2014–2015 Washington *watt*smart Business Program Evaluation

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ADM
ENERGY RESEARCH AND EVALUATION

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Glossary of Terms

Custom Energy Savings Calculation Methodology

Energy savings calculated using a custom methodology require project and site-specific inputs, such as operating hours, average load, and equipment performance. These projects typically do not meet requirements for deemed or prescriptive calculations (described below), and are commonly industrial/process-related. Metered and/or trend data are typically collected during the analysis and/or post-inspection phase of custom projects.

Deemed Energy Savings Calculation Methodology

Energy savings calculated using deemed values refer to one savings factor-per-measure unit for all projects, regardless of facility types, equipment end uses, or operating hours. For example, Pacific Power uses a deemed value of 1,160 kWh/horsepower for all HVAC variable frequency drive projects and a deemed value of 0.37 kWh/CFM for all evaporative cooling projects.

Demand Side Management Central

Demand Side Management Central (DSMC) is Pacific Power's project management and reporting database, which provides project management tools, validation check on each project, and a data warehouse with reporting capability.

Evaluated Savings

Evaluated savings represent the total program savings, based on the validated savings and installations, without an adjustment for behavioral effects such as freeridership or spillover. They are most often calculated for a given measure 'i' as:

$$Evaluated\ Savings_i = Verified\ Installations_i * Unit\ Consumption_i$$

Evaluated Net Savings

Evaluated net savings are the program savings net of what would have occurred in the program's absence. These savings are the observed impacts attributable to the program. Net savings are calculated as the product of evaluated gross savings and the net-to-gross (NTG) ratio:

$$Net\ Savings = Evaluated\ Gross\ Savings * NTG$$

Freeridership

Freeridership in energy efficiency programs is represented by participants who would have adopted the energy-efficient measure in the program's absence. This is often expressed as the freeridership rate, or the proportion of evaluated savings that can be classified as freeridership.

Realization Rate

The realization rate is the ratio of evaluated savings to the savings reported (or claimed) by the program administrator.

In-Service Rate

The in-service rate (also known as the installation rate) is the proportion of incented measures actually installed.

Net-to-Gross

NTG is the ratio of net savings to evaluated gross savings:

$$NTG = (1 - Freeridership\ Rate) + Spillover\ Rate$$

Prescriptive Energy Savings Calculation Methodology

Energy savings calculated using a prescriptive methodology or calculator require more than one input to determine energy savings (e.g., HVAC equipment performance, operating hours, and capacity).

Spillover

Spillover is the adoption of an energy efficiency measure induced by the program's presence, but not directly funded by the program. As with freeridership, this is expressed as a fraction of evaluated savings (or the spillover rate).

T-Test

In regression analysis, a t-test is applied to determine whether the estimated coefficient differs significantly from zero. A t-test with a p-value less than 0.10 indicates that there is a 90% probability that the estimated coefficient is different from zero.

Technical Resource Library

The Technical Resource Library is the official database repository of measure definitions, which is linked to the DSMC.

Trade Ally

For the purposes of the process evaluation, trade allies include any market actors who provide design services, as well as contractors, distributors, manufacturers, and vendors who provide facility evaluations and/or supply or install energy-efficient measures incented through the program.

Verification Engineer

Verification engineers are third parties hired to verify project savings.

Executive Summary

Through its ***watt***smart® Business Program, Pacific Power offers services and incentives to commercial, industrial, and agricultural customers to help customers improve energy efficiency of their equipment and operations through midstream (distributors/suppliers) and downstream (customer) incentive mechanisms. During the 2014 and 2015 program years, the ***watt***smart Business Program reported electricity savings of 49,631,480 kWh in Washington.

Pacific Power contracted with the Cadmus team (comprised of The Cadmus Group, ADM Associates, and VuPoint Research) to conduct impact and process evaluations of the Washington ***watt***smart Business Program for program years 2014 and 2015. Cadmus subcontracted a portion of the impact evaluation to ADM Associates, and VuPoint Research performed the telephone surveys. For the impact evaluation, the team assessed energy impacts and program cost-effectiveness. For the process evaluation, the team assessed program delivery and efficacy, bottlenecks, barriers, and opportunities for improvements. The team evaluated midstream and downstream delivery channels, encompassing energy efficiency measures and services in four delivery channels:

- ***Small Business Lighting (SBL):*** Pacific Power provided free facility assessments and incentives for small business customers that made upgrades, such as T5 and T8 fluorescent lamps and ballasts, lighting controls and LED exit signs, or existing interior lighting systems. A network of program-approved contractors performs the assessments and install lighting upgrades for the SBL offer.
- ***Typical Upgrades (also known as Prescriptive Measures):*** Pacific Power provided customers with prescriptive incentives for lighting, HVAC, compressed air, motors and variable frequency drives (VFDs), green motor rewinds, building envelope, food service, appliances, office, farm and dairy, irrigation, wastewater, and refrigeration equipment.
- ***Custom Analysis:*** Pacific Power provided technical services and customer incentives for first-year energy savings resulting from specialized, preapproved, capital equipment upgrades not covered by the Typical Upgrades incentives. Pacific Power also offered custom incentives for measures installed by customers participating in its Energy Management Recommissioning or Industrial Recommissioning offerings.
- ***LED Instant Incentives (also known as Midstream)****:* Pacific Power offered instant incentives for screw-in LED lighting purchased from a participating lighting distributor. This offer was added effective June 1, 2015.

Key Findings

Key Impact Evaluation Findings

In general, Cadmus deferred to current Regional Technical Forum (RTF) measure workbooks and saving estimation methodologies, where available. For reported savings, Cadmus reviewed both reported baselines and savings methodologies for reasonableness. The RTF uses a market baseline to calculate

evaluated measure level savings—a baseline more efficient than federal or state minimum code requirements. This market baseline provides a snapshot in time, and represents values such as the average efficiency. In many instances, reported savings were based on as-found conditions. For both baselines (market and as found), Cadmus reviewed the baseline—and, if available, the methodology used to derive the baseline—for reasonableness.

For the impact evaluation, the Cadmus team analyzed 96 projects that contributed 37% of the 2014 and 2015 program savings. Table 1 provides a summary of the evaluation findings, including the number of unique projects, evaluated savings, and precision. Overall, the realization rate was 99.3% for the two program years, though variability occurred between measure categories. The impact evaluation achieved ±4.2% precision with 90% confidence overall. The report's Evaluated Savings Results by Strata section describes specific details and findings per strata. Two strata, Lighting and Refrigeration, account for over 74% of the savings in Washington. The key findings for those strata are described in the following bullet points.

