WAC 480-109-100(3)(c)(i), PSE will be allowed to carry that value, along with the 21,990 MWh excess earned from its 2016-2017 biennium, in meeting up to 20 percent of a potential electric savings shortfall for the 2020-2021 biennium.[37] Excess savings of 38,906 MWh earned from the 2014-2015 biennium drops off for the current biennium and can no longer be used to meet any electric savings shortfall.

Table III-7: Excess Electric Savings Accounting

Excess Savings for Penalty Target Accounting									
	a EIA Penalty Target	b Decoupling Penalty Target	20% of EIA Penalty Target (WAC 480-109-100(3)(c))	c Actual PSE-Specific Savings	= c - (a + b) Excess Value	Available for potential 2016-2017 Shortfall	Available for 2018-2019 Shortfall	Available for 2020-2021 Shortfall	Available for 2022-2023 Shortfall
2014-2015	485,770	27,920	97,154	552,596	38,906	38,906	38,906	-	-
2016-2017	537,078	27,993	107,416	587,061	21,990		21,990	21,990	-
2018-2019	448,109	23,658	89,622	508,285	36,518			36,518	36,518
2020-2021	359,861	17,993	71,972						-
			(This is the amount of excess savings needed to meet the maximum allowed by the RCW.)	*Verfied savings: after adjustments, true-ups, and vetting.*					
Total Available Excess for Penalty Targets						**38,906**	**60,896**	**58,509**	

B. Penalty Calculations

PSE's electric and natural gas portfolio are subject to potential financial penalties. Potential electric shortfall are subject to penalties stipulated in RCW 19.285.060. Section M.43 in Exhibit F of the Order 03 Stipulation Agreement in Docket UG-011571 outline potential penalties for falling short of PSE's biennial natural gas target.

[37] The indicated value in the table is based on 20 percent of the originally-filed 2020-2021 BCP. It does not reflect the revised savings target, as filed in PSE's April 15 petition.

1) Electric Penalty Calculation

Potential electric penalties to which PSE may be subject are based on (1) the EIA Penalty Target and (2) the Decoupling Threshold that the Commission sets in its Biennial Conservation Plan Order.[38] RCW 19.285.060(1), that penalty is $50.00 per MWh missed, adjusted for inflation. Thus, PSE faced a potential $61.00 per MWh[39] of shortfall at the conclusion of the biennium and final savings reporting indicated in this Report.

It is important to note that a penalty would only be applied if PSE did not have excess savings available to mitigate up to 20 percent of its 2018-2019 target, per WAC 480-109-100(3)(c).

As indicated in Table III-6 and Table III-7, PSE exceeded its 2018-2019 EIA Penalty Target and its Decoupling Threshold, thus avoiding any penalty.

2) Natural Gas Penalty Calculation

Section M of the 2002 Stipulation Agreement, included as Exhibit F in Order 03 of Docket UG-011571, contains the rules pertinent to potential natural gas penalties.

a. Calculating Natural Gas Savings Applicable to Penalties

The first step in determining whether PSE will be subject to a natural gas savings shortfall penalty is performing the calculation outlined in Section M.39:

> "Achievement of annual targets for savings from cost-effective electricity conservation programs and from cost-effective natural gas programs, as established in Section D, shall be subject to a penalty mechanism. *[Electric calculation process superseded by the Electric Settlement in Docket UE-100177.]* PSE shall compute, every two years, the total natural gas savings captured through PSE natural gas efficiency programs during each two-year time period, and divide this total by two, to determine an average annual natural gas savings achievement for that period. These computations shall determine whether the Company achieved each of the minimum savings targets, on average.

[38] Applicable to the 2018-2019 biennium, the Commission set those targets in Order 01 of Dockets UE-171087 and UG-171088.

[39] This is an imprecise calculation, based on an inflation table available from the US government. Had a penalty been necessary, PSE would take additional steps to thoroughly vet the precise figures.

(continued) If the Company achieves its average annual savings goals, as determined with the Advisory Committee, during a two-year period, then no penalty will be applied for that two-year period. If the average annual savings targets are not achieved during a two-year period then a penalty is assessed according to Paragraph 43; the penalty applies only to each individual year in which that year's actual annual target is not met."

Section M.43 of the Stipulation Agreement enumerates the specific penalty amounts, should any be needed, based on the calculation steps outlined in Section M.39:

"The financial penalties for failure to achieve the annual conservation savings targets are as follows.

- Achieve savings that are 90 to 99% of the goal: $200,000 penalty applies
- Achieve savings that are 75% to 89% of the goal: $500,000 penalty applies
- Achieve savings that are less than 75% of the goal: $750,000 penalty applies"

b. 2018-2019 Natural Gas Penalty Calculation

Table III-8 follows the steps outlined in Section M.39 to calculate the potential natural gas penalty. As presented, PSE should not be subject to any penalty amount enumerated in Section M.43.

Table III-8: Calculating Potential Natural Gas Penalties

Natural Gas Savings Achievement			
Step	**Therms**		
(1) Total natural gas savings (reported)			
	2018	**2019**	**Total biennial savings**
Actual	3,771,309	3,228,161	6,999,470
Goal	3,269,604	3,147,391	6,416,995
(2) Divide total by two			
	Total biennial savings	**Divided by two**	= Average Annual Natural Gas Savings for Period
Actual*	6,950,176	3,475,088	
Goal	6,416,995	3,208,498	
** Totals reflect trued-up savings figures.*			
(3) Did PSE achieve each of the minimum savings targets on average?			
	Average Achieved	**Average Target**	**Met?**
2018, 2019	3,475,088	3,208,498	✓

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IV. RESIDENTIAL ENERGY MANAGEMENT OVERVIEW

Chapter 4 provides a summary of the results made possible by customers served by Residential Energy Management (REM) staff. PSE will discuss savings and expenditure metrics, highlights of programs that drove results, ongoing efforts to connect with potentially hard-to-reach customer segments, and cost-effectiveness results.

A. 2019 Residential Energy Management Sector Summary

Table IV-1 and Table IV-2 provide, at a program level, REM 2019 savings and expenditure figures, respectively. PSE provides detailed program discussions in Chapter 5: *Residential Program Details*. PSE discusses the Business Energy Management (BEM) Sector results in Chapter 6: *Business Energy Management Overview,* and Chapter 7: *Business Energy Management Program Details*.

The Sector surpassed its electric savings goals 113 percent, and completed 2019 near its natural gas savings goal, falling short by only 8 percent. REM program staff managed the Sector's expenditures quite well. Particularly noteworthy is that electric spending was 6 percent lower than planned. Natural gas expenditures were higher than planned, at 11 percent over budget.

Table IV-1: 2019 Residential Electric and Natural Gas Savings

2019 Savings				2019 Goal
Schedule	**Programs**	**Total**	**% of Goal**	
Electric	Electric			Electric
Gas	Gas			Gas
E201	Low Income	2,649	135.4%	1,956
E214	Single Family Existing	91,893	114.9%	79,997
E215	Single Family New Construction	228		382
E217	Multi Family Existing	13,002	88.3%	14,729
E218	Multi Family New Construction	6,165	164.3%	3,752
	Total Electric Programs	**113,937**	113.0%	100,816
G201	Low Income	18,830	117.1%	16,080
G214	Single Family Existing	1,218,898	86.0%	1,418,098
G215	Single Family New Construction	987	6.2%	16,045
G217	Multi Family Existing	34,433	68.8%	50,031
G218	Multi Family New Construction	181,981	216.6%	84,000
	Total Gas Programs	**1,455,129**	91.8%	1,584,254

Table IV-2: 2019 Residential Electric and Natural Gas Expenditures

2019 Expenditures				2019 Budget
Schedule	Programs	Total	% of Budget	
Electric	Electric			Electric
Gas	Gas			Gas
E201	Low Income	$ 6,737,232	143.7%	$ 4,688,441
E214	Single Family Existing	$ 20,405,172	95.5%	$ 21,376,702
E215	Single Family New Construction	$ 153,903	56.4%	$ 272,905
E217	Multi Family Existing	$ 6,015,737	64.6%	$ 9,315,207
E218	Multi Family New Construction	$ 1,904,569	97.5%	$ 1,954,068
	Total Electric Programs	**$ 35,216,613**	93.6%	$ 37,607,323
G201	Low Income	$ 914,253	139.4%	$ 656,080
G214	Single Family Existing	$ 6,556,456	103.6%	$ 6,326,822
G215	Single Family New Construction	$ 21,763	19.3%	$ 112,972
G217	Multi Family Existing	$ 308,937	76.9%	$ 401,871
G218	Multi Family New Construction	$ 1,064,468	229.4%	$ 464,003
	Total Gas Programs	**$ 8,865,878**	111.4%	$ 7,961,748

B. Notable 2019 Accomplishments

Several programs within the REM Sector sustained their innovative and noteworthy efforts to achieve the maximum savings while meeting customer expectations. The Single Family Existing group continued the successful Energy Upgrades campaign, as well as pop-up events, retail establishment field training, and thank-you kits for selected programs. The Manufactured Home Campaign, integrating several Single Family Existing programs, achieved results that exceeded expectations.[40] The Low Income Weatherization program started its manufactured home replacement pilot, and coordinated the free upgrades of over 150 ductless heat pumps in previously-weatherized homes. The Multifamily Retrofit program continued its successful “Strive for Five” customer recognition program, and the Multifamily New Construction program continued to develop lasting relationships with builders and developers in the region.

Program staff facilitated several pilot-like initiatives, including a study of line-voltage thermostats in the Multifamily program, and the Space and Water Heat program participated in a BPA heat pump water heater demand response pilot.

[40] Since manufactured homes do not have a distinct program, the campaign is referenced in the participating programs’ 2019 reviews. PSE provides key campaign metrics in Chapter 2, Introduction, in the Hard-to-Reach/Manufactured Homes discussion.

C. 2019 Key Performance Drivers

Several key programs within the REM sector made key impacts on the success achieved in 2019, as discussed in the following sections. PSE provides program-specific discussions on key drivers of REM savings and expenditures in Chapter 5.

1) Key Savings Contributors

Several REM programs met or exceeded their savings goals. Particularly noteworthy are the Residential Lighting program, which exceeded its electric savings goal by approximately 16,000 MWh. The program is—by a substantial margin—the largest contributor of electric savings in the Energy Efficiency Portfolio. The Single Family Space Heat program exceeded its electric and natural gas savings goals by substantial margins, owing to an increase in ductless heat pumps, resulting from limited-time incentives and manufacturer partnerships. Those programs that joined in the Manufactured Home Campaign also increased savings.

The Home Appliances program boosted participation in the Appliance Decommissioning measure by running a program awareness campaign during the summer of 2019, and the Multifamily New Construction program substantially exceeded its electric savings goal by proactively managing and influencing the variety of design, development, and construction associates well in advance of project commencement.

REM program staff employed a wide range of continuous improvement and innovation methods to drive savings results. A variety of programs, including Home Energy Assessments, Single Family Weatherization, Single Family Space and Water Heat, and Home Energy Reports, collaborated to implement the successful Manufactured Home Campaign. Staff also proactively managed incentive levels and promotions, such as pop-up events, the Energy Upgrades campaign, and incentive-sharing with water utilities on applicable measures. Using data analyses and market feedback, they managed the adoption and retirement of measures, and managed partnerships with manufacturers and retailers to effectively double customer rebates for limited periods.

Program implementation delays had some undesirable impacts on some programs: the Multifamily Retrofit program's third-party implementer had limited access to projects during the harsh January 2019 winter driving conditions. And, with its comprehensive prescriptive offering, the Single Family New Construction program was gaining traction throughout much of 2019.

Also beyond the direct control of program staff, the Web-Enabled Thermostat program's reported performance was impacted by a major manufacturer's website strategy alteration.[41]

On the natural gas side, natural gas furnaces had a strong performance, and a higher-than-planned customer participation in the Appliance Decommissioning program resulted in savings that surpassed goals. Additionally, the Multifamily New Construction program saw significantly higher participation as a result of its proactive engagement and streamlined program design. The Low Income Weatherization program also finished the year 17 above its natural gas savings goal, in large part due to a large boiler project in the City of Seattle.

Due to cost-ineffectiveness, PSE phased out its online store, ShopPSE. As the only source for natural gas residential showerheads, this affected their resultant reported savings. And, coincident with its electric savings performance, natural gas savings in the Single Family New Construction program were affected by its slow uptake by builders and developers. The Multifamily Retrofit program's direct install offerings, as was the case in its electric portfolio, was impacted by the harsh winter. The program has also seen a contraction among contractor projects.

2) Key Expenditure Drivers

The majority of REM programs managed their electric and natural gas expenses exceptionally well. Program staff employed cost-reduction initiatives, proactive incentive management, and extensive use of data analysis and outreach finish 2019 within range of their anticipated spends. For the majority of instances, expenditures tracked closely with savings achievement. Through achieving better-than-expected marketing efficiencies, the Retail Lighting program was 19 percent under its anticipated spend, while achieving savings that were 26 percent above goal. Manufacturer and retail partnerships also resulted in cost efficiencies, and utility and agency cooperation also provided reimbursements to participating programs.

[41] In May 2019, the manufacturer's smart thermostat brand was purchased by a large internet provider and integrated into the provider's online marketplace. The provider then closed down the PSE's instant rebate platform, and PSE has not been able to re-establish it. This resulted in a loss of 30 percent of the program savings potential.

D. Targeting Hard to Reach and Proportionately Underserved Market Segments in 2019

As noted in Chapter 2, section H.4, several programs in the REM Sector positively impacted many of the Hard-to-Reach and Proportionately Underserved customer segments. PSE provides additional detail on its initiatives to connect with potentially hard-to-reach customer segments in the program discussions in Chapter 5. Here, REM provides some highlights of those discussions.

Through partnering with its Energy Efficiency Communities and Events organizations, REM made strides in reaching low-income customers in 2019 by working closely with low-income agencies, community organizations, and numerous other groups to develop creative solutions and pilots for the specific needs of this customer segment.[42]

Consistent with its long-standing policy, PSE does not limit the amount of funding that it makes available to low-income agencies through its Low Income Weatherization program. The program also provides funding for certain repairs needed to effect energy-efficiency measures. LIW also addresses the manufactured home Hard-to-Reach segment.

20 percent of almost 1,800 housing units served by the program in 2019 were manufactured homes. In 2019, LIW implemented its manufactured home replacement pilot, and facilitated more than 150 ductless heat pump installations in manufactured homes that were previously weatherized. LIW also created a direct-marketing campaign in the manufactured home sector, consisting of emails, social media, and direct mail. The campaign included Spanish-speaking and multicultural radio and television advertisements.

REM also addressed the need to provide energy-efficiency calls to action for working-class and moderate-income customers in multifamily dwellings. In 2019, the Sector developed a strategy to reach multifamily residents who may not have access to/information about energy-efficiency measures, including energy fairs at apartment and condominium complexes. Staff also used GIS analysis of census data to identify regions categorized as “assumed low income”, which help target awareness efforts. The Multifamily New Construction program targeted specific affordable and rural multifamily building types.

[42] Section II.G.4.a.i outlines several other points of focus for the LIW team.

In the manufactured home segment, several REM programs integrated to conduct the Manufactured Home Campaign, which resulted in a doubling of incentives paid to manufactured home customers, installation of more than 70 smart thermostats in manufactured homes, augmented customer awareness by 27 percent, and provided Home Energy Assessments to more than 2,800 customers.

PSE provides details of these, and additional initiatives, in the program discussions throughout Chapter 5.

E. REM 2019 Cost Effectiveness

PSE presents the complete Total Resource Cost (TRC) and Utility Cost (UC) tables, showing cost-effectiveness calculations by program in Exhibit 2 of this Report. Table IV-3 represents the actual calculated TRC and UC benefit-to-cost (B/C) tests for the Residential Sector. It is important to note that, consistent with WAC 480-109-100(10), PSE omits the Low Income Weatherization costs from the REM and Portfolio calculations. LIW is included, however, in the overall presentation of cost-effectiveness in Exhibit 2.

Table IV-3: 2019 Residential Sector Cost-Effectiveness Tests

Benefit to Cost Ratios Residential Energy Management		
	Total Resource Cost	**Utility Cost**
Electric	1.83	2.37
Gas	1.56	2.14

Indicated TRC includes the application of a 10 percent Conservation credit value.

1) REM Program Cost-Effectiveness Performance

With the exception of REM's Single Family Space Heat and Water Heat programs, all programs finished 2019 with a TRC of over 1.0.

The overall Sector total TRC B/C ratio was 1.83. LIW, which is allowed special cost-effectiveness treatment under WAC 480-109-100(10), and was impacted by implementing agreed-to terms of the 2017 General Rate Case Stipulation Agreement [43] and the 2018 Macquarie transfer of ownership,[44] had an electric TRC of 0.58.

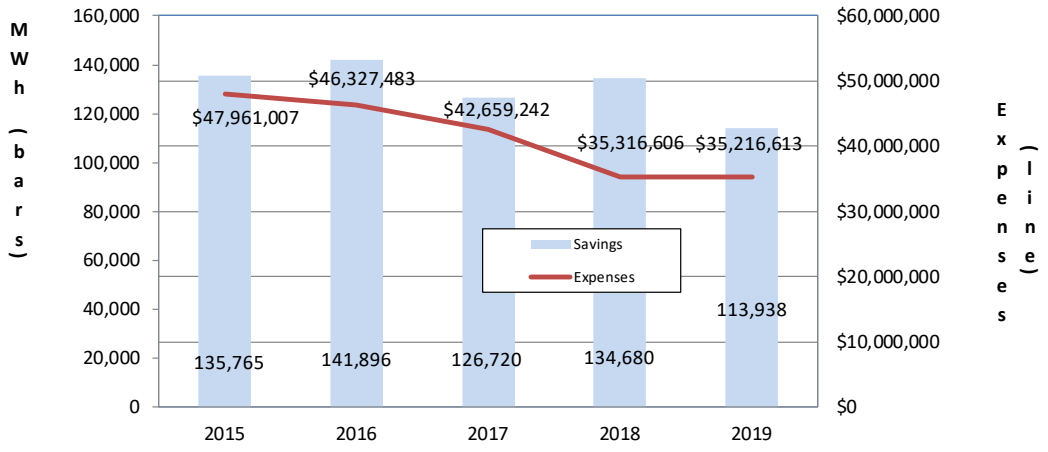
REM's overall natural gas TRC was 1.56, excluding LIW. LIW's natural gas cost-effectiveness (TRC of 0.38) is consistent with the Commission's 2012 policy statement on natural gas cost-effectiveness,[45] although the program's compliance with the 2017 General Rate Case Stipulation Agreement and 2018 Macquarie settlement also contributed to a lower cost-to-savings ratio.

The Single Family Water Heat program, with its slow start of storage water heaters, missed its cost-effectiveness TRC, and the Single Family New Construction program's lack of broad engagement contributed to a TRC lower than 1.0. Single Family Weatherization had a TRC slightly lower than 1.0.

F. Five-Year, 2015-2019 Trends

Figure IV-1 provides a representation of REM's 5-year electric savings and expenditures performance.

Figure IV-1:Residential Electric Five-Year Trends



[43] Dockets UE-170033 and UG-170034.

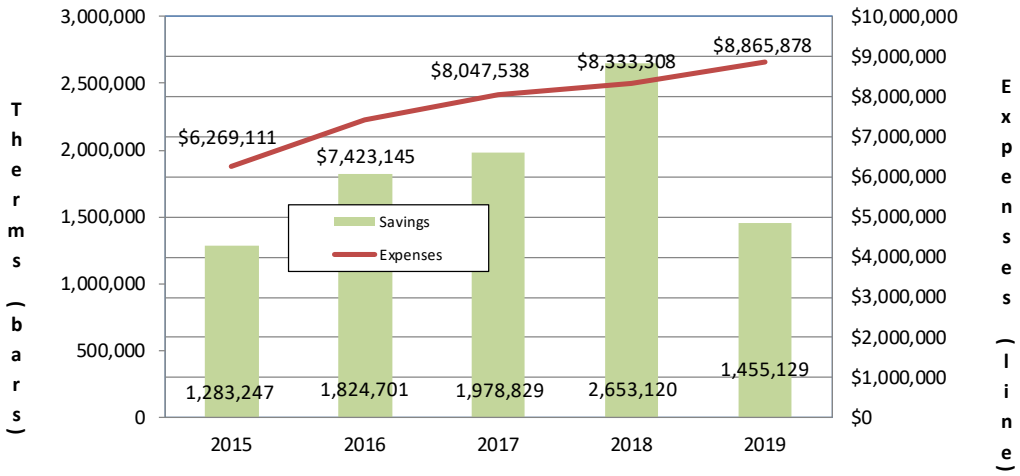
[44] Docket U-180680.

[45] Docket UG-121207.

In 2019, electric savings were 16 percent lower from 2015 levels, while commensurate expenditures were 27 percent lower. From 2018 to 2019, there was a reduction of electric savings by 15 percent, while spending was 0.3 percent lower for the same period.

Figure IV-2 provides a view of REM's 5-year natural gas savings and expenditures performance. On the natural gas side, there was a 13 percent increase in 2019 from the 2015 therm savings, and a 41 percent increase in natural gas expenditures. From 2018 to 2019, however, there was a 45 percent decrease in savings, with a 6 percent increase in spending. Key drivers of this decrease include, but are not limited to: an adjustment of -164,000 therms in the Home Energy Report program, resulting from the 2018 program evaluation;[46] the elimination of PSE's Smart Thermostat instant rebate form on a new manufacturer's website; and the retirement of the ShopPSE virtual store in mid-2019. PSE presents these and other variance discussions in the following program review chapter.

Figure IV-2: Residential Natural Gas Five-Year Trends



[46] As discussed in Chapter 3 of the Report, HER reports the first-year savings of a two-year measure life. In the second year of a biennium, PSE only reports incremental savings, and then trues-up the overall two years, based on verified annual evaluations. In 2018, the HER program reported savings of 890,000 therms. Subsequent to the preliminary 2018 evaluation, which indicated that the actual savings should be 727,900 therms, program staff entered a savings correction of -164,000 therms for 2019. This resulted in an apparent reduction of 1,057,000 therms from 2018 to 2019.

G. 2019 Program Measure Tables

PSE provides measure tables in each of the program discussions in Chapter 5: *Residential Program Details*. As noted in Chapter 2, PSE provides these high-level figures to afford a sense of program scale, customer demand, key savings contributors, and interesting measure types in each program. The tables are extracted from DSMc, include a limited number of measure types, and aren't intended to be a comprehensive list of all measures installed. PSE provides only a representative sampling of measure types. The listed measures aren't intended to comprise the total amount of 2019 program savings, and aren't intended to be used as audit tools or to reconcile actual tracking records.

It is noteworthy that selected measures may have units indicated in the "Dual" savings column in applicable program measure tables. These are measures—water-saving, some insulation, and various HVAC categories, for instance—where it isn't possible to conclusively determine the customer's primary applicable fuel type.

Using algorithms created to calculate electric and natural gas savings in these instances, the "dual" savings type applies specific ratios or existing electric-only and natural gas-only savings values to determine the amount of electric and natural gas savings attributable to those measures.

Showerheads installed in locations where PSE provides both the electric and natural gas service is one example. Another applies to equipment that conserve both electric and natural gas: certain clothes washers and commercial dishwashers, for instance.

H. 2019 Program Discussions

The program discussions In Chapter 5 outline process and tactical improvements that enhance the customer's energy-efficiency experience and prudently utilize Conservation Rider funding, along with program results, key drivers of savings and expenditures, adaptive management, and significant accomplishments.

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V. RESIDENTIAL PROGRAM DETAIL DISCUSSIONS

The following program discussions address specific results and accomplishments in the Residential Energy Management Sector. The discussion flow aligns with Energy Efficiency's Exhibit 1: *Savings and Budgets*.

A. Low Income Weatherization

Schedules E/G 201

1) Description

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

In 2019, the goal of Puget Sound Energy's Low-Income Weatherization 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 continues 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.

2) 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 Low Income Weatherization provides funding of many cost-effective home weatherization Measures for low-income customers receiving gas and/or electric heat from PSE.

Funds are used for single-family, multi-family and mobile home residences. 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.

a. Sources of Funding

Sources of Low Income Weatherization funding include, but are not limited to, Electric Rider, Gas Tracker, Company funds (Shareholder), BPA credits or other federal or state government programs.

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

i. 2017 General Rate Case Settlement Stipulation

In the 2017 General Rate Case, PSE agreed to additional funding for the LIW Program:

> Beginning January 1, 2018, PSE will provide an additional amount of $2 million to facilitate project support activities. The funding is consistent with terms outlined in PSE's 2017 General Rate Case (GRC) Settlement Stipulation Agreement.[47]

There is no cap on low-income funding; if agencies provide cost-effective projects beyond PSE's forecasted biennial total, PSE will continue funding the standard activities.

ii. 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.

iii. Manufactured Home Replacement Community Energy Efficiency Program (CEEP) Grant

In 2018, CEEP issued a grant for $300,000 which was leveraged with PSE and Commerce Weatherization program dollars for a total of four manufactured home replacements. The grant funding has been extended through June 2020.

[47] Dockets UE-170033 and UG-170034.

iv. *Macquarie Transfer Settlement Commitment #46*

On March 7, 2019 The Washington Utilities and Transportation Commission issued a Final Order[48] 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."

v. *Green Power Community Support Grants*

In 2018, the Community Energy Efficiency Program (CEEP) issued a grant to PSE for $250,000. In collaboration with the PSE Green Power program, which matched the CEEP funds, PSE facilitated funds for low income solar installations.

b. 2019 Ad-Hoc Funding Disposition

In 2019, the Low Income Weatherization program met all funding requirements.

i. *2017 General Rate Case Settlement Stipulation*

Through June 30, 2019, PSE continued to provide reimbursement to partnering agencies of up to 30 percent of projects that agencies enter into PSE's LIW online portal for project support and extended the 30 percent reimbursement rate through the end of the 2018-2019 biennium.

ii. *Special Contract Funding*

PSE accumulated slightly over $60,000 from May through December 2019 to be applied to future Energy Efficiency projects. PSE has a number of proposals under consideration, which will be vetted in 2020.

[48] Docket U-180680.

iii. Manufactured Home Replacement Community Energy Efficiency Program (CEEP) Grant

Of the four scheduled manufactured home replacements, two were completed in 2019 with the other two scheduled for completion in 2020. See overview above, Manufactured Home Replacement Community Energy Efficiency Program (CEEP) grant.

iv. Macquarie Transfer Settlement Commitment #46

Although 2019 did not yield firm plans for the required spending, started consultations with stakeholders, which continues into 2020.

v. Green Power Community Support Grants

Five solar Installation Projects were completed for Low Income Program for three agencies – King County Housing Authority (KCHA), Opportunity Council, and HopeSource.

3) 2019 Program Review

The 2019 Low Income Weatherization program electric savings met 135 percent of goal and natural gas savings finished the year at 117 percent of goal. The electric and natural gas program exceeded expectations which is discussed further under “Key Variance Drivers”. The Program served 1,825 housing units. Of those, 16 percent were single family, 64 percent were multi-family, and 20 percent were manufactured home residences.

4) Adaptive Management

As noted in Section A.2.b, the program demonstrated continuous improvement by adaptively managing its disbursements of General Rate Case, Green Power/CEEP, and Special Contract ad-hoc funding effectively. The program also initiated several innovative customer services, as discussed in the following Pilot-Like Initiative section.

5) Pilot-Like Initiatives

Manufactured Home Replacement Pilot (MHRP)

Of the four scheduled manufactured home replacements, two were completed in 2019 with the other two scheduled for completion in 2020. See overview above, Manufactured Home Replacement Community Energy Efficiency Program (CEEP) grant.

The Energy Project Ductless Heat Pump (DHP) Collaborative

This effort was led by The Energy Project in coordination with Department of Commerce and PSE. The TEP goal was to target and install 300 DHPs in previously weatherized manufactured-home units by June 30, 2019. The list of potential candidates was made accessible to agencies for targeting purposes. Per Commerce guidance, households identified as part of this initiative could be verified as low-income either through energy assistance participation, PSE HELP participation or by having received Weatherization in the last 12 months. Agencies followed individual procurement policies by soliciting a third party installation contractor. PSE committed to tailor and complement marketing tactics to support TEP DHP goals.

A total of 162 DHPs were installed as a result collaborative in 2019.

2019 Manufactured Home Campaign

In 2019, PSE launched a manufactured home campaign to expand customer awareness and participation in PSE's Manufactured Home Programs.

Results specific to the PSE Weatherization Program include:

- 131 percent increase in customers served (384 total) from 2018.
- 209 percent increase in free ductless heat pump installations (269 total, which includes installs from above collaborative) from 2018.
- Weatherization Assistance web page became the second most visited webpage, with an average of 5:39 minutes spent on the page.

6) Hard to Reach and/or Proportionately Underserved Segments

By its design, the Low Income Weatherization program is completely focused on a Hard-To-Reach segment of PSE customers: those that meet a specific income criteria. The program also reached other Hard-To-Reach Segments including, Rural, Manufactured Home, Multi-family, and Renters. For example, the program served over 1,100 multifamily units and more than 350 manufactured home units in 2019, compared to almost 750 multifamily units and 230 manufactured home units in 2018.

7) Key Variance Drivers

In 2019, the LIW electric program savings were 135 percent of goal and natural gas program savings were 117 percent of goal. The primary driver of the electric variance was increased production opportunities, particularly in the MF sector in the fourth quarter and in the Manufactured Home sector from the Energy Efficiency-wide Manufactured Home campaign and the DHP collaborative described above.

The primary reason for the gas variance was increased production opportunities in general but also combined with savings achieved from boiler replacement by the Seattle HomeWise program.

Savings that exceeded forecasts also drove commensurate additional expenditures in the form of Direct Benefit to Customer incentives.

8) Measure Summary

Table V-1 provides a high-level summary of LIW measures installed in 2019. The figures represent unique dwelling units (homes, apartments, manufactured homes, etc.), and don't always correlate to the total number of measures installed.

Table V-1: Low Income Weatherization Measure Highlights

Low Income Weatherization Measure Counts					
Measure Type	**Measure**	**Electric**	**Dual**	**Natural Gas**	
Barrier	Vapor Barrier				
Combined	Integrated Space and Water Heat				
Insulation	Door: weather strip, sweep	20		1	
	Attic Insulation	170,000		43,000	*
	Duct Insulation	500		4,300	*
	Floor Insulation	205,000		33,000	*
	Pipe Insulation	120			
	Wall Insulation	45,000		21,000	*
Lighting	LED Lamp	2,200			
Mobile Homes	Mobile Home Replacement	2			
Refrigerator	Refrigerator Replacement	30			
Safety	CO Detector	70		1	
	Smoke Detector	10		1	
Sealing	Air Sealing	120			
	Air Sealing Package	20			
	Duct Sealing	10		50	
	Shell Sealing	152,000		39,000	*
Space Heat	Programmable Thermostat	30			
	Furnace Replacement	2		30	
	Ductless Heat Pump	520			
	HVAC Boiler				
Ventilation	Mechanical Ventilation	140			
	Whole House Ventilation	370			
Water	Heat Pump Water Heater				
	Tankless Water Heater			4	
	Water Heater			2	
	Water Heater Insulation	6			
	Water Heater Replacement	1			
	Residential Use Aerator	10			
	Residential Use Showerhead	5			
Window	Double Pane to Double Pane	6,100			*
	Single Pane to Double Pane	1,500			*

*** Some units are in square feet**

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.

B. Single Family Existing

Schedules E/G 214

1) Description

Single Family Existing 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, 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, not limited to:

- Light-Emitting Diode (LED) lighting including A-line, BR-30, indoor & outdoor fixtures, MR-16, and candelabra.
- Appliances—including Energy Star® clothes washers and dryers, heat pump dryers, and others through PSE's partnership with NEEA.
- Retail, online, leave-behind, and engagement LEDs and water-savings products manufactured in 1992 or earlier.
- Refrigerator and Freezer Decommissioning – both secondary and primary units.
- Home Performance activities that may include home energy assessments, audits, and all-inclusive home retrofit services.

- Weatherization, including windows, insulation air and duct sealing, with targeted measures for manufactured home customers.
- Space heating including hydronic systems, high efficiency furnaces, high efficiency boilers, high efficiency fireplaces, heat pumps, and system controls, such as web-enabled thermostats.
- Water heating, including heat pump water heaters, 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.

2) Group Performance

Table V-2 provides a 2019 summary of savings for programs within the Single Family Existing group.

Table V-2: Single Family Existing 2019 Savings

		2019 Savings		2019 Goal
Schedule	Programs	Total	YE % of Goal	
Electric	Electric			Electric
Gas	Gas			Gas
E214	Single Family Existing			
	Residential Lighting	75,828	126.2%	60,073
	Space heat	9,293	127.7%	7,276
	Water heat	534	70.5%	758
	Home Energy Assessments	5,651	118.1%	4,783
	Home Appliances	2,481	121.1%	2,048
	Single Family Rental Pilot	0		0
	Web-Enabled Thermostats	959		1,639
	Showerheads	1,369	87.3%	1,568
	Weatherization	1,890	102.1%	1,852
	Home Energy Reports	-6,111		0
Subtotals		**91,893**	**114.9%**	**79,997**
G214	Single Family Existing			
	Residential Lighting	0		0
	Space heat	629,030	124.8%	504,161
	Water heat	66,093		109,907
	Home Energy Assessments	0		0
	Home Appliances	16,950	138.8%	12,210
	Single Family Rental Pilot	0		0
	Web-Enabled Thermostats	239,865	92.9%	258,070
	Showerheads	38,765	33.2%	116,701
	Weatherization	392,942	94.2%	417,049
	Home Energy Reports	-164,747		0
Subtotals		**1,218,898**	**86.0%**	**1,418,098**

Table V-3 provides program-level details of expenditures for the Single Family Existing group, which consists of multiple single-family programs.