- Lighting accounts for 43% of all reported energy savings in Washington. Cadmus evaluated 16 projects accounting for 15% of reported energy savings within the lighting strata resulting in a realization rate of 94% within the lighting strata. The differences in savings resulted from discrepancies in the claimed hours of use and space use changes that occurred after the verification site visit.
- Refrigeration projects make up the second highest strata with 32% of all reported energy savings. Cadmus evaluated a sample of 10 refrigeration projects accounting for 46% of reported energy savings within the refrigeration strata. The realization rate was 102% within the refrigeration strata. Most projects were found to achieve savings very close to 100% with minor deviations due to changes in setpoints or equipment load profiles.

Table 1. 2014 and 2015 *watt*smart Business Program Savings*

Strata	Unique Projects**	Reported Savings (kWh)	Evaluated Savings (kWh)	Realization Rate	Precision*
Agricultural	71	2,048,905	2,183,301	107%	15.0%
Compressed Air	19	2,420,219	2,249,153	93%	42.2%
HVAC	32	2,624,595	2,631,612	100%	0.3%
Lighting	608	21,085,823	19,877,380	94%	5.4%
Motor Systems	26	1,270,716	1,647,203	130%	25.2%
Other	157	2,727,246	2,928,389	107%	17.8%
Recommissioning	4	1,740,256	1,740,256	100%	N/A
Refrigeration	53	15,713,720	16,024,241	102%	5.4%
Total	**970**	**49,631,480**	**49,281,534**	**99.3%**	**4.2%**

*Poor precision values are the result of large variability within sampled projects.

**A Unique Project is defined as each unique project ID per strata. In some cases, a project may involve measures implemented in multiple strata; these would be counted as multiple Unique Projects.

Table 2 and Table 3 show impact evaluation findings by program year, for 2014 and 2015, respectively. The Cadmus team combined the 2014 and 2015 program years to perform the analysis, and applied the overall realization rates to the reported savings for each year.

Table 2. 2014 *watt*smart Business Program Savings*

Strata	Unique Projects	Reported Savings (kWh)	Evaluated Savings (kWh)	Realization Rate
Agricultural	38	887,526	945,742	107%
Compressed Air	11	1,022,146	949,899	93%
HVAC	16	2,512,837	2,519,555	100%
Lighting	271	9,738,933	9,180,788	94%
Motor Systems	11	482,249	625,130	130%
Other	21	1,854,835	1,991,635	107%
Recommissioning	1	539,546	539,546	100%
Refrigeration	24	8,934,282	9,110,833	102%
Total	**393**	**25,972,354**	**25,863,128**	**99.6%**

*Totals may not sum due to rounding.

Table 3. 2015 *watt*smart Business Program Savings*

Strata	Unique Projects	Reported Savings (kWh)	Evaluated Savings (kWh)	Realization Rate
Agricultural	33	1,161,379	1,237,558	107%
Compressed Air	8	1,398,073	1,299,254	93%
HVAC	16	111,758	112,057	100%
Lighting	337	11,346,890	10,696,592	94%
Motor Systems	15	788,467	1,022,074	130%
Other	136	872,411	936,754	107%
Recommissioning	3	1,200,710	1,200,710	100%
Refrigeration	29	6,779,438	6,913,407	102%
Total	**577**	**23,659,126**	**23,418,406**	**99.0%**

*Totals may not sum due to rounding.

Key Process Evaluation Findings

The key process evaluation findings follow. This report's Process Evaluation section provides more nuanced descriptions of these key findings. Due to the very low response rate with the Recommissioning, LED Instant Incentive, Partial Participants, and Nonparticipants with managed account groups, this report does not include findings from those surveys. However, non-managed account groups are included in the process evaluation section due to high response rates. Nonparticipants with managed accounts are customers with large accounts, managed by Pacific Power in-house. Non-managed nonparticipants typically have lower energy usage and do not have a dedicated Pacific Power account manager.

The evaluation team also reviewed Pacific Power's overall marketing strategy, communications and key messages, marketing calendar, and budget. Those findings follow the participant findings:

- A high percentage of participants (from 89% up to 100%) in three program delivery channels (e.g., SBL, Typical Upgrades, Custom Analysis) reported being very satisfied with the work provided by their vendor/contractor or by the assistance they received from the Energy Engineer. Participants in the SBL channel (83%) and the Typical Upgrades channel (86%) also reported being very satisfied with the equipment they installed. Participants in all delivery channels (from 64% up to 75%) reported being very satisfied with the incentives they received. (The Satisfaction section of each program delivery channel provides details for each rating.)
- One-hundred percent of participants in the SBL, Typical Updates, and Custom Analysis delivery channels reported one or more benefits from the program. Each group reported better lighting quality and reduced energy consumption and demand as two of the three most frequently reported benefits. SBL and Typical Upgrades participants reported lower bills as their third most-frequent benefit, and Custom Analysis participants reported increased productivity as their third most-common benefit.
- Participants in the SBL and the Typical Upgrades channels reported low awareness levels of the ***watt***smart Business Program name (44% and 56% respectively.) Participants in the Custom Analysis channel had the highest awareness of the program name (75%).
- Non-managed nonparticipants (those typically with lower energy usage and without a dedicated Pacific Power account manager) reported the lowest awareness of the ***watt***smart Business Program name (35%). In assessing nonparticipants' reasons for not using the ***watt***smart Business Program, the Cadmus team found that 50% of nonparticipants reported not using the program primarily because they did not know enough about it.
- Custom Analysis participants said they preferred to be kept informed about the program through active engagement with Pacific Power representatives and mass marketing efforts (***watt***smart representative [50%], a utility mailing/bill insert/website [25%], or a Pacific Power representative [25%]). Custom Analysis delivery channel customers' preferences aligned well with the program design.
- The majority of SBL (69%) and Typical Upgrades customers (54%) preferred to receive program updates from ***watt***smart Business Program representatives. These customer-stated preferences did not align with the most cost-effective program design for these channels—interaction with contractors/vendors. However, 25% of participants in both channels said their second preferred information source was a utility mailing/bill insert/website, which aligned with the program's design.
- Participants in each program delivery channel reported few challenges, and none that had a significant impact on their program participation.
- During the evaluation period, Pacific Power simplified the ***watt***smart Business analysis tool, adding functionality to auto-populate the application and supplements.