Table V-3: Single Family Existing 2019 Expenditures

2019 Expenditures				2019 Budget
Schedule	Programs	Total	YE % of Budget	
Electric	Electric			Electric
Gas	Gas			Gas
E214	Single Family Existing			
	Residential Lighting	$ 9,487,159	81.3%	$11,667,684
	Space heat	$ 4,321,206	124.9%	$3,460,106
	Water heat	$ 324,272	80.7%	$401,840
	Home Energy Assessments	$ 2,733,746	109.1%	$2,505,934
	Home Appliances	$ 1,057,619	124.4%	$850,025
	Single Family Rental Pilot	$ 5,356		$104,586
	Web-Enabled Thermostats	$ 219,774		$423,669
	Showerheads	$ 329,872	81.6%	$404,352
	Weatherization	$ 1,029,315	122.0%	$843,713
	Home Energy Reports	$ 896,853	125.5%	$714,793
Subtotals		**$ 20,405,172**	**95.5%**	**$21,376,702**
G214	Single Family Existing			
	Residential Lighting	$ -		$0
	Space heat	$ 2,194,959	145.0%	$1,513,380
	Water heat	$ 365,492		$341,556
	Home Energy Assessments	$ -		$0
	Home Appliances	$ -		$0
	Single Family Rental Pilot	$ 5,356		$94,586
	Web-Enabled Thermostats	$ 669,986	63.4%	$1,057,223
	Showerheads	$ 153,232	40.8%	$375,962
	Weatherization	$ 2,572,549	109.4%	$2,351,337
	Home Energy Reports	$ 594,880	100.4%	$592,778
Subtotals		**$ 6,556,456**	**103.6%**	**$6,326,822**

3) Single Family Existing 2019 Customer Engagements

In 2019 the Single Family Existing programs collaborated to develop and execute unique customer engagement campaigns focused on driving customer awareness of and participation in PSE's single-family residential energy efficiency programs. The following discussions highlight some of the key 2019 customer awareness initiatives.

a. The Energy Upgrades Campaign

2019 marked the sixth year of this award-winning campaign. PSE discusses all of the campaign key metrics in the below list.

The campaign continued to use the message of "save money and shrink your bill with energy efficiency upgrades". PSE's research has shown that saving money cuts across all segmentations of customers and the word "upgrade" signals to customers that energy efficiency does not mean the customer has to sacrifice anything.

The multi-faceted campaign launched in April 2019. PSE partnered with three lighting manufacturers, an appliance manufacturer, and several retailers in PSE's service territory to offer special limited time offers from April through November on select products. The offers rotated throughout the campaign to give attention to each partner. PSE used a variety of marketing and outreach tactics, including but not limited to; paid advertising, bill inserts, social media, and in-store events.

The Energy Upgrades Campaign utilized many marketing assets in order to achieve millions of impressions. This included transit ads, social media, a campaign website, email, bill inserts, cinema ads, earned media through press releases, and more.

<u>2019 Upgrades Campaign by the numbers:</u>

- 41,201,051 advertising impressions.
- 6 months of limited time offers on select LED products.
- 2 months of limited time offers on select appliance products.
- 1,818,670 emails to PSE customers marketing limited time offers.
- 36 different in-store retail blitz events at 3 different retail chains.
- 2 different in-store retail blitz events at 2 different independent retailers.
- 14,964 Golden Tickets distributed to customers at the retail blitz events.
- 14,138 Golden Tickets redeemed by customers at the retail blitz events.
- 56,546,948 total impressions for 2019.

b. Retail Store Awareness and Field Services

In 2019, Puget Sound Energy successfully implemented field services in 335 locations. 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 retail and distributor locations included lighting, appliances, smart thermostats, and heat pump water heaters. The field services team also added new initiatives in 2019, servicing commercial food service distributors and manufactured home lots, ensuring that PSE's customers have an abundance of tools to reduce their energy usage using energy efficiency

i. Summary of Field Visits, trainings, and events

Field Visits:

The field team visited retail stores, electrical distribution centers, commercial food service distributors and manufactured home lots every week of the year, for a total of almost 2,650 visits.

Field representatives visited stores based on the following tiers:

- A (1-2 visits per month)
- B (1 visit per month)
- C (1 visit every other month, with two levels of communication in the off month)
  - C1 (1 visit every other month, call/email other month)
  - C2 (1 visit every other month)
- D (1 visit every quarter)
- E (1 visit or call every six months)

The tiered system was designed to allow field representatives flexibility with how their time was spent between low- and high-maintenance stores, in addition to new program partner locations.

Visits per tier and average visits per month by tier are shown in the table below.

Store Tier	# of Stores	Total # of 2019 Visits	Visits per Store	Avg. Visits Per Month
A (1-2 visits per month)	36	480	13.3	40
B (1 visit per month)	105	1133	10.7	94.4
C1 (1 visit (call/email) every other month)	59	398	6.7	33.2
C2 (1 visit every other month)	47	293	6.2	24.4
D (1 visit every quarter)	82	325	4.0	27.1
E (1 visit or call every 6 months)	6	18	3.0	1.5

The field team visit metrics are based on overall tier types and does not account for any fluctuations in partnerships. For instance, Tier A and B locations were populated with some Commercial Kitchen partners. Field outreach to those partners began in late quarter two. The visits per store numbers appear low given the fact that visits did not occur early in the year for that category. Additionally, Manufactured Homes was launched toward the end of 2019, with many of those partners assigned tier B and C status. The additional time required to train and engage these partners is not accounted for in the table.

Trainings:

In 2019 the field team educated partners on multiple program offerings and product technologies. These included:

- Retail (lighting, appliances, showerheads, smart thermostats),
- Lighting to Go (Commercial lighting retrofit lamps),
- Commercial Kitchens (Dishwashers, Ovens, Fryers, Steamers, Griddles, Holding Cabinets, Ice Machines, On-Demand Overwrappers),
- Manufactured Homes (ENERGY STAR® and NEEM+ homes).

PSE's training efforts resulted in more than 1,300 training visits.

Territory	Training Visits
Olympic	134
South	394
North	454
Greater Seattle	219
TOTAL	1,321

Events:

Field representatives completed 85 events in 2019, with the majority being focused on engaging and educating customers on energy-efficient products and programs offered by PSE. In 2019, the field team continued to offer two different formats for events: High Impact Events (HIEs) and pop-up events. HIEs are 8-hour events, staffed by multiple field representatives and scheduled with store management in advance.

Pop-up events are on-the-spot events that take advantage of high foot traffic periods in stores. Both types of events aim to engage store associates and PSE customers with energy-efficient products and program knowledge. In addition to HIEs and pop-up events, the field team assisted with special promotions and projects, such as Upgrades sell-through events.

ii. Thank You Kits

2019 marked the sixth year of PSE's successful "Thank You" kits. PSE offers two types of kits based on the residential customer's fuel type. Customers receive a kit if they applied for a PSE rebate or participated in a PSE renewable energy program. The electric and combined service kit contains two A-Lamp LEDs and two faucet aerators. PSE sent electric "Thank You" kits to more than 25,500 eligible residential electric and combined service customers.

The natural gas-only customer kit contains two bathroom faucet aerators, one kitchen aerator, and one showerhead. PSE sent gas-only "Thank You" kits to over 7,100 eligible residential customers.

The purpose of the "Thank You" kits is to show appreciation to PSE customers for their interest in its energy efficiency programs and to offer a surprise opportunity to adopt energy efficient measures in their home.

"Thank You" kits include a brochure thanking the customer for their participation and detailing PSE's various residential programs. By sending these energy efficient products, PSE gave customers the opportunity to trial these measures in their home.

iii. Pop-Up Retail Events

PSE continued its popular "pop-up" retail events at PSE businesses throughout PSE's service territory. A pop-up retail event is a limited-time—often one day—opportunity for customers to learn about and purchase PSE qualified and products qualifying for rebates. Other PSE conservation programs are often also promoted.

Events are generally offered to businesses with more than 150 employees in the core PSE electric service territory. In 2019, in collaboration with these businesses, PSE conducted over 85 events; approximately the same number as 2018. It is estimated that over 20,000 customers were made aware of the energy efficiency offerings while purchasing over 10,000 PSE branded Energy Efficiency Kits.

C. Program Reviews

The following discussions provide 2019 recaps for the individual programs that comprise the Single Family Existing suite of offerings.

1) Retail Lighting

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

a. 2019 Program Accomplishments

In 2019, the Residential Retail Lighting program exceeded its savings goal while staying under budget. Effective campaigns such as Energy Upgrades contributed to the program's successful performance. LED multi-packs continued to be popular in 2019 and the average retail price of LEDs was low enough to encourage customer adoption. PSE offers LED rebates at a variety of geographically-diverse retailers, including big box stores, grocery stores, and independent hardware stores, making it easy for customers to take advantage of rebates.

b. Adaptive Management

Throughout 2019 PSE kept informed of EISA 2020 and Washington State House Bill 1444 updates. Although these regulatory announcements ultimately did not impact the PSE Residential Retail Lighting Program until 2020, PSE monitored potential impacts to the lighting market in 2019.

c. Key Variance Drivers

The Retail Lighting program completed 2019 under budget, primarily due to better-than-expected efficiencies in marketing and retail field service as the organization continued successful, established strategies and campaigns. PSE conducted three successful Upgrades Campaign segments that saw boosts in sales and therefore savings. Many campaign marketing assets were reused from previous years with minor updates which lowered the marketing and outside services costs. There were also special promotions at a large retail partner, where PSE's rebate was added to a manufacturer rebate.

2) Space and Water Heating

The Space and Water Heating programs deliver incentives and drive installations of heating and water heating systems, including but not limited to: natural gas furnaces and boilers, heat pumps, hydronic systems, and domestic water heaters.

a. 2019 Program Accomplishments

Electric Space heating continued to see an increase in customer heat pump installations (including ductless heat pumps). The program worked with market partners to provide qualifying customers a limited-time offer on ductless heat pumps that combined PSE rebates with manufacturer financing incentives.

PSE continued to see strong performance from the Energy Star® natural gas furnace measure for the third year in a row. In 2019, approximately 70 percent of incentives processed came from contractors that are part of PSE's Contractor Alliance Network, who can offer instant rebates to PSE's customers.

b. Adaptive Management

The Residential Electric Water Heat program management team gained valuable insight through marketing efforts and feedback but continue to see less than ideal redemption. 2019 was a year of planning long term changes to the program. Changes being considered for 2020 include moving to a midstream and instant retail discount program model.

c. Pilot-Like Initiatives

In 2019, PSE introduced a separate ductless heat pump measure to encourage customers to install a DHP instead of a less efficient code-qualified unit. PSE quickly realized that this incentive was not being used as anticipated, as customers were using it to supplement an existing gas system for only a portion of their homes (versus the entire home).

As this was not the intent of the incentive, it was retired at the end of the year and the whole home air source heat pump rebate was adjusted to include mini-split technology.

PSE also participated in the Bonneville Power Agency (BPA) Heat Pump Water Heater Demand Response Pilot to test advanced water heater demand response communication technology. PSE recruited customers, provided monitoring equipment, coordinated communications and customer surveys, and attended working meetings with the BPA. PSE also facilitated the pass through of rebates to the customers. The pilot was successful, with PSE contributing the highest number of customer participants.

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

Space and Water Heat was an important part of the Manufactured homes initiative. PSE increased its incentive amounts for space and water heating equipment in order to increase redemptions. This was also used as pilot-like initiative, as program staff worked closely with contractors to identify other market barriers to increased installations.

e. Key Variance Drivers

Natural Gas Water heating is a new program PSE launched in 2018. Contractor response was very positive. Both a storage and tankless water heater rebate were included in the program. Redemptions of tankless water heaters exceed PSE targets but the storage tank rebate was slower to start off. PSE continues to monitor the success of these new measures.

While Water Heat incentives met expectations, Space Heat incentive expenses were higher than planned, although proportional with the increased electric savings.

3) Home Energy Assessments

Home Energy Assessments provide customers with a no-cost in-home service performed by PSE-qualified Home Energy Assessment Specialists. The program is intended to increase the awareness of customers regarding their home's energy consumption and identify cost-effective ways to use less energy. Participants receive a detailed Home Energy Assessment report which provides guidance on cost-effective upgrades and associated PSE rebates available. Additionally, eligible customers benefit from instant energy savings from the direct installation or distribution of leave-behind high-efficiency products to include, but not limited to: light bulbs, showerheads, and faucet aerators.

a. 2019 Program Accomplishments

In 2019, the HEA program served 15,777 residential customers, providing an average 13 products and 358 kWh in savings per customer. Overall customer satisfaction for the program exceeded 8.5 out of 10. PSE also implemented steps to improve access to the program by low income and manufactured home customers, as outlined below.

b. Adaptive Management

In 2019, the Home Energy Assessment program coordinated with other PSE Single Family Existing programs to deliver services to manufactured home customers within PSE's territory. Through increased targeted marketing and coordination with external stakeholders, PSE completed over 2,800 HEAs in manufactured homes in 2019. Later in the year, PSE added a Smart Thermostat measure with assisted installation for manufactured home customers. The Smart Thermostat measure included a $25 customer co-pay and was delivered to 77 manufactured homes in 2019.

In addition to improvements in how HEA is implemented, much work was put into analyzing lead sources for HEA and identifying which of those lead sources was most cost effective. PSE continued to improve upon its HEA outreach and marketing efforts by leveraging the data gathered during HEAs to send customers emails that are customized to their needs. PSE reached 9,694 manufactured homes in 80 communities throughout its territory via its door-to-door efforts, converting 15.7 percent to HEA on the spot.

PSE worked with the vendor to develop a set of Key Performance Indicators to drive customer satisfaction, energy savings and participation rates, and operational efficiency. Customer survey data was closely monitored and shared with the program vendor to address customer service issues and enact program improvements.

c. Hard-to-Reach and/or Proportionately Underserved Customers

In order to better access hard-to-reach and proportionally underserved customers, PSE launched a significant effort to serve manufactured home customers in the territory. In 2019, PSE performed over 2,800 manufactured homes, roughly seven times the volume in 2018.

PSE coordinated these efforts with both internal and external partners to drive customer participation in complementary programs such as Low Income Weatherization, Space and Water Heating, and Single Family Weatherization. For example, throughout the 2019 manufactured home campaign, PSE delivered 384 referrals to CAP agencies implementing PSE's Low Income Weatherization program.

d. Key Variance Drivers

The HEA program went above savings and spending targets. Savings targets were impacted positively by the manufactured homes campaign and its significant marketing effort. The campaign increased spending both on marketing and assessment costs above the original target.

4) Home Appliances

In 2019, this program offered incentives on a variety of residential appliances customers. These include:

- Refrigerator & Freezer Decommissioning;
- Energy Star® Clothes Washers;
- Heat Pump Dryers; and
- Energy Star Dryers.

a. 2019 Program Accomplishments

In 2019, PSE successfully recruited manufacturer Beko Home Appliances to partner in the Upgrades campaign and highlight energy efficient laundry equipment; in particular the heat pump dryer technology. PSE offered double rebates on ENERGY STAR certified clothes washers and dryers manufactured by Beko Home Appliances at local retailers that carried the brand, such as Albert Lee and DeWaard and Bode. Customers were targeted in stores through the Upgrades Campaign and promotional email sends to customers. In addition, PSE conducted three online sweepstake giveaways with Beko clothes washers and heat pump dryer pair combinations via social media to educate and engage customers about the technology.

PSE also conducted a program awareness campaign from July through August to boost participation in the Appliance Decommissioning program.

By leveraging low-cost marketing tactics such as targeted email sends, social media posts, and search engine marketing to promote the program, PSE saw more than a 400 percent increase in customer participation in the program during the campaign.

b. 2019 Adaptive Management

To maintain cost effectiveness for the Appliance Decommissioning, PSE changed program eligibility to refrigerators and freezers manufactured in 1992 or earlier. PSE had used limited time offers and charity campaigns historically to drive program participation. However, these strategies were determined to be cost prohibitive in 2019. Instead PSE chose to do an awareness campaign and leverage low-cost marketing tactics such as targeted email sends, social media posts, and search engine marketing to promote the program.

c. Key Variance Drivers

Although retail appliance rebate applications did not meet anticipated targets, the success of the Appliance Decommissioning Awareness campaign led the Appliance Program to exceed its overall electric savings and natural gas savings goals. The electric expenditures were commensurate with savings, due to an increase of Direct Benefit to Customer for 2019. The program exceeded its natural gas savings estimate as a result of the Leave Behind kits[49] for the Appliance Decommissioning program. The Leave Behind kit includes a showerhead and three aerators. Rather than a majority of electric customers participating, the majority of participants were in PSE's dual fuel territory, shifting the savings from electric-only to a proportion of natural gas reported savings. In addition to the higher proportion of natural gas customers, the Appliance Decommissioning program also had a higher participation than originally forecasted, increasing the volume of kits that PSE distributed.

[49] It is important to note the distinction between Leave-Behind kits and Thank You kits. Leave-Behind kits are distributed by PSE's third-party Decommissioning partner at the time that they remove the appliance from the customer's site, whereas Thank You kits are mailed to customers in the majority of cases.

5) Web-Enabled Thermostats

PSE offers rebates for Energy Star®-certified smart thermostats. Customers must heat their homes with a PSE fuel source to be eligible to participate in the program.

a. 2019 Program Accomplishments

PSE's Smart Thermostat program was evaluated in 2019. The third party evaluator concluded that despite conflicting information on savings values for smart thermostats, PSE's methodology for calculating savings was correct and recommended they continue with the approach until more conclusive research on savings values becomes available.

b. Adaptive Management

PSE offered instant rebates on smart thermostats at pop-up retail in 2019, providing customers another purchase avenue through which they could learn about and have access to smart thermostat technology.

c. Key Variance Drivers

A major manufacturer's website updates resulted in a suspension of PSE's instant rebate service for most of 2019, and continuing in to 2020. These instant rebates made up a significant portion of rebates for the program and the loss caused the Smart Thermostat program to fall short of its 2019 savings and spending goals.

6) Residential Showerheads

PSE offers instant incentives on WaterSense® labeled showerheads to customers through retail stores, targeted emails, engagements and through shopPSE. PSE continued to look for ways to build and strengthen its showerhead program portfolio in 2019.

a. 2019 Program Accomplishments

PSE continued its partnership with Costco in 2019 to offer instant discounts on WaterSense showerheads to customers. Costco added additional SKUs, providing customers more energy efficient showerhead options.

PSE also was able to sign an agreement L'Image, a showerhead manufacturer that supplies Dollar Stores. The partnership will enable PSE to expand on opportunities for low-income customers to participate in the Retail Showerhead program. PSE also continued its partnership with Uninex and Goodwill to make the Retail Showerhead program more accessible for low-income customers.

b. Adaptive management

PSE lowered incentives on 1.75 to 2.0 GPM showerheads in 2019. The approach allowed the program to continue offering the showerheads, while at the same time keeping the electric measure cost effective. On the natural gas side, PSE is currently exploring options for online marketplaces that might support the showerhead program.

PSE ended the faucet and thermostatic resistor valve rebates at the beginning of 2019 since the measures had little participation and high cost, resulting in cost-ineffectiveness.

c. Key Variance Drivers

The PSE showerhead program encountered two challenges in 2019 that significantly impacted its success. First, a major manufacturer participant had persistent reporting problems that reduced 2019 rebates.

PSE also began to phase out its online retail marketplace, ShopPSE, in 2019 due to cost-ineffectiveness. Natural gas showerhead rebates are only available through PSE's online marketplace, which therefore reduced savings. Combined, these factors led to the showerhead program falling short of its savings goals and anticipated spending.

7) Weatherization

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

a. 2019 Program Accomplishments

The program continues to provide top quality weatherization services, delivered through PSE's Trade Ally Network. In 2019, PSE launched a new Weatherization rebate portal, transitioning from a third-party portal to an internally managed system. PSE also expanded manufactured home rebate offerings with new measures and increased rebates in coordination with the Home Energy Assessment program and other Single Family Existing Residential offerings.

PSE continued to provide account management and verification services to Weatherization contractors through the internal verification team.

b. Adaptive Management

PSE retrained Weatherization Trade Allies to utilize the new portal for all Weatherization rebate submissions. PSE also expanded manufactured home rebate offerings in response to stakeholder feedback and direction from the UTC. Offerings for manufactured homes included new measures and increased rebates in coordination with the Home Energy Assessment program and other Single Family Existing Residential offerings.

c. Pilot-Like Initiatives

In the fall of 2019, the Weatherization program started a 'bundled rebate' incentive aimed at driving deeper retrofits in customers' homes. During this pilot, if a customer completes any three weatherization measures, PSE will provide an additional $250 on top of the rebates associated with each measure. If a customer completes any four weatherization measures, PSE will provide an additional $400 on top of the rebates associated with each measure.

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

In addition to the new and increased rebates for manufactured home customers, the Weatherization program also funded and organized trainings. One training for weatherization contractors was about manufactured home attic insulation. Another workshop brought a panel of weatherization contractors and PSE's Home Energy Assessment vendor together to improve data sharing, messaging, and operations to better serve residents of manufactured homes.

e. Key Variance Drivers

The Single Family Weatherization Program met its electric savings goal, but overshot it electric spending target by approximately 20 percent. The program met its natural gas savings target while spending less than forecast. A key contributor to the increased spending was the Manufactured Home initiative, which included significantly increased rebates in insulation, duct sealing, and windows.

8) Home Energy Reports

The Home Energy Reports program successfully delivered almost 783,000 print Reports and nearly 700,000 email Reports. PSE's 2019 Customer Engagement Tracker survey revealed that 85 percent of customers are reading the reports, and more specifically, 79 percent from the 2008 (the first HER pilot group) and 90 percent of the newly launched manufactured home group recall reading the reports

a. Adaptive Management

In 2019, the Home Energy Report expanded in response to an expected decline in participation due to customers moving out of the home. In May, PSE refilled 25,000 customers to its 2015 electric only high user wave and it added a manufactured home wave that serves approximately 40,000 customers and gives these customers personal energy efficiency recommendations for their home type.

Twenty-six percent (the same figure as in 2018) of customers self-report being more satisfied with PSE in response to the Reports program. As it has done in years past, the actual 2019 savings will be "trued up" following the next impact evaluation.

b. Key Variance Drivers

The Home Energy Report program added a new manufactured home customer group in May 2019 and resulted in a higher electric spend than budgeted. Consistent with the program's 2-year measure life and annual evaluation schedule, staff entered an electric savings adjustment of -6,111 MWh and -58,000 therms in 2019, in accordance with the 2018 evaluation findings. Readers will note that the program planned zero savings for 2019: although the 2019 ACP was submitted prior to the 2018 evaluation findings. Please see Chapter 3, Section A.1.a for further details.

9) Single Family Existing Measure Highlights

It is interesting to note that many of the water-savings measures indicated in the following table (such showerheads, aerators, etc.) are often reported in PSE's electric-only, natural gas-only, or combined territories. The latter figures are presented in the "Dual" column. PSE presents measures, grouped by types reported in 2019, in Table V-4.

Table V-4: Overview of 2019 Single Family Existing Measure Activity

Single Family Existing Program Measure Counts				
Program Measure Type	Measure	Electric	Dual	Natural Gas
Retail Lighting				
	LED Fixture, indoor & outdoor	490,000		
	T8 to LED conversion	43,000		
	LED Lamp	3,779,000		
	String Lighting, indoor & outdoor	34,000		
	Thank You kits	9,500		
Space Heat				
Heat Pump	Heat Pump Sizing and Lockout Control	130		
	Ductless Heat Pump	1,700		
	Ground Source Heat Pump	2		
	Heat Pump	1,200		
	Heat Pump Conversion from FAF	720		
Boiler	HVAC Boiler	60		
Combined	Integrated Space and Water Heat	90		
Fireplace	Gas Fireplace	440		
Furnace	Gas Furnace	5,000		
Kits	Thank You kits	15,000	5,800	10,000
Water Heat				
Water	Heat Pump Water Heater	380		
	Storage Water Heater			130
	Tankless Water Heater			1,100
Kits	Thank You kits	2,300	1,300	2,600
Home Energy Assessments				
Energy Assessment	Home Assessment	12,000		3,400
Lamp	LED Lamp	169,000		
Water	Residential Showerhead	13,000		9,900
	Residential Aerator	8,200		7,700
Controls	Web-Enabled Thermostat	30		

Single Family Existing Program Measure Counts, *continued*					
Program Measure Type	Measure	Electric	Dual	Natural Gas	
Home Appliances					
Appliances	Clothes Dryer				
	Clothes Dryer, Vented	2,900			
	Clothes Dryer, Ventless	70			
	Clothes Washer	1,600	2,200		
	Refrigerator	900			
Kits	Thank You kits	23,000	9,500	400	
Web-Enabled Thermostats					
	Web-Enabled Thermostat	100		6,300	
Kits	Thank You kits	10,000	7,800	10,000	
Residential Showerheads					
	Residential Aerator	7,200	-	15,000	
	Showerhead	8,200	22,000	500	
Kits	Thank You kits	3,800	5,700	200	
					*
Weatherization					
Sealing	Insulation and Duct Sealing	150		1,000	
	Air Sealing	482,000		1,790,000	*
	Duct Sealing	30		160	*
Energy Assessment	Home Performance Assessment				*
Insulation	Attic Insulation	255,000		985,000	
	Floor Insulation	284,000		763,000	
	Wall Insulation	30,000		122,000	
Safety	CO Detector			530	
Kits	Thank You kits	5,600	3,000	4,700	
	LED Lamp				*
	Residential Use Showerhead				*
Ventilation	Whole House Ventilation	20			
Window	Single Pane to U30	75,000	-	157,000	
	Double Pane/Metal Frame to U30	6,900		380	
Home Energy Reports		65,000		58,000	

* Some measures are stated in terms of square feet.

C. Single Family New Construction

Schedules E215 and G215

a. Description

The following discussion applies to new construction, both “stick-built” single family homes and manufactured homes. Conservation Schedule terms and conditions, as outlined in the above-noted Schedule numbers, govern the applicability, measure types, funding, analyses and general rules and provisions for each structure classification. Where there are specific requirements, service offerings, measures, incentives, marketing, or outreach applicable to the specific structure type, they are noted in each of the following sections.

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.

b. 2019 Program Review

The Single Family New Construction (SFNC) program, in its second year of implementation since relaunching, continued to work closely with the Northwest Energy Efficiency Alliance (NEEA), the Master Builders Associations (MBAs), and other builder organizations in order to maintain a strong presence in the market and provide technical support. PSE's SFNC program is consistent with NEEA's Next Step Homes Performance Path program, which utilizes the RTF approved standard modelling protocol. The standard modelling protocol provides a simplified method for estimating reliable savings with site-specific energy modeling for efficient new homes. The goal is to align all market actors (utilities, realtors, builders, raters, MLS providers, financers, homebuyers) with a metric that differentiates homes on energy efficiency. By relying on certified home raters to market the program, PSE is able to keep program costs down and increase the influence of energy efficiency by requiring builders collaborate with raters.

The benefits of offering a comprehensive single-family program based on modeling protocols is that it enables PSE to determine savings on a house-by-house basis employing integrated design techniques with the same asset metric tool used by the other market actors (for instance, REM/Rate™).[50]

The protocol validates REM/Rate savings estimates for new construction as an alternative to establishing individual UES measures allowing for greater program agility.

Some of the outcomes realized by this program design include:

- Ability for PSE to easily report all incremental savings above code in energy efficient homes.
- Customizable program for new construction tailored to the market's needs.
- Realtors can use the rating metric to communicate the energy efficiency of a home and increase sales rates.

[50] From the REM/Rate™ website, http://www.remrate.com/: REM/**Rate**™ software calculates heating, cooling, hot water, lighting, and appliance energy loads, consumption and costs for new and existing single and multi-family homes.

- Builders use performance ratings to communicate the value of energy efficiency and sell homes for a premium.
- Raters provide builders with building science expertise to achieve integrated design savings that meet both market demand and utility objectives.
- Homebuyers are able to identify which homes are more efficient and make comparative decisions.

PSE worked closely with seven certified home raters in the Trade Ally Network. These raters were trained and PSE-verified so that they meet certain quality control criteria. The home raters work directly with the builders to promote the program, facilitate the participation process, and leverage PSE incentives to drive more qualifying homes. PSE successfully processed and paid 39 rebates to builders.

PSE's MHNC program is based on two tiers of RTF-deemed measures. The first tier is Energy Star® certified and the second tier is Energy Star with Northwest Energy Efficiency Manufactured (NEEM) Homes Plus (Energy Star w/ NEEM+). Each home must be certified by NEEM, which is a DOE accredited certifying body for Energy Star homes.

To receive a MHNC rebate, the customer or sales person must complete an application at the point of sale and returns to PSE along with the proof of sale and NEEM certification. Sales Performance Incentives Funds (SPIFs) may be provided to sales staff who sell qualified homes and complete the rebate application on the customer's behalf, which ultimately help motivate sales staff to promote a higher adoption of Energy Star homes.

PSE successfully processed and paid 43 manufactured home rebates to customers. In Q4 of 2019, the program also enlisted the help of C+C to market and train manufactured home dealers, while also providing a more formal rebate and SPIF process to increase the volume of redemptions going forward. With the help of NEEM sales data, PSE was able to target the retailers with the highest sales volumes of Energy Star homes.

c. Adaptive Management

Based on feedback from home builders, raters, and NEEA, one of the major barriers to the SFNC program home enrollment is the increasingly stringent energy codes or limited financial benefit for installing energy efficiency measures due to low housing inventory and high demand in the Puget Sound region. Homes are often only built to code and there is little need for builders to differentiate given that homes are selling quickly in the current market.

In order to qualify for the program a builder must achieve 20-30 percent better than energy code energy use, which can be challenging in the current code climate. In response to the market feedback, PSE developed a stand-alone Energy Star smart thermostat measure for projects that were not able to meet the 20 percent minimum threshold above WSEC. The $75 rebate amount and qualifications are consistent with single family existing program. The program anticipates a significant uptake in 2020 as a result of creating alternate participation pathways that do not conflict with the WSEC credit system.

With respect to the MHNC program, sales performance incentive funds (SPIFs) are used to encourage manufactured home retailers to promote qualified homes to buyers. For qualifying homes that are sold to PSE customers, the sales person is eligible for $200-$300, depending on the model. PSE experienced no uptake on SPIFs from retailers in 2019 mainly due to a lack of awareness, but with increased outreach and training to Sales staff at various dealers, PSE expects to see much greater redemptions in 2020 for both rebates and SPIFs.

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

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

e. Key Variance Drivers

The electric spending was 52 percent of what was budgeted for 2019, while the natural gas spending was at 19 percent. PSE underspent in the electric and natural gas programs due to the SFNC and MHNC programs still being relatively new and continuing to ramp up from being on hiatus for a number of years.

Additionally, with stringent energy codes and cost effectiveness constraints, builders have a more difficult time offsetting the higher incremental costs toward achieving the minimum 20 percent threshold. The electric savings were almost 50 percent of target, while the natural gas savings was at 6 percent.

f. Measure Overviews

PSE provides a general overview of prescriptive measure categories reported in the 2019 Single Family and Manufactured Home New Construction programs in Table V-8 and Table V-6.

Table V-5: Single Family New Construction 2019 Prescriptive Measure Summary

Single Family New Construction Measure Counts				
Measure Type	**Measure**	**Electric**	**Dual**	**Natural Gas**
Combined	Built Green - 4 Star or Equiv. - 20% above WSEC	10	1	
Combined	Built Green - 5 Star or Equiv. - 30% above WSEC	20	2	

Table V-6: Manufactured Home New Construction 2019 Prescriptive Measure Summary

Manufactured Home New Construction Measure Counts				
Measure Type	**Measure**	**Electric**	**Dual**	**Natural Gas**
Manufactured Home	NEEM 1.1 Rated Energy Star®	40		
Manufactured Home	NEEM 2.0 Rated Energy Star®	1		

D. Multifamily Retrofit

Schedules E/G 217

1) Description

The objective of the Multifamily Retrofit program is to increase the installation of cost effective energy efficient measures into existing multifamily (MF) buildings with PSE natural gas and/or electric service.

The Multifamily Retrofit program is designed to increase the uptake and installation of selected energy efficient measures in 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.

2) 2019 Program Review

Overall, the program achieved 88 percent of the electric target and 69 percent of the natural gas target, while expending 65 percent and 77 percent of budget respectively.

Over the course of 2019, the Multifamily Retrofit program reached 364 multifamily properties across almost 3,250 buildings, and ultimately served nearly 25,000 household units. Contractor-installed measures accounted for approximately 58 percent of the total savings, while vendor direct-install measures comprised the remaining 42 percent.

Despite lower-than-desired savings, the program saw an increase in both contractor driven projects and direct-install activity. The program continues to engage with among large portfolio owners more familiar with the program. New outreach strategies have proven successful at recruiting smaller portfolio owners with less than 3 sites.

a. Air Sealing

Air Sealing continues to be an important measure for the deep retrofit of multifamily buildings and 2019 was a successful year with interest spreading to new management groups. Air sealing projects can take up to 12 months to complete and some were started in 2018, but overall 10 sites completed air sealing work across 42 buildings. The program's field team works very closely with its certified air sealing contractors to offer refresher training and coordinates third-party infiltration reduction blower door tests.

b. Energy Fairs & Customer Recognition

The Multifamily program has continued its "Strive for Five" award campaign that acknowledges properties for participating in multiple upgrades. Sites that have undergone three or more upgrades are presented with a plaque to display in their leasing office. Many have achieved upgrades in all five categories. In 2019 the program awarded 13 new plaques, and an additional 9 plates were given to sites who already received a plaque. The "Strive for Five" plaques are a great way for management teams to demonstrate their commitment to energy efficiency.

Energy Fairs have also been an ongoing component of the multifamily program. Across 5 different sites the program engaged with nearly 1,300 apartments. Electric and gas safety is always reiterated when in the community, and the team also informed residents about PSE commitment to clean energy goals and provided resources for low income bill pay assistance.

3) Adaptive Management

Common area Direct Install

In mid-2019 the program expanded the direct install offering to common areas when conducting in-unit direct install. Typically these areas included leasing offices, gyms, and clubhouses. Overall the field team replaced qualifying screw-in CFLs and incandescent at 46 sites.

Portfolio management and data mining

Throughout 2019 the program completed extensive research into market opportunities using purchased data, and other business intelligence tools to focus outreach efforts on underserved properties. The field team was able to dedicate an outreach person to assist with following up on these opportunities. Participation of new properties not only helped achieve annual savings targets, but these sites will also receive awareness marketing and program announcements for future incentive opportunities.

Limited Time Offer

On a few occasions the Multifamily Program has leveraged a bonus incentive to help incent stalled projects that were not able to begin due to high capital costs and low return on investment. Employing an additional $0.05 to help close stalled Common Area Lighting projects ultimately generated an additional 1.3 million kWh in savings for 2019.

4) Pilot-Like Initiatives

Line Voltage Connected Thermostats

The Multifamily Retrofit Program received grant funding from WSU CEEP and BPA in 2018 to install Line Voltage Connected Thermostats. Overall seven properties were selected to participate across three phases of the pilot.

Different thermostat models were installed during each phase prior to 2019, however the bulk of engagement and marketing efforts took place during 2019. The implementation vendor held staff trainings, conducted field surveys and helped produced a reference video to help residents understand the benefits of certain features such as geofencing. Results from the pilot are not yet available but PSE continues to view smart thermostats as a viable measure going forward.

Tubspouts

Evolve Technologies is the manufacture of the direct install device Thermostatic Restrictor Valve, and they recently developed a compatible tubspout. Together the two devices work as a system to stop the water during pre-shower warm up once it achieves 95 degrees. The system is estimated to save over 3,000 gallons of water per year per installation. Minimal additional training is needed for the installation, but the program installed 160 units in a property in Silverdale. Initial feedback has been positive and the program plans to incorporate this into the standard offering for direct install.