- Participants in the Typical Upgrades delivery channel were satisfied with the timeframe in which they received their incentive checks, regardless of whether that took one week or more than eight weeks. Participants in the Custom Analysis channel reported lower satisfaction as the longer the time grew for their incentive checks to arrive. Seventy-five percent of participants in the Typical Upgrades channel received their incentives in six weeks or less; the remaining 25% received them in more than seven weeks. Slightly more participants in the Custom Analysis channel (57%) received their checks in four to six weeks, and the remaining 43% received them in more than eight weeks.
- The two program implementers maintained separate databases from which they reviewed, uploaded projects to Demand Side Management Central (DSMC), and processed applications on a weekly basis. Inputs of measure names, project savings, and incentive amounts must be error free to be accepted by DSMC. Pacific Power and program implementers reported that their data exchange it is not yet error free.

Marketing and Outreach

- Overall, the ***watts***mart business program's marketing efforts are well-planned and help support program goals. The overall business and communication objectives offer appropriate criteria for measuring the ***watts***mart Business program's high-level effectiveness.
- Pacific Power's marketing budget, as outlined, is appropriate for the program.
- As Pacific Power outlined in the marketing calendar, the program's key marketing messages are appropriate and align with Pacific Power's overall marketing communication strategies. Some delivery channels, however, addressing a different audience (e.g., the SBL delivery channel) did not include targeted messages.
- Though Pacific Power markets the program year-round through owned media (e.g., bill inserts, email blasts), they focus paid media during four months in spring and fall. Pacific Power may be able to expand paid media somewhat beyond these four months, while still avoiding the true summer and holiday seasons (July–August, November–December), when customers are typically distracted by other activities.
- The SBL delivery channel functions as designed, relying heavily on the network of approved trade allies in marketing the program to customers. While approved trade allies serve as valuable partners, the marketing mix should include other outreach efforts (e.g., bill inserts, email blasts, case studies) to supplement trade ally marketing.
- The Typical Upgrades delivery channel uses a comprehensive marketing plan and should continue in its current form.
- Pacific Power provides a comprehensive webpage for the Custom Analysis delivery channel that answers customer questions about eligibility and steps to participate in the channel.
- Pacific Power's reliance on in-house staff to market the Custom Analysis delivery channel to large managed accounts, and its appropriate use of program implementers and trade allies in marketing to smaller, non-managed accounts, should continue. The addition of email blasts or

direct mail communications, however, focusing on raising customer awareness of the Custom Analysis delivery channel, would enhance current efforts.

- The LED Instant Incentives delivery channel uses an appropriate marketing plan for an upstream program and should continue in its current form.

Cost-Effectiveness Results

As shown in Table 4, the program proved cost-effective in the 2014 and 2015 evaluation years from all test perspectives, except for the Ratepayer Impact Measure (RIM) test. The program was cost-effective from the PacifiCorp Total Resource Cost Test (PTRC) perspective, with a benefit/cost ratio of 1.53.

Table 4. 2014–2015 Evaluated *watt*smart Business Program Cost-Effectiveness Summary*

Cost-Effectiveness Test	Levelized $/kWh	Costs	Benefits	Net Benefits	Benefit/ Cost Ratio
PacifiCorp Total Resource Cost Test (PTRC) (TRC + 10% Conservation Adder)	$0.048	$20,014,026	$30,552,070	$10,538,044	1.53
Total Resource Cost Test (TRC) No Adder	$0.048	$20,014,026	$27,774,609	$7,760,583	1.39
Utility Cost Test (UCT)	$0.029	$12,086,361	$27,774,609	$15,688,248	2.30
Ratepayer Impact Measure (RIM) Test		$46,249,923	$27,774,609	($18,475,313)	0.60
Participant Cost Test (PCT)		$15,156,738	$41,392,634	$26,235,897	2.73
Lifecycle Revenue Impacts ($/kWh)					$0.000397392
Discounted Participant Payback (years)					2.78

*The cost-effectiveness calculations assume a net to gross of 1.0.

The RIM test measures program impacts on customer rates. Most energy efficiency programs do not pass the RIM test because, although energy efficiency programs reduce energy delivery costs, they also reduce energy sales. As a result, the average rate per unit of energy may increase. A RIM benefit/cost ratio greater than 1.0 indicates that rates as well as costs will go down due to the program. Typically, this only happens for demand response programs or programs targeted to the highest marginal cost hours (when marginal costs are greater than rates).

Recommendations

Based on the impact and process evaluation interviews, surveys, site visits, measurements, and other analyses, the Cadmus team drew the following recommendations (this report's Conclusions and Recommendations section provides a more complete discussion of the findings and associated recommendations).

Savings Considerations

Recommendation: Consider adding an HVAC interactive effect factor consistent with the Non-Residential Lighting Standard Protocol approved on December 14, 2016. The protocol defines HVAC heating and cooling interactive effects for each of the twenty-seven commercial and industrial building types. Cadmus recommends incorporating the HVAC interactive effects into the existing Pacific Power wattsmart Business prescriptive lighting calculator.

Recommendation: Consider increasing the deemed savings for prescriptive HVAC VFD fan and pump motor projects. To evaluate the energy savings for these projects, the Cadmus team used deemed savings values from Cadmus' 2014 *Variable Speed Drive Loadshape Project* report, created for the Northeast Energy Efficiency Partnership (NEEP), shown in Table 27 of the Savings Considerations section. This resulted in realization rates greater than 100% for all three deemed VFD projects. The Cadmus team recommends using these deemed values for HVAC fan motor projects. Cadmus derived an overall realization rate of 175% for these projects.

For central equipment (e.g., hot/chilled water pumps, condenser water pumps, cooling tower fans), the quantity of evaluated projects were insufficiently high to draw conclusions on the current deemed savings value.

Recommendation: The Cadmus team recommends that Pacific Power considers additional training to participating motor service centers, regarding the need to provide a more accurate estimate for motor installation times (rather than always entering six months from the time of service). After delivering the training or new instructions, the Cadmus team recommends that the program begins reviewing applications and tracking estimated reinstall dates to ensure motor service centers provide more reliable estimates and better understand when savings may be realized. If motor replacements are estimated as occurring in over a year, the Cadmus team recommends considering prorating energy savings by project or based on an average of applications submitted. Green motor rewinds represent a small percentage of total program savings (i.e., green motor rewind projects account for 0.14% of total claimed savings in the evaluation sample), but projects do not always realize first-year savings for projects where motor installation occurs beyond the first year.

Overall Program Management

Recommendation: Continue enhancing the existing, customer-facing vendor search tool. This could include a rating system of participating contractors for various measure categories, based on the quality of work performed and including ratings from program participants (an arrangement similar to Yelp). Additionally, Pacific Power could add a note or (if acceptable) a link to the Washington State Department of Labor and Industries website, where participants can search by a contractor's name to verify the contractor's licensing and worker's compensation status, and to view any infractions tracked by the state. The Cadmus team recommends Pacific Power visit the Energy Trust of Oregon website (http://www.energytrust.org/find-a-contractor/commercial/) for an example of their contractor selection tips.

Program Data Interface

Recommendation: Assess the size of any data exchange inconsistencies and associated impacts, and identify the most appropriate solution, which could include the following:

- Continue the same process
- Revise the implementers' databases to use drop-down menus with precise measure names and formulas, or provide look-up tables of saving/incentive amounts, and update this as needed

- Have Pacific Power revise the DSMC batch process to allow some room for variations in DSMC uploads
- Have Pacific Power provide implementers with a direct interface to the DSMC rather than using their own databases
- Have Pacific Power provide trade allies with direct access to the DSMC

Small Business Lighting

Recommendation: While an account management approach may not prove cost-effective in the SBL delivery channel, consider methods for increasing direct contact from Pacific Power or implementer staff. These could include expanding the "Targeted town" luncheon event format to other small business associations.

Nonparticipants

Recommendation: Talk to contractors, vendors and distributors to gain insights into how much they have penetrated their small business target market and to determine what additional resources Pacific Power could provide to help them increase outreach to customers without an active ongoing project.

Recommendation: If additional program growth is desired in any of the program delivery channels, consider performing a comprehensive marketing effectiveness assessment to both evaluate the impact of existing marketing and outreach activities, and to investigate how to better reach and motivate these customers.

Program Marketing and Outreach

Overall

Recommendation: Create delivery channel-specific marketing goals, objectives, and Key Performance Indicators (KPIs) to ensure that each delivery channel performs as needed.

Recommendation: Communicate KPIs, goals, and objectives together on the calendar; so all parties remain aware of performance indicators.

Recommendation: Specifically call out utilizing a diverse mix of marketing touchpoints in the communication strategies.

SBL

Recommendation: Diversify marketing touchpoints beyond the approved trade ally network to encourage business owners to reach out to contractors. For example, consider implementing the approach used in Oregon with direct mail and email blasts.

Custom Analysis

Recommendation: Develop an email blast or direct-mail communication similar to the email blasts used for the 2015 LED Instant Incentive marketing campaign.

Messaging and Calendar

Recommendation: Create marketing messages targeted to specific delivery channels, but that remain in line with overall program key marketing messages.

Recommendation: Slightly space out newspaper and radio ads to accommodate more marketing time. Additionally, move email blasts closer to the year's start, right after the busy holiday season ends.

Recommendation: During January and February, extend lighting's paid media campaigns, and, during May and June, extend HVAC's paid media campaign to take advantage of slow periods.

Introduction

Program Description

Through the ***watt***smart Business Program, Pacific Power offered incentives for measures and services through four delivery channels: Small Business Lighting (SBL); Typical Upgrades (also known as Prescriptive Measures); Custom Analysis; and LED Instant Incentives (also known as Midstream) for program years 2014 and 2015. Pacific Power also offered custom incentives for measures installed by customers participating in its Energy Management Recommissioning or Industrial Recommissioning offerings.

The Pacific Power program manager who oversee nonresidential energy efficiency programs in Washington is responsible for contracting and managing the program administrators, managing in-house delivery and cost-effectiveness, achieving and monitoring program performance and compliance, conducting program marketing, and recommending changes to the program terms and conditions.

The program is administered through multiple delivery channels that are differentiated based on customer need. The SBL delivery channel is an enhanced incentive offering for small business customers. Nexant managed the SBL program-approved trade allies and SBL projects for all participants.

The second delivery channel, Typical Upgrades, is delivered through trade allies and targeted for prescriptive opportunities, primarily for small and midsize customers; however, large customers may also receive these incentives. Pacific Power contracted with Nexant., and Cascade Energy to coordinate the trade allies who deliver these upgrades and to administer the Typical Upgrades delivery channel. These companies manage trade ally coordination, provide training and support, and conduct application processing services for commercial and industrial/agricultural measures.

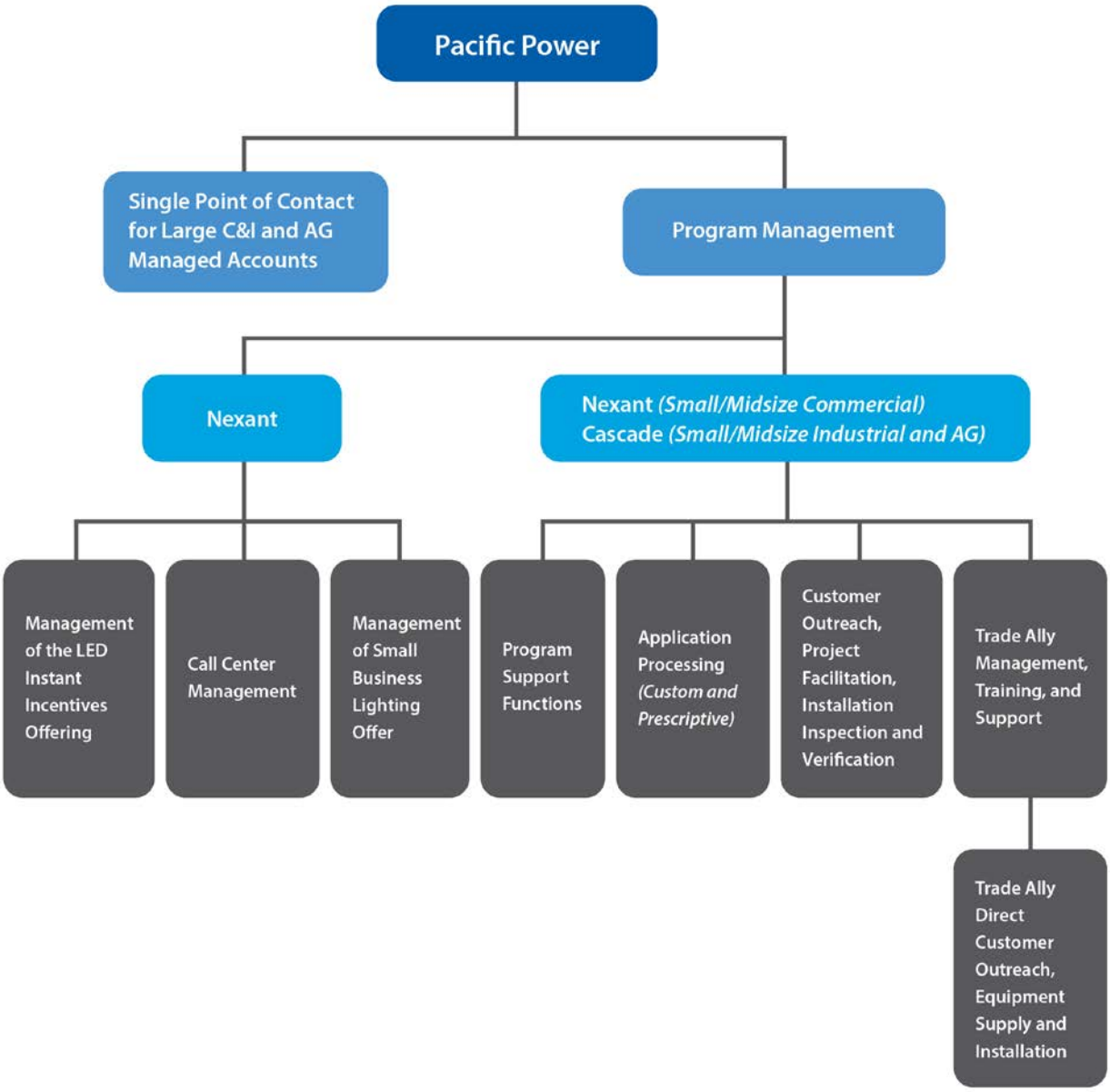
Both of these administrators also implement custom projects for non-managed accounts, and conduct direct customer outreach, project facilitation, and measurement and verification.