Incentive-Sharing for Water-Savings Measures

PSE has continued its partnership with the Cascade Water Alliance (CWA) in a joint effort to help the region save water. CWA and PSE split the installed cost of water-saving aerators and showerheads in locations that span both utilities' service territories. The added revenue helps to offset a portion of the program's overall costs, reflecting staff's commitment to identifying cost reduction strategies and prudently using ratepayer funds. For 2019 there were nearly 2,000 water saving devices installed.

5) Hard-to-Reach and/or Proportionately Underserved Segments

Multifamily is a key segment of the population considered to be "hard-to-reach" and PSE is especially proud to have served nearly 25,000 households in 2019. The program worked closely with the Lummi Nation Tribe to conduct extensive direct install throughout their multifamily community. Three "Energy Fairs" were scheduled to provide resources, information and refreshments.

6) Key Variance Drivers

The Multifamily Program commenced 2019 with a slow start, which played a role in finishing the year 12 percent below target. Winter conditions in January led to unsafe driving conditions and cancellations of direct install appointments. However, there continues to be an overall contraction among contractor projects. For example, in 2019 there were 45 percent fewer attic insulation projects than 2018, 25 percent fewer common area lighting projects, and 30 percent fewer double pane window projects.

This indicates that many older properties have been upgraded and therefore, there are fewer retrofit opportunities. Contractors have also commented that they've witnessed a handful of trained employees take jobs in the new construction field. Despite these trends, 2019 finished roughly 2 million kWh higher than 2018, which is largely due to a 12 percent increase of direct install savings.

7) Measure Highlights

Table V-7 provides a general overview of measure categories reported in the Multifamily Retrofit program in 2019.

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

Table V-7: Multifamily Retrofit 2019 Measures

Multifamily New Construction Measure Counts			
Measure Type	**Measure**	**Electric**	**Natural Gas**
Air Sealing	Door - Energy Star	170	
Appliances	Clothes Washer	4	
	Refrigerator - Energy Star	140	
Fireplace	Gas Fireplace		
Lighting	LED Lamp	164,000	
HVAC	Gas Furnace		1
	Integrated Space and Water Heating		3
	Ductless Heat Pump	10	
Insulation	Attic Insulation	620,000 *	29,000 *
	Floor Insulation	91,000 *	6,900 *
	Wall Insulation	240 *	
Behavior	Strategic Energy Management		
Thermostat	Elect. Line Voltage Thermostat	1,200	
	Web-Enabled Thermostat		2
Ventilation	Ventilation with Air Sealing	450	
Water	Water Heater Pipe Insulation	1,300	
	Showerhead	710	
	Residential Use Showerhead Restrictor	5,400	640
	Bathtub Spout Diverter	180	
	Residential Use Aerator	9,700	1,200
	Heat Pump Water Heater	4	
	Tankless Water Heater		1
Window	Double Pane	83,000 *	6,300 *
	Triple Pane	6,200 *	1,100 *

** Units are square feet*

E. Multifamily New Construction

Schedule E218, G218; applicable to Multifamily construction

1) Description

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 (cumulatively, the program refers to these as “partners”) who are constructing new single-family residential structures and multifamily buildings. The program also works with these partners to market energy efficient equipment to their customers. Energy Efficiency encourages the purchase and installation of energy efficient products for their construction projects.

For new multifamily construction projects, PSE packages financial incentives under one grant and are 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.

The program includes prescriptive rebates, and/or incentives, and calculated grants. Eligible customers include builders, developers, owners or agents receiving electricity through PSE’s residential schedules 7 (including 17, 27, 37 and 47) and 7A; and commercial schedules 8, 11, 12, 24, 25, 26, and 31; and/or natural gas service through PSE’s residential schedule 23 and commercial schedule 31.

Structures include but are not limited to single-family dwellings, duplexes, 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 builders, developers, showrooms and distributors, which allows for the tracking of specific measure details.

2) 2019 Program Review

In collaboration with PSE's third party vendor, CLEAResult, PSE provided an incentive marketing plan to provide increased industry awareness of new construction programs, and to stimulate earlier contact by customers in the project design process. Earlier contact with prospective projects allowed PSE's energy efficiency team to have a greater energy savings influence on the projects and provide a better customer experience with a timely, proactive grant process. This approach provides customers with a simple, understandable path to achieving holistic energy savings.

The new construction market is a complex, interdependent system of varied market actors, technical requirements, and decision factors. In Washington, stringent state and city energy codes mandate measures that would otherwise be high-value targets for utility energy efficiency programs. PSE is challenged to reach all parts of this diverse and expanding new construction market, achieve savings goals over "stretch" code thresholds, and maintain high customer satisfaction.

The MFNC program design addresses this complex scenario by focusing on building design and target markets. PSE brings customers to the design table as a partner early enough to optimize efficiency opportunities. The MFNC program also provides tools to ensure results through meaningful market engagement strategies, early design incentives, and a whole-building, whole process approach.

Before new construction projects even begin, PSE's Account Managers develop relationships with architects and engineers to influence building and system design. The New Construction team scaled its outreach efforts with specific consideration for challenging market segments, including hard-to-reach customers in rural areas, and important market segments such as affordable multifamily.

To effectively influence the fast-moving, cost-conscious multifamily market, PSE created tiered measure packages specifically for its service territory that are simple and engaging for customers. The third party engineering team brings extensive new construction experience to support custom measures and energy models for customers, maximizing energy savings for PSE from each project. This emphasis on people and their motivations and challenges enables PSE to help developers achieve a high level of gas and electric savings more cost-effectively than other firms, and with improved customer satisfaction results.

3) 2019 Achievements

In 2019, PSE continued to implement the MFNC program using the updated program design from 2018 which allowed for proactive engagement with its customers and yielded a strong pipeline of projects throughout the year. The team conducted two Early Design Assistance (EDA) meetings, where they invited all of the Mechanical, Electrical, and Plumbing (MEP) companies to discuss the roles in the overall energy savings of the project. The primary purpose of developing the EDA was to shift focus to energy use targets, rather than a percent savings over code metric. PSE facilitates charrette-style work sessions and provides shoebox models to help customers optimize solutions and meet energy targets.

PSE's current proactive presence in the market is unparalleled to what it was able to achieve in previous years in the MFNC program, dating back to 2007. Industry professionals and MEPs are beginning to recognize PSE's presence and count on the team to help them achieve their energy efficiency goals and financial targets. With this increased outreach and customer engagement, MFNC was able to increase their project totals for the year and completed over 40 projects while maintaining a consistent pipeline of projects for 2020.

4) Adaptive Management

PSE focuses on creating a culture of collaboration and transparency with its customers participating in the MFNC program, and actively seeks feedback on the grant process. The MFNC team continues to seek Energy Management Engineer (EME) feedback to update program guidelines, especially EME training and increased project experience. The MFNC program also actively seeks feedback from the 3rd party implementer regarding program mechanics and customer interaction and satisfaction.

In response to this valuable feedback PSE has done the following:

- Updated the program manual with process work flows and M&V guidelines, reporting templates, and KPI tracking.
- Developed the MFNC Program Guide to allow for smooth transitions if new members are added to the MFNC team.
- Updated the monthly forecast tool to increase forecast accuracy.
- Updated marketing and website content to provide clearer messaging to PSE customers.
- Updated MFNC program guidelines based on the feedback of PSE EMEs that have had the opportunity to work through one or more NC projects.

The team consistently and regularly monitors and addresses Key Performance Indicators (KPIs). Based on program metrics, feedback from participants and stakeholders, and evaluation recommendations, PSE regularly updates program materials, presentations, and talking points to address any points of confusion and streamline the participant experience.

5) Hard-to-Reach and/or Proportionately Underserved Segments

In 2019, PSE continued to use targeted outreach strategies and/or increased Affordable New Construction incentives to target specific building types and hard to reach customer segments, such as rural customers, small businesses, and affordable housing. Housing affordability is currently a major crisis in this region, and PSE is promoting additional energy efficiency incentives on top of tax incentives to help ensure new projects are sustainable. The MFNC program aligns with the WSHFC low income tax credit qualifications and offers enhanced incentives to customers who meet those qualifications. In 2019, the MFNC program completed five affordable housing projects impacting a total of 539 units.

6) Key Variance Drivers

Due to the organization's streamlined program design the MFNC program was able to capitalize on the new construction boom in the Puget Sound region. The program continues to have a strong pipeline of projects into 2020 even as the energy code becomes more stringent.

The electric MFNC program budget ended the year at 97 percent of what was budgeted for the 2019 year. The Direct Benefit to Customer (DBtC) reached 100 percent of the 2019 forecast. The final electric savings were at 164 percent of the anticipated goal due to increased program outreach and stabilization of the new program approach.

The MFNC natural gas program budget ended the year over budget and at 217 percent of its savings goal. Many projects that were originally scheduled to close in 2018 were pushed to 2019. This, in addition to a few large custom multifamily gas projects, caused the increase in gas savings and budget.

7) Multifamily New Construction Measures

MFNC projects are either packaged incentive offerings based on prototype modeling and prescriptive measures or custom whole building new construction grants if the customer can provide their own energy model. Whole building savings calculations are based on energy modeling and follow the BEM Whole Building New Construction custom grant procedure.

Customer's energy modelers create baseline models based on Washington State Code (WSEC) and follow ASHRAE Appendix G guidelines where applicable and standard practice. Additionally, program staff developed Energy Model Standards and Required Documentation to provide direction on standard practice and PSE expectations to customers providing their own energy models. Engineers review all submitted files to ensure baseline models follow modeling guidelines and meet energy code requirements, and proposed models match design drawings and project submittals. Additional details on assumptions such as building occupancy may also be verified with project owner.

MFNC packaged incentive offering savings are based on prototype modeling created specifically for PSE's territory as well as RTF deemed measures used in other PSE programs. Results are reviewed by PSE engineering staff, similar to the whole building energy model process. In cases where it makes sense, PSE has aligned with other regional multifamily offerings and affordable housing incentives to streamline the experience for the customer. For prescriptive and lighting measures, PSE uses the measures and calculators already in place for PSE customers. Any new measures follow approved processes for measure development with all calculations available for review by PSE engineering. All savings calculation documents are maintained in project folders. All MFNC project savings are calculated on a whole building basis, therefore, there are no individual prescriptive measures listed in the table below.

Table V-8: Multifamily New Construction 2019 Prescriptive Measure Summary

Multifamily New Construction Prescriptive Measure Counts			
Measure Type	**Measure**	**Electric**	**Natural Gas**
Clothes Washer	Residential Use Washer	590	
Water	Residential Use Showerhead		790

VI. BUSINESS ENERGY MANAGEMENT OVERVIEW

Chapter 6 provides a summary of the results made possible by customers served by Business Energy Management (BEM) staff. PSE will discuss savings and expenditure metrics, highlights of programs that drove results, ongoing efforts to connect with potentially hard-to-reach customer segments, cost-effectiveness results, and measure savings type profiles.

A. 2019 Business Energy Management Sector Summary

The following discussions provide brief summaries of the BEM sector. PSE provides detailed program discussions in Chapter 7: *BEM Program Details*. Table VI-1 and Table VI-2 provide, at a program level, BEM savings and expenditure figures.

The Sector fell slight short of its electric savings goals by only 2 percent, while it exceeded its natural gas savings goal by 14 percent. BEM program staff managed the expenditures quite well. Electric spending was 20 percent lower than planned, while natural gas expenditure finished 2019 30 percent above the anticipated spending.

Table VI-1: Business Energy Management 2019 Savings

2019 Savings				2019 Goal
Schedule	**Programs**	**Total**	**% of Goal**	
Electric	Electric			Electric
Gas	Gas			Gas
E250	C/I Retrofit	59,067	97.2%	60,750
E251	C/I New Construction	17,038	85.2%	20,000
E253	Resource Conservation Manager - RCM	15,350	118.1%	13,000
E258	Large Power User - Self Directed: 449 + non-449	446	44.6%	1,000
E261	Energy Efficiency Technology Evaluation	0		0
E262	Commercial Rebates	20,117	102.3%	19,657
	Total Electric Programs	**112,018**	97.9%	114,407
G250	C/I Retrofit	405,298	95.4%	425,000
G251	C/I New Construction	68,545	65.3%	105,000
G253	CSEM	596,042	89.0%	670,000
G261	Energy Efficiency Technology Evaluation	0		n/a
G262	Commercial Rebates	703,145	194.7%	361,137
	Total Gas Programs	**1,773,030**	113.6%	**1,561,137**

Table VI-2: Business Energy Management 2019 Expenditures

2019 Expenditures				2019 Budget
Schedule	**Programs**	**Total**	**% of Budget**	
Electric	Electric			Electric
Gas	Gas			Gas
E250	C/I Retrofit	$ 10,221,283	66.5%	$ 15,380,824
E251	C/I New Construction	$ 3,458,097	72.1%	$ 4,795,358
E253	Resource Conservation Manager - RCM	$ 1,054,635	74.4%	$ 1,417,739
E258	Large Power User - Self Directed: 449 + non-449	$ 3,387,908	176.4%	$ 1,920,497
E261	Energy Efficiency Technology Evaluation	$ -		$ -
E262	Commercial Rebates	$ 5,360,857	92.7%	$ 5,780,091
	Total Electric Programs	**$ 23,482,780**	80.2%	$ 29,294,509
G250	C/I Retrofit	$ 1,658,873	100.6%	$ 1,648,600
G251	C/I New Construction	$ 493,838	98.8%	$ 499,700
G253	CSEM	$ 469,247	82.4%	$ 569,682
G261	Energy Efficiency Technology Evaluation	$ -		$ -
G262	Commercial Rebates	$ 2,503,071	206.7%	$ 1,211,191
	Total Gas Programs	**$ 5,125,028**	130.4%	$ 3,929,173

B. Notable 2019 Accomplishments

Several programs within the BEM Sector continued their noteworthy drive and proactive management to engage a wide range of customers, developers, contractors, and vendors to achieve the maximum savings while meeting customer expectations. The Commercial Kitchens and Laundry program made notable innovations by expanding their midstream offerings, and aligning with their Retail program counterparts. The Commercial Midstream program itself experienced significant channel participation in its first full year of operation.

The Lighting to Go program significantly exceeded its electric savings goal due to the popularity of the Tubular LED (TLED) and recessed can retrofit kits, and the Commercial Strategic Energy Management (CSEM) organization developed several innovative solutions for customers, resulting in higher-than-planned savings. In what is quickly becoming a leading Energy Efficiency standard practice, the Small Business Direct Install program initiated several key partnerships with conservation districts across the PSE territory to collaboratively promote PSE services to small agricultural customers. And, the Industrial Systems Optimization Program (ISOP) implemented a unique incentive structure for customers that complete their projects within 120 days of receiving their optimization report.

C. Key 2019 Performance Drivers

PSE provides program-specific discussions on key drivers of BEM savings and expenditures in Chapter 7. The following sections provide brief highlights of those; readers may reference the above tables for these highlights.

1) Key Savings Contributors

CSEM, Lighting to Go, Commercial Midstream, and Business Lighting Grants[51] led the Sector's electric savings achievement for 2019, while the remaining BEM programs finished the year within expected parameters. Technology advancements in LED lighting and product cost reductions led to higher-than-planned savings in applicable programs. The Commercial Kitchen & Laundry program implemented a redesigned midstream approach, which led to increased distributor participation and satisfaction. As a result of customers' reactive-basis (replace on failure) purchasing model, however, in 2019, this did not translate to increased savings, however. In spite of improved marketing and outreach, along with early design involvement, several C/I New Construction large indoor agriculture lighting project were cancelled in 2019.

On the natural gas side, the new Commercial Midstream program gained substantial popularity with other Energy Efficiency programs and channel partners alike, and finished 2019 185 percent above its savings expectation. The Commercial Kitchen & Laundry program also drove higher-than-expected savings achievement, resulting from the improved distribution approach, as well as the difficulty in predicting customers' equipment failures (as is similarly the case in the electric portfolio).

The Commercial HVAC program had difficulty gaining acceptance of the newly-updated Advance Rooftop Controller (ARC) prescriptive rebate in 2019. The Small Business Direct Install program was faced with market saturation and lower-than-expected sprayhead savings, resulting in a substantial savings shortfall. In the C/I New Construction program, where projects often carry large therm savings, there were few completed projects, resulting in a 35 percent shortfall.

[51] Business Lighting is a separate group within C/I Retrofit. The other C/I Retrofit group is Industrial Systems Optimization Program (ISOP).

2) Key Expenditure Drivers

Program staff proactively and prudently managed their incentive offerings, promotions, marketing, and outreach, and employed cost-reduction strategies appropriately. Like their REM counterparts, the majority of BEM expenses tracked coincidentally with savings, primarily driven by Direct Benefit to Customer expenses. One exception is in the C/I New Construction program, where contracted services are a fixed cost, regardless of savings achieved. A notable expense variance occurred in the Large Power User/Self-Directed program. In conjunction with the end of its 4-year cycle, PSE performed a journal entry to transfer approximately $1.97 million of unused funds from the Schedule 258 account to the general Conservation Rider per Schedule 258 program tariff requirements. This appeared as a credit to the C/I Retrofit fund, Schedule 250, which is represented as an over-spend in the Large Power User category, and a large under-spend in the C/I Retrofit category.

The Business Lighting program's budget variance was created when it maintained the TLED incentive to match the Lighting to Go $2 per lamp rebate, and customers relied on using TLEDs, rather than new or retrofit fixtures. The CSEM expenditures were less than planned due to lower staffing expenses, and Commercial HVAC's updated ARC measure not having the planned market uptake caused a spending imbalance.

D. Targeting Hard to Reach and/or Proportionately Underserved Market Segments in 2019

PSE provides additional detail on its initiative to connect with potentially hard-to-reach customer segments in the program discussions in Chapter 7. Here, BEM provides some highlights of those discussions.

One hurdle for businesses interested in pursuing a custom energy-efficiency grant is their size. Smaller businesses often don't meet eligibility requirements for some programs, including potential lighting projects that are less than 25,000 kWh of first-year savings. BEM programs continue to evaluate these potential projects for grant opportunities. Commercial New Construction's Lighting Power Density (LPD) incentive approach also addresses the needs of smaller customers that do not qualify for whole-building incentives. In 2019, C/I New Construction continued to streamline the program to make it easier for smaller commercial customers to participate.

By continuing to collaborate with the Multifamily New Construction program, the C/I New Construction team enabled increased small business awareness and enrollment in all of Energy Efficiency's programs.

The Business Rebates programs manage a suite of prescriptive measures that are designed to target hard-to-reach, potentially under-served customers who do not traditionally participate in energy efficiency programs. For instance, most restaurant customers overlap some underserved or hard-to-reach segments, due to many factors: many are small businesses; some rent their space; some are in rural communities; some have uncertainty as to the longevity of their business; and others have reduced awareness of energy efficiency.

The Commercial Kitchen & Laundry program continued to reach these customers in unique ways that work for them, including door-to-door outreach through small business community outreach, and the sustained midstream rebate delivery through local equipment distributors. The kitchen program also continued its partnership with the Small Business Direct Install blitz activities, allowing for direct face time with individual restaurant customers.

The Small Business Direct Install program serves a unique set of customers who may be in rural areas, have limited access to resources, may be in difficult-to-access areas (for instance, Point Roberts, Washington), or be skeptical of efficiency services. Small-to-medium agriculture customers are, to a larger extent than small business customers, geographically diverse. Farms are characteristically in outlying areas that are rarely targeted for conservation by other vendors. Additionally, customer interest is seasonal—farms aren't able to address energy efficiency upgrades during growing seasons; they typically address upgrades during late fall and winter.

The small-to-medium sized hotel customer has many barriers to participating in PSE's programs, including limited access to the capital needed to make improvements. They also have many types of equipment which could qualify for rebates, and are often unsure where to start the process. The SBDI program serves as a central point of contact for this wide range of small business customers. This program brings the opportunity to these customers in a way that they can understand, providing a starting point on their energy efficiency projects. With many no-cost installations available to the customer, investments can be spent on larger opportunities with the help of the program's co-pay structure.

SBDI partnered with the Energy Efficient Communities organization to coordinate five multi-day "blitzes" that covered 11 communities in 2019. Some of the blitzes incorporated rural locations, engaged multi-cultural businesses, and addressed small commercial kitchens, lodging, agriculture, and several other small business entities. PSE also implemented a new outreach technique for small businesses who may not have a downtown core location, opting to contact 95 customers by telephone.

E. BEM 2019 Cost Effectiveness

Table VI-3 represents the Total Resource Cost (TRC) and Utility Cost (UC) benefit-to-cost ratios for BEM.

Table VI-3: Business Sector Cost-Effectiveness Tests

Benefit to Cost Ratios Business Energy Management		
	Total Resource Cost	**Utility Cost**
Electric	1.73	2.89
Gas	2.20	1.81

Indicated TRC includes the application of a 10 percent Conservation credit value.

PSE presents a complete listing of cost-effectiveness ratios by program in *Exhibit 2: Program Cost Effectiveness*. The overall BEM Sector finished 2019 with an electric TRC of 1.73 and a natural gas TRC of 2.20. With the exception of Commercial HVAC, all BEM electric programs finished 2019 with a TRC above 1.0, which was impacted by the slow uptake of its new Advanced Rooftop Controller prescriptive rebate.

On the natural gas side, all programs finished the year with a TRC above 1.0, with the exception of Small Business Direct Install, which completed the year with showerhead and aerator saturation, and sprayhead measures that had lower-than-planned savings.

The Sector consistently applied the principles of the Commission's 2012 natural gas policy statement,[52] which indicated that while a balanced TRC is optimally preferred, a portfolio should maintain a UC benefit/cost ratio above 1.0.

F. Five-Year Trends, 2015-2019

Figure VI-1 provides a representation of BEM's 5-year electric savings and expenditures. BEM's electric savings are approximately 4 percent lower in 2019, as compared to five years earlier, while electric expenditures over the same timeframe decreased by 25 percent. From 2018 to 2019, electric savings decreased 25 percent, and spending was 41 percent lower.

Figure VI-1: Business Energy Management Five-Year Trends: Electric

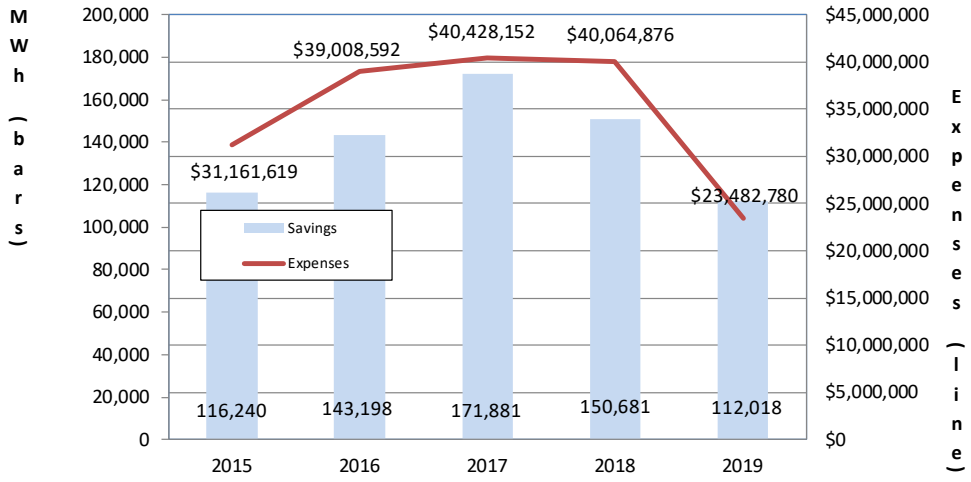
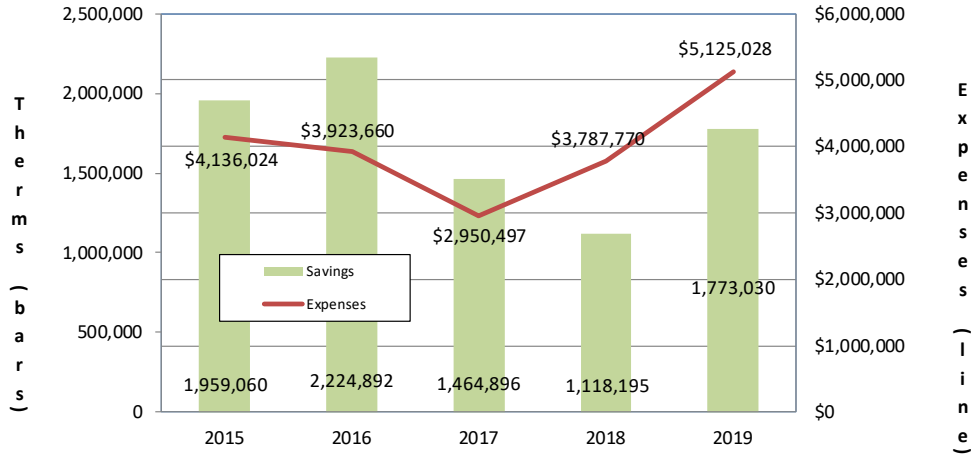


Figure VI-2 provides a view of BEM's 5-year natural gas savings and expenditures. BEM's natural gas savings have gone down approximately 9 percent from 2015 to 2019, and the commensurate spending increased 24 percent.

[52] Docket UG-121207.

2019 natural gas savings saw a decrease of 59 percent from 2018 levels, while expenditures were 35 percent higher than in 2018.

Figure VI-2: Business Energy Management Five-Year Trends: Natural Gas



G. 2019 Program Measure Tables

PSE provides project and measure tables in each of the program discussions in Chapter 6: *Business Program Details*. As noted in Chapter 2, PSE provides these high-level figures to afford a sense of program scale, customer demand, key savings contributors, and interesting measure types in each program. The tables include a limited number of measure types, and aren't intended to be a comprehensive list of all measures installed. PSE provides only a representative sampling of measure types. The listed measures or projects aren't intended to comprise the total amount of 2019 program savings. Program measure tables aren't intended to be used as audit tools or to reconcile actual tracking records.

It is noteworthy that selected measures may have units indicated in the "Dual" savings column in applicable program measure tables. These are measures—water-saving, some insulation, and various HVAC categories, for instance—where it isn't possible to conclusively determine the customer's primary applicable fuel type, or equipment that conserve both electric and natural gas: commercial dishwashers, for instance, and many custom grant projects have both electric and natural gas savings.

H. 2019 Program Discussions

The program discussions In Chapter 7 outline process and tactical improvements that enhance the customer's energy-efficiency experience and prudently utilize Conservation Rider funding, along with program results, key drivers of savings and expenditures, adaptive management, and significant accomplishments.

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VII. BUSINESS PROGRAM DETAIL DISCUSSIONS

The following discussions provide program-specific reviews of 2019 accomplishments, continuous improvement initiatives, and variance drivers.

A. Commercial/Industrial Retrofit

Schedules E/G 250

1) Description

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 makes 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 existing building commissioning (O&M) improvements are provided through the Comprehensive Building Tune-Up (CBTU) Program.

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.

2) C/I Retrofit: Custom Grants (Non-Lighting)

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

a. Adaptive Management

In 2019, PSE reviewed and streamlined verification requirements for the HVAC Controls Protocol. The goal of this undertaking was to encourage program participation from smaller buildings by reducing customer/contractor documentation while maintaining an appropriate level of rigor in the verification process.

b. Pilot-Like Initiatives

PSE staff have consulted with industry professionals to revamp building commissioning offerings. After a substantial amount of planning and preparation in 2019, PSE will be offering a Monitoring-based Commissioning (MBCx) measure in 2020 that will utilize software analytics and regular customer meetings to evaluate building energy performance, correct inefficient operations and ensure energy savings persistence.

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

PSE continues to evaluate projects that do not meet rebate eligibility requirements for custom grant opportunities when necessary. These projects typically involve small businesses that are difficult to categorize into a specific business type.

d. Key Variance Drivers

HVAC Controls projects continue to contribute substantial (approximately 25 percent) electrical energy savings toward the non-lighting portion of Schedule 250. The program completed fewer electric projects than forecast, leading to a slight electric savings shortfall.

The resulting commensurate reduction in paid grants, along with a large end-of-cycle journal entry from the Large Power User/Self-Directed program, resulted in actual electric spending below expectations. The natural gas sector of the program finished 2019 on target and on budget.

3) Business Lighting Program

The Business Lighting Grants 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.

a. Program Accomplishments

The Business Lighting program paid approximately 621 projects in 2019. The average project size was just under 74,000 kWh per project. The Business Lighting program exceeded the 2019 savings goals by 5 percent while coming in under budget by 18 percent. The budget savings is primarily a result of the TLED incentive matching the Lighting-To-Go $2/tube incentive and customers using TLEDs instead of new fixtures or fixture retrofits and simplification of the internal processing.

b. Adaptive Management

The Business Lighting Team consistently monitors the trends of the lighting market. The trend in 2019 was continued adoption of LED products and reduced LED prices as predicted at the beginning of the year.

In October 2019, the team decided to raise the base incentive at $0.175/kWh for fixtures and kits, maintained the $2 each for TLED tubes, maintained the Luminaire Level Lighting Control bonus at $75 per fixture, but added a $0.05 per kWh bonus for measures that add automatic controls to spur more control projects in 2020. Program staff designed a new application/calculator to take effect Jan 1, 2020.

c. 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 2019, the program paid 207 of these projects. These projects accounted for approximately 34 percent of the project count and 10 percent of the program savings. Additionally, 7 Relight Washington (small Washington cities) street lighting projects were completed in 2019.

d. Key Variance Drivers

LED technology, fixtures and TLED tubes are being adopted at a fast rate in part due to continued LED price reductions throughout 2019. Budget variances were driven primarily by maintaining the TLED incentive to match the Lighting-To-Go $2/tube incentive and customers using TLEDs instead of new fixtures or fixture retrofits. Additionally, the simplification and streamlining of the program reduced overall staff costs.

4) Contracted Programs

In addition to Commercial/Industrial Retrofit Custom Grant offerings, PSE contracts with industry experts to develop and implement cost effective programs tailored to the unique needs of target markets. Measure-specific incentives are provided through these contracted programs:

a. Industrial System Optimization Program (ISOP)

The program focuses on operational and maintenance (O&M) measures to be verified through custom analysis on an individual project or site basis. Incentives are based on actual savings achieved. Customers agree to continue monitoring and verification following implementation to assure persistence of the savings.

i. Program Accomplishments

The Industrial System Optimization Program engaged with 16 industrial customers in 2019, the last year of a two-year program cycle. Of these customers, 12 customers have completed an ISOP project. The other four customers participated in the first cohort industrial strategic energy management (ISEM) program.

ii. Adaptive Management

PSE implemented a new incentive structure in the 2018-2019 program cycle: when a customer implemented action items within 120 days after the optimization report was presented, the customer received an incentive up to 100 percent of the cost. This motivated the customers to complete projects to save energy right away, resulting in two new projects completion within the first year of the program cycle. This is a first in the ISOP program implementation.

iii. Pilot-Like Initiatives

ISOP also started an ISEM program using a cohort setup to engage customers to practice strategic energy management. Customers interact with the cohort and learn from each other while being trained on the fundamentals of ISEM. The ISEM program provides opportunity for PSE staff to explore and learn about ISEM to develop future ISEM program.

5) 2019 Project and Measure Type Summary

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. It should be noted that in this specific table, the column "Both Electric and Natural Gas" isn't indicative of adding the "Electric" and "Natural Gas" columns together. Rather, these are projects in which both electric and natural gas measures were installed.

Table VII-1 provides a representative number of Commercial/Industrial Retrofit projects completed in 2019.

Table VII-1: Commercial/Industrial Retrofit Projects

Commercial/Industrial Retrofit Custom Grants	Number of Custom Grant Projects		
Program Project Classification	Electric	Natural Gas	Both Electric & Natural Gas
Commercial/Industrial Custom Grants			
Commercial & Industrial Retrofit	55	35	11
C/I Lighting Grants			
Business Lighting Grants	625	0	0
Contracted Programs			
ISOP	7	0	1
Total Project Count	687	35	12

Custom Grant projects often consist of more than a single measure

PSE presents a representative number of electric and natural gas measure categories installed in their respective programs in Table VII-2. A key contributor to overall Commercial/Industrial Retrofit's achievement is its Business Lighting Grants, noted at the bottom of the table.

It is important to clarify that these are measure categories, not individual measures, and PSE rounds totals greater than 10 for this Report. 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 VII-2: (a) Highlights of Commercial/Industrial Retrofit and Lighting Grants Measure Categories

Highlights of Measure Categories by Program	Count of Measure Categories		
	Electric	Natural Gas	Total Measure Count
Commercial & Industrial Retrofit			
(All custom grants)			
Boiler - Hot Water - Custom	0	10	10
CBTU - Assessment Phase	4	2	6
CBTU - Commissioning Phase	2	2	4
CBTU - Performance Phase	2	1	3
Chiller - Custom	2	0	2
Compressor or Dryer or Receiver - Custom	6	0	6
Data Center - Cooling - Custom	1	0	1
Fan - VFD - Custom	4	0	4
Generic Measure - Custom	2	0	2
HVAC - Other & VRF - Custom	7	1	8
HVAC Control - Only, Base & Performance Custom	25	10	35
Insulation - Building Shell & Exterior Roof - Custom	0	2	2
Motor - Custom	1	0	1
Process - Modification & Heating System - Custom	2	2	4
Pump - VFD - Custom	2	0	2
Refrigeration - Custom	10	10	20
Unitary Equipment - Custom	4	4	8
Water Heater - Commercial - Custom	0	4	4
Total Measures	**74**	**48**	**122**
Commercial & Industrial Lighting Grants			
Lighting - Performance Custom	4	0	4
Lighting - Custom	605	0	605
Lighting - Street - Custom	15	0	15
Total Measures	**624**	**0**	**624**

Table VII-2: (b) Highlights of Commercial/Industrial Contracted Program Measure Categories

Highlights of Measure Categories by Program	Count of Measure Categories		
	Electric	Natural Gas	Total Measure Count
Contracted Programs			
Industrial Systems Optimization Program			
Compressed Air System - Custom	1	0	1
Fan or Pump or Blower - Custom	1	0	1
Field Services - Custom	5	1	6
Generic Measure - Custom	1	0	1
Total Measures	**8**	**0**	**8**

B. Commercial/Industrial New Construction

Schedules E/G 251

PSE works with designers and developers of any large or small new Commercial / Industrial 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. Three 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.

1) 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 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.