Pacific Power targets the Custom Analysis delivery channel to large energy users which generally have multiple opportunities for energy efficiency upgrades and who have projects that require custom analysis. The largest of these customers are managed in-house by a Pacific Power internal project manager (large accounts are typically ≥100 kW). Pacific Power provides energy efficiency analysis and verification of savings through a pre-contracted group of engineering firms.

In the fourth delivery channel, LED Instant Incentives, Pacific Power targets the lighting maintenance market by offering customers instant incentives on LED screw-in lighting purchased through a participating lighting distributor. Customers that purchase through a nonparticipating distributor do not receive an instant discount, but may apply to Pacific Power for incentives post-purchase. Nexant also manages the participating distributors that deliver this offering. This channel was added June 1, 2015.

Figure 1 provides an overview of the program management responsibilities.

Figure 1. *watt*smart Business Program Delivery Roles



Evaluation Objectives

The Cadmus team assessed ***watt***smart Business Program incentives in Washington to determine savings achievement, assess cost-effectiveness, and, where applicable, identify areas to improve program delivery and customer involvement and satisfaction. Table 5 lists the evaluation goals, along with the corresponding evaluation activities employed to achieve those goals.

Table 5. Evaluation Objectives and Activities

Pacific Power Evaluation Objectives	Management Interviews	Participant Surveys	Partial Participant and Nonparticipant Surveys	Site Visits	Engineering Measurements	Site-Level Billing Analysis	Net-to-Gross Analysis	Reporting
Document and measure program effects	X	X		X	X	X	X	X
Verify installation and savings		X		X	X	X	X	
Evaluate the program process and the effectiveness of delivery and efficiency	X	X	X					
Understand motivations of participants, nonparticipants, and partial participants		X	X					
Provide data support for program cost-effectiveness assessments		X		X	X	X	X	
Identify areas for potential improvements	X	X	X	X	X	X	X	
Document compliance with regulatory requirements								X

Data Collection and Evaluation Activities

The Cadmus team performed on-site visits and engineering analysis for 96 projects to achieve 90% confidence and ±10% precision at the portfolio level. The team's process evaluation included a thorough review of program operation and marketing materials and data tracking. The team interviewed program managers and implementers to thoroughly understand and document the program's history, objectives, and operations. In addition, the team surveyed program participants, partial participants, and nonparticipants regarding program delivery channels and operations.[1]

Impact Sampling and Extrapolation Methodology

Through the Washington ***watt***smart Business Program, Pacific Power provides incentives for the 30 measure types shown in Table 6. The Cadmus team stratified these 30 measure types into the eight strata shown in the table—strata designed to account for the largest amount of savings and quantity of projects per strata. The team designed the sampling plan for 2014 and 2015 combined participation to achieve approximately ±20% precision at 80% confidence per strata, and to exceed ±10% precision at 90% confidence at the nonresidential portfolio level. To account for the wide range of project sizes, the

[1] Participants are customers that completed a project through the program during the evaluation period of 2014 and/or 2015. Partial participants are customers that initiated a project through the program in 2014 or 2015, but did not complete that project. Nonparticipants are customers that have never initiated or completed a project through the program or who had not done so in 2014 and 2015.

team created a plan to divide each end-use strata into a selected group, from which it hand-selected a few very large sites, and then randomly sampled the remaining projects.

Table 6 shows the total project counts and energy savings reported in the tracking database, total reported energy savings, and sampled projects.

Table 6. Washington 2014-2015 *watts*mart Business Program Impact Sampling

Strata	Measure Type	Number of Incentivized Measures	Energy Savings (kWh)	Unique Sampled Projects
Agricultural	Irrigation	61	2,048,905	20
	Dairy Farm Equipment	2		
	Water Distribution Equipment	55		
	Irrigation Pumps	12		
Compressed Air	Compressed Air	26	2,420,219	8
HVAC	HVAC	36	2,624,595	14
	Cooling	10		
	Heat Pump	13		
Lighting	Lighting	1,416	21,085,823	16
	General Illuminance	1,087		
	Non-General Illuminance	37		
	Exterior Lighting	21		
Motor Systems	Motors	34	1,270,716	12
	Green Motor Rewinds	7		
Other	Building Shell	12	2,727,246	14
	Additional Measures	6		
	Food Services	13		
	Office Equipment	4		
	Controls	262		
	Insulation	7		
	Roof	5		
	Dishwashers	3		
	Cooking Equipment	7		
	Windows	1		
Recommissioning	Energy Management	4	1,740,256	2

Strata	Measure Type	Number of Incentivized Measures	Energy Savings (kWh)	Unique Sampled Projects
Refrigeration			15,713,720	10
	Fast Acting Doors	25		
	Refrigeration	92		
	Grocery Refrigeration	4		
	Ice Machine	2		
	Refrigerators	1		
Total		**3,265**	**49,631,480**	**96**

The Cadmus team divided sampled projects into two categories: Selected and Random. Random projects were chosen randomly, and the evaluated results were extrapolated to the rest of the population within the stratum. Selected projects were hand-picked from the projects with the highest claimed energy savings per strata. These projects were evaluated individually, and the results were included within each stratum, but the associated realization rates were not extrapolated to the population. Figure 2 provides an example of the Cadmus team's application of realization rates for selected and random sites within the lighting stratum to the population, per strata.

Figure 2. Realization Rate Extrapolation

Strata	Total Unique Projects		Projects Sampled	
	Quantity	Claimed Savings	Quantity	Claimed Savings
Lighting	608	21,086 MWh	16	3,253 MWh

Selected Projects		Random Projects	
Quantity	Claimed Savings	Quantity	Claimed Savings
4	2,899 MWh	12	354 MWh

Selected Projects Realization Rate	Random Projects Realization Rate
86%	96%

Strata	Selected Savings, MWh		Remaining Population, MWh		Total Savings, MWh		RR
	Claimed	Evaluated	Claimed	Evaluated	Claimed	Evaluated	
Lighting	2,899	2,492	18,187	17,386	21,086	19,877	94%

Table 7 shows the total quantity of projects sampled, the associated reported energy savings, and the percentage this sample represented out of the population.

Table 7. Washington 2014–2015 *watts*mart Business Program Impact Sampling Summary

Strata	Sample Type	Unique Projects Sampled	Reported Energy Savings (kWh)		Percentage kWh Sampled
			Sampled Projects	All Projects	
Agricultural	Selected	5	939,140	2,048,905	59.3%
	Random	15	276,221		
Compressed Air	Selected	3	965,450	2,420,219	57.5%
	Random	5	425,579		
HVAC	Selected	3	1,077,914	2,631,612	43.2%
	Random	11	56,612		
Lighting	Selected	4	2,898,675	21,085,823	15.4%
	Random	12	353,831		
Motor Systems	Selected	4	1,009,265	1,270,716	86.6%
	Random	8	91,660		
Other	Selected	4	1,632,867	2,727,246	66.8%
	Random	10	188,153		
Recommissioning	Selected	2	1,353,333	1,740,256	77.8%
Refrigeration	Selected	6	6,294,855	15,713,720	45.5%
	Random	4	855,453		
Total		**96**	**18,419,008**	**49,631,480**	**37.1%**

Process Sample Design and Data Collection Methods

The Cadmus team conducted the process evaluation by assessing each program delivery channel. The four program delivery channels each corresponded to one of the incentive types: SBL, Typical Upgrades, Custom Analysis, and LED Instant Incentives.

The team developed samples for three customer populations—participants, partial participants, and nonparticipants—using simple random sampling within each ***watt***smart Business Program delivery channel. This defined participants as customers that completed a SBL, Typical Upgrades, Custom Analysis, or LED Instant Incentives project through the program during the evaluation period for program years 2014 and 2015. The team defined partial participants as customers that initiated a Typical Upgrades or Custom Analysis project through the program in 2014 or 2015, but did not complete that project. The team did not stratify these customers because of the small population and because not all data provided for these customers clearly identified the delivery channel. Rather, the team selected projects for review using simple random sampling.

Finally, the Cadmus team defined nonparticipants as customers that never initiated or completed a project through the program or that had not done so in 2014 and 2015. The team sorted

nonparticipants into managed and non-managed accounts. Managed accounts represented customers with an assigned Pacific Power account manager.

Table 8 shows the final sample disposition for each data collection activity.[2] As shown, the team achieved ±10.7% precision at 90% confidence for participants in the SBL, Typical Upgrades, and Custom Analysis delivery channels. The small sample population of participants (n=4) that installed equipment associated with a recommissioning project, and participants in the LED Instant Incentives delivery channel, generally were unresponsive to VuPoint's contact attempts, even after several calls at different times throughout the week. The four recommissioning participants were either not available, did not answer, or did not have working phone numbers. The Partial Participant group was similarly small (n=21 after removing duplicates) and unresponsive to VuPoint's contact attempts.

The team achieved ±8.7% precision at 90% confidence for nonparticipants. Eighty-six of 88 respondents to the nonparticipant survey were Pacific Power non-managed accounts, which are by default smaller accounts. VuPoint was unable to reach a significant number of nonparticipants with managed accounts, either because they were unavailable or their calls were repeatedly answered by voice mail or answering machines.

Due to the very low response rate with the Recommissioning, LED Instant Incentive, Partial Participant, and Nonparticipants with managed accounts groups, the Cadmus team did not include findings from those surveys in this report.

The Surveys section of the Process Evaluation chapter provides a detailed methodology for each surveyed population.

[2] Cadmus contracted with VuPoint Research to conduct the Participant, Partial Participant, and Nonparticipant surveys. VuPoint is a third-party research company experienced in conducting both residential and nonresidential quantitative and qualitative research in the Northwest. VuPoint applied industry-recognized best practices, including using experienced recruiters and dialing customer contacts up to five times during different times of the workday and on different workdays of the week until achieving the designated quota for each customer segment or exhausting the sample.

Table 8. Washington 2014–2015 *watt*smart Business Program Data Collection and Sampling

Data Collection Activity	Precision and Confidence Target*	Precision and Confidence Achieved	Population**	Sampling Frame**	Target Completes	Achieved Completes
Pacific Power Program Staff Interviews	N/A	N/A	N/A	N/A	N/A	2
Program Administrator Interviews	N/A	N/A	N/A	N/A	N/A	6
Participant Surveys (SBL)	±10% at 90% (combined)	±10.7% at 90% (combined)	592	75	22	18
Participant Surveys (Typical Upgrade)				432	28	28
Participant Surveys (Custom Analysis)				53	20	8
Recommissioning/Industrial Recommissioning				4	4	0
Participant Surveys (LED Instant Incentives)	±10% at 90%	±54.6% at 90%	9	9	8	2
Partial Participant Surveys	±15% at 90%	±82.5% at 90%	49	21	19	1
Nonparticipant Surveys (Managed)	±10% at 90% (combined)	±8.7% at 90% (combined)	4,948	50	20	2
Nonparticipant Surveys (Non-Managed)				4,880	50	86
Total			**5,598**	**5,524**	**171**	**153**

*Sample sizes are based on a 0.5 coefficient of variation (CV). The CV is the ratio of standard deviation (a measure of the dispersion of data points in a data series) to the series mean.