2) 2019 Accomplishments

In 2019, the Commercial New Construction team continued to work with CLEAResult in conjunction with the Multi-Family New Construction program to improve marketing and outreach. The team completed the first Early Design Assistance (EDA) meeting with a school district that will turn into a project in 2020. Program staff engaged directly with members of the design community, including developers, architects and designers to improve awareness of the program. The UW's Integrated Design Lab assisted in outreach efforts, and contributed to design and modeling efforts on a handful of projects. As a part of continuous improvement efforts, program staff created an Energy Modeling Guidelines document in conjunction with Solarc, and created an energy model tracking spreadsheet to improve internal communication.

3) Pilot-Like Initiatives

C/I New Construction staff continued to work with CLEAResult on marketing and recruiting customers to participate in the EDA program. This program will incentivize developers to consider their buildings' energy consumption holistically early in the design process.

4) Adaptive Management

Program staff continue to focus on creating a culture of collaboration and transparency with their customers participating in the new construction programs, and actively seek feedback from customers, the design community, and other utilities on the grant project process. Staff also continue to seek EME feedback to update program guidelines, especially EME training and increased project experience.

5) Hard-to-Reach and/or Proportionately Underserved Segments

The Commercial New Construction Program applies to and serves Small Business, Commercial Tenant, and Industrial customers.

6) Key Variance Drivers

a. Natural Gas Savings Lower than Expected

Natural Gas savings in New Construction are primarily driven by a small number of large projects. In 2019, there were few large projects, resulting in savings being 35 percent lower than expected. Although spending was lower than budgeted, it was higher than the decrease in savings because the outside services (primarily the CLEAResult contract) are a fixed cost.

b. Electric Savings Lower than Expected

Several large indoor agriculture lighting projects that were forecasted to be installed in 2019 were cancelled, which resulted in electric savings being 15 percent lower than expected. Spending also decreased accordingly, while cost-effectiveness was maintained.

7) 2019 Project and Measure Type Summary

The C/I New Construction representative number of projects completed in 2019 are shown in Table VII-3. PSE rounds figures over 10 for this Report.

Table VII-3: 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	40	2	8
Total Project Count	**40**	**2**	**8**

Custom Grant projects often consist of more than a single measure

PSE presents the number of electric and natural gas measures installed in Table VII-4.

Table VII-4: Commercial/Industrial New Construction Measure Categories

Highlights of Measure Categories by Program	Count of Measure Categories		
	Electric	Natural Gas	Total Measure Count
Commercial/Industrial New Construction			
(All custom grants)			
Boiler - Hot Water - Custom	0	1	1
Chiller - Custom	1	0	1
Compressor or Dryer or Receiver - Custom	1	0	1
Lighting - Custom	20	0	20
Lighting Power Density Reduction - Custom	10	0	10
Refrigeration - Custom	2	1	3
Whole Building Design - Custom	10	10	20
Total Measures	**44**	**12**	**56**

C. Commercial Strategic Energy Management

Schedules E/G 253

1) Description

PSE offers Commercial Strategic Energy Management Services (CSEM) to any school district, public-sector government agency, and Commercial or Industrial (C/I) customer 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.

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:

a. Program Start Up

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

b. Resource Accounting Software

- Purchase and/or implementation of Resource Accounting Software.
- Audits of existing databases to review for inclusion of all facilities, accounts, meters, etc., sufficient facility details, missing data, and overall data integrity.

c. 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.

d. 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.

e. Energy Data Services

- Historical and on-going monthly PSE billing data and access to Resource Accounting Software.
- Energy Interval Services for internet viewing of facility gas and electric interval meter data.

f. 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.

2) 2019 Accomplishments

In 2019, the CSEM program contributed to the energy savings target, revamped the customer training curriculum, developed seasonal campaign materials for customers, and implemented the Continuous Engagement Credit (CEC) system.

The team also held the annual customer meeting and awards ceremony with a broadened scope to include multi-family and industrial SEM customers. 2019 was also a grant renewal year for the majority of participants, so the CSEM team updated grants along with completing annual energy savings analyses for customers.

The CSEM program achieved its electric and natural gas savings from 31 projects.

Trainings: PSE continues to provide training opportunities to CSEM customers. This strategy offers excellent customer service. It also achieves energy savings via the energy management initiatives resulting from the new ideas Energy Champions bring back to their facilities. Trainings completed in 2019 were:

In-person Customer Training:

- Why Smart Buildings – Building the Business Case
- BOC Level 1
- BOC Level II

Customer Webinars:

- CSEM Seasonal Savings Opportunities webinar
- Continuous Engagement Credit webinar
- SEMHub Introductory Coursework
- SEMHub advanced coursework
- BOC Lighting Controls
- Dedicated Outdoor Air Systems DOAS
- Energy Management Information Systems: How Do You Track and Communicate Savings Over Time
- Going Beyond Benchmarking your Building
- Buildings Tune-Ups in Buildings with BAS
- Safety Practices in Building Operations

3) Adaptive Management

The CSEM team is committed to meeting the needs of its customers at the same time that they use best practices to measure and verify program savings. The program's offerings are adjusted accordingly as new information is available. In addition to the continued implementation of the CSEM program, program staff worked with the evaluation team to identify opportunities for improvement.

Adaptive Management initiatives completed in 2019 include:

- Quarterly reports from PSE identifying customer buildings with the most and least energy savings.
- Customer trainings with follow-up webinars and coaching to encourage implementation of new energy-saving initiatives.
- Development of CSEM seasonal energy management campaign materials followed by piecemealed distribution of the materials to the customer. The purpose of these campaigns is to generate internal conversations at the customer organization about low-cost / no-cost seasonal energy-saving opportunities. These campaigns support a paradigm shift towards the continuous improvement framework of SEM, where preventive activities prioritize seasonal energy saving opportunities.
- Implementation of the Continuous Engagement Credit system, which is an alternative to the Target Incentive system. It encourages PSE customers to continue to engage with the CSEM program and take on energy-saving actions.

4) Key Variance Drivers

Electric Savings –The CSEM program completed 2019 at 118 percent of the target savings. The result came from increased program implementation activities to support more customers in achieving electric savings. The program finished below the electric budget, mainly for two reasons. First, the number of customers who exceeded their performance target was less than anticipated. Therefore less target incentive was distributed than budgeted. Second, the staff managing the program was smaller than planned.

Natural Gas Savings –The CSEM program reached 89 percent of the target savings. Due to the variability of metered savings, this variance from forecasted savings is within the normal range.

5) 2019 Results by Customer Sector

Table VII-5 below shows the number of RCM program projects.

Table VII-6 presents a representative summary view of 2019 incentive and allowance categories paid. PSE rounds totals over 10 for this Report.

Table VII-5: Number of CSEM Projects

Program	Project Count Per Program			
	Electric	Gas	Both Electric & Gas	All Projects Combined
Commercial Strategic Energy Management	13	5	13	31
Total Projects	13	5	13	31

Table VII-6: Representative CSEM Incentives & Allowance

Commercial Strategic Energy Management	
Incentive Type	**Count**
CSEM	
CSEM - Performance Incentive - Year 1	17
CSEM - Performance Incentive - Year 2	8
CSEM - Start Up Incentive - Year 1	2
CSEM - Target Incentive - Year 1	16
CSEM - Target Incentive - Year 2	8
CSEM - Training Allowance - Year 1	8
CSEM - Training Allowance - Year 2	4
Generic Measure - Custom	1
RCM - Performance Incentive - Year 1	2
RCM - Performance Incentive - Year 2	6
RCM - Performance Incentive - Year 3	15
RCM - Performance Target Incentive - Year	2
RCM - Performance Target Incentive - Year	6
RCM - Performance Target Incentive - Year	15
RCM - Start Up Incentive - Year 1	2
RCM - Training Allowance - Year 1	3
RCM - Training Allowance - Year 2	5
RCM - Training Allowance - Year 3	11
Total	**131**

Custom Grant projects often consist of more than a single measure

D. Large Power User/Self Directed

Schedule E258

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.

1) Description

The Large Power User/Self-Directed 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.

2) Program Accomplishments

Since 2019 was the first year of the new program cycle, allocations were calculated and communicated to the customers via the non-competitive phase RFP in early April. A new measure—the funding of energy studies—was introduced in an effort to help customers identify potential projects at their sites.

Only one project was completed in 2019, saving approximately 450,000 kWh/yr. This is likely due to 2019 being the first year of a new cycle, which typically sees the least amount of completed projects due to the reduced amount of time to start and finish a project.

There were 12 projects in progress at the end of 2019, with estimated savings potential of approximately 5,500,000 kWh/yr.

3) Key Variance Drivers

Program spending in 2019 was approximately $2.3 million for the 449 customers ($377,000 in labor and NEEA funding, and $1.97 million for the end of cycle true up), and $1.04 million for schedule 40 & 46 customers ($223,000 in incentives, $819,000 in labor and NEEA funding). The end-of-cycle true up for the 449 customers transferred unspent allocations from the end of the 2015-2018 program cycle to the general Energy Efficiency budget (specifically, Schedule 250: C/I Retrofit).

Aside from the end of cycle true-up, program spending was down significantly from 2018 since the final year of a program cycle (2018) generally sees the most incentive payouts (as customers rush to complete their projects), while the first year of a new cycle has the least amount of incentive spending, as mentioned in Section 2.

4) 2019 Project and Measure Type Summary

Table VII-7 shows the distribution of projects by customer rate schedule. Table VII-8 indicates a representative number of measure types installed to provide a sense of program scale. PSE rounds totals more than 10 for this Report. A project may include substantially more than one measure.

Table VII-7: Large Power User/Self-Directed Number of Projects

PROGRAM	Project Count Per Program
	Electric Only
High Voltage 40 46 49	43
High Voltage 449	18

Table VII-8: Large Power User/Self-Directed Measure Classifications

PROGRAM MEASURE CATEGORY	Count
Pump	5
Lighting	27
Process	6
Fan	5
HVAC	12
RTU	1
Custom Grant	2
CTBU	1
Total Measure Count	**59**

E. Energy Efficient Technology Evaluation

Schedules E/G 261

The purpose of Energy Efficiency Technology Evaluation is to identify new, energy efficient technologies and products for PSE program offerings. Ideally, PSE would identify cost effective technologies and measures with significant savings potential, which are commercially available. However, there are many emerging technologies that range from "commercially available, but not used in the Northwest," to "conceptual" or "prototypical" technologies still in the development phase.

It is relatively simple to determine whether new, commercially available technologies are suitable, as long as generally accepted engineering calculations can be used, and manufacturers can provide reliable data. For example, vendors frequently approach PSE with new, improved products, claimed to save more energy than their older models, or their competition. Usually these proposals are evaluated by the Energy Management Engineer who is managing the project, who then shares his/her experience with others in the group.

Some technologies are not so simple to evaluate. Those that are truly new typically have little experiential history, or there is no generally accepted method to calculate the performance. Clearly, it would be risky to broadly offer incentives through PSE's programs - risky with regard to uncertain savings and risky for its customers due to unforeseen product issues. If the potential savings look significant, PSE may try the technology on a limited quantity of projects, especially if it is working with a customer who understands the risks and would like to be an "early adopter." Sometimes the most prudent approach is to monitor the progress of the technology, especially if the savings potential appears limited. PSE's effort is not intended for basic research, or product development, but to identify technologies that are available and suitable for its programs.

The most challenging situations arise when vendors propose products that are "too good to be true." Often their savings claims are supported by testimonials from satisfied customers, with little or no reliable test data. Many technologies, such as transient voltage suppressors, power factor correction devices and paint with high R-Value, have been known for years to save little or no energy, but the vendor may insist their product is different, even though it may only have a different name on the box.

Fortunately, PSE has experience with many of these products, or can readily find others who have had experience. It is important, however, to distinguish between inaccurate claims and those that might truly be the new emerging technology that deserves attention.

1) 2019 Accomplishments and Activities

PSE is working with NEEA to further research on Condensing Gas RTU applications in its territory. Recently, a demonstration project was installed for one of PSE's Renton Customers. A PSE engineer was on site through the installation, and will be providing data and savings analysis support over the next few years.

F. Business Rebates

Schedules E/G 262

The following Measure categories are managed in-house by PSE Staff:

- Commercial Kitchen Equipment,
- Commercial Clothes Washers,
- Commercial HVAC,
- Commercial Retail Lighting – Lighting to Go.

PSE also contracts with industry experts to implement cost effective Measures tailored to the unique needs of target markets. The following additional Measure categories are offered through contracted programs:

- Midstream Commercial HVAC and Water Heat Rebates,
- Commercial Maintenance measures including web enabled thermostats and Advanced rooftop controls.
- Direct Install Measures (Lighting, Refrigeration, Plug Load, Basic HVAC and Water Saving) for Small Businesses, Lodging and Small Agriculture customers.

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.

1) 2019 Accomplishments and Activities

Many Business Rebates are designed to target hard-to-reach customers who do not traditionally participate in energy efficiency programs. Program design focuses on bringing the opportunity to the customer, whether this is at their place of business, through a trusted community partner, or through a trade ally (for example, contractors and distributors).

Similar to the Residential Sector's Single Family Existing Schedule (E/G 214), the Business Rebates organization is comprised of several separate programs. Therefore, PSE presents a savings and expenditure breakout (Table VII-9 and Table VII-10, respectively) of the overall Schedule 262 programs to facilitate the appropriate level of reporting transparency.

Table VII-9: Business Rebate Programs, 2019 Savings

2019 Savings				2019 Goal
Schedule	Programs	Total	YE % of Goal	
Electric	Electric			Electric
Gas	Gas			Gas
E262	Business Rebates			
	Lighting to Go (AKA Business Lighting Markdowns)	11,361	126.7%	8,970
	Commercial Kitchen & Laundry	383	84.6%	452
	Commercial Midstream	6,667	765.4%	871
	Commercial HVAC	623	57.5%	1,084
	Small Business Direct Install	1,083		8,280
Subtotals		**20,117**	**102.3%**	**19,657**
G262	Business Rebates			
	Commercial Kitchen & Laundry	113,058	130.8%	86,464
	Commercial Midstream	587,522		
	Commercial HVAC	1,876	6.4%	29,475
	Small Business Direct Install	689	1.8%	39,300
Subtotals		**703,145**	**194.7%**	**361,137**

The Commercial Rebates program continued offering its successful prescriptive rebates in lighting, kitchen, commercial HVAC, hospitality and other programs. It also contracted the delivery of specialty programs such as Small Business Direct Install and launched the quite successful Commercial Midstream program, which has seen increased interest from other programs who may be able to leverage the model.

The team also made new inroads in the Hard-to-Reach customer segment, with a push to engage Native American and English-as-a-second-language constituents.

Table VII-10: Business Rebate Programs, 2019 Expenditures

2019 Expenditures				2019 Budget
Schedule	Programs	Total	YE % of Budget	
Electric	Electric			Electric
Gas	Gas			Gas
E262	Business Rebates			
	Lighting to Go (AKA Business Lighting Markdowns)	$ 704,086	146.7%	$479,864
	Commercial Kitchen & Laundry	$ 119,303	78.1%	$152,826
	Commercial Midstream	$ 3,455,377	456.2%	$757,442
	Commercial HVAC	$ 227,268	61.7%	$368,480
	Small Business Direct Install	$ 854,823		$4,021,479
Subtotals		**$ 5,360,857**	**92.7%**	**$5,780,091**
G262	Business Rebates			
	Commercial Kitchen & Laundry	$ 354,314	132.1%	$268,229
	Commercial Midstream	$ 2,013,049		
	Commercial HVAC	$ 47,033	36.0%	$130,812
	Small Business Direct Install	$ 88,675	40.1%	$220,990
Subtotals		**$ 2,503,071**	**206.7%**	**$1,211,191**

2) 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 screw-in LED measures as well as plug-and-play Tubular LED (TLED) measures.

a. Program Accomplishments

Lighting to Go again exceeded projected savings. TLED lamps and Recessed Can Retrofit Kits made up the bulk of incentives paid. Both are popular items with customers, with the Recessed Can Retrofit Kits offering the highest incentive amount in the program.

b. Adaptive Management

Program staff retain a strong focus on making the program easy for participating distributors. In 2019, program staff worked with its field services vendor to improve the program information available at check-out counters.

c. Key Variance Drivers

Lighting to Go exceeded the projected savings in large part due the popularity of TLEDs and recessed can retrofit kits. TLEDs in particular far outpaced projections and at the same time had incentive expenses that were commensurate with savings.

3) Commercial Kitchens & Laundry

PSE continued the historical regional delivery method of this program; offering a joint utility application across multiple participating utilities, shared qualifying product lists, a single point of contact (PSE), engaging consistent midstream distributors, as well as outreach for the program across all territories, making it easier for customers to navigate more complex measure offerings.

The midstream aspect of the program also continued to award customers cost-effective prescriptive instant rebates in the store, where the customer is actively making a purchasing decision around energy efficient kitchen equipment.

The Commercial Laundry program continued to offer a fuel-specific, pro-rated option to laundromat customers for upgrading their washing machine equipment.

a. Program Accomplishments

The Commercial Kitchen program rolled out an expanded new and improved approach to the midstream distributor offering in 2019. This redesign included an informed and coordinated distributor outreach and education plan as well as in-depth and targeted training materials and tools designed for and with the distributors themselves. This improved midstream point of purchase (POP) approach and delivery doubled the pool of participating equipment distributors. Previously participating distributors became even more comfortable with the program while new distributors appreciated the opportunity to stay competitive in their marketplace.

This increased participation in the program, and the distributors appreciate the consistent training opportunities, the hands-on approach they receive from their designated field representatives, and how appreciative their customers are that they have become experts in being advocates for the utility rebate programs.

From a customer's perspective, this updated midstream approach closely aligns with the look and experience the "residential" customer has through the larger Residential Retail Programs, allowing for a cohesive experience and consistent PSE presence in the field.

b. Hard-to-Reach, and/or Proportionately Underserved Segments

Most restaurant customers are considered underserved or hard-to-reach due to many factors including lack of upfront capital, renting of their space, uncertainty as to the longevity of their business, and reduced awareness of energy efficiency.

This program continued to reach these customers in unique ways that work for them. This included door-to-door outreach through small business community canvasing, attendance and/or tabling at various industry-specific expos and conferences, presentations to regional and segmental association, as well as the continued midstream rebate delivery through local equipment distributors.

The kitchen program also continued to collaborate with the Small Business Direct Install program's blitz activities, allowing for direct face time with over 50 individual restaurant customers, walking through their kitchens and discussing individualized recommendations for their businesses.

The program also partnered with the Washington Hospitality Association and local utilities to represent at four industry expo events held in 2019. PSE gave an energy efficiency- and conservation-focused presentation at one of those events aimed to educate attendees on program specifics, as well as cross-promotional opportunities and behavioral change recommendations. During these conferences, the program impressions reached 800 customers within this hard-to-reach segment.

For a frame of reference, this industry has approximately 8,000 businesses within PSE's service territory, which equates this customer touch to 10 percent of customers. This is impressive, given an industry that never leaves their business.

The program also incentivized over 250 pieces of equipment, more than 30 percent of which received rebates at Point of Purchase (POP) through the midstream program delivery and the participating distributors.

c. Pilot-Like Initiatives

Many Commercial Kitchen initiatives noted in the Accomplishments discussion could also be consider analogous to pilots.

d. Adaptive Management

In order to improve distributor satisfaction with an ever changing program, PSE worked to design and implement a renewed and improved in-store POP presence, including training schedules, delivery materials and tools, in-store signage, and more streamlined interaction with PSE as the regional lead of the program.

e. Key Variance Drivers

The program exceeded its natural gas savings goal by 30 percent, and achieved 85 percent of electric savings target. Program spending in both sectors tracked similarly. This variance is largely because most restaurant customers make purchasing decisions on a reactive basis, creating uncertainty around program planning. Program staff continuously gather data and market information to better refine future program target planning.

4) Commercial Midstream

Please see the Commercial HVAC program review, Pilot-Like Initiatives and Key Variance Drivers, for a discussion on the evolution of the program to the Midstream model.

5) 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 varying levels of business energy assessments to identify basic and complex retrofit opportunities and facilitate participation in PSE's rebate programs, based on segment type, such as hospitality, grocery and agriculture.

a. Program Accomplishments

During 2019, PSE successfully completed four small business blitzes, including a multi-program series of events for the Lummi Nation and a Multi-Cultural Pilot to reach non-native English speaking customers. Small business blitzes are a collaborative effort with Outreach and Government Affairs to bring the SBDI program to a community, through partnership with City, Chambers of Commerce staff, and downtown associations, offering free and low cost energy efficiency projects to all of the small businesses in the downtown corridor over the course of two- to-three days.

b. Hard-to-Reach and/or Proportionately Underserved Segments

New in 2019, the SBDI program brought comprehensive energy saving services to the Lummi Nation. Program staff partnered with Home Energy Assessments and Multifamily Retrofit residential programs, and, led by the Energy Efficient Communities team to reach their residents, business owners, and governing body facilities over the course of two months. PSE tried new outreach techniques, contacting 95 businesses by phone, as they don't have a downtown core found in SBDI's typical blitzes.

The program ultimately completed seven energy audits in actual business locations in an area where the majority of known businesses are in the owner's residences.

c. Pilot-Like Initiatives

In 2019, SBDI piloted a Multi-Cultural research project to find the best way to reach customers for whom English is not their primary language. Previously during blitzes, it has been a challenge to explain the program to this customer segment, who is more skeptical and vulnerable due to the language barriers. Program staff pursed two separate strategies, ultimately finding that a variation to the blitz model is the most successful outreach tactic.

Strategy 1 partnered with a local environmental coalition to pre -schedule and provide translation services for the free assessments and installations reaching 17 businesses over 4 days. The program reached nine Latino and eight Chinese-owned businesses.

Strategy 2 partnered with a third-party outreach firm to scout blitz geography to determine languages and communities specific to the area. PSE transcreated the blitz flier into the two most prominent languages: Spanish and Korean. Following the blitz model, staff delivered the fliers to targeted businesses the week prior to a blitz week. During the blitz, in-language staff joined the blitz teams, and through this strategy, PSE assessed and installed 32 businesses over 3 days: 14 Korean, 8 Vietnamese, and 10 Spanish-owned businesses.

In-language expertise was instrumental to bridge the gap and develop trust with these small businesses.

d. Adaptive Management

In 2018, staff changed the electric side of the program to offer free TLEDs which led to a dramatic increase in work for the program, notably from subcontractors PSE had partnered with that were bringing in work from their clients. In 2019, to better manage the incoming projects, PSE reinforced the process of distributing projects to the subcontracts that were referred through PSE Energy Advisors, website and blitzes.

e. Key Variance Drivers

It is useful to observe 2019's budget variance in light of 2018's program activities and actual performance. In 2018, program staff, in response to customer demand and cost-effectiveness considerations, made the switch from Tubular LEDs (TLEDs) that had a customer co-pay in 2017, to offering free TLEDs. At the time, there was a high customer demand for TLEDs, but customers were resistant to the co-pay.

2018 was also the first year where the Lodging DI and Agricultural DI programs all operated under the SBDI umbrella. The switch to free TLEDs was also accompanied by a carryover of a policy of allowing sub-contractors (who normally were directed by SBDI's primary third-party implementer) to install TLEDs at their discretion.

Program staff realized that this policy, though, led to disorganization in the field, a lack of focus, lower targeting of hard-to-reach small business customers, and potential encroachment of similar PSE Energy Efficiency programs (most noticeably, Commercial Lighting Grants). This approach also resulted in a lessening of SBDI staff's insights into other potential customer opportunities, such as HVAC, shell, or other high-value energy-efficiency opportunities.

Late in 2018, program staff reverted back to a PSE referral model for its sub-contractors, and implemented this change at the beginning of 2019. Program staff did not adjust the 2019 budget for the 2019 ACP, anticipating a realignment of productivity to expected levels. Although this policy adjustment resulted in an expenditure (and commensurate savings) shortfall, the program continued its community small business blitzes, while also adding a multicultural blitz pilot to reach this potentially under-served segment.

The program is now well-positioned for the 2020-2021 period.

The program underperformed on savings and budget targets on the natural gas side. One driver is that therm savings that were achieved were more expensive than originally anticipated. In 2019, it was not possible for this program to effectively achieve therm savings, as aerator savings have significantly declined and other measures are saturated (showerheads and sprayheads) from past PSE efforts.

6) Commercial HVAC

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.

a. Program Accomplishments

In 2019 the Commercial HVAC rebates program started processing rebates for PSE's commercial connected thermostat rebate program. Commercial connected thermostat outreach was a focus for 2019 working with manufacturers and contractors to get thermostats added to the qualified products list and promote the incentive within the market. Program staff also worked with a joint utility group to standardize PSE's Advanced Rooftop Control (ARC) rebate. PSE also introduced an Electric Resistance to Ductless heat pump incentive.

b. Hard-to-Reach and/or Proportionately Underserved Segments

In 2019, the introduction of the Electric Resistance to Ductless Heat Pump incentive was targeted to small business mostly in PSE's rural territory who currently heat with electric resistance. The $500 per ton rebate, along with trade ally focus, was particularly successful in its Island County service territory.

c. Pilot-Like Initiatives

PSE continued to learn from the launch into a midstream program model for its commercial HVAC and Water Heat Measures. Midstream Natural Gas water heating outperformed expectations and HVAC reach program goals in both years. The program was able to work with the market to increase redemptions at the end of 2019 in order to help PSE meet goals. Another advantage to the midstream channel is the ease of participation through the instant rebate process and lack of paperwork. This allows the program to influence and capture market activity, particularly the emergency replacements, that might otherwise not occur in downstream rebate programs.

The major hurdle the midstream channel has been working to overcome is the interaction with whole building programs that PSE also operates. The process for checking if whole building programs have participated in midstream is cumbersome and took some time to develop a model with which staff could work. The program had to adjust savings[53] on a select projects so that PSE could pay the whole building grant.

[53] These savings adjustments occurred prior to reporting, and therefore, it was unnecessary to include the instances in Exhibit 1, Supplement 2: Savings Adjustments.

Overall, the savings and market integration benefits of the midstream model have been shown to increase savings and allow PSE to work closer with the equipment market.

d. Adaptive Management

The main adaptive management undertaken in 2019 was the revision to the Advanced Rooftop Controls rebate. Program staff worked with regional utilities to add a small unit incentive.

This change has not seen the uptake hoped for, and so in mid-2019, regional utilities started planning and engineering to make additional changes to the incentive. These changes will create a per-unit incentive (vs currently per ton) and will launch in early 2020.

e. Key Variance Drivers

Although the electric sector was within the range of its 2019 expectations, channel partners (distributors and contractors) enthusiastically embraced the Midstream natural gas measures, and at a quicker pace than originally anticipated, based on the previous year's experience, and on ramp rates of similar programs across the country. Program staff regularly met with distributors, who developed innovative ways to apply incentives, increased their equipment stock, and provided extended warranties. The majority of the variance is related to DBtC, which was more than a five-fold increase over projections.

2019 Commercial HVAC electric (58 percent of goal) and natural gas (2 percent of goal) savings fell short of expectations as the program struggled to gain traction with the Advanced Rooftop Control and Commercial connected thermostat rebate. As previously noted, much of 2019 was spent meeting with other regional utilities redesigning program specifications.

7) Business Rebates 2019 Measure Highlights

PSE presents a high-level view of the Business Rebates projects managed in 2019 in Table VII-11.

It is interesting to note that in this organization, more than one measure type may be installed in a single project. PSE rounds figures greater than 10 for this Report.

Table VII-11: Number of Business Rebate Projects Managed in 2019

Business Rebates	Number of Projects		
Program Project Classification	**Electric**	**Natural Gas**	**Both Electric & Natural Gas**
Business Rebates			
Commercial Kitchen/Laundry	45	115	4
Commercial HVAC	30	0	4
Commercial Midstream (NEW)	235	415	0
Small Business Direct Install	525	7	0
Business Lighting Markdown (Lighting to Go)	7,790	0	0
Total Project Count	**8,625**	**537**	**8**

In Table VII-12, PSE indicates the number of measures, by category, installed in 2019 for three of the Business Rebates programs: Business Lighting Markdown (also referred to as "Lighting to Go"), Commercial Kitchen & Laundry, and Commercial HVAC. 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 VII-12: Number of Business Rebate Measures Installed by Type

Business Rebates Measure Counts				
Program Measure Type	Measure	Electric	Dual	Natural Gas
Business Lighting Markdown (Lighting To Go)				
Lighting	LED Retrofit Kit	43,000		
	LED Lamp	45,000		
	TLED Lamp	78,000		
Commercial Kitchen & Laundry				
Commercial Kitchen	Fryer			120
	Ice Maker	20		
	Oven	40		70
	Steam Cooker	2		
Dishwasher	Commercial Dishwasher	3	1	5
Water	Commercial Water Heater			1
Commercial HVAC				
Heat Pump	Ductless Heat Pump	70		
Thermostat	Thermostat Web-Enabled	3	7	
Ventilation	Supply Fan VFD and Controller	90	120	
Commercial Midstream				
HVAC	Heat Pump	250		
	Air Conditioner	250		
Water Heat	Boiler			40
	Water Heater - Storage			420
	Water Heater - Tankless			4

Table VII-13 provides a summary of measure counts installed in 2019 for the Direct Install programs.

Table VII-13: Number of Business Rebate Measures Installed by Type, Direct Install Programs

Business Rebates Measure Counts - Direct Install Programs				
Program Measure Type	Measure	Electric	Dual	Natural Gas
Small Business Direct Install				
Controls	Occupancy Sensor, Lighting	30		
	Programmable Thermostat	2		
Lighting	Refrigeration Lighting	70		
	LED Fixture	1,500		
	Tubular Fixture	2,600		
	LED Lamp	8,600		
	TLED Lamp	21,000		
Refrigeration Control	Compressor	50		
Sealing	Auto Closer	1		
	Gasket	4		
	Strip Curtain	4		
Signage	LED Sign	3		
Water	Commercial Use Aerator	10		4
	Commercial Use Showerhead			
	Commercial Use Sprayhead	10		9

VIII. PILOTS WITH UNCERTAIN SAVINGS

Primary Schedule: E249. Also, E/G 253

A. Description

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.

Although Pilots appears in Exhibit 1 after REM and BEM Sectors, it is presented in the Report at this point because both REM and BEM may share similar Pilot measures. PSE discusses pilots that have uncertain savings potentials in this Chapter. PSE discusses programs or measure offerings that could be considered analogous to pilots—but have a reasonable expectation of savings achievement—in applicable REM and BEM program sections in the previous Chapters. Table VIII-1 presents 2019 pilot program expenditures.

Table VIII-1: 2019 Residential and Business Pilot Program Savings

2019 Savings				2019 Goal
Schedule	**Programs**	**Total**	**% of Goal**	
Electric	Electric			Electric
E249	Residential Pilot	0		0
E249	Business Pilot: Pay for Performance	0		750
Subtotal		**0**	0.0%	750
G249	Residential Pilot	0		0
G249	Business Pilot: Pay for Performance	0		2,000
Subtotal		**0**		2,000

Table VIII-2 presents 2019 pilot program savings.

Table VIII-2: 2019 Residential and Business Pilot Program Expenditures

2019 Expenditures				2019 Budget
Schedule	Programs	Total	% of Budget	
Electric	Electric			Electric
E249	Residential Pilot	$ -		$ -
E249	Business Pilot: Pay for Performance	$ 20,565		$ 244,130
Subtotal		**$ 20,565**	8.4%	$ 244,130
G249	Residential Pilot	$ -		$ -
G249	Business Pilot: Pay for Performance	$ -		$ 10,000
Subtotal		**$ -**	0.0%	$ 10,000

B. Commercial Pay for Performance

In 2019, PSE continued the Commercial Pay for Performance (P4P) pilot with the goal of enlisting at least four more existing buildings with at least 15 percent energy savings potential, coming from capital projects.

In 2019, PSE contracted with one additional customer, bringing the total to two contracted projects. PSE also launched the P4P website in 2019:

> https://www.pse.com/rebates/business-incentives/commercial-retrofit-grants/pay-for-performance

PSE held an internal program review at the end of February and discussed potential program changes to increase participation, and decided to enlist the help of NEEC and NWEC to bring together a group of external stakeholders to solicit direct feedback on program design and barriers. In September, a jointly-sponsored meeting was held at the Smart Buildings Center where program staff concluded that PSE's P4P program design was good, and that the biggest barriers were:

1) Customers obtaining sufficient capital funds to implement projects of this size within the one-year contract stipulation.

3) Customer awareness. While Energy Services Companies (ESCOs) and others in the energy efficiency industry are familiar with the term “pay for performance”, this is a new concept and program design for building owners.
4) Program benefits. PSE has incentives available for almost any efficiency measure, where a known incentive is determined up front. Contractors and customers need a clearer understanding of the benefits of going through the P4P route.

As a result, PSE is taking the following actions:

1) PSE is scheduled to present on P4P with a banking institution in 2020 to learn more about financing options as it relates to this type of program and project size.
2) PSE has been looking for public speaking engagements to promote P4P. Since September 2019, PSE presented to two Building Operator Certification (BOC) classes, and to a set of project managers at WA Department of Enterprise Services who manage energy efficiency projects for public entities. PSE is also scheduled to present at: two conferences in 2020 where P4P will be presented; present at the annual CSEM meeting; and to partner more with internal Energy Efficiency teams to promote the P4P program.
3) PSE started working with the Marketing team to create a one-page program flyer that focuses on the benefits of P4P, to be released in 2020. Similar content is also scheduled to be published in the BOC Winter/Spring, semi-annual newsletter.

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IX. REGIONAL EFFICIENCY PROGRAMS AND RELATIONSHIPS

A. Overview

Table IX-1 and Table IX-2 provide savings and expenditure results for two programs that PSE classifies as Regional; the Northwest Energy Efficiency Alliance (NEEA) and Production and Distribution expenditures & savings. These programs are outside of the REM and BEM Sectors.

Table IX-1: NEEA and Production & Distribution 2019 Savings

2019 Savings				2019 Goal
Schedule	**Programs**	**Total**	**% of Goal**	
Electric	Electric			Electric
E254	Northwest Energy Efficiency Alliance	11,300	100.0%	11,300
E292	Production & Distribution Facilities	670	44.7%	1,500
Subtotal		**11,970**	93.5%	12,800
	NEEA Natural Gas Market Transformation Initiative	0		0
Subtotal		**0**		0

Table IX-2: NEEA and Production & Distribution 2019 Expenditures

2019 Expenditures				2019 Budget
Schedule	**Programs**	**Total**	**% of Budget**	
Electric	Electric			Electric
E254	Northwest Energy Efficiency Alliance	$ 4,052,907	77.9%	$ 5,200,000
E292	Production & Distribution Facilities	$0		$ -
Subtotal		**$ 4,052,907**	77.9%	$ 5,200,000
	NEEA Natural Gas Market Transformation Initiative	$ 2,227,813	91.5%	$ 2,434,244
Subtotal		**$ 2,227,813**	91.5%	$ 2,434,244

B. Northwest Energy Efficiency Alliance

(PSE uses the NEEA trademark with permission.)