**Population is based on unique pairings of customer names and measure names, with the sample frame based on unique customer names with contact information (and site addresses for partial participants). Sources: Pacific Power. *WA WSB 2015 Participants*. March 2, 2016; Pacific Power. *WA 2014 WSB Eval_Rpt*. April 12, 2016; Nexant Inc. *Copy of Nexant WSB FX Partial Participant Data*. July 12, 2016; Cascade Engineering Services. *Cascade UT WA WY PTAC Partial Participants*. August 16, 2016; Pacific Power. *ID UT WA WY NonRes Cust 201609*. August 23, 2016; Pacific Power. *2014-2015 WSB Near Participants.* August 15, 2016; PacifiCorp. *Pacific Power Managed Accounts December 2015*. December 3, 2009, last modified October 21, 2016.

Impact Evaluation

This chapter provides the impact evaluation findings for the ***watt***smart Business Program that resulted from the Cadmus team's data analysis. The team incorporated the following activities:

- Participant surveys
- Partial participant surveys
- Nonparticipant surveys
- Site visits
- Engineering measurements
- Site-level billing analysis

Reported savings are electricity savings (kWh) that Pacific Power reported in the 2014 and 2015 *Washington Annual Reports on Conservation Acquisition* (annual reports).[3] To determine evaluated savings, the Cadmus team applied step 1 through step 4 shown in Table 9.

Table 9. Impact Steps to Determine Evaluated Savings

Savings Estimate	Step	Action
Evaluated Savings	1	Tracking Database Review: Validate the accuracy of data in the participant database and verify that savings match annual reports
	2	Verification: Adjust savings based on actual installation rates
	3	Unit Energy Savings: Validate saving calculations (i.e., engineering review, analysis, and meter data)
	4	Realization Rates: Extrapolate realization rates to the population

Step 1: In the first step of verifying the accuracy of data in the participant database, the Cadmus team reviewed the program tracking database to ensure that participants and reported savings matched annual reports.

Step 2: The team selected a sample of sites from the Pacific Power program database, stratifying the distribution of measures among sampled sites, primarily by end-use type: lighting, recommissioning, HVAC, refrigeration, motor systems, compressed air, agricultural, and other measures. The team completed 96 site visits as part of the 2014 and 2015 program evaluation. Site visits were performed to verify measure installations.

Step 3: The team then reviewed all project documentation; developed an evaluation, measurement, and verification plan; and performed site visits to verify the installation, specifications, and operation of incented measures. The team installed light loggers at seven sites and power metering equipment at

[3] These reports are available online: http://www.pacificorp.com/content/dam/pacificorp/doc/Energy_Sources/Demand_Side_Management/2016/2015_WA_Annual_Report.pdf ; and http://www.pacificorp.com/content/dam/pacificorp/doc/Energy_Sources/Demand_Side_Management/2015/WA_AnnualReport_FINAL-Report-CORRECTED_050815.pdf

four sites within the sample. Trend data from building/facility management systems, providing historical performance, were collected for eight projects.

Step 4: This step involved reviewing measure savings assumptions, equations, and inputs, which included billing analysis for selected measures. For complicated or custom measures, the team conducted an engineering analysis using the appropriate measurement and verification options within the International Performance Measurement and Verification Protocol. For sites where light loggers or power meters were installed, the team used the logger data to determine hours of use or power consumption for the metered equipment types. In some instances, customers provided trend data from their building management systems, which the team used to determine equipment load profiles, hours of use, and performance characteristics.

Site Visits and Engineering Measurements

The Cadmus team reviewed all project documentation available from Pacific Power. This documentation included project applications, equipment invoices, reports published by third-party energy engineering consultants, and savings calculation spreadsheets.

The team used a data collection form at each site visit and performed the following tasks:

- Verified the installation and operation of equipment that received incentives, confirmed that installed equipment met program eligibility requirements, and verified that the quantity of installed measures matched program documentation.
- Collected additional data to inform the savings analyses and performed a detailed review of site project files to collect additional data for each site.
  - Where applicable, the team interviewed facility personnel involved with the project, gathering information (e.g., type of equipment replaced, hours of operation) that could not be verified on site or through documentation reviews or metering.

Overall Evaluated Savings Results

Table 10 presents reported and evaluated savings for the 2014 and 2015 program years, with an overall realization rate of 99.3%.

Table 10. Reported and Evaluated Savings by Program Year

Program Year	Program Savings (kWh)		Program Realization Rate
	Reported	Evaluated	
2014	25,972,354	25,863,128	99.6%
2015	23,659,126	23,418,406	99.0%
Total	**49,631,480**	**49,281,534**	**99.3%**

Table 11 provides the evaluation results for reported and evaluated savings, along with realization rates by measure type.

Table 11. Reported and Evaluated *watt*smart Business Program Savings by Strata (2014-2015)

Strata	Program Savings (kWh)		Realization Rate	Precision*
	Reported	Evaluated		
Agricultural	2,048,905	2,183,301	107%	15.0%
Compressed Air	2,420,219	2,249,153	93%	42.2%
HVAC	2,624,595	2,631,612	100%	0.3%
Lighting	21,085,823	19,877,380	94%	5.4%
Motor Systems	1,270,716	1,647,203	130%	25.2%
Other	2,727,246	2,928,389	107%	17.8%
Recommissioning	1,740,256	1,740,256	100%	NA
Refrigeration	15,713,720	16,024,241	102%	5.4%
Total	**49,631,480**	**49,281,534**	**99.3%**	**4.2%**

*Precision is calculated at 80% confidence per strata and 90% confidence for the program overall.

Evaluated Savings Results by Strata

Lighting

Pacific Power provides incentives for four types of lighting projects: exterior lighting, general illuminance, lighting, and non-general illuminance. These projects are either for retrofits, major renovations, or new construction, and involve high-efficient lighting technologies such as LEDs and CEE T8's.

Pacific Power incented 2,561 lighting measures within 608 unique projects, and reported 21,085,823 kWh in energy savings for the 2014 and 2015 years. The incented lighting projects accounted for 43% of all reported energy savings in Washington.

Methodology

The Cadmus team evaluated 16 lighting projects, accounting for 15% of all reported energy savings within the lighting strata. Pacific Power used the prescriptive ***watt***smart Business Lighting Calculator to determine incentive amounts for all of the lighting projects in Washington.[4] The Lighting Calculator documents customer information, project locations, light fixture specifications, energy saving calculations, and financial information. Critical inputs used to calculate energy savings included the following:

- Lighting operation schedule
- Space name, type and area

[4] Between 2013 and 2015, Pacific Power combined a number of programs under the ***watt***smart Business Program umbrella: the Energy FinAnswer program was rolled into the Custom Analysis delivery channel, and the FinAnswer Express Program was rolled into the Typical Upgrades delivery channel.