Schedule E254

1) Description

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 benefits 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 without duplicating efforts. 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 ratepayers and Energy Efficiency programs on several NEEA committees, including the:

- Regional Products Portfolio Advisory Committee;
- Residential Advisory Committee;
- Commercial Advisory Committee;
- Regional Emerging Technology Steering Committee;
- The cost-effectiveness committee; and
- The Natural Gas Advisory Committee.

These committees and their respective sub-committees require a significant commitment; meetings are often all-day, and are held quarterly at a minimum. Energy Efficiency staff become closely engaged in upstream/midstream channel partnership strategies, cost-effectiveness calculation development, product training and technology portfolio determination, and, in cooperation with Washington IOUs, developed improved, consistent savings reporting tenets.

Energy Efficiency staff collaborated with NEEA on several distributor training initiatives, limited-time-offers (LTOs) and sales SPIFs for distributors. Staff worked with NEEA to implement a regional instant rebate offering, although a key vendor altered the terms of service late in the process, causing the project to be put on indefinite hold.

Energy Management Engineers (EMEs) worked with NEEA on the XMP pump initiative by providing support on the research project completed in 2019. PSE continues to support the ongoing pilot program. Staff also took part in NEEA's SEM working group, and focused on setting priorities for the next 5-year cycle. Some Energy Efficiency staff also participate in NEEA's Product Council meetings where energy-saving devises and strategies can be discussed. NEEA also facilitates conferences and meetings with industry experts, such as the Gas Technology Institute (GTI).

Exhibit 10: *NEEA Activities and Accomplishments* of this Report summarizes NEEA's 2019 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.

2) 2019 NEEA Savings

NEEA provided its savings forecasts during PSE's 2018-2019 Biennial Conservation Plan (BCP) development in the latter part of 2017, and updated its 2019 forecast in the latter half of 2018. In consultation with the CRAG, PSE adapted the source figures provided by NEEA. The revised 2019 electric savings figure is noted in Exhibit 1. NEEA's final 2019 electric savings results will include NEEA initiatives started in 2019. The results from those initiatives aren't available at the time of PSE's standard Annual Report publication, and so PSE reports the deemed savings value in the Annual Reports. NEEA finalized its 2018 and 2019 savings calculations in April 2020, and PSE presents the adjusted totals in Chapter 3 of this Report.

3) NEEA Expenses

Exhibit 1 indicates an apparent under-spend in the NEEA electric category of approximately $1.2 million. Actual payments that PSE made to NEEA totaled $4.053 million in 2019. One driver of the difference is a funder's share adjustment made by NEEA in March. Additionally, accounting transfers addressed expenses incurred for NEEA's end-use load research and PSE staff costs associated with NEEA committee participation. Each year, a journal entry is made to transfer 10 percent of Large Power User/Self-Directed funding allocations, representing PSE's administrative burden, as well as a 7.5 percent allocation to contribute to regional market transformation (NEEA) activities.

4) NEEA's Natural Gas Market Transformation Collaborative

NEEA provides a more comprehensive discussion of its 2019 natural gas market transformation activities in Exhibit 10. PSE ratepayers are major funders of NEEA's collaborative, with a 41.25 percent share of the overall 5-year budget of $18.3 million. 2019 was the final year of the initial 5-year NEEA business plan.

The NEEA Natural Gas Market Transformation 2019 expenses of $2.28 million were well within the budget of $2.43 million: a difference of $206,000. One driver of this variance is invoice timing: NEEA bills funders a quarter ahead. Therefore, the December 2018 invoice is paid by PSE in January 2019, etc. Furthermore, PSE's 2019 funding share increased by $428,000 from 2018.

Similar to the NEEA electric initiatives, Energy Efficiency staff who worked on NEEA's Natural Gas Market Transformation efforts charged their time to this order number (18230660) in 2019.

NEEA works in concert with 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 2019 included:

- Natural gas-fired heat pump water heaters,
- Rooftop HVAC,
- Water/space heat combination systems.

In 2019, there was progress made on the Energy Efficient Water Heater and Condensing Roof Top Units (RTUs). More manufacturers became engaged with natural gas heat pump water heater technologies, and the initial RTU failures were overcome, with new manufactures enlisted for four pilots, starting in 2019. The natural gas clothes dryer and the hearth measure are also in scanning modes, until new codes are enacted.

NEEA also explored funding Next Step Homes, which is a new construction initiative in both the electric and natural gas sectors. NEEA reported regional natural gas savings derived from this initiative in early 2020. NEEA reported the first savings estimates from the region's natural gas collaborative, with PSE's share calculated to be 98,049 therms.

Table IX-3: NEEA Estimates of Natural Gas Savings

Puget Sound Energy's 2019 Savings Forecast			2019 NEEA Measures
Sector	Program	Products	Gas Program Measures
Residential	Efficient Gas Water Heater	EGWH	-
	Next Step Homes	Codes	-
		Voluntary	96,370
Commerci	Condensing Gas Rooftop Units	C-RTUs	1,679
	Total Savings		98,049

This amount represents PSE's 41.25 percent funding share of NEEA's Natural Gas Collaborative. Condensing Rooftop Units savings are derived from four pilot measures installed throughout the NW Region in 2019, two of which are located in PSE's service territory.

Next Step Homes savings are derived from a number of new construction programs within the four-state region. The calculated savings are based on methodologies that NEEA and its contractors apply for new construction homes built to above-code standards throughout the NW Region, including three programs in Washington.

NEEA or its contractors calculated and reported all UES values. To avoid double-counting, NEEA discounts any savings derived from utility programs. Additionally, if there is overlap in any of the Next Step programs (for instance, if any "WA Performance Path" homes were also counted by the "Energy Performance Score" program), NEEA subtracts the latter from the former to avoid double-counting. Although it is possible to attribute savings estimates from CRTUs in PSE's service territory, there is less certainty associated with Next Step Homes savings. Since receiving NEEA's report on regional 2019 natural gas savings, PSE analysts have collaborated with NEEA analysts to better understand attribution and calculation steps used to determine savings values.

Therefore, until PSE better understands, and is able to represent the savings calculation variables, it will omit the NEEA-reported therm savings from its Exhibit 1: *Savings and Expenditures*, and Exhibit 2: *Cost-Effectiveness Calculations* documentation.

5) Exhibit 10: NEEA 2019 Report of Activities and Initiatives

Exhibit 10 of this Report summarizes 2019 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.

C. Production and Distribution Efficiency

Schedule E292

1) Description

The Production and Distribution Efficiency program involves implementing energy conservation Measures within PSE's own production and distribution facilities that prove cost-effective, reliable and feasible. Within production facilities, conservation Measures reduce ancillary loads at the site and exclude efficiency improvements made to the generating equipment itself.

These Measures may include, but are not limited to, lighting upgrades, variable speed drives and compressor upgrades.

For transmission and distribution (T&D) efficiency, improvements are implemented at PSE's electric substations. These improvements can involve reducing the energy use within the substation itself and the distribution of energy from it.

They can range from on-site Measures like lighting and heat pumps to system Measures like phase balancing and conservation voltage reduction (CVR) (also referred to as voltage optimization [VO]).

2) Adaptive Management

This program requires coordination between the Energy Efficiency program manager and staff in other PSE departments to collect project-specific details for program tracking and reporting. Maintaining a regular flow of communication has reinforced the energy-efficiency culture within PSE. These efforts included performing lighting quality and energy efficiency assessment at six power generation plants.

3) 2019 Accomplishments

PSE implemented CVR at two substations in 2019, resulting in over 670,000 annual kWh savings. PSE had pre-selected four substations for CVR implementation in 2019. PSE implemented CVR at two substations in 2019, resulting in 670,392 annual kWh savings. This outcome is significantly less than targeted because the phase balancing analysis of two substations determined that these substations were not adequate for CVR. Also, phase balancing analysis and time series studies were done at five substations. The results of the study are being utilized to determine which substations are adequate for implementation of CVR in 2020.

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X. MEASUREMENT & VERIFICATION

PSE's Energy Efficiency department provides a discussion of Measurement & Verification (M&V) at this point in the 2019 Annual Report because M&V relates directly to the REM, BEM, Pilots and Regional savings programs reviewed in the previous chapters. This Report is the appropriate document for PSE to provide this discussion, as Exhibit 3: *Program Details*, does not lend itself to an overview of these critical operational functions.

It is important that readers understand the rigor with which PSE manages its two fundamental conservation metrics—savings achievement and financial prudence—by applying stringent M&V principles. Energy Efficiency devotes staffing, processes, training, and systems with an eye toward applying these observations, metrics, data, and process verification. Staff focus on consistently improving efficiencies, productivity and transparency, and ensuring the highest degree of savings and financial accounting accuracy.

Supporting organizations that are also responsible for executing elements of these functions include Program Evaluation, Rebate Processing, Data and Systems Services, and the Verification Team. These are key contributors to Energy Efficiency's success.[54] The Report discusses Rebate Processing, Verification Team, and Data & Systems Services activities in Chapter 11: *Portfolio Support*. Evaluation activities and accomplishments are reviewed in Chapter 12: *Research & Compliance*. The remaining departments—Energy Advisors, Energy Efficient Communities, Strategic Planning, Marketing Research, etc.—also apply a variety of M&V tenets to their work for Energy Efficiency.

This chapter discusses: savings accounting; tracking and verification; financial accounting and tracking of Conservation Rider expenditures; compiling, and; reporting of Energy Efficiency information. The discussions provide general highlights of measurement and verification activities that Energy Efficiency staff regularly perform, including review, analyses, and vetting of:

- Data provided by vendors, contractors, customer rebate and grant applications, and reseller invoices;
- Program staff input, customer surveys, and evaluations;

[54] The Budget, Evaluation, Administration & Regulatory Team also makes significant contributions to Measurement and Verification practices. That team's costs (primarily labor) assess to the overall Energy Efficiency organization, and are not separately budgeted or represented in Exhibit 1: *Savings and Budgets.*

- The correct application of savings values indicated by evaluation studies, engineering analyses, or the RTF;
- Savings values, to ensure that they are properly archived;
- All tracking systems, to ensure that they are accurately counting the number of measures installed, are applying the correct savings values; and
- When corrections are required, they are recorded using generally-accepted accounting procedures.

Energy Efficiency verifies electric and natural gas conservation savings and expenditures using a wide range of metrics, processes, tools, systems, and reports. Several Energy Efficiency groups perform more than one measurement and/or verification process. For instance, program staff in particular review and verify measure installations, grant status, and sales reports[55] for measure type and measure count accuracy. The Verification Team's essential role in the overall M&V process is clearly indicated in the team's name: verification of measure installations in both residential and certain commercial structures. Data and Systems Services staff, rebate analysts, Budget, Administration & Regulatory (BAR) staff, and third-party reviewers also perform critical measurement and verification tasks.

A. Energy Efficiency Accounting and Tracking Infrastructure

Energy Efficiency employs a combination of proprietary and enterprise software applications and tools to accumulate, validate, report, and where necessary, adjust financial and energy savings figures with a high degree of integrity and accuracy. All are critical in Energy Efficiency's measurement and verification efforts. PSE references these systems in Figure X-1 on page 187. Readers will note that DSMc—often referenced in this Report—is central to Energy Efficiency data and information reporting.

[55] It is difficult to verify the installation of consumer lamps sold through retailers, for instance.

1) Demand Side Management Central (DSMc)

DSMc consolidated the different functionality (programs, measures, reporting, etc.) that were provided by disparate, largely custom in-house applications, and functions as Energy Efficiency's central conservation project management system. Consistent with long-standing practices and corporate policies that govern access to other reporting systems, Energy Efficiency policies strictly limit access to DSMc to authorized staff only. The type of access ("reporting only", "data entry only", "approval only", etc.) is also limited according to PSE strict segregation of duties rules.

The *EES Tracking & Forecasting Database* will continue to be used for internal forecasting and aggregation of reporting of project data, in conjunction with DSMc. CSY, CMS, and the Source of Savings Database—formerly employed to track projects, measure data, customer rebate application status, etc., and excluded from the systems diagram—will continue to be available for historical archival reference.

2) SAP

SAP, PSE's enterprise financial accounting system, will continue to operate as it does today with respect to Energy Efficiency program operations, program spending, and incentive payment distribution. PSE manages all financial transactions in SAP, through the application of order numbers, cost-element (or accounting) numbers, transaction codes and rules, etc. SAP interacts with DSMc to import and export financial data related to conservation projects.

3) CMS

CMS (Customer Management System) is a proprietary system used to provide useful, customer-centric information. The majority of rebate status and measure installation functions are now addressed through DSMc. In 2019, CMS was used for contractor referrals, and may continue to be used for brochure disbursement and collateral inventory management, as well as archival reference.

4) EES Tracking and Forecasting System

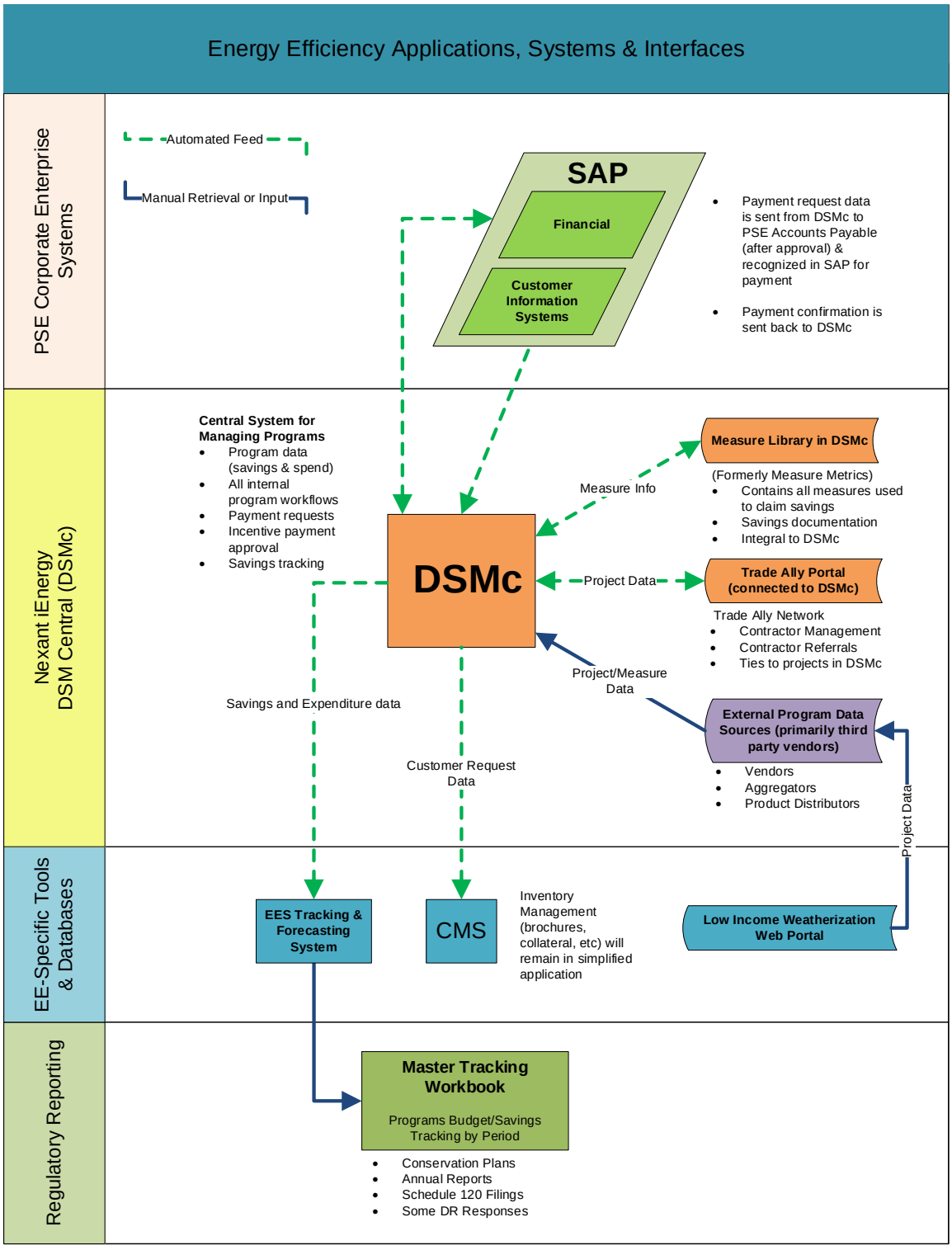
This Microsoft® Access™ database aggregates savings and financial information by order number, program, Sector, or Portfolio views. Energy Efficiency program staff and management use its reports to monitor performance progress against goals and targets.

5) Master Tracking Workbook

As the name implies, the Master Tracking Workbook is a Microsoft® Excel™ file, which BAR staff use to log all expense and savings data by month for internal Energy Efficiency reporting and external reporting. The majority of financial and savings tables in this Report, including Exhibit 1, are linked together in the Master Tracking Workbook. The Workbook is also the source of Energy Efficiency's annual Schedule 120 review with UTC Staff and CRAG members. Maintenance of this workbook is one key to assuring segregation of duties and provides an additional review step in Energy Efficiency's reporting.

Energy Efficiency illustrates its system interfaces in Figure X-1.

Figure X-1: Energy Efficiency Management Tracking and Reporting Interface



B. Savings Accounting, Tracking, and Verification

Energy Efficiency's measurement and verification processes—most of which are long-standing embedded elements of its programs—are consistent with and often exceed the requirements outlined in condition (6)(c):

> "Puget Sound Energy must spend a reasonable amount of its conservation budget on EM&V, including a reasonable proportion on independent, third-party EM&V. Puget Sound Energy must perform EM&V annually on a four-year schedule of selected programs such that, over the EM&V cycle, all major programs are covered. (…)"

The following discussions highlight key areas of measurement and verification resources, tools, and processes implemented by Energy Efficiency staff to accurately measure and track electric and natural gas measure savings, along with their corresponding expenditures, which PSE discusses in Section C.

Where applicable and possible,[56] many conservation programs track the number of rebates processed, measures installed, grants paid, contracts or Memos Of Understanding (MOUs) executed, and invoices paid using tools built specifically for those programs. PSE intends that the following discussions provide general overviews, rather than comprehensive process reviews.

PSE has continuously implemented and refined several processes and guidelines of how those tools are implemented over many years to ensure that electric and natural gas savings reporting maintain the highest accuracy standards. A crucial process outlines the methods of vetting, justifying, counting and reporting measure savings: *Guidelines for Ensuring the Accuracy of Electric and Natural gas Savings Claims*.

This comprehensive document ensures consistency across programs and Sectors, outlines rounding rules for savings values and measure counts, discusses applicable reporting periods, and how retired measures are tracked, reported and archived.

[56] Retail lighting is an example in which PSE received data feeds from certain retail establishments. The data consists of the number of particular units sold, rather than any specific customer information. This is one reason why it isn't possible to indicate the number of lamps per household installed in all Residential programs.

1) Accounting for and Tracking Conservation Savings

A key outcome of the Measurement & Verification function is the accurate representation of measures installed, and accounting for conservation savings as they are determined by one or more of the following:

- Prescriptively setting the savings value;
- Determining savings values using standard engineering calculations applied for a class of measures;
- Formally evaluating the actual savings realization rates or;
- Measuring savings at the customer meter or equipment locations (primarily associated with custom grants).

Two of the most critical measurement and verification elements necessary to ensure savings accuracy are the verification of the savings associated with those measures, and the verification of measure installation.

a. Measure Savings Values

Exhibit 5[57] of this Report lists the savings values for all prescriptive measures, by program and fuel type. Prescriptive measure values fall into two categories: RTF Unit Energy Savings (UES) and PSE Deemed.

As applied by Energy Efficiency, both are consistent with WAC 480-109-100(5):

> (5) Energy savings. A utility must use unit energy savings values and standard protocols approved by the regional technical forum, unless a unit energy savings value or standard protocol is:
>
> (a) Based on generally accepted methods, impact evaluation data, or other reliable and relevant data that includes verified savings levels; and
>
> (b) Presented to its advisory group for review. The commission retains discretion to determine an appropriate value or protocol.

All deemed measure source of measure cases are archived and is available for query in DSMc.

[57] PSE created Exhibit 5: *Prescriptive Measures,* from a DSMc reporting extract.

When necessary, program staff apply any measure savings revisions at the beginning of the year following the publication of the updated measure savings value, if that publication occurs prior to September 1 of a planning year. This is consistent with Energy Efficiency's *Measure Revision Guidelines*,

Calculated measures are similar to deemed measures, in that their savings value can be determined on a per-unit basis. The step that differentiates them from Deemed (or UES) values is that there are one or more additional calculations that must be completed before an accurate representation of their savings value can be determined. These calculations—based on, but not limited to engineering analyses, samples, and industry standards, etc.—can range from hours of operation, tonnage (in the case of an HVAC measure), building type (for instance, school, retail, restaurant), etc. Due to their complexity and variability, the source of savings for these types of measures aren't archived in DSMc.[58] Instead, the savings calculations and realized savings are denoted in individual project files.

Measures installed as a part of Commercial/Industrial custom grants are unique, in that every grant project is evaluated by a PSE Energy Management Engineer (EME). EMEs use data loggers, meter data, engineering computations, and other measuring tools to evaluate predicted savings. A senior EME verifies every project's calculations for savings prior to grant payment.

b. Measure Savings Verification

A key reference in the assurance of measure savings verification is PSE's reliance on the information archived in DSMc. Energy Efficiency staff regularly compare the savings figures indicated in the measure business cases against those archived in DSMc, which is the key source of accumulated and recorded year-to-date aggregate savings. When necessary, PSE follows a rigorous savings adjustment process if it is discovered that certain savings values disagree between the references.

[58] For instance, certain Commercial HVAC measures in the past had more than 300 permutations, causing database management to become unwieldy.

Rebate application processing and analysis is another vital measure savings verification component. A complete discussion of the Rebates Processing organization's activities and accomplishments is included in Chapter 11: *Portfolio Support*, starting on page 199.

c. Business Energy Management Custom Project Verification

When EMEs manage custom grants, they conduct a full range of verification activities, either in the Commercial/Industrial (C/I) Retrofit, C/I New Construction, Commercial Strategic Energy Management (CSEM), or Large Power/Self-Directed programs. There are also custom grant projects in REM's Multifamily programs.

EMEs verify project elements such as equipment specifications, measure quantity, baseline energy consumption, potential savings, projected and actual equipment performance, and actual conservation results.

Every custom grant project includes a peer review by a more senior EME. A large number of Business Lighting Rebate projects are also selected for EME review, and the Verification Team inspects a calculated number of projects and commercial prescriptive rebates at customer locations. Before a custom grant is authorized for payment, it must meet verification requirements.

Business Energy Management staff use DSMc to manage the processing steps for custom grants, from the initial customer discussion, through the grant creation, work progress and savings measurement, final verification, and grant payment.

d. Savings Tracking

After vetting a prescriptive measure's savings value and obtaining the director of Energy Efficiency's approval, the measure value and source of savings data is archived.[59] Program staff then follow a meticulous process to verify and report their measures' monthly installations.

[59] The primary source of savings archival database is DSMc. Savings are accumulated and reported as projects are completed in DSMc. DSMc is the primary repository of savings tracking, with the EES Tracking Database being used as a vetting tool. Additionally, all financial data originates with SAP, which will continue to be the sole financial repository. EES tracking tools will extract financial information for forecasting and reporting.

Program data is systematically uploaded and coupled to information in the measure library in DSMc, where the archived savings value is linked to the applicable measure quantity. Program staff check vendor/contractor invoices and reports for measure values and counts prior to payment to ensure entry accuracy, prevention of double-counting, etc.

To ensure accurate savings reporting,[60] program staff and Data and Systems Services staff confirm the monthly savings and expenditure figures in DSMc. After this check, the data is locked for entry, and is available for department-wide reporting (discussed in the Savings Reporting section). DSMc also tracks and reports on calculated and custom measure data, which is aggregated and logged into DSMc.

2) Savings Adjustments

Although Energy Efficiency's programs maintain robust processes and systems that undergo continuous improvements to ensure accurate savings and financial tracking, there are infrequent instances when an adjustment is necessary.

Exhibit 1, Supplement 2: *Savings Adjustments,* lists and describes every electric and natural gas savings adjustment, along with its respective adjustment value, and an aggregate total of all adjustments that PSE performed throughout 2019. Adjustments apply to all measure types. The savings adjustment process is outlined in the Energy Efficiency document *Guidelines for Ensuring the Accuracy of Electric and Natural Gas Savings Claims*.

All adjustments, once approved, are made in the current reporting month, even if making the adjustment results in a negative savings value in the current month; although very rare, there may be multiple adjustments for a single program or multiple programs in a single month. Adjustments may apply to either electric or natural gas values and may be positive (indicating that the originally-reported value was understated) or negative (indicating that the originally-reported value was overstated).

[60] Measure data originates from a variety of sources, including contracted vendors, third-party administrators, Low-Income Agencies, direct install reports, rebate applications, etc. Entities outside of Energy Efficiency only report measure counts. Savings values are only archived and reported from within DSMc.

The Manager, Budget, Administration & Regulatory approves savings adjustments only after the applicable program staff has addressed five standard questions:

1. What was the reporting discrepancy?
2. How was the discrepancy discovered?
3. What was the effect of the discrepancy?
4. How was it corrected?
5. How did program staff ensure that the discrepancy is not repeated?

Once approved, an adjustment entry is made in DSMc. Adjustments apply only to the ongoing reporting of cumulative savings values. They do not apply to archived, per-measure savings values, unless analysis reveals that those are erroneous.

Savings values are revised only:

1. In the case of errors. If it is discovered that an archived savings value is incorrect (for instance, it is entered into DSMc as "43" kWh, when the actual savings is "34" kWh), the savings value is adjusted and all savings reported to that point—back to the beginning of the current year—are corrected.

   To maintain historical perspective, measures are never deleted from DSMc. Rather, they are retired.

2. In the case of an evaluation, industry study or RTF revision updating the savings value of a current measure. If a measure's UES value is adjusted mid-year (prior to September 1), PSE updates the value at the beginning of the following year, consistent with Energy Efficiency's *Measure Revision Guidelines*.

3) Savings Reporting

When DSMc became fully operational in 2017, Energy Efficiency retired CSY (for the purposes of ongoing conservation project management). Once compiled and verified in DSMc and the EES Tracking Database, all program figures are copied to the Master Tracking Workbook, managed by BAR staff. This step provides segregation of duties, and an extra opportunity for staff examination before the data are archived.

After BAR staff populate the Master Tracking Workbook (the final step noted in Figure X-1 on page 187) with the monthly savings and financial information, they forward the summary report to program staff for a last double-check and vetting. The aggregated monthly data is linked to the Energy Efficiency Exhibit 1: *Savings and Expenditures* spreadsheet, which also populates the various savings and financial tables within this Report.

A range of Energy Efficiency staff routinely reviews the department's key recording systems. The systems are regularly upgraded, improved, and double-checked by program staff and the Data and Systems Services team to validate their accuracy throughout the year.

C. Financial Accounting and Tracking of Conservation Rider Expenditures

Energy Efficiency staff are responsible for ensuring the accuracy of invoices and financial charges applied to their programs. These can include charges from other PSE departments: marketing department labor charges for Direct-to-Consumer group collateral development, or Energy Efficiency Communities field support, for instance. Program staff are required to reconcile their program's SAP records on a monthly basis to ensure accuracy.

Energy Efficiency staff also attend regular accounting training, including introductory sessions for newer employees, as well as refresher training made available throughout the year. Additionally, staff members who are authorized to approve invoices are required to attend annual training and sign a due diligence affirmation, consistent with PSE corporate accounting policies.

PSE employs SAP as its enterprise-level accounting system. PSE uses financial information collected and reported in SAP on conservation expenses in its annual Schedule 120 filing—PSE's funding mechanism for conservation programs. When PSE hosts UTC Staff and CRAG members to review the previous year's Schedule 120 expenses in preparation for its annual Commission open meeting, BAR staff[61] use SAP to satisfy reviewers' queries. These reviews typically occur in the late March-early April timeframe—subsequent to PSE's Schedule 120 filing, and prior to the updated Schedule 120 rates going into effect on May 1.

[61] Members of Energy Efficiency's Budget, Administration, and Regulatory department.

As noted in the Conservation Savings discussion in the previous section, Energy Efficiency intends that the below-referenced process discussions only provide an overview, rather than a comprehensive process review.

Financial accounting applies to PSE-internal expenses incurred as a part of executing conservation programs (labor, customer incentives, employee expense, etc.), and expenses incurred paying third-party evaluators, vendors, printers, etc.

1) Expense Tracking

SAP accumulates charges (or credits), and applies them to applicable Energy Efficiency order numbers.[62] Within each order number, there are cost elements (sometimes referred to as account numbers), that are used to log the specific type of account to which the expense is recognized.[63] SAP provides functionality that allows authorized users to "drill down" into expenses; accessing specific invoices or charges from supporting departments, etc.

2) Financial Adjustments

Similar to measure savings adjustments, expenses that have already been logged into SAP erroneously must be adjusted to reflect the correct accounting.[64] The process used to effect those infrequent adjustments is similar to that discussed in the measure savings adjustment section above, although controlled at a corporate level with strict policy guidance.

[62] The order numbers used by Energy Efficiency programs are listed in the "Sector Views" of the 2018-2019 Biennial Conservation Plan's Exhibit 1: *Savings and Budgets* workbook. Order numbers, formatted according to FERC accounting requirements, are used to account for program costs in SAP.

[63] Cost elements can include, but are not limited to categories such as labor, overhead, outside services, incentives, employee expenses, etc.

[64] An example may be where a natural gas rebate was entered into SAP (through the application of an incorrect order number) as an electric rebate. In this case, a savings adjustment (reclassify therm savings as kWh savings) and a financial adjustment are required.

Moving expenses from an incorrect account to the correct account is accomplished by the use of a journal entry (JE).

This process is strictly controlled by the Company, and has rigid segregation of duties requirements. For instance, in the two-step JE process, a staff member who "parks" a journal entry may not also "post" it in SAP.

3) Expenditure Data Assimilation

Each month, BAR staff download SAP program order number totals for all Energy Efficiency programs and functional organizations, and enters them into the EES Master Tracking Workbook. The EES Tracking and Forecasting Database also archives expense data, using a feed from SAP.[65]

The Workbook and Database are intentionally separate to ensure segregation of duties, thus providing an additional point of reconciliation.

D. Final Assembly of Energy Efficiency Information

Once BAR staff load the monthly electric and natural gas savings and expenditure data into the Master Tracking Workbook, the data is vetted by applicable Energy Efficiency staff. Any needed adjustments are made, and linked spreadsheets within the workbook are ready to be extracted into the many Annual Report tables and Exhibits reference herein. The assembled data is also used as a reference in the creation of Exhibit 2: *Cost-Effectiveness Results*. As previously noted, PSE creates Exhibit 5: *Prescriptive Measures* from a measure report in DSMc.

[65] Figure X-1 on page 187 illustrates these systems.

E. Data and Systems Services

Data and Systems Services perform an integral support role for all of Energy Efficiency, and is a key component of measurement and verification functions for the entire department. The group provides the department with the tools, data, reporting and analyses necessary for rigorous measurement, verification, and Evaluation processes. The organization is the primary PSE data source for the vendor that produces the Biennial Electric Conservation Achievement Review (BECAR).

This team manages system administration, technical support, and system enhancements for the DSMc project management application. PSE provides a complete discussion of the team's 2019 activities and accomplishments in Chapter 11: *Portfolio Support*, in the Data and Systems Services section.

F. M&V Accomplishments, Continuous Improvement and Adaptive Management

The following points are illustrative of PSE's commitment to continuous improvement and adaptive management in all facets of its Energy Efficiency business—not just to program that generate conservation savings. Throughout 2019, Energy Efficiency organizations, while maintaining their focus on maximizing the accuracy of reporting savings and financial data, also met their customers' expectations, increased M&V efficiencies, prudently used ratepayer funds, and minimized the impact of increasing regulatory requests. Highlights of key M&V accomplishments include:

- The savings adjustment documentation was enhanced, ensuring that electric and natural gas savings reconciliations were tracked separately, clarifying staff lookups.
- Data and Systems Services enhanced the 2019 ACP Planners' interface with the Exhibit 1: Savings and Budgets workbook, reducing the potential for keying errors.
- The Budget and Administration team added several steps and worksheet lookups in the Master Tracking Workbook to reduce defect opportunities and add reconciliation steps.

PSE discusses additional M&V-specific 2019 accomplishments and continuous improvement initiatives in applicable Verification Team, Rebates Processing, Data and Systems Services, and Program Evaluation sections of the Report.

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XI. EFFICIENCY PORTFOLIO SUPPORT

A. Overview

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) Functional Group Performance

Table XI-1 provides a 2019 year-to-date summary of expenditures for the Portfolio Support organizations.

Table XI-1: Portfolio Support, 2019 Expenditures

2019 Expenditures				2019 Budget
Schedule	Programs	Total	% of Budget	
Electric	Electric			Electric
Gas	Gas			Gas
	Data and Systems Services	$ 1,067,671	97.5%	$ 1,095,387
	Rebates Processing	$ 556,388	99.6%	$ 558,344
	Verification Team	$ 463,416	86.5%	$ 535,443
	Programs Support	$ 315,450	76.7%	$ 411,434
	Trade Ally Support	$ 127,485	108.0%	$ 118,000
	Contractor Alliance Network	$ 35,683	108.5%	$ 32,896
	Automated Benchmarking System	$ 265,133	153.5%	$ 172,732
	Energy Advisors	$ 921,070	80.3%	$ 1,147,436
	Energy Efficient Communities	$ 837,289	84.7%	$ 989,080
	Customer Digital Experience			
	Customer Online	$ 535,433	85.9%	$ 623,618
	Market Integration	$ 241,486	92.4%	$ 261,227
	Customer Awareness Tools	$ 592,955		
	ShopPSE	$ 3,111		
	Events	$ 357,382	59.9%	$ 596,352
	Brochures	$ 38,069	46.1%	$ 82,493
	Education	$ -		$ -
	Total Electric	**$ 6,358,021**	**88.1%**	**$ 7,218,303**
	Data and Systems Services	$ 159,536	97.5%	$ 163,679
	Rebates Processing	$ 86,304	104.1%	$ 82,866
	Verification Team	$ 55,825	70.4%	$ 79,339
	Programs Support	$ 47,029	76.2%	$ 61,686
	Trade Ally Support	$ 14,499	65.9%	$ 22,000
	Contractor Alliance Network	$ (8,515)	-25.9%	$ 32,896
	Automated Benchmarking System	$ 108,105	278.2%	$ 38,864
	Energy Advisors	$ 192,895	111.4%	$ 173,187
	Energy Efficient Communities	$ 132,693	92.7%	$ 143,160
	Customer Digital Experience			
	Customer Online	$ 127,533	111.4%	$ 114,484
	Customer Awareness Tools	$ 108,846		
	Market Integration	$ 35,643	46.3%	$ 77,034
	ShopPSE	$ 3,324		
	Events	$ 97,442	88.0%	$ 110,764
	Brochures	$ 7,171	73.1%	$ 9,809
	Education	$ -		$ -
	Total Gas	**$ 1,168,328**	**95.8%**	**$ 1,219,333**

B. 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 HVAC and weatherization rebates online.
- 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.

1) 2019 Accomplishments and Activities

In 2019, the D&SS organization launched its new Bill Credit rebate payment option for PSE customers. In 2019, nearly 9 percent of customers submitting their rebate online chose this payment option over the traditional check payment option. This payment feature was also added to two of Energy Efficiency's commercial grant programs in 2019: Commercial Industrial Retrofit and Business Lighting.

In 2019, the team also implemented a new, mobile-friendly interface for online residential rebate submittal. This new interface can be easily used on customers' mobile devices to submit and track the status of their rebate submissions.

Additionally, a new interface was created to feed PSE's data lake[66] with completed project data from DSMc. This data feed will enable groups throughout PSE easy access to key data points regarding customers' energy efficiency activities in a data repository that contains data from areas across the organization – billing, usage, Interactive Voice Response (IVR) etc.

2) Adaptive Management through Continuous Improvement

As part of the team's effort to launch a new rebate portal for customers, all of Energy Efficiency's residential rebate programs were revised and enhanced to provide much more flexibility in the programs when new rebates are introduced. In the past, a new rebate introduction could take several weeks of configuration and testing to make it available to customers in PSE's online system. With the changes the team introduced, new rebates in its programs can be launched very quickly, providing program managers more flexibility to adjust their program offerings if needed. Additional features were built into these programs to further prevent duplicate rebate payments, enhance rebate reporting, and improve tracking of rebate submission issues from customers.

C. Rebate Processing

Rebates Processing functions 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.

[66] Different than a data warehouse, which archives filtered, structured data, this is PSE's IT term for data repository that contains data from a variety of sources in a variety of forms: a vast pool of raw data, the purpose for which has not yet been defined.

Rebates Processing roles 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.

As noted in Chapter 9: *Measurement & Verification*, 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 XI-2 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 XI-2: 2019 In-House Residential Rebates Paid

Program	Count	Electric Incentives Paid	Gas Incentives Paid
Electric Home Heating	3,620	$4,072,395	$0
Electric Water Heating	378	$203,752	$0
Natural Gas Home Heating	5,596	$0	$1,967,525
Natural Gas Water Heating	1,240	$0	$295,915
Single Family Weatherization & Windows	3,823	$730,018	$2,263,135
Totals	**14,657**	**$5,006,165**	**$4,526,575**

1) 2019 Continuous Improvements and Accomplishments

The Rebate Processing team successfully managed processing over 15,300 rebates for residential and commercial customers. The team have revamped its Public User Interface; which has greatly streamlined the overall process by providing more ease and options for PSE customers and contractors alike. All of PSE's trade ally partners are now using the online portal to submit their rebate claims. This greatly enhances their experience regarding the tracking and reporting of their submittals. It also speeds up the processing timeframe so that customers and contractors promptly receive their payment.

D. Verification Team

Energy Efficiency's 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.

The "Measurement & Verification: Policies, Guidelines, Protocols & Processes" document introduces M&V protocols to be used across the Energy Efficiency functions.

1) Composition

The Verification Team consists of three quality assurance specialists and one business analyst. 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 Energy Efficiency 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.

2) 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[67] 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.

[67] 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 2019.

3) 2019 Team Accomplishments

The Verification Team completed over 2,000 site and phone verifications for over 20 unique energy efficiency programs, both residential and commercial. In addition, the virtual verification option that launched in 2018 has proven to be a very successful alternative for PSE customers. This option allows the verification team to contact customers via their smart phone and walk them through a "virtual" verification of their equipment. This has greatly reduced time spent on jobs that are simple to do, particularly if a customer lives in the far reaches of PSE's service territory. Staff are offering this option to all applicable installations and have received very positive feedback as a result.

Table XI-3: Summary of Verifications by Measure Type

Measure Category	Count
Commercial Cooking Equipment	8
Commercial HVAC	5
Ductless Heat Pump	205
Forced Air Furnace to Heat Pump Conversion	130
Gas Boiler	12
Gas Furnace	430
Gas Fireplace	30
Geothermal Heat Pump	
Heat Pump Water Heater	30
Heat Pumps	150
Hospitality Rebates	15
Integrated Space & Water Heat	40
Multifamily Retrofit	3
Single Family Weatherization- Windows	160
Single Family Weatherization- Insulation	440
Appliances & Smart T-Stats	280
Small Business Direct Install	75
TOTAL VERIFICATIONS	2,013

In 2019, the team received approval to pilot its new "Virtual Verification" program late in the year. This pilot allows the Verification Team to contact customers via their smart phone and walk them through a "virtual" verification of their equipment while the QA Specialist is not physically onsite at their location.

The QA Specialist is able to walk the customer through the inspection on an app such as FaceTime, WebEx video conferencing, etc. to easily ascertain the equipment information,[68] and still provide the same level of service and professionalism. While this is still in its early stages, the team is confident that this can greatly reduce time spent on jobs that are simple to do; particularly if a customer lives in the far reaches of PSE's service territory. The team anticipates that this will provide many of PSE's customers with another option that will make participating in a verification less time-consuming and more cost-effective. It is important to note that verification by a home, project, business or dwelling can involve a significant number of individual measures.

E. 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;
- 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.

[68] A key element of the Virtual Verification is that customers are not asked to inspect weatherization measures, measure for which a ladder would be required, etc. Only those measures that are easily accessible and visible are considered.

1) 2019 Accomplishments and Activities

A key 2019 focus area for Programs Support staff was enhancing internal customer communications to customer-facing employees, and collaborating with program staff and marketing to provide talking points and monthly highlights. The organization also was a central contributor to developing and managing Energy Efficiency policies, enhancing document control, managing internal websites, and coordinating reports and presentations to various PSE staff. Staff also led streamlining processes and continuous improvement efforts.

2019 was a Year in which Energy Efficiency, and in particular, the Programs Support staff devoted much of the year to developing and rolling out updated and enhanced planning processes for the next biennial program years (2020-2021).

Planning years are significant in that all program teams and Energy Efficiency support groups work together to develop and tailor their program portfolio mix for the next two years. Programs Support facilitates and manages the planning process—from beginning to end. Some of the key planning activities included:

- Schedule and adhere to timelines;
- Develop, facilitate, and distribute Request for Proposals/Information (RFPs/RFIs);
- Prepare internal and external communications (OCM activities—keeping all Stakeholders informed);
- Manage special and ad-hoc projects to support Energy Efficiency departments;
- Organize and lead regular planning meetings;
- Create working templates, forms and tracking documents; and
- Follow up with program leads to ensure key milestones have been met.

F. 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 Contractor Alliance Network, or soon to be re-named the Trade Ally Network), which manages direct relationships and referral processes for CAN.

1) Description

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.

2) 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 2019 focused mainly on local or regional conservation efforts. 2019 memberships[69] included:

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

PSE also enhanced its resources by subscribing to eSource in 2019.

This extensive industry database provides an additional insight for program staff to ensure that they maintain awareness in utility and efficiency developments. 2019'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).

G. Contractor Alliance Network

The Contractor Alliance Network (CAN) 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.

1) 2019 Program Accomplishments

In 2019, the Contractor Alliance Network (CAN) had a slight reduction in total members from 188 in 2018, to 180 members enrolled. These trade allies were responsible for closing over 2,000 customer referrals which accounted for just under $7 million in project costs for installing energy efficiency measures,

[69] These are included in Exhibit 1, Supplement 3 of this report, which provides a high-level view of 2019 expenditures for memberships and sponsorships.

A key focus in 2019 was the continued development of a restructured trade ally network and strategy. The goals around the restructuring were intended to provide improved tools and resources for participating trade allies, and expand capabilities of engaging a broader range of trade allies who are associated with the delivery of energy efficiency measures. The goal of broadening the program's reach is to communicate, train, and educate all entities involved with Energy Efficiency programs and provide greater accessibility and communication paths to and from PSE.

2) Continuous Improvement through Adaptive Management

In 2019, the program team focused on the implementation of a restructured trade ally network. Some of the key strategies that were implemented included:

- Rebranding the network to *PSE's Trade Ally Network,* and associated referred contractors as *Recommended Energy Professionals*, to align with customer preference and better represent trade professionals associated with Energy Efficiency programs.
- Rebranding the CAN team to the *Trade Ally Support* (TAS) team to align with the strategic objectives of the team.
- Centralizing trade ally communications by creating a new mailbox for the TAS team.
- Scoping and launching a new Trade Ally Portal, *Trade Ally Connect* (TAC) to centralize trade ally tools and resources including creating single sign-on capabilities for referral tracking and reporting, and rebate processing.
- Revising some referral product categories from the standard direct referral to providing distribution list style referrals.
- Enhancing referral capabilities of PSE field staff and program implementation staff, specifically, Home Energy Assessment Energy Specialists, by providing them unique logins to the Trade Ally Portal.
- Implementing account support functions including the development of a residential HVAC / Water Heat Trade Ally Advisory Council, facilitating over 40 trade ally trainings, and 60 independent deep-dive, engagement meetings.

In alignment with the trade ally strategy outlined above, the CAN team worked in collaboration with program staff to develop and support two unique limited time promotional offers.

One promotional offer focused on supporting the Manufactured Home Customer initiative and the installation of high efficiency ductless heat pump systems. Participating trade allies agreed to provide customers with an additional $100 discount on the installation of qualifying equipment. The other promotional offer provided a bundle incentive to PSE customers participating in the single-family weatherization program. The latter promotion was not mutually exclusive to the manufactured home customer segment. Instead, the bundle, or bonus incentive, was initiated to provide participating trade allies with a sales tool to encourage deeper retrofit opportunities for customers. The weatherization bundle will continue through the early part of 2020.

The system enhancements inherent in TAC extends the referral functionalities of PSE field and program implementation staff to have the same capabilities as a PSE Energy Advisor. This enhancement allows these stakeholders to facilitate real-time direct referrals for customers. The process also allows for improved tracking and reporting with respect to referral conversions coming from those sources, and aligning with the strategic objectives of the CAN team to improve overall referral quality.

Additional enhancements are being added to the TAC through 2020 to support improved user experience for trade allies and customers, as well as aligning with development of a Moderate Income Customer Initiative.

3) Hard-to-Reach and/or Proportionately Underserved Segments

In 2019, the Contractor Alliance Network team, in collaboration with program staff, continued to support the Manufactured Home customer segment through dedicated referral products and training for both Weatherization and HVAC measures. The CAN team worked closely with Corporate Communications to provide direct marketing to this customer segment through the promotional offer outlined above.

In addition, the CAN team helped facilitate contractor training related to best practices for insulating attics respective to the manufactured home structure type.

During the latter part of 2019, the CAN team worked closely with the EE Strategic Initiatives team to identify potential financing resources available to vulnerable customer segments. These segments include customers with limited income sources, lower credit worthiness, higher debt-to-income ratios, etc. The CAN team will continue to focus on identifying financing resources available to these segments and providing resources to participating trade allies and customers through an initial awareness campaign in 2020.

4) Pilot-Like Initiatives

In 2019, one of the primary features of the CAN team's strategic priorities included providing enhanced account support for trade allies. The CAN team organized and develop some tactics around enhancing support to trade allies in 2019 including piloting the following initiatives:

- Development of residential HVAC and Water Heat Advisory Council
- Implementation of Energy Management Engineer (EME) outreach to key trade allies

The HVAC / Water Heat Advisory Council met two times during 2019. The agendas of the meetings were driven by the interests of the trade allies with the intention of knowledge sharing across the industry and utility. The work completed in the advisory council meetings has helped inform research of customer financing options and preferences, tactics to improve marketing and communications amongst customers and internal stakeholders, and understanding legislative and code impacts across the industry and utility, leading to improved planning efforts. The CAN team plans continuation and expansion of the advisory council process in 2020.

The EME outreach effort was primarily intended to incorporate Business Energy Management staff into more an account support role to commercial trade allies to encourage program participation and drive process improvements. The outreach pilot realized a lower than anticipated success-rate in terms of completed connections, therefore illustrating the need for improving internal tracking and reporting processes.

The key enhancements identified included cleaning up trade ally contact data and associating projects at the installing contractor level. The initiative was an important step in identifying additional strategies for engaging commercial trade allies through an integrative outreach strategy to be continued in 2020.

5) Key Variance Drivers

CAN revenue generated from referral fees mainly underperformed in 2019. The program did not generate enough revenue to cover general operations, by $27,000. Key impacts to the financial standing of the program included:

- Lower visibility and marketability of the program in early 2019 due to revisions of PSE technologies and website.

- Increased Outside Service expenditures were applied to licensing and implementation costs associated with the development of the Trade Ally Portal.
- Higher referral volume overall, yet lower conversions to reported sales from trade allies in the first half of the year.

As noted in accomplishments above, in 2019 the CAN team transitioned some of the referral product categories to list style referrals. These list referrals operate more like a directory in which a customer requests contractor resources and is provided a complete list of the authorized contractors via email. The list referral product categories generally include larger project types such as solar PV, commercial lighting, multifamily retrofit, and generators. The list referrals are not tracked and reported by the contractor and have no associated fees with them.

Outside Service expenditures deviated from the 2019 budget. The original budget was put in place and earmarked for the development of a trade ally portal. The portal would in effect be a software application to centralize trade ally resources, including contact management, referral reporting, performance dashboards, etc. Scoping and implementation of the project began late in the year with some of the expenses being pushed into 2020.

H. 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 2019, 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.

1) Program Accomplishments

PSE continued to see an uptick in the use of MyData in 2019. PSE received another 1,472 new user requests for MyData in 2019. The original target audience was customers benchmarking their energy use, and now also includes customers wishing to track energy use at multiple sites as an aggregate unit. It is essential to clarify that each customer may be responsible for more than one building or facility.

As MyData nears end of life, PSE began a significant upgrade of MyData to improve data access, completeness, and speed of delivery. The ongoing effort includes rebuilding the backend of the software, and reconfiguring the underlying data streams to align with PSE's current IT cloud infrastructure.

2) Hard-to-Reach and/or Proportionately Underserved Segments

MyData is available to all PSE customers. It is used extensively by Small-to-Medium Business (SMB) customers in Seattle to assist in compliance with the benchmarking regulations.

3) Adaptive Management

Program staff continues to use customer feedback to plan for future improvements. PSE expects MyData to play an essential role in enabling customers to comply with HB 1257; program staff have been active participants in the preliminary rulemaking discussions for HB 1257.

I. 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, community challengers, available promotions 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 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 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, 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.

1) 2019 Accomplishments

The Energy Advisor team interacted with over 60,000 PSE customers this year. This included over 7,000 customer engagements while staffing community events. The development of online self-service options has led to a decrease in customer calls to the Energy Advisor line. The online Public User Interface has also made it easier for customers to submit rebate applications without having to contact an EA. A significant accomplishment this year was the team's focus on promoting self-service tools and their benefits during every customer interaction.

The EA team also exceed their HEA sign up goal of 2,636 by 20 percent: 3,157 sign ups in 2019. They supported the design and implementation of PSE bill alerts, new trade ally strategy including the Trade Ally Connect (TAC) tool, and PSE.com Energy Center widgets.

Table XI-4 provides a summary of key Energy Advisor customer-focused metrics.

Table XI-4: Key Energy Advisor Metrics

2019 Energy Advisors	
Calls Answered	46,464
Emails	3,713
Events Staffed	115
Walk-in Customers Served[70]	230

The metrics noted in Table XI-4 denote:

- Calls Answered are both Residential Sector, and a portion of Business Sector incoming activity.
- Events staffed are those 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.

2) 2019 Adaptation and Continuous Improvement

New for 2019, energy advisors are utilizing the DSMc system to check rebate status for customers and contractors. They are also promoting the Public User Interface (PUI) so customers can submit their rebate applications and check rebate statuses online.

PSE continues to improve its information distribution to customers based on their evolving requirements. For example, PSE makes use of emails with PDF attachments and hyperlinks via its Energy Advisors, as well as mailed hardcopy brochures and rebate applications through its brochure fulfillment process.

[70] PSE remote business offices closed in mid-2019.

J. 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.

1) Description

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 2019 Energy Efficient Communities' areas of focus. As can be inferred from the list of accomplishments and activities, a significant portion of the team's efforts was focused on potentially hard-to-reach customer segments. Thus, they were not highlighted in a separate category.

2) Program Accomplishments

In 2019, the EEC team accomplished a variety of customer outreach initiatives in support of various EE programs, including the following:

- Conducted 10 home energy assessment door-to-door blitzes in Federal Way, Lacey, Auburn, Gig Harbor, Tumwater, Renton, Tacoma, Silverdale, Issaquah and the Lummi Nation to drive awareness and program participation. Sent postcards to nearly 20,000 customers, knocked on more than 10,000 doors and secured 977 program sign-ups. Three of these blitzes were in rural communities. Three specifically targeted low-income customers.

- Supported five small business direct install blitzes in Puyallup, Burlington, the Lummi Nation, and the Seatac/Pacific Highway corridor. Engaged with 171 small businesses and completed upgrades for more than 100 customers. The Seatac/Pacific Highway corridor campaign targeted business owners speaking Spanish, Vietnamese and Korean.
- Delivered dozens of presentations to chambers, homeowners associations, downtown associations, non-profit organizations, etc. and tabled at hundreds of local events to promote select energy efficiency programs.
- Conducted small business meet and greets in Woodinville, Tumwater, Bow-Edison, Edmonds, Kent, DuPont, Cle Elum, Bellingham, Port Orchard, Monroe, Issaquah, and Snoqualmie. The purpose of this tactic is to have a light touch with PSE's small business customers to drive awareness of its energy efficiency programs. The team engaged with 254 businesses in these communities and targeted areas that it hadn't been in recently.
- Partnered with 24 non-profit organizations (Powerful Partnerships) that specialize in supporting vulnerable populations or environmental protection. The team extended its reach through these organizations to promote select energy efficiency programs through monthly digital/print/web/social outlets, as well as dozens of tabling events. During the year, EEC had over 8,000 meaningful conversations with customers.
- Created county profiles that 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's website and are used during presentations to a variety of audiences, such as city councils; as handouts to select audiences, like homeowners' association meetings; and tabling events.

3) Continuous Improvement and Adaptation

The Energy Efficient Communities team continued to reach diverse customer segments by:

- Piloting in-language small business direct install blitzes targeted to business customers with team members that speak their language to build trust and increase participation. The team tested this approach in Renton, Bellevue, and along the Seatac/Pacific Highway corridor.

- Piloting a community-wide initiative with the Lummi tribe in Whatcom County to bring a full suite of applicable energy efficiency programs to their community in a defined period of time, including Home Energy Assessments, Multifamily direct install, Small Business Direct Installs, a community energy fair, and a great community partnership.

4) Pilot-Like Initiatives

In 2019, the EEC team also supported Home Energy Assessment campaigns designed to meet low-income customers, including:

- Door to door to reach customers living in mobile home parks. This is in addition to the 10 campaigns listed above. Team members knocked on more than 9,000 doors and secured over 1,500 program sign-ups.
- Partnered with a city Housing Repair Program to offer assessments to the pilot city's most vulnerable citizens. City sponsored Housing Repair Programs offer free home improvements to income qualified residents with a goal to keep residents living safely in their home. The improvements range from replacing a furnace to installing a grab bar in bathrooms. Decisions on what to replace or repair are evaluated during an in-home "repair assessment". PSE brochures for Home Energy Assessments were provided during that appointment. Then lists of those residents that received the brochure were provided to PSE and followed up with to schedule. During the six month pilot program PSE followed up with 43 leads.

K. 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.

These tools, implemented in 2014 and regularly improved and updated since then, help customers understand the specifics behind their energy usage, show neighbor comparisons (residential customers),[71] notify customers of higher than usual usage, and provide new ways to encourage efficient behaviors, by suggesting personalized tips, tools, ideas and checklists, based on a customer's automated energy usage profile and self-assessment information. Ongoing management includes purchases made through shopPSE, (http://PSE.com/shoppse).

PSE's "Savings & Energy Center" continues to see significant page traffic and overall engagement with customers.

PSE provides several highlights of its 2019 online metrics in Table XI-5.

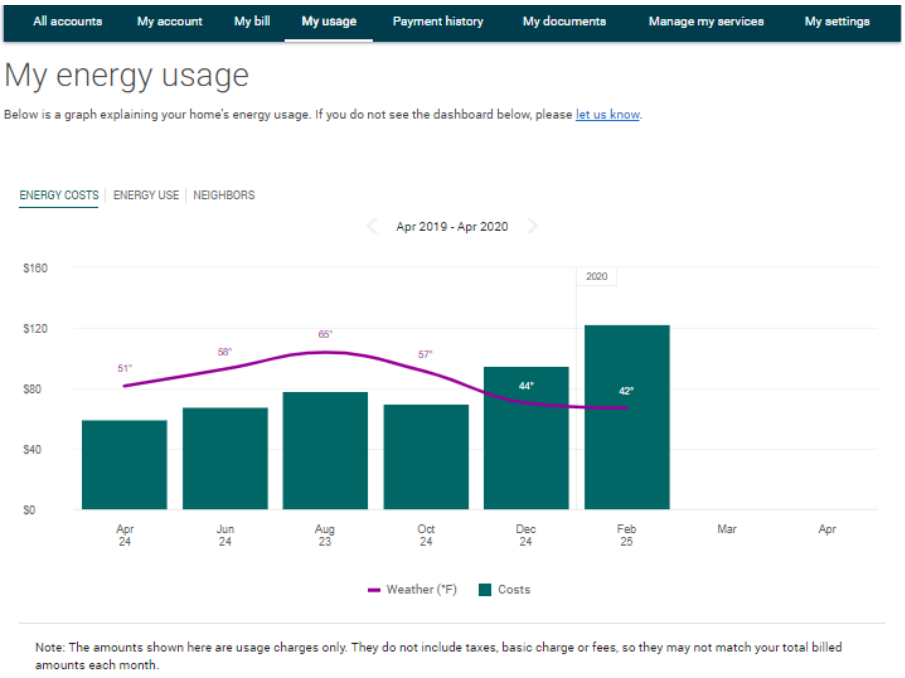
Table XI-5: Energy Efficiency On-Line Metrics

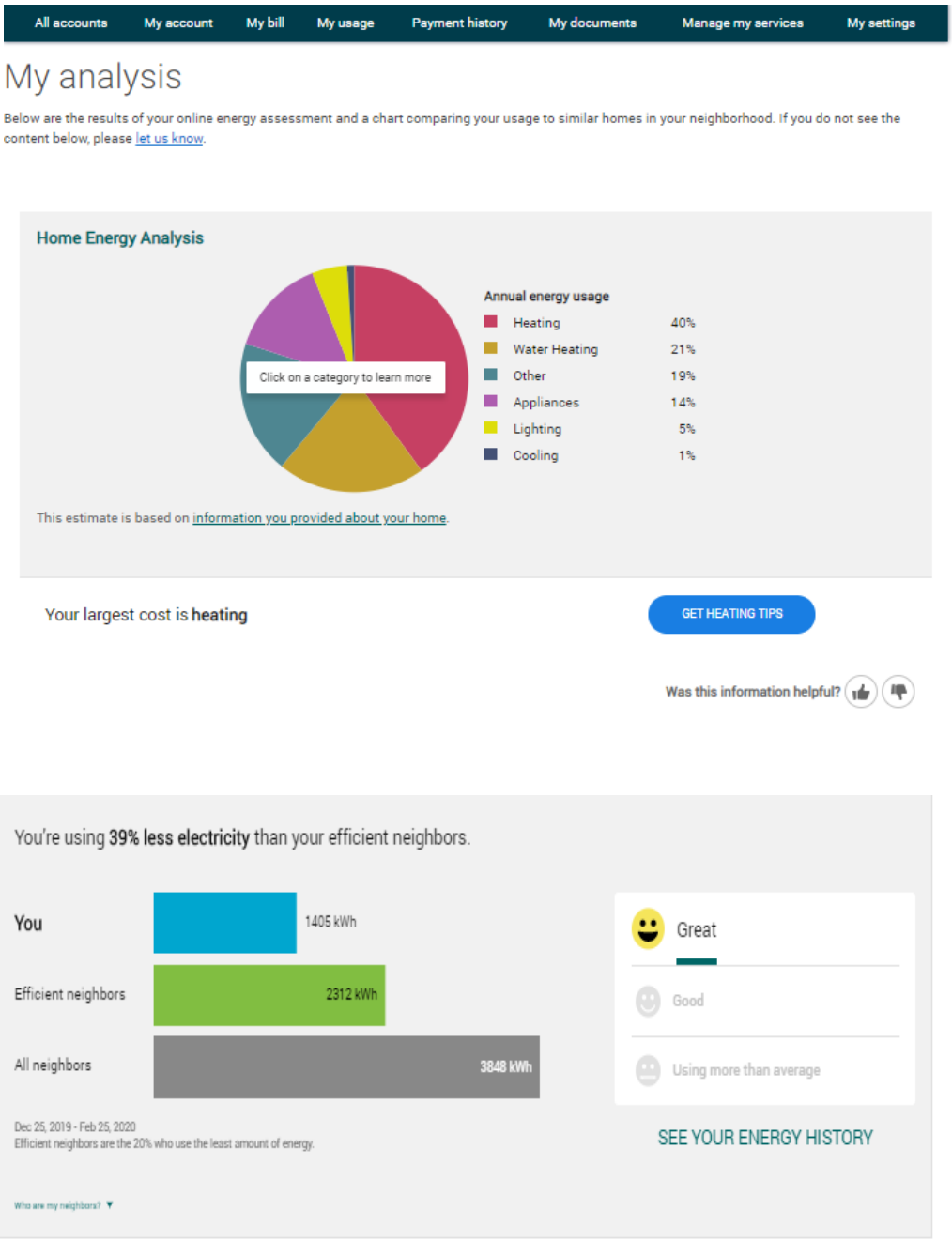
2019 Customer Online Experience Metrics	Web Page Views 2019
Savings & Energy Center *[all EE-related content pages on pse.com]*	Over 1.2 million
PSE digital account Energy Center tools *[pse.com Energy center landing page and Oracle tools]*	Over 490,000
Ask an Energy Advisor inquiry form page *[https://www.pse.com/rebates/ask-advisor-form]*	More than 18,000
Recommended Energy Professional information page *[https://www.pse.com/rebates/find-a-contractor]*	Nearly 50,000

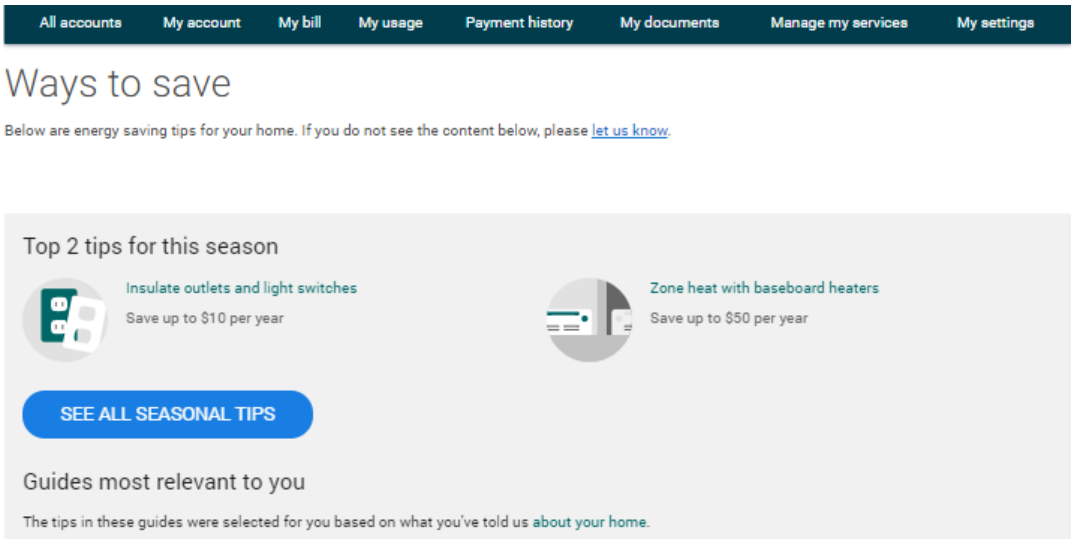
[71] Specific customer details; addresses, names, account information, etc. are rigorously protected. Instead, only general, non-specific comparisons will be provided.

PSE provides a screen image of its myPSE Digital Account Energy Center Tools in Figure XI-1.

Figure XI-1: Screen Images of myPSE Digital Account Energy Center Tools




All accounts
My account
My bill
My usage
Payment history
My documents
Manage my services
My settings
My analysis
Below are the results of your online energy assessment and a chart comparing your usage to similar homes in your neighborhood. If you do not see the content below, please let us know.
Home Energy Analysis
Click on a category to learn more
Annual energy usage
Heating 40%
Water Heating 21%
Other 19%
Appliances 14%
Lighting 5%
Cooling 1%
This estimate is based on information you provided about your home.
Your largest cost is heating
GET HEATING TIPS
Was this information helpful?
You're using 39% less electricity than your efficient neighbors.
You
1405 kWh
Efficient neighbors
2312 kWh
All neighbors
3848 kWh
Great
Good
Using more than average
Dec 25, 2019 - Feb 25, 2020
Efficient neighbors are the 20% who use the least amount of energy.
SEE YOUR ENERGY HISTORY
Who are my neighbors?



1) 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:

a. Unusual Usage Alerts (UUA)

- Delivered to customers when their energy usage is abnormal compared to the previous year.
- Since the service's inception, over 600,000 PSE customers have received the alerts.
- Unusual usage alerts are triggered when a customer is trending to use more than 30 percent of they used for the same billing cycle the year prior.

b. 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.

c. Seasonal Readiness Emails (SRE)

- PSE's contractor sends up to 300,000 reports to customers twice a year during the changing seasons, once in the summer and once in the winter.

d. 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 outreaches. The instrument incorporates a variety of standardized questions that enable applicable comparisons to other surveyed contractor utility deployments, representing over 69,000 customer interviews across 44 distinct utility partners. At PSE, the instrument aims to accomplish the following key objectives:

- Explore customer interaction with and reception of the Home Energy Reports; for both those in PSE's legacy deployments as well as the groups from 2014 and 2019,
- 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.

2) ShopPSE

ShopPSE was Energy Efficiency's online retail website through 2019 and has since been retired due to cost ineffectiveness. This tool provided PSE customers with a wide variety of energy-savings devices, including LED lamps and showerheads. However, due to increasing costs and lower participation, the cost-effectiveness had become untenable. PSE is currently exploring other marketplace offerings.

3) Customer Digital Experience Accomplishments

In 2019, Customer Digital Experience continued to provide the tools found in the myPSE Account Energy Center to help customers understand the specifics behind their energy usage and show neighbor comparisons (residential customers).[72] 2019 marked a substantial increase in web visitors, suggesting that customers are favoring the digital experience.

In 2019, ShopPSE resulted in 671 purchases of showerheads and LED bulbs.

The Customer Digital Experience also assisted customers in saving energy through email engagement messaging. For example, unusual usage alerts (UUA) notify customers when their usage is trending to be more than 30 percent higher from the same time from the previous year and provides tips on how to curb usage and save energy. In 2019, PSE sent 418,162 unusual usage alerts to customers with an open rate of 48 percent, which is significantly higher than the industry standard.[73]

According to a survey PSE conducted in 2019, almost 60 percent of UUA recipients take some sort of action; 20 percent specifically cite taking steps save energy. Additionally Energy Efficiency communicated with customers via seasonal readiness emails, that provided tips to help customers save energy throughout the winter and summer seasons.

Lastly, in 2019, Customer Digital Experience also provided customers with their E-Bill notifications, a service that provide customers with an email when their bill is ready to view with a chart showing approximate energy usage for major use categories (for example, 50 percent towards heating).

4) Hard-to-Reach and/or Proportionately Underserved Segments

Customer Digital Experience maintains technical and content design standards that support the accessible presentation of information about energy efficiency programs to customers with disabilities.

[72] Specific customer details; addresses, names, account information, etc. is rigorously protected. Instead, only general, non-specific comparisons will be provided.

[73] Per Oracle's year-end report to PSE.

The standards use assistive technology for browsing the web, referencing the Americans with Disabilities Act and W3C Web Accessibility Initiative Web Content Accessibility Guidelines (WCAG).

5) Adaptive Management

PSE stopped providing the E-Bill services through Energy Efficiency in October 2019 in order to transfer this service to another department in effort to streamline customer communications within PSE.

L. Market Integration

Market Integration consists of salary costs of employees and contractors working on energy-efficiency marketing and promotional support activities. This is to make marketing efforts more transparent. Tasks include the enhancement of online energy-efficiency tools and features social media and media engagement. Other tasks include traditional marketing executions that center on promotional channels used across all programs, such as advertising, events, collateral, and websites.

In 2019, to reinforce and broaden the impact of energy efficiency programmatic marketing, PSE continued to run energy efficiency television and digital video awareness advertising, promoting rebates and instant discounts offered by PSE.

The ads can be viewed here:

- PSE Rebates Make it Easy:

  https://www.youtube.com/watch?v=mm5R0hV0Ucc

- Get a Free Home Energy Assessment:

  https://www.youtube.com/watch?v=1w99q4GbDtg&list=PLKBwvqFi6HOijJRJDsmI9wET7YQz4OYxK&index=5

The two advertisements received more than 32.4 million impressions in PSE's service area over a 5-month period.

M. Events

The Energy Efficiency department participates in community, local, and regional events throughout the year, 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 plan 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 Energy Efficiency 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. Energy Efficiency staff match customer interests and needs with Energy Efficiency programs, and gather customer feedback to inform and influence future programs.

The Customer Engagement team develops a thoughtful plan, providing specific criteria for event design and engagement that aligns with overall business goals, supporting Energy Efficiency programs with an emphasis on presence, affiliation, and relevance. Each event holds a particular value to stakeholders and relates to PSE Energy Efficiency program objectives.

The Customer Engagement team organizes events using an event management data system to improve communication and customer experience. The team assesses event requests, reviewing and vetting opportunities in advance with a focus on tactical planning. PSE proactively seeks new audiences, using available demographic data to identify harder to reach customer segments such as seniors, rural communities, small business owners, etc.

PSE employs a third-party vendor to augment its dedicated events staffing to ensure maximum energy-efficiency exposure. The goal 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 door-to-door, open houses, and community events.

1) 2019 Accomplishments

In 2019, the Customer Engagement team partnered with the Energy Efficiency team throughout PSE's service territory to have a presence at a substantial number of diverse community event opportunities. Through this internal partnership, PSE was able to reach out to over half a million people to share the message of Energy Efficiency programs.

2) Highlights of Residential Events

With broader resources provided by contract staffing, the team was able to implement a broad variety of community events throughout the counties served by PSE. These community events include:

- Island County festivals
- Whatcom, Skagit, Kitsap, Kittitas, Thurston Counties – Home Shows
- Kittitas County Fair, Wild Horse REC events, Farmers Market
- King County festivals, home fair and low income community events
- Kitsap community fairs
- Multi-Family Residential energy fairs
- Food Banks
- Powerful Partners tabling events

3) Reaching into PSE Businesses

The Community Engagement team, in concert with the Energy Efficient team, continued Energy Efficiency's ongoing practice of engaging PSE employees, vendor partners, and key clients in extolling the customer benefits of energy efficiency. These efforts included at events:

- TechniArt Corporate Fairs (also termed "Pop-up events" in the Single Family Existing and Direct-to-Consumer program discussions) in the PSE business campuses and offices.
- Customer Employee events: Boeing, Expedia, Microsoft and City Halls.
- TRENDS conference to reach large and small property owners, multifamily property owners and managers, personnel and representatives

4) Hard-to-Reach and/or Proportionately Underserved Segments

In partnership with Energy Efficiency and local Outreach Leads, the Customer Engagement team delivered numerous tabling events at local Food Banks where staff engaged this vulnerable community segment and provided awareness, education and resources for accessing energy savings through PSE's low income and weatherization programs.

Table XI-6 provides a summary of 2019 events in which PSE presented energy-efficiency information. PSE rounds totals over 10 for this Report.

Table XI-6: Total Events

2019 Events	Count
REM	260
BEM	8
Residential Door-to-Door	10
Customer Outreach	410
Contractors, Partners in Community	100
Total	**788**

N. Energy Efficiency Brochures

PSE provides brochures and how-to guides on numerous energy efficiency opportunities, including low-cost equipment, weatherization measures, major weatherization improvements, and equipment upgrades.

This information includes investment and savings estimates where appropriate. The brochures provided as part of this program are general energy efficiency in nature, whereas program-specific (for example, business programs, residential heat pumps, or mobile home duct sealing), are budgeted within those specific programs. These brochures are available to customers in paper form and online at the PSE website. Where required by tariff, brochures are included as bill inserts.

1) 2019 Accomplishments

The brochures staff in collaboration with PSE's Communications Marketing group continued to work toward improving the customer experience by reducing the overall variety of available brochures. This reduction of titles helped bring focus to those that are used most frequently.

2) Adaptive Management

Selected brochures that were taken out of print as part of the improved focus of inventory are being posted to the PSE website for online access.

3) Hard-To-Reach, Potentially Underserved Segments

PSE made available more copies of foreign language energy-efficiency brochures to support its hard-to-reach community efforts at food bank tablings and ethnic events.

4) Key Variance Drivers

The shift of inventory needs resulted in lower spending from the projected budget. Table XI-7 provides a view of 2019 brochure distribution.

Table XI-7: Brochures and Mailings Distributed

Energy Efficiency Brochures	Qty
Brochures mailed	1,300
Brochures downloaded from pse.com	68,000
2019 Energy Efficiency Brochures & Customer Referral Letters	**Qty**
Post CAN Thank You Customer Completion Letters	2,000
Home Energy Assessment Letters	4
Electric Heating Letters	50
Natural Gas Heating Letters (Natural Gas Furnace)	350
Natural Gas & Electric Insulation Letters	350
Customer Referral Letters	3,600
Energy Efficiency Brochures	1,300
Customer Natural Gas & Electric Thank You Kits	40

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XII. EFFICIENCY RESEARCH & COMPLIANCE

A. Overview

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. Table XII-1 provides a 2019 summary of expenditures for the Research & Compliance Sector.

Table XII-1: Research & Compliance 2019 Expenditures

2019 Expenditures				2019 Budget
Schedule	**Programs**	**Total**	**% of Budget**	
Electric	Electric			Electric
Gas	Gas			Gas
	Conservation Supply Curves	$ 183,797	87.6%	$ 209,931
	Strategic Planning	$ 661,258	71.6%	$ 924,071
	Market Research	$ 168,297	67.9%	$ 247,715
	Program Evaluation	$ 1,687,449	101.7%	$ 1,659,900
	BECAR	$ 32,457	42.7%	$ 76,086
	Total Electric	**$ 2,733,257**	**87.7%**	**$ 3,117,703**
	Conservation Supply Curves	$ 26,360	84.0%	$ 31,369
	Strategic Planning	$ 46,511	53.5%	$ 86,891
	Market Research	$ 25,311	68.4%	$ 37,015
	Program Evaluation	$ 269,895	134.5%	$ 200,738
	Total Gas	**$ 368,078**	103.4%	$ 356,013

B. 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.

1) Conservation Supply Curve 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.

2) 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.

3) 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 2019 in Exhibit 2.

4) 2019 Accomplishments and Activities

Cadmus provided the conservation supply curve data for input in the IRP portfolio models. These files included both electric and natural gas energy efficiency, electric demand response, and distributed (customer-sited) generation for multiple scenarios, including with and without intra-year ramping, varying weighted average cost of capital (WACC) values for discounting the present value of benefits, and extrapolations of retrofit potential beyond the traditional 10-year retrofit ramping period. Finally, Cadmus provided the final conservation potential assessment (CPA) report.

Other notable accomplishments in 2019 included:

- Conducted a market study of the manufactured home sector with Cadmus Consulting to better understand current market size, dwelling characteristics, demographics, and remaining conservation potential.
- Review and interpretation of passed energy efficiency legislation, including; SB 5116, HB 1257, and HB 1444.
- Target setting for the 2020-2021 biennium amidst a rapidly changing northwest energy landscape.

The Strategic Planning function also provided budget contributions to the RTF, Regional End Use Load Study and the Residential Building Stock Assessment (RBSA).

5) Key Variance Drivers

The Strategic Planning expenditures were 30 percent under budget in 2019, largely due to staffing changes midyear, and an underspend on the Commercial Building Stock Assessment (CBSA) study, which resulted from a delay in the regional study field visits.

C. 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.

1) Description

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.

2) 2019 Results

In 2019, PSE Energy Efficiency Market Research efforts focused on a variety of effort to improve Energy Efficiency marketing effectiveness.

a. Program Accomplishments

In 2019, the organization completed the following:

- Conducted research and provided support materials for targeted door-to-door campaigns in 10 PSE communities.
- Provided customer data to support business door-to-door campaigns in 5 PSE communities.
- Developed a reporting dashboard for EES web traffic to improve marketing and transaction performance.
- Conducted research to determine marketing traits for home energy assessment programs.
- Conducted persona modelling research to improve marketing of EES programs.

b. Hard-to-Reach and/or Proportionately Underserved Segments

- Conducted research identifying business customer segment with building stock exceeding 50,000 square feet for energy efficiency program development.
- Contributed to the strategy for small and medium business customers building on primary research from 2018.
- Supported research identifying PSE's manufactured home segment characteristics and locations, provided direct research support for EES home energy assessment outreach campaigns.
- Conducted research updating PSE's Multi-Family segment market penetration.
- Provided customer data supporting outreach campaigns for residential and business segments in the Lummi Nation.

c. Adaptive Management

In 2019 Market Research's contributions to adaptive management are included in the organization's accomplishments listed in the previous section. The staff's adaptive management efforts were part of continuous improvement efforts included more proactively in the front end of the research process.

d. Key Variance Drivers

The key variance driver in 2019 resulted from the original biennial labor estimates being higher than actual expenditures. The Market Research team employed continuous improvement techniques to provide a consistent level of Energy Efficiency support while minimizing labor expenditures.

D. 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.

1) Description

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 8), 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 2018-2019, PSE has contracted with one third-party evaluator, Opinion Dynamics, for all programs except Home Energy Reports (HER). This approach will encourage greater efficiency and integration of data and results. The HER program will continue to be evaluated by DNV-GL, the same consultant used in previous years, to maintain analytical consistency and continuity.

Evaluation resources focused on residential programs in 2019. The level of detail at which each program is evaluated was determined by prioritizing each program into evaluation tiers. All levels of rigor will be consistent with the principles, objective, and metrics prescribed in the guiding Evaluation Framework (Exhibit 8) in PSE's 2018-2019 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.

In 2019, the Home Energy Reports, Home Energy Assessment, and Web-Enabled Thermostat programs 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.

2) Evaluation Studies

The Evaluation Team completed the following impact evaluations in 2019, which are included in this Report as Exhibit 6, Supplement 1:

- 2017-2019 Home Energy Assessment Evaluation Report.
- 2018 Home Energy Reports Program Impact Evaluation.
- 2017-2018 Web-Enabled Thermostats Program Impact and Process Evaluation.

3) Additional 2019 Activities and Accomplishments

The Evaluation team completed a Verification Team Work Process review. The team assessed the work processes of Energy Efficiency's Verification Team, and found potential process improvements in the areas of team structure, documentation, sampling strategy, and verification findings. Evaluation staff provided improvement recommendations to the Verification Team to address.

4) Adaptive Management through Continuous Improvement

In 2019, PSE continued implementing the Adaptive Management strategy initiated at the start of the biennium. Evaluations completed for the Home Energy Reports, Home Energy Assessment and Web-Enabled Thermostat programs examined performance based on program theories, Key Performance Indicators (KPIs) and deemed savings values, and identified opportunities to update and improve these programs. Programs have undertaken specific improvement actions in response.

5) Key Variance Drivers

The Program Evaluation team spent slightly more than $96,000 budgeted in 2019 (combined electric and natural gas sectors). This variance was driven by two major factors: first, a program underspend of $233,000 was due to carryover of contracted evaluation services into 2020. Second, an overspend of $236,700 on the electric side and $61,500 on the natural gas side was due to the initiation of a new four-year funding agreement between PSE and the Northwest Power and Conservation Council as part of PSE's sponsorship of the Regional Technical Forum (RTF). The 2018-19 biennium budget called for PSE's annual payment to the council, but the establishment of a new four-year funding agreement prompted PSE to pay its 2020 funding allotment in October of 2019. The RTF's addition of gas measures to its portfolio lead PSE to split the funding allocation between electric (82 percent) and natural gas (18 percent), $61,500 overspend on the gas sector.

E. Biennial Electric Conservation Achievement Review (BECAR)

PSE, along with Commission staff, co-manages the Biennial Electric Conservation Achievement Review (BECAR), which is required to comply with WAC 480-109-120 (4)(v).

BECAR is an independent review of PSE's biennial electric savings and adaptive management practices. Every two years, PSE and Commission Staff, with review by PSE's CRAG, selects a consultant to conduct the BECAR for the biennium. The review examines electric savings baselines, measure savings calculation methodology, tracking and reporting accuracy, validates reported electric savings, reviews Company actions taken in response to the recommendations from the previous BECAR, and assesses whether the company has undertaken follow-up actions on program evaluation studies completed during the biennium.

PSE provides the CRAG with interim BECAR status and reports throughout the biennium, and includes the BECAR final report as an appendix to its Biennial Electric Achievement Report to the Commission, in accordance with WAC 480-109-120(4).

1) 2019 Accomplishments and Activities

In 2019, PSE continued the 2018-19 BECAR process. Accomplishments for the first year of this BECAR included: a review of PSE responses to 2016-2017 BECAR recommendations (BECAR Program Response Review Interim Memo); a review of PSE responses to 2018 evaluation recommendations (PSE Evaluations Program Response Review Interim Memo); a 2018 portfolio savings review (Portfolio Savings Review Interim Memo); and savings validation of tracking database and annual report (Mid-Cycle BECAR Report.).

2) Key Variance Drivers

BECAR expenditures were $40,000 (45 percent) less than planned because Outside Services charges were less than anticipated.

XIII. OTHER CUSTOMER PROGRAMS

A. Overview

In 2019, the only program (partially) funded by the Conservation Rider, for which conservation savings are not claimed, was Net Metering. Net Metering primarily focuses on customer-side generation, including solar, wind, anaerobic digesters (bionatural gas, etc.) and small-scale hydro. Net Metered systems are smaller than 100 kiloWatts (kW).[74] Only Other Electric Programs are excluded from Energy Efficiency's cost-effectiveness calculations.

1) Sector Performance

Table XIII-1 provides a 2019 summary of expenditures and energy savings for Other Electric Programs.

Table XIII-1: Other Electric Program 2019 Expenditures

2019 Expenditures				2019 Budget
Schedule	Electric			Electric
E150	Net Metering	$ 1,534,295	140.5%	$ 1,091,698
E195	Electric Vehicle Charger Incentive	$ -		$ -
	Demand Response	$ -		
	Total Electric	**$ 1,534,295**		$ 1,091,698

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

B. 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 amended June 8, 2000 (see RCW 80.60).

1) Description

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 18, 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.

Most customers enrolled in PSE's Net Metering program who have solar systems installed before June 2019 are also enrolled in the WA State Renewable Energy Production Incentive Program. Eligibility, incentive rates, terms, and annual payments for this program are determined by the WSU Energy Program, with the terms of PSE's administration to its customers described in Schedule 151. In 2019, PSE administered over $19 million to customer participants in this program. Due to the state program budget being fully obligated by June of 2019, this program is closed to new PSE net metered customers. PSE continues to work with WSU Energy Program and its customers to administer annual payments to existing program participants through the end of their term in the production incentive program.

While schedule 150 applies to customers who generate electricity using water, wind, solar energy or biogas from animal waste as fuel in 2019, 99.9 percent of new net metered systems were solar PV (photovoltaic) with a median size of 10.3 kW DC—and 9.4 kW DC for residential systems alone.

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

Energy produced by customer-generator systems directly reduces energy used in the home or business from the grid. When 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 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.

2) 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 2019, the actual costs collected under that order exceeded the program's budgeted amounts by 40 percent. The difference is due to a higher number of system installations than anticipated, as well as an increase in the average system size, which leads to a higher output of solar energy.

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. This impacts how PSE plans for and meets customer tracking, accounting, and reimbursement expectations. The Customer Connected Solar Team coordinates with other WA 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.

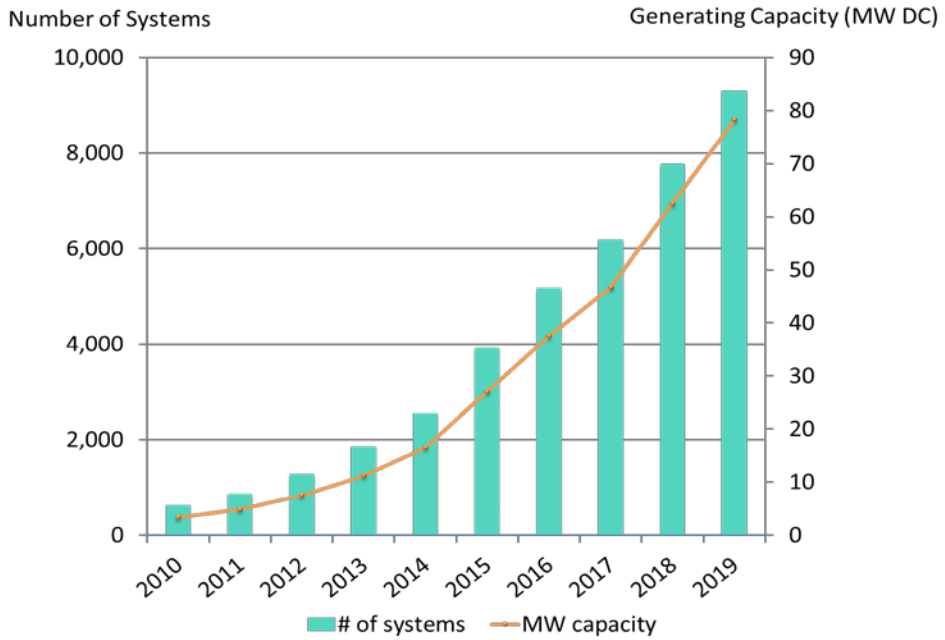
3) Program accomplishments

In 2019, 1,538 new customer-generators were added to the program. At the close of 2019, PSE was net metering 9,300 customer accounts for a combined customer-generating capacity of 78.3 MW DC. Figure XIII-1 provides a 10-year program view of cumulative year-end number and capacity of net metered systems.

4) Adaptive Management

In 2019, PSE participated in policy and rule-making discussions around Washington State's net metering and production incentive programs, and revised tariffs and business processes accordingly. State production incentives are no longer the driver of adoption. The goal of these changes was to facilitate scaling-up of customer-generation through the expansion and clarity of eligibility for net metering, development of a more efficient interconnection application process, and the move to simplify electrical standards. PSE made public revisions to Schedule 150 and 152, along with an enhanced interconnection application process flow (using PSE's established PowerClerk system), and revisions to the Customer Generation chapter of PSE's Electric Service Handbook. All were updated at PSE.com, and shared with the solar installer community in 2019.

Figure XIII-1: Net Metering Customer-Generator System Count, 2009-2019



C. 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.

The Production Incentive Program is operated in conjunction with, and in addition to, the Net Metering program. For the 2018-2019 State Fiscal Year, PSE paid 8,045 participating customers $19.3 million in production incentives. Eligibility, incentive rates, terms, and annual payments for this program are determined by the WSU Energy Program, with the terms of PSE's administration to its customers described in Schedule 151. Due to the state program budget being fully obligated by June of 2019, this program closed to new PSE net metered customers in the fall of 2019. PSE continues to work with WSU Energy Program and its customers to administer annual payments to existing program participants through the end of their term in the production incentive program.

In light of the fact that production incentives are no longer available to new PSE solar customers, and that production meters are thus no longer a necessary part of a solar project's design, PSE has revised the Customer Generation chapter of its Electric Service Handbooks (both residential and commercial). PSE is offering clear standards for solar installations both with and without production metering. After closing the incentive program, PSE did *not* see a significant drop in the number of new interconnection and net metering applications received.

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XIV. 2018-2019 BIENNIAL ADAPTIVE MANAGEMENT SUMMARY

PSE provides numerous details of its adaptive management accomplishments through its application of continuous improvement process implementation, Total Quality Management (TQM) throughout the 2018 and 2019 Annual Reports. As a courtesy to readers, PSE provides brief highlights of those in this chapter to summarize PSE's efforts for the entire biennium. This is consistent with WAC 480-109-120(4)(b)(vi).

Each table, organized by year, provides an adaptive management sample, along with an Annual Report page number reference for additional context and detail.

A. 2018 Adaptive Management Steps

Table XIV-1, which spans three pages, provides extracts from the 2018 adaptive management discussions in each program review. For the full discussion, please refer to the indicated 2018 Annual Report page number.

Table XIV-1: 2018 Adaptive Management Steps (1)

Program	Discussion	**Detailed in:** *Annual Report Page Number Reference*
Retail Lighting	PSE suspended some budgeted marketing activities as staff worked on improved marketing analysis to ensure confidence that the spending would help meet program goals.	66
Home Appliances	To maintain cost-effectiveness, PSE lowered incentives for ENERGY STAR® refrigerators, clothes washers electric dryers, and reduced Heat Pump dryer incentives The freezer rebate was also discontinued. Additionally, PSE contracted with a new rebate processing vendor in 2018 in an effort to lower administrative and operating costs for the downstream rebate program.	67
Web-Enabled Thermostats	PSE focused Web-Enabled Thermostat marketing efforts on reaching electric heating customers, which includedvia social media, email, and other programs' cross promotions in efforts to raise customer participation in the program.	69
Home Energy Assessments	The program transitioned from multiple vendors to a single vendor, resulting in a number of program improvements, including: a more consistent customer experience, increased ability to enact program improvements, and a singular marketing message. PSE continued to improve upon its HEA marketing efforts, and PSE began incorporating a call to action for the HEA in the unusual usage alerts. PSE also began offering limited Saturday appointments for HEA's for customers that are not available during the week.	73
Weatherization	PSE transitioned project verifications from a third party to PSE's internal verification team. Additionally, PSE also prepared for the transition of contractor account management from a third party to PSE.	75
Space & Water Heat	PSE implemented a process to analyze customer satisfaction survey results and follow up with customers who responded with low satisfaction scores. PSE implemented an email reminder campaign to contractors to make sure they ensure customers are aware of the rebate, and designed a rebate thank you card that contractors can include in the sales packet that they leave with customers.	76
Low Income Weatherization	The program implemented measures considered cost effective by the Department of Commerce (DOC) in addition to prescriptive measures typically offered by the Program. For DOC measures, the program was able to leverage Savings to Investment Ratio (SIR) values on custom measures while capturing TREAT energy modeled savings values.	83
SF New Construction	Based on feedback from home builders, raters, and NEEA, PSE worked with NEEA to include smart thermostats and 100 percent LED lighting into the percent-better-than-code improvements within the AXIS database.	89

Table XIV-2: 2018 Adaptive Management Steps (2)

Program	Discussion	Detailed in: *Annual Report Page Number Reference*
MF Retrofit	The Multifamily team hosts energy fair table events and attends HOA board meeting in an ongoing effort to make their participation easier and raise awareness of the program, which helped achieve 50 percent participation in direct install. The Multifamily program also made process improvements for handling applications from condo owners, and developed specified brochures to outline their process.	94
MF New Construction	PSE not only redesigned the program to fit the market's needs but also obtained valuable feedback from over 20 different meetings with the building community, which informed the team of multiple opportunities for improvement such as adding an EDA incentive, including new measures, and customer website experience improvements.	103
Commercial/Industrial Retrofit	Program staff continued to focus on internal process improvements to streamline the tracking of C/I Retrofit projects. Program staff enhanced forecasting tools to allow EMEs to better view and update project completion dates.	116
Custom Lighting Grants	In October, the program raised the Luminaires Level Lighting Control bonus to $75/fixture (from $50/fixture) to spur more projects with integrated controls.	117
Idustrial Systems Optimization Program (ISOP)	PSE implemented a new incentive structure: when a customer implemented action items within 120 days after the optimization report was presented, the customer received an incentive up to 100 percent of the cost. This motivated the customers to complete projects to save energy right away, resulting in two new projects completion within the first year of the program cycle. This is first in ISOP program.	118
C/I New Construction	Program staff continue to focus on creating a culture of collaboration and transparency with their new construction customers by actively seeking feedback on the grant project process. Staff also continue to seek EME feedback to update program guidelines, especially EME training and increased project experience.	123
Commercial Strategic Energy Management (CSEM)	The program participated in creating a PSE-specific landing page on NEEA's SEMHUb (an on-line training tool for SEM), and development of a Beginner's and Advanced curricula on the SEMHub for PSE customers.It issued quarterly reports, identifying customer buildings with the most and least energy savings, and created training with follow-up webinars and coaching to encourage implementation of new energy saving initiatives.	131
Commercial Kitchens & Laundry	In order to improve distributor satisfaction with an ever-changing program, PSE designdc and implemented a renewed and improved in-store POP presence, including training schedules, delivery materials and tools, in-store signage, and more streamlined interaction with PSE as the regional lead of the program.	141
Small Business Direct Install (SBDI)	PSE integrated the Lodging and Agriculture programs into the Small Business Direct Install program. PSE provided segment-specific outreach efforts, and developed several key partnerships with Conservation Districts across the territory, in order to collaboratively promote PSE's energy efficiency services to small agriculture customers. PSE also developed a process that allows a seamless transfer of qualified customers from the Home Energy Assessment program to SBDI, ensuring that a home on a residential schedule with a commercial operation can participate in both programs.	143
Commercial HVAC	Due to the portfolio's unanticipated success in achieving therm savings, the implementer worked with distribution to phase in the innovative approach to test acceptance of the Commercial Midstream pilot and ensure that systems were set up before a territory-wide implementation. The program also instituted new processes and policies as it ramped up, to ensure alignment (and reduce overlap) with existing PSE programs.	145

Table XIV-3: 2018 Adaptive Management Steps (3)

Program	Discussion	**Detailed in:** *Annual Report Page Number Reference*
Transmission, Distribution & Generation	The program coordinated between Energy Efficiency and staff in other PSE departments to collect project-specific details for program tracking and reporting, which maintained a regular flow of communication, reinforcing the energy-efficiency culture within PSE. These efforts included doing lighting quality and energy efficiency assessment at six power generation plants.	158
Data and Systems Support	The team implemented new reports in its DSMc system, provided detailed and accurate reporting for SOX audits, and enabled community-specific Energy Efficiency activity reporting. The team created a new City/Zip check process to review, clean, and standardize program data that the team receives from external vendors. The team also created an invoice tracking process to enable more effective financial and data verification from external vendors.	178
Customer Digital Experience	PSE suspended E-Bill services provided through Energy Efficiency in October in an effort to streamline customer communications within PSE.	200
EE Brochures	Selected brochures that were taken out of print as part of the improved focus of inventory are being posted to the PSE website for online access.	204
Market Research	Market Research refreshed the propensity model gauging customer likelihood to participate in PSE's EE appliance, weatherization, Home Energy Assessment, and space heat programs. The organization conducted research and provided support materials for targeted door-to-door campaigns in 10 PSE communities, and provided research identifying Low Income eligible Mobile/Manufactured Home customers. Also, it reviewed and highlighted emerging HTR secondary research as available to continue support EE HTR efforts.	212
Program Evaluation	The team implemented a new approach of examining all tariffed programs within a two-year period. ThEvaluation staff continuously look to integrate advanced data analytics (often called EM&V 2.0). Part of this work will include assessment of the extent to which M&V 2.0 techniques can replace or supplement traditional impact evaluation and project verification methods.	215
Net Metering	PSE continued to refine its use of PowerClerk for customer-owned net metered systems. The tool streamlines the interconnection application process, and provides greater visibility into the status of an application for PSE, installers and customers.	220
Stakeholder Relations	Exhibit 9: *Requirement Compliance Checklist* demonstrates PSE's adaptive management through the application of continuous improvement principles by providing Stakeholders with a single representation of compliance deliverables status.	226
Compliance	Energy Efficiency's application of compliance controls reflects its use of adaptive management through continuous improvement. PSE sustains its emphasis on regulatory compliance throughout the biennium. Energy Efficiency management and staff regularly review and discuss regulatory requirements, whether RCW, WAC, or Commission Orders.	228

E. 2019 Adaptive Management Steps Summary

Table XIV-4, which spans three pages, provides extracts from the 2019 adaptive management discussions in each program review, provided in this document. For the full discussion, please refer to the indicated 2019 Annual Report page number.

Table XIV-4: Highlights of 2019 Adaptive Management Steps (1)

Program	Discussion	**Detailed in:** *Annual Report Page Number Reference*
Low Income Weatherization	The program demonstrated continuous improvement by adaptively managing its disbursements of General Rate Case, Green Power/CEEP, and Special Contract ad-hoc funding effectively. The program also initiated several innovative customer services, including a Manufactured Home Replacement, a DHP upgrade Collaborative, and a Manufactured Home Campaign.	83
Retail Lighting	PSE kept informed of EISA 2020 and Washington State House Bill 1444 updates, and monitored potential impacts to the lighting market throughout 2019.	96
Single Family Water Heat	The program management team gained valuable insight through marketing efforts and feedback. 2019 was a year of planning long-term changes to the program. Changes being considered for 2020 include moving to a midstream and instant retail discount program model.	97
Home Energy Assessments	In 2019, the program coordinated with other PSE Single Family Existing Residential programs to deliver services to manufactured home customers within PSE's territory. Later in the year, PSE added a Smart Thermostat measure with assisted installation for manufactured home customers.	99
Home Appliances	To maintain cost effectiveness for the Appliance Decommissioning, PSE changed program eligibility to refrigerators and freezers manufactured in 1992 or earlier. PSE conducted an awareness campaign, and leveraged low-cost marketing tactics such as targeted email sends, social media posts, and search engine marketing to promote the program.	101
Smart Thermostats	PSE offered instant rebates on smart thermostats at pop-up retail in 2019, providing customers another purchase avenue through which they could learn about and have access to smart thermostat technology.	102
Retail Showerheads	PSE lowered incentives on 1.75 to 2.0 GPM showerheads in 2019. PSE ended the faucet and thermostatic resistor valve rebates at the beginning of 2019, due to cost-ineffectiveness concerns.	103
SF Weatherization	PSE retrained Weatherization Trade Allies to utilize the new portal for all Weatherization rebate submissions. PSE also expanded manufactured home rebate offerings in response to stakeholder feedback and direction from the UTC. Offerings for manufactured homes included new measures and increased rebates in coordination with the Home Energy Assessment program and other Single Family Existing Residential offerings.	104
Home Energy Reports	In 2019, the program expanded in response to a decline in participation due to customers moving out of the home. In May, PSE refilled 25,000 customers to its 2015 electric-only high-user segment level, and it added a manufactured home segment that serves approximately 40,000 customers.	105
Single Family New Construction	In response to the market feedback, PSE developed a stand-alone Energy Star smart thermostat measure for projects that were not able to meet the 20% minimum threshold above WSEC. The $75 rebate amount and qualifications are consistent with the Single Family Existing program. With respect to the MHNC program, sales performance incentive funds (SPIFs) are used to encourage manufactured home retailers to promote qualified homes to buyers. PSE experienced no uptake on SPIFs from retailers in 2019 mainly due to a lack of awareness, but with increased outreach and training to Sales staff at various dealers, PSE expects to see much greater redemptions in 2020 for both rebates and SPIFs.	111

Table XIV-5: Highlights of 2019 Adaptive Management Steps (2)

Program	Discussion	Detailed in: *Annual Report Page Number Reference*
Multifamily Retrofit	In mid-2019 the program expanded the direct install offering to common areas when conducting in-unit direct install. Throughout 2019, the program completed extensive research into market opportunities to focus outreach efforts on underserved properties. The field team was able to dedicate an outreach person to assist with following up on these opportunities. On a few occasions, the Multifamily Program has leveraged a bonus incentive to help incent stalled projects that were not able to begin due to high capital costs and low return on investment.	115
Multifamily New Construction	PSE continues to focus on creating a culture of collaboration and transparency with its customers participating in the program, and actively seeks feedback on the grant process. The program team also continues to seek Energy Management Engineer (EME) feedback to update program guidelines, especially EME training and increased project experience. The MFNC program also actively seeks feedback from the 3rd party implementer regarding program mechanics and customer interaction and satisfaction.	122
C/I Retrofit	In 2019, PSE reviewed and streamlined verification requirements for the HVAC Controls Protocol to encourage program participation from smaller buildings by reducing customer/contractor documentation while maintaining an appropriate level of rigor in the verification process.	136
Custom Lighting Grants	In the fourth quarter of 2019, the team increased the base incentive to 0.175/kWh for fixtures and kits, maintained the $2 each for TLED tubes, maintained the Luminaire Level Lighting Control bonus at $75/fixture, but added a $0.05/kWh bonus for measures that add automatic controls. Program staff designed a new application/calculator to take effect Jan 1, 2020.	137
Industrial Systems Optimization Program	PSE implemented an innovative incentive structure in the 2018-2019 program cycle: when a customer implemented action items within 120 days after the optimization report was presented, the customer received an incentive up to 100 percent of the cost.	139
CI New Construction	Program staff continue to focus on creating a culture of collaboration and transparency with their customers participating in the new construction programs, and actively seek feedback from customers, the design community, and other utilities on the grant project process. Staff also continue to seek EME feedback to update program guidelines, especially EME training and increased project experience.	144
Commercial Strategic Energy Management	The program executed several innovative customer solutions, including quarterly reports from PSE identifying customer buildings with the most and least energy savings, customer trainings with follow-up webinars and coaching, development of CSEM seasonal energy management campaign materials followed by varying distribution of the materials to the customer, and implementation of the Continuous Engagement Credit system, which is an alternative to the Target Incentive system.	150
Lighting to Go	Program staff retain a strong focus on making the program easy for participating distributors. In 2019, program staff worked with its field services vendor to improve the program information available at check-out counters.	160
Commercial Kitchens	In order to improve distributor satisfaction with an ever-changing program, PSE worked to design and implement a renewed and improved in-store POP presence, including training schedules, delivery materials and tools, in-store signage, and more streamlined interaction with PSE as the regional lead of the program.	162
Small Business Direct Install	In 2018, staff changed the program to offer free TLEDs. In 2019, to better manage the incoming projects, PSE reinforced the process of distributing projects to the subcontracts that were referred through PSE Energy Advisors, website and blitzes.	164
Commercial HVAC/Midstream	A key improvement in 2019 was the revision to the Advanced Rooftop Controls rebate. Program staff worked with regional utilities to add a small unit incentive. In mid-2019, regional utilities started planning and engineering to make additional changes to the incentive. These changes will create a per-unit incentive (vs currently per ton) and will launch in early 2020.	167
Generation, Distribution, Transmission	This program requires coordination between the Energy Efficiency program manager and staff in other PSE departments to collect project-specific details for program tracking and reporting. Maintaining a regular flow of communication has reinforced the energy-efficiency culture within PSE. These efforts included performing lighting quality and energy efficiency assessment at six power generation plants.	181
Data and Systems Support	As part of the team's effort to launch a new rebate portal for customers, all of Energy Efficiency's residential rebate programs were revised and enhanced to provide much more flexibility in the programs when new rebates are introduced. With the changes the team introduced, new rebates in its programs can be launched very quickly, providing program managers more flexibility to adju st their program offerings if needed. Additional features were built into these programs to further prevent duplicate rebate payments, enhance rebate reporting, and improve tracking of rebate submission issues from customers.	202

Table XIV-6: Highlights of 2019 Adaptive Management Steps (3)

Program	Discussion	Detailed in: *Annual Report Page Number Reference*
Contractor Alliance Network	The program undertook several adaptive management initiatives in 2019. Key improvements included Rebranding the network to *PSE's Trade Ally Network,* associated referred contractors as *Recommended Energy Professionals* , centralizing trade ally communications by creating a new mailbox for the TAS team, and scoping and launching a new Trade Ally Portal: Trade Ally Connect (TAC). The program also revised some referral product categories from the standard direct referral to providing distribution list style referrals, enhanced referral capabilities of PSE field staff and program implementation staff, and implemented account support functions.	211
Automated Benchmarking System (MyData)	Program staff continues to use customer feedback to plan for future improvements. PSE expects MyData to play an essential role in enabling customers to comply with HB 1257, as they have been active participants in the preliminary rulemaking discussions for HB 1257.	215
Customer Digital Experience	PSE stopped providing the E-Bill services through Energy Efficiency in October 2019 in order to transfer this service to another department in effort to streamline customer communications within PSE.	227
Brochures	Selected brochures that were taken out of print as part of the improved focus of inventory are being posted to the PSE website for online access.	231
Market Research	Market Research staff implemented several adaptive management initiative in support of Energy Efficiency programs. These include conducting research and providing support materials for targeted residential door-to-door campaigns in 10 PSE communities, and business door-to-door campaigns in 5 PSE communities, developing a reporting dashboard for EES web traffic, and conducting research to determine marketing traits for home energy assessment programs.	238
Evaluation	Evaluations completed for the Home Energy Reports, Home Energy Assessment and Web-Enabled Thermostat programs examined performance based on program theories, Key Performance Indicators (KPIs) and deemed savings values, and identified opportunities to update and improve these programs.	240
Net Metering	In 2019, PSE participated in policy and rule-making discussions around Washington State's net metering and production incentive programs, and revised tariffs and business processes accordingly. Revisions to Schedule 150 and 152, along with revamped interconnection application process flow (using PSE's established PowerClerk system) and revisions to the Customer Generation chapter of PSE's Electric Service Handbook were all made public, updated at PSE.com, and shared with the solar installer community in 2019.	246

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XV. COMPLIANCE

By the end of 2019, PSE achieved its biennial expectations in meeting its regulatory requirements, including laws, rules, Commission Orders, CRAG requests, and conditions. This chapter presents an overview of PSE's compliance with conservation-specific requirement deliverables provided in 2019.

PSE provides a discussion specific to the 2018-2019 biennium in Section E of this chapter. Sections A through D pertain specifically to the 2019 program year.

A. RCW 19.285

Consistent with RCW 19.285.040, the Company continued to adaptively execute its 2018-2019 Plan while consistently collaborating with CRAG members and Commission staff to fulfill its two-year conservation targets.

B. WAC 480-109

PSE complied with all applicable WAC 480-109 requirements in 2019. Key among these are the requirement to provide the CRAG with drafts of all conservation filings 30 days in advance, CRAG meeting frequency, Low Income Weatherization funding and cost-effectiveness treatment, and the annual reporting and annual planning filings timeframes.

C. Commission Orders

PSE seamlessly incorporated the updated 2018-2019 conditions, outlined in Attachment A of Order 01 in Docket UE-171087 into its standard business operations. PSE also implemented practices and procedures to comply with Commission orders in other, related dockets, including U-180680, which outlined stipulations in the sale of interests from Macquarie ownership, and UE-180607 and UG-180608, which dealt with 2019-2021 IRP requirements.

D. 2019 Compliance Results

PSE tracks and reports compliance with Commission requirements outlined in the documents listed in Table XV-1. It is notable that there are approximately eight requirements that are targeted for completion in early 2020: these primarily relate to biennial reporting, including the final Biennial Electric Conservation Achievement Review (BECAR).

In addition to notations and references in PSE's reporting and planning compliance filings, Energy Efficiency's key compliance reporting vehicle is Exhibit 9: *Requirement Compliance Checklist*. Each requirement type (according to docket number) is highlighted in a different color in the Exhibit for easier reference.

PSE highlights several key deliverables that were satisfied in 2019 in Table XV-2. Please note that PSE only listed key or significant deliverables satisfied in that table.

Table XV-1: Tracking Compliance Requirements

Requirement Documents Tracked in Exhibit 9: Requirement Compliance Checklist			
Docket Number	Name	Pertains To	Exhibit 9 Color Code
UG-011571	2001 General Rate Cast, Exhibit F to Settlement Stipulation	Original set of conservation conditions; only natural gas requirements now apply.	Lime
U-072375	Multiparty Settlement Stipulation	2008 Merger Agreement: two low-income requirements pertaining to conservation.	Lilac
UE-100177	Conditions for Approval of PSE's 2010-2011 Conservation Targets and Settlement Terms	2010 electric settlement agreement: Sections A - J and L still apply.	Green
UG-121207	Commission Policy Statement on the Treatment of Natural Gas Cost-Effectiveness	Three recommendations for IOUs.	Blue
UE-121697 and UG-121705 (consolidated) and UE-130137 and UG-130138 (consolidated)	Order Granting Decoupling Petition	Two conservation-specific requirements.	Orange
UE-131723	WAC 480-109 revisions	2015 requirements updates.	White
UE-170033, UG-170034	2017 General Rate Case	Specific requirements for LIW	Pale Blue
UE-171087	Order 01 Attachment A	2018-2019 conditions.	Yellow
U-180680	Macquarie sale stipulations	Several LIW requirements	Lilac

Table XV-2: Highlights of Key 2019 Completed Requirements

Section	Requirement, UG-011571	Applicable Compliance Vehicle
H.21	Completed -- Annual budgets will be built up from the bottom.	2019 Exhibit 1: Savings and Budgets
H.25	Completed -- (Rider) funds may include reasonable administration costs for PSE's net metering program.	2019 Exhibit 1: Savings and Budgets
Section	**Requirement, UE-100177**	**Applicable Compliance Vehicle**
C.6	Completed -- In general each individual energy efficiency program shall be designed to be cost-effective.	2019 Exhibit 2: Cost-Effectiveness Estimates
F.11	Completed -- The annual budget of the program will be built up from the bottom.	2019 Exhibit 1
G.14	Completed -- PSE will continue to honor Commitments 22 and 23 from U-072375 with regard to future funding levels.	2019 Exhibit 1
Section	**Requirement, UE-130137 & UG-130138**	**Applicable Compliance Vehicle**
pgs. 76, 77, ¶178	Completed -- PSE will add $500,000 in Rider funding and $100,000 shareholder funding annually to its Low Income Weatherization program	2019 Exhibit 1, LIW program detail pages
Section	**Requirement, UE-121697 & UG-121705**	**Applicable Compliance Vehicle**
pg. 17, G.31	Completed -- PSE will agree to achieve electric conservation 5 percent above the Commission-approved biennial target.	Exhibit 1, "Building the Electric Target"
Section	**Requirement, UE-171087**	**Applicable Compliance Vehicle**
(4)(a)	Completed -- PSE must submit annual budgets that include program-level detail	2019 Exhibit 1
(5)	Completed -- PSE must maintain its program descriptions on file with the Commission.	2019 Exhibit 3: Program Details
(6)(c)	Completed -- PSE must spend a reasonable amount of its conservation budget on EM&V.	2019 ACP Exhibit 1, line bl indicates EM&V budget amount
(7)(c)	Completed -- Puget Sound Energy may spend up to 10 percent of its conservation budget on programs whose savings impact has not yet been measured	2019 ACP Exhibit 1, line bi indicates non savings-specific anticipated spending

Table XV-2, Continued

Section	Requirement, WAC 480-109	Applicable Compliance Vehicle
100(5)	Completed -- A utility must use unit energy savings values and protocols approved by the regional technical forum [sic], unless it is based on reasonable analyses and evaluations.	2019 Exhibit 5: Prescriptive Measure Savings Values
100(10)	Completed -- A utility may fund low-income measures based on TREAT models that achieve a Savings to Investment Ratio of 1.0.	2019 ACP Overview, page 61
110(2)	Completed -- A utility must meet with its advisory group at least four times per year.	2019 CRAG meeting summary notes.
120(2)	Completed -- On or before November 15th every even-numbered year, a utility must file with the Commission an annual conservation plan, containing any changes to program details and annual budget.	2019 ACP: Volumes 1 and 2

Exhibit 9 contains the comprehensive list of satisfied requirements.

E. 2018-2019 Biennial Compliance [75]

PSE has noted several instances and provides references in this and its 2018 Annual Report of compliance with its numerous regulatory requirements. This section provides a summary of PSE's overall biennial compliance.

1) WAC 480-109-120(4) Compliance

This subsection of WAC 480-109 pertains to utilities' biennial reporting.

[75] As indicated in Chapter 1, PSE will clearly denote Report sections in chapters that are not specific to the 2018-2019 biennial discussion with unique formatting.

Table XV-3 provides reference to applicable sections of this Report that addresses each requirement.

Table XV-3: WAC 480-109-120(4)(b) Compliance

WAC 480-109 Compliance	
Section 120(4)(b) Requirement The biennial conservation report must include:	Chapter & Section of 2019 Annual/2018-2019 Biennial Report
(i) The biennial conservation target;	Chapter 1, Part I.A provides the target in Table I-2.
(ii) Planned and claimed electricity savings from conservation;	Chapter 1, Part I.A provides the savings achieved in Table I-2.
(iii) Budgeted and actual expenditures made to acquire conservation;	Chapter 1, Part I.A provides the planned and actual expenditures in Table I-2.
(iv) The portfolio-level cost-effectiveness of the actual electricity savings from conservation;	Exhibit 2: 2018-2019 Electric Cost-Effectiveness provides cumulative two-year Portfolio results.
(v) An independent third-party evaluation of portfolio-level biennial conservation savings achievement;	Appendix 1 provides DNV-GL's Biennial Electric Conservation Achievement Review.
(vi) A summary of the steps taken to adaptively manage conservation programs throughout the preceding two years; and	Chapter 14 provides summaries and references of adaptive management steps discussed in the 2018 and 2019 Annual Reports of Energy Conservation Accomplishments.
(vii) Any other information needed to justify the conservation savings achievement.	Chapters 3 and 10 provides background on PSE's savings validation processes. Chatper 15 provides summary discussions of regulatory compliance , and Chapter 16 provides background on Stakeholder Engagement.

Please note that it is likely that there are more than one location for the indicated discussion. Those listed in the "Chapter & Section" column indicate the primary discussion location.

2) Exhibit 9: Requirement Compliance Checklist

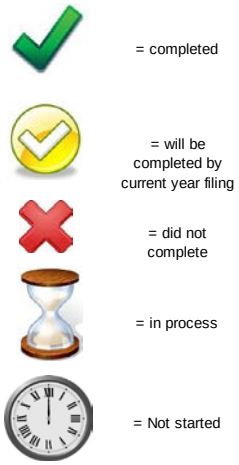
Exhibit 9: *Requirement Compliance Checklist* demonstrates PSE's adaptive management through the application of continuous improvement principles by providing Stakeholders with a single representation of compliance deliverables status.

Exhibit 9 includes all unique electric and natural gas portfolio requirements, sorted by classification, over the current two-year period. PSE updated the Checklist in 2019 to reflect inclusion of the updated 2018-2019 conditions. The Exhibit is a "living" document. It is periodically updated and reconciled throughout its applicable biennium to correlate to current Commission orders.

It is interesting to note that PSE classifies some requirements as "Standard Business Practice" in Exhibit 9. These requirements include obligations such as describing the need for line extension policies, requiring PSE to continue to honor Commitments 22 and 23 from U-072375,[76] describe the makeup of the Conservation Resource Advisory Group (CRAG), etc.

They describe no set deliverable date, or have no specific CRAG role. Energy Efficiency routinely reviews these to ensure that there are no updates or revisions. Where there are none, the conditions are notated as "completed". In the attached Exhibit 9, these are noted in the "Deliverable Provided Date" column as "ongoing," or "No specific deliverable—ongoing business practice."

Readers may quickly ascertain the status of any deliverable through the use of these icons:

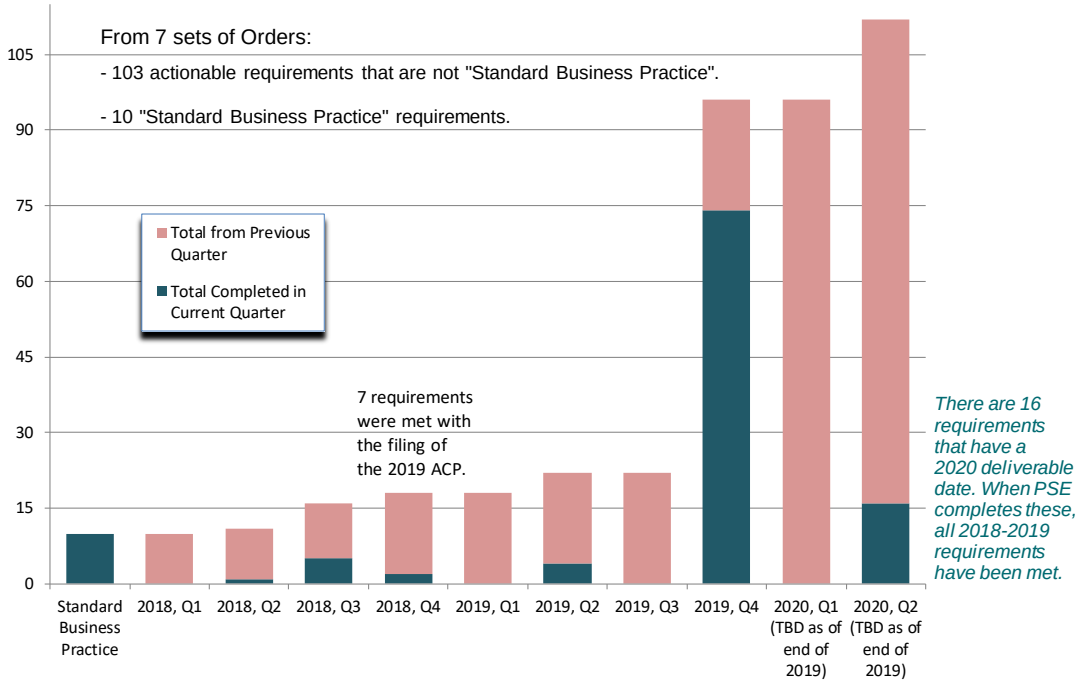


[76] This requirement is regarding funding levels for Low Income Weatherization programs in the 2008 PSE Merger Agreement.

As readers will note in Figure XV-1, there are many requirements that aren't completed until the final quarter of the biennium. This is due to the nature of many of the deliverables. Readers should not infer from this that PSE delays requirement completion until the end of the biennium; rather, most of these are "In Progress" (noted by the hourglass symbol in the iterative Exhibit 9 publications) throughout a portion of the biennium. One example is the requirement that PSE maintains its program details on file with the Commission in the same docket as the current BCP. Since PSE updates the "living" Exhibit 3: *Program Details* document regularly throughout the biennium, it doesn't classify the requirement as "completed" until the end of the biennium.

Figure XV-1 presents PSE's completed deliverables as of the end of 2019.

Figure XV-1: 2018-2019 Requirement Completion Status



F. Compliance Controls

Energy Efficiency's application of compliance controls reflects its use of adaptive management through continuous improvement. PSE sustains its emphasis on regulatory compliance throughout the biennium. Energy Efficiency management and staff regularly review and discuss regulatory requirements, whether RCW, WAC, or Commission Orders.

Energy Efficiency staff consider compliance elements during CRAG meeting planning, staff meetings, and especially throughout the year-long biennial planning process. Energy Efficiency's regulatory compliance staff actively participate in planning functions, and ensure that program staff are familiar with tariffs and rules that pertain to their programs.

Regulatory compliance staff also monitor the compliance progress throughout the biennium and alert management of upcoming key deliverables to ensure that the deliverables are met in a timely fashion. In addition to the publication of Exhibit 9 throughout the year, the regulatory compliance staff also provides an annual calendar, with key regulatory deliverables highlighted for quick reference.

It is also important to consider that Energy Efficiency staff must also operate their programs within PSE corporate guidelines and policies: SoX reporting requirements; safety processes; cyber-security; and Corporate Contracting department requisites, for instance.

The successful follow-through on several significant 2019 filings (the 2018 Annual Report, Schedule 120 Rate Recovery, Biennial EIA Report, the 2019 ACP, for example) is a reflection on Energy Efficiency's strict attention to regulatory requirements.

XVI. 2019 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 2019.

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 2019 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 2019. In the list, PSE presents the date and description of each filing the UTC Docket number for straightforward reference.

All conservation-specific filings[77] complied with WAC 480-109-110(3): CRAG members received draft copies of each of the filings[78] indicated in XIV.A.1 on the following page.

1) Energy Efficiency-Specific Filings

- March 1, 2019: Filed electric Schedule 120, UE-190149. Effective May 1, 2019, the updated Schedule 120 represents an average decrease of the electric Conservation Rider portion of affected customer bills by 0.94 percent.
- March 1, 2019: Filed natural gas Schedule 120, UG-190148. Effective May 1, 2019, the updated Schedule 120 represents an average increase of the natural gas Conservation Rider portion of affected customer bills by 0.1 percent.

[77] Although included in the conservation filing listing, the 2021 IRP progress report is not conservation-specific. The filing is included in the listing because the Conservation Potential Assessment (CPA) element of the IRP is a key determinant of Energy Efficiency's savings targets.

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

- April 1, 2019: Filed 2018 Annual Report of Conservation Accomplishments, UE-171087. 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.
- May 20, 2019: Filed an updated Exhibit 3: Program Details, UE-171087. This revision updated all various measure tables and customer service offerings as a result of PSE adaptive management.
- May 31, 2019: Filed the 2018-2019 mid-term Department of Commerce EIA spreadsheet, UE-171087. Consistent with WAC 480-109-120(3)(c) and RCW 19.285.070(1).
- June 11, 2019: Filed the Statewide Advisory Group final report, UE-171087. The SWAG report reflected agreements on the treatment of NEEA savings, and noted discussions on potential utility incentives and Resource Value Test (RVT) cost-effectiveness calculation attributes.
- November 1, 2019: Filed 2020-2021 Annual Conservation Plan, UE-190905 and UG-190913. The plan indicates a biennial electric savings target of 476,468 MWh, and 7.77 million therms, and is consistent with Order 01 in Dockets UE-180607 and UG-180608.
- November 1, 2019: PSE filed Conservation Tariff revisions, Dockets UE-190909 and UG-190110. Mentions of fuel conversions were removed, and budget and termination dates were updated, among other changes.
- November 15, 2019: PSE filed its 2021 IRP Progress Report, consistent with Order 02 in Dockets UE-180607 and UG-180608.

B. Conservation Resource Advisory Group

PSE acknowledges and is very appreciative for the amount of work and committed engagement demonstrated by the Conservation Resource Advisory Group (CRAG) throughout 2019. 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.

In addition to attending eight CRAG meetings (two of which were teleconferences or webinars), most CRAG members also made significant contributions to the Statewide Advisory Group's (SWAG's) two meetings in 2019. Members discussed and made significant progress on issues ranging from cost-effectiveness calculation methodologies, whether NEEA savings should be included in utilities' EIA Penalty Thresholds, to a potential utility incentive mechanism.

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

1) 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.

2) CRAG Vision

Throughout 2019, CRAG members consistently demonstrated qualities of the CRAG vision, established in May 2010:

> Members actively participate in CRAG processes and advise on PSE decisions so that ratepayer funds are being used to achieve all cost-effective energy conservation in the most prudent, beneficial manner.

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 13, 2019. PSE also provides laminated copies of the Statement at each CRAG meeting. PSE and CRAG members conducted all CRAG interactions with the utmost respect for potentially alternative views, and participants were engaged, with the clear vision of customer benefit and continuous improvement uppermost in mind.

3) 2019 Adaptation through Continuous Improvement

Consistently building on efficiencies that PSE initiated in 2010, Energy Efficiency continued to execute a number of steps to maximize transparency and improve efficiencies for CRAG members including:

- Emails that are formatted to immediately call attention to the desired level of action.
- PSE added a program-by-program comparison chart in Exhibit 1 of the 2020-2021 Biennial Conservation Plan, providing CRAG members with a direct and streamlined way of comparing the previous biennium's values indicated in the 2018-2019 BPC to the updated values in the new BCP.
- All 2019 CRAG meetings were conducted at the Smart Buildings Center in Seattle.[79]
- Populating large files (such as the Biennial Electric Conservation Report and ACP) on PSE's secure FTP site for easy access, removing the burden of large and cumbersome email attachments.
- All report and plan responses to queries from CRAG members are consistently formatted, and turned around within one week of receipt.

4) CRAG Activities

In 2019, PSE welcomed one new permanent CRAG member. In addition to conducting CRAG meetings and various sub-committee meetings, PSE provided filings background and workpapers, data, opinions, references, comments, and data request responses to CRAG members throughout the year. PSE facilitated ad-hoc meetings, including primers for the Home Energy Reports (HER) program and Large Power User/Self-Directed program, and its annual Schedule 120 financial review in its offices in Bothell.

5) Publication Updates

PSE provides the CRAG with several document drafts prior to filings. For instance, the first and second quarter updates to its *Program Details* (Exhibit 3) and the draft 2020-2021 Biennial Conservation Plan, as required by WAC 480-109-110(3).

[79] PSE expresses its sincere appreciation to the Smart Buildings Center staff for their kind and gracious support.

It has been a long-standing practice to provide the CRAG with a mark-up version and clean version of the documents, which enhances the ability to quickly view the applicable modifications. PSE also provides a summary of the changes in the notifying email. As required by WAC 480-109-130(6), PSE updates these documents on the PSE.com website following Commission acknowledgement or issuance of an approval order.

6) CRAG Meetings

In 2019, PSE met the requirements of WAC 480-109-110(2) and condition (3)(e) by convening four 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 last five in-person meetings coincided with the development of the 2020-2021 Biennial Conservation Plan. The BCP development therefore represented a more than six-month engagement with the CRAG. All 2019 CRAG meetings were hosted by the Smart Buildings Center, and PSE is most appreciative of their gracious hospitality and assistance with any technical difficulties that presented themselves.

The following discussions are very high-level “snapshots” of the eight 2019 CRAG meetings (including two webinars). They are intended only to provide a general sense of the meeting topics. All CRAG members received a full meeting summary document, along with all handout material and the complete slide deck shortly after each CRAG meeting.

a. March 13 Meeting Highlights:

Consistent with PSE's long-established practice, during the first CRAG meeting of the year, the attendees reviewed the CRAG Vision Statement, Meeting Guidelines and Measures of Success. Everyone agreed that each were still valid and had merit to be carried forward.

The key topics of this meeting were the Schedule 120 filing, a 2018 Annual Report highlight review, general program updates, and a progress report on the Biennial Electric Conservation Achievement Review. PSE reviewed its understandings derived on utility incentives from the SWAG meetings, and a kickoff of the 2020-2021 BCP planning process.

Key Outcomes

The attendees agreed that:

1) PSE should include how it will account for the costs of deferred capital projects in a potential targeted EE program.
2) PSE would like to participate in the Efficiency Exchange discussion on Demand Response pilots.
3) The CRAG should tee up questions relative to a potential utility incentive mechanism for an upcoming webinar.
4) CRAG members should review PSE's program bid/no-bid criteria and have questions ready by the next CRAG meeting.
5) PSE should provide CRAG members with a Large Power User/Self-Directed program review/
6) It would be a good idea to include interested CRAG members in designing 2018-2019 evaluation metrics.

b. April 19 Teleconference

PSE arranged this teleconference to continue the discussion on the potential of a utility incentive program. Discussion elements included the potential inclusion/exclusion of Retail Wheeling (Rate Schedule 449) savings in penalties, potential incentive rates, cost recovery split, the treatment of potential excess savings, and an innovation adder, and SWAG/CRAG roles.

At the conclusion of the conference call, the attendees agreed that:

1) UTC staff need to talk to PSE to determine a path forward. Public Counsel requested that they be included in those conversations.
2) PSE's positions need to be clarified prior to filing a petition on July 1.
3) It is important that concerned CRAG members attend the May 3 SWAG conference call, were the role of the SWAG can be discussed, in addition to reviewing any outstanding issues with the SWAG report.
4) Determine if there is a need, or incentive, to re-engage the SWAG for another meeting.
5) Take time to include additional SWAG report edits before May 3rd.

c. June 19 Meeting Highlights:

This primary focus of this meeting was on the development of the 2020-2021 Biennial Conservation Plan. The attendees discussed the BCP and IRP savings target development, reviewed new legislation and potential implementation, received updates on RFI/RFP status, and reviewed BCP planning issues. PSE provided Residential Energy Management and Business Energy Management program updates, including status of the manufactured home focus and Macquarie ownership transfer and Targeted DSM.

Key Outcomes

The attendees agreed that:

1) PSE will offer retail lighting beyond until the end of the MOUs: January 31, 2020. January 2020 savings will be counted toward PSE's 2020-21 penalty threshold.
2) A CPA primer would be worthwhile in an upcoming CRAG meeting.
3) CRAG members were generally supportive of the three HEA strategies presented:
   i. Inclusion with Home Energy Reports on a reduced scale
   ii. Partnership with other Home Services through New Products and Services
   iii. Inclusion of savings attributable to HEA-related behavior change
4) PSE would provide CRAG members with the AMI rollout schedule.
5) PSE would provide CRAG members with any large NEEA contract changes.

d. July 24 Meeting Highlights:

This meeting's agenda focus was the first of three 2020-2021 BCP deliverables: discuss the draft BCP savings targets. Accordingly, PSE presented several important topics:

1) A direct-install lighting proposal,
2) Updates on CVR, Pay for Performance, and NEEA,
3) Targeted DSM pilot development,
4) On-bill repayment research and alternatives,
5) Evaluation updates, and
6) The first draft of 2020-2021 conditions.

Key Outcomes

1) PSE will file the 2020-2021 BCP on November 1, indicating the then-applicable (2017 IRP pro-rata guidance) savings targets, and will not update that filing until after the Commission's December open meeting, the final 2019 IRP guidance is confirmed, and the 2019 IRP is filed with the Commission.
2) As a Targeted DSM pilot proposal is developed, there is general consensus that:
    i. Applying localized avoided costs,
    ii. Applying localized (different than "standard") incentives,
    iii. Evaluating the cost-effectiveness of localized projects,

    are appropriate. PSE will need to clarify the proposed funding for energy-efficiency, localized demand response, and other pilot elements in its Targeted DSM proposal.
3) PSE will need to review the manufactured home evaluation report for areas that potentially impact the revised HEA program.
4) It would be useful for PSE to share its CVR overview slide deck, first presented in May 2018. Likewise, it would be useful for the CRAG to have a copy of the BPA CVR overview.
5) It would be a good idea for PSE to provide an overview, "Brown bag" or CRAG presentation (perhaps early 2020) on EM&V 2.0 advanced analytics.

e. August 28 Meeting Highlights:

This meeting's agenda consisted of two important topics:

1) A review of draft 2020-2021 program overviews and budgets, and
2) A review of the Targeted DSM proposal.

Key Outcomes

1) PSE agreed to prepare a Home Energy Reports program primer for interested CRAG members.

f. September 10 Webinar Highlights:

PSE provided this overview of the Home Energy Reports program: its origins, design, savings calculation, and evaluation history. Program staff also provided historical and current verified savings results for interested CRAG members.

g. September 25 Meeting Highlights:

The focus of this meeting was to review PSE's conservation tariff Schedule updates, and address any updates to the draft BCP, provided to the CRAG in the August 28 and July 24 meetings.

Key Outcomes

1) PSE reviewed the savings and budget changes and their drivers from the previous CRAG meetings. PSE then reviewed tariff requirements outlined in WAC 480-80-030, and the various notation found on tariff sheets. All Schedule revisions, and a summary of new Schedules created for the Targeted DSM pilot were presented during the meeting.

h. October 23 Meeting Highlights:

PSE convened this CPA overview at the request of several CRAG members. Subject matter experts included PSE's Resource Planning senior planning analyst and Cadmus' senior analyst, who was a key contributor to the development of PSE's Conservation Potential Assessment. PSE also provided CRAG members with a status update on its on-bill repayment research.

Key Outcomes

CRAG members were provided with a clear overview of PSE's CPA development and its relationship to the Company's savings targets.

GLOSSARY OF COMMONLY-USED TERMS

Unless otherwise noted in a specific Conservation Schedule, the following commonly-used terms, used throughout and applicable only to this document[80] have the below noted meanings. Definitions or glossaries contained in other Energy Efficiency documents, policies or guidelines referring to specific processes or unique functions shall have the meanings noted in those documents, policies or guidelines.

A. Definitions

A-line or A-Lamp	A bulb with a rounded cover that has the same basic appearance as a standard incandescent bulb. A-line/A-Lamp bulbs are a good option if you have a light fixture that doesn't conceal the bulb or a lamp with a shade that attaches directly to the bulb. A-Line bulbs disperse light at a wide angle and are ideal for fixtures used to spread light throughout the room. LED A-line bulbs are a good choice for: • Room area lighting • Reading lamps • Hallways The "A" itself stands for arbitrary.
Calculated Savings	This savings type is different than deemed or UES 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). This term is used in the Savings Type field in Appendix B, List of Measures.
Conditions	Also "2010 Electric conservation Settlement Agreement Terms conditions", "Energy Independence Act conditions" or "Order 01, Docket UE-171087 conditions". Specific deliverables and stipulations by which the Company must operate or produce through the course of operating and managing Energy Efficiency programs during a specified biennium. In addition to compliance requirements outlined in Sections A through J and L, of the 2010 Settlement Agreement, the conditions are listed under Attachment A of Order 01 in Docket UE-171087.

[80] Some acronyms, such as "ECM" have a different connotation outside the purview of PSE or conservation activities. For instance, beyond Energy Efficiency, "ECM" may mean "Electric Conservation Measure". In context of PSE conservation programs, though, it means "Electronically Commutated Motor".

Definitions, continued

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 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 has a hypothetical deemed value of 23 kWh per year.) This classification applies to both RTF and PSE deemed.
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 PSE's 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; either a PSE staff member, a PSE contractor or PSE contractor—rather than a PSE customer—into a qualifying structure.
Electric Savings	Savings 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. Savings are counted at the customer meter, not the busbar.
Energy Efficiency	A department of Puget Sound Energy that implements energy conservation programs. Formerly referred to as Energy Efficiency Services or Customer Solutions.
Hydronic	A system of heating using fluid (usually water) as the conductive material to transfer heat to the desired area. This type of system is usually applied in a radiant floor system.

Definitions, continued

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.[81] Measures must also meet cost-effectiveness standards.
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 condition (6)(c). This term is used in the Savings Type field in Appendix B, List of Measures.
RTF Deemed	Former reference to the RTF's UES (Unit Energy Savings).
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. 2) 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.

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

B. Acronyms

The below-listed acronyms are found throughout program discussions in this report. Where possible, PSE has defined these acronyms within the discussion. As a courtesy, PSE also provides them in the below list for easy reference.

AESP	Association of Energy Service Professionals
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.
ASHRAE	American Society of Heating, Refrigerating, and Air-Conditioning Engineers
BPA	Bonneville Power Administration
CEE	Consortium for Energy Efficiency
CMS	Customer Management System. A PSE proprietary software application that tracks customer activities, inventory and rebate processing.
CRAG	Conservation Resource Advisory Group
CVR	Conservation Voltage Regulation
DSM	Demand-Side Management. Typically used as an acronym for energy conservation.
EC Motor (ECM)	Electronically Commutated Motor
EME	Energy Management Engineer
EM&V	Evaluation, Measurement and Verification
ERR	Evaluation Report Response. A form used to complete an evaluation study's resultant actions.
GPM	Gallons Per Minute
HVAC	Heating, Ventilation and Air Conditioning
IR	InfraRed. A technology typically used in remote-control devices.
KPI	Key Performance Indicator
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 (lamp type)
MWh	Megawatt-hour. 1,000 kWh = 1 MWh
NEEA	Northwest Energy Efficiency Alliance
NEEC	Northwest Energy Efficiency Council

Acronyms, continued

NWPCC	NorthWest Power Conservation Council
O&M	Operations & Maintenance
PV	PhotoVoltaic. Primarily applies to solar renewable energy generation systems. PV converts solar energy into Direct Current (DC) electricity.
RCW	Revised Code of Washington
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.
SAP	Systems, Applications, Products in data Products. A very large, enterprise-wide financial, HR, workflow-tracking accounting system.
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).[82]
UC	Utility Cost: The Company's costs of administering programs included, but not limited to, costs associated with incentives, audited, analysis, technical review and funding specific to the Measure or program and evaluation.[83]
VO	Voltage Optimization
WAC	Washington Administrative Code
WAMOA	Washington Association of Maintenance and Operations Administrators
WSEC	Washington State Energy Code
WSHFC	Washington State Housing Finance Commission
WUTC	Washington Utilities and Transportation Commission. Also referred to as UTC.

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

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

C. Savings Terminology

The below table provides a comparison of savings terminology that the IOUs created and agreed would clarify the numerous elements that comprise their savings goals and penalty thresholds. PSE first used these updated terms in its 2019 Annual Conservation Plan. As PSE was not applying these terms to its 2019 savings attributes, it provides the below table as reference only.

PSE's formerly used terms (pre-2019)	Updated Terms (2019)	Definition
Total Biennial Potential	**CPA Pro-Rata Share**	Pro-rata share of the utilities IRP's Conservation Potential Assessment's 10-year potential or 2 year total (whichever is greater). Includes NEEA.
Total Base Savings	**EIA Target**	[(CPA Pro-Rata Share) + (other programs/measures with confident savings that were omitted from CPA)]
Decoupling Penalty Target	**Decoupling Threshold**	[EIA Target * 0.05]
Total Portfolio Target	**Total Utility Conservation Goal/Achievement**	All savings programs funded by Conservation Riders [EIA Target + Decoupling Threshold]
Excluded	**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 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)]

Revised Savings Terminology, continued

PSE's formerly used terms (pre-2019)	Updated Terms (2019)	Definition
EIA Penalty Target	**EIA Penalty Threshold**	[Utility-Specific Conservation - Decoupling Threshold]
Excess Savings (1)	**Excess Savings for Carbon (Dept of Commerce driven)**	(Referencing results, rather than targets) The difference of [Total Utility-Conservation Achievement – Total Utility Conservation Goal]
Excess Savings (2)	**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)]

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CONCLUSION

This concludes the Energy Efficiency 2019 Annual Report and 2018-2019 Biennial Report of Energy Conservation Accomplishments.

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

A. Exhibits Included in the 2019 Report of Conservation Accomplishments

Exhibit 1: Conservation Targets and Budgets versus Actual Achievements and Spending
Exhibit 2: Program Cost Effectiveness
Exhibit 5: Prescriptive Measures
Exhibit 9: Requirement Compliance Checklist
Exhibit 10: NEEA 2019 Report of Activities and Initiatives

B. Supplements

Exhibit 1 *(Table of savings and expenditures)*
- Supplement 1: Expenditures by Cost Element Group
- Supplement 2: 2019 Savings adjustments
- Supplement 3: 2019 Sponsorships and Memberships
- Supplement 4: Portfolio Measure Category Counts

Exhibit 6 *(The Evaluation Plan is excluded from this report)*
- Supplement 1: Evaluation studies with their associated Evaluation Report Responses (ERRs) performed in 2019

C. Appendices

PSE also provides Appendices associated specifically with the 2018-2019 biennium:

- 2018-2019 Exhibit 2: Biennial Cost-Effectiveness,
- The Department of Commerce EIA 2018-2019 Report (consistent with WAC 480-109-120(3)(c),
- PSE's 2018-2019 BECAR (Biennial Electric Conservation Achievement Review), consistent with WAC 480-109-120(4)(v).

Energy Efficiency looks forward to a productive and successful 2020.

Respectfully submitted,

The Men and Women of Energy Efficiency