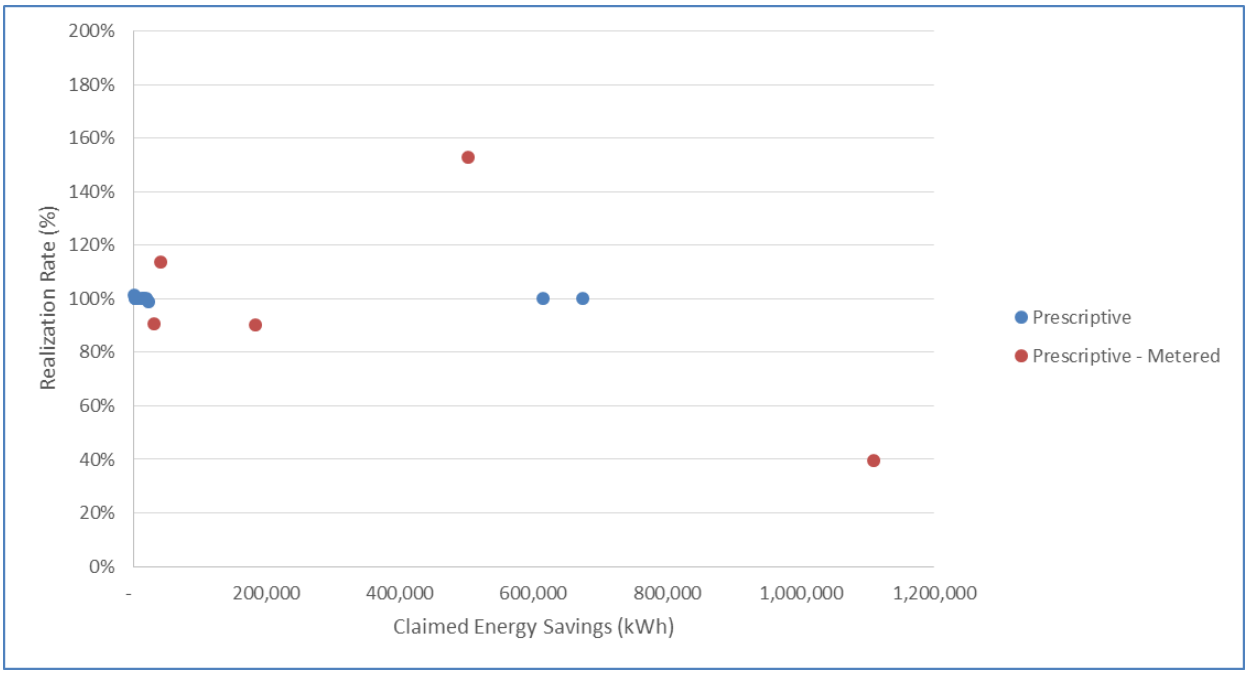
- Baseline lighting fixture location, type, quantity, controls, and wattage
- Proposed lighting fixture location, type, quantity, controls, and wattage

The Cadmus team reviewed the calculator methodology and assumptions to determine their applicability for each sampled project. The team also performed site visits at each of the sampled projects to inspect and document the installed lighting equipment. For 5 of the 16 projects visited, the team installed light loggers to document hours of use where incentivized lighting fixtures were installed. The team installed two to six light loggers per facility in representative spaces, and determined these representative spaces as the areas with fixtures where the highest energy savings were claimed. The team left the loggers in place for a minimum of three weeks, then retrieved and analyzed the data. The team extrapolated measured hours of use to annual hours of use, and updated the prescriptive calculators with the revised values.

Findings

Figure 3 shows realization rates and associated claimed energy savings for each of the sampled lighting projects.

Figure 3. Lighting—Sample Results



One site exhibited a less than 80% realization rate, and one site exhibited a greater than 120% realization rate. For the remaining sites, the Cadmus team found no (or a nominal) difference between the evaluated savings and the reported savings. For sites with evaluated energy savings less than 80% or greater than 120%, the differences in savings resulted from discrepancies in the quantity of fixtures or the claimed hours of use. Table 12 provides specific details.

Table 12. Lighting—Sample Detailed Findings

Project	Project Measures	Reported kWh	Evaluated kWh	Site Realization Rate	Notes
WAFX2_000670 New construction	LEDs	1,109,273	437,300	39%	Only 108 of 167 fixtures still in use due to a renovation that occurred after project completion. Light loggers indicate lower hours of use
WBWA_14221 Retrofit	LEDs and Occupancy Sensors	502,347	767,166	153%	Light loggers indicate greater reduction in hours of use

Further explanation follows for a few of the more atypical measure-level realization rates:

- One project (WAFX2_000670) underwent a renovation between the date of implementation and the site visit. The space use changed, and 59 of the 167 fixtures were no longer in use. Light loggers were installed for a period of three weeks, and observed hours of use were lower than indicated on the rebate documentation.
- One project (WBWA_14221) involved a large lighting upgrade. The Cadmus team installed light loggers for a period of three weeks. Analysis of the light logger data indicated greater hours of use than expected resulting in a realization rate of 153%,.

HVAC

Pacific Power incented 59 HVAC measures within 32 unique projects. These projects consisted of chillers, pump and fan motor variable frequency drives (VFDs), air-handling units, air-source and ground-source heat pumps, packaged terminal heat pumps, and controls upgrades. Pacific Power reported energy savings of 2,624,595 kWh, accounting for 5% of all reported energy savings for the 2014 and 2015 program years.

Methodology

The Cadmus team evaluated 14 HVAC projects, accounting for 43% of all reported energy savings within the HVAC strata. Of the evaluated projects, Pacific Power used prescriptive calculations for 11 projects and custom calculations for three projects. The company used one of two prescriptive calculators to determine the costs, energy savings, and incentive amounts for prescriptive HVAC projects:

- Pacific Power HVAC Calculator
- Pacific Power Chiller Calculator

These prescriptive calculators documented the customer information, project location, equipment specifications, and energy savings calculations. Table 13 lists the critical inputs used to calculate the energy savings.

Table 13. Critical Inputs to Calculating Energy Savings

Pacific Power HVAC Calculator	Pacific Power Chiller Calculator
Manufacturer make/model	Manufacturer make/model
Quantity	Quantity
Cooling capacity	Chiller service type
Energy Efficiency Ratio (EER), Seasonal EER (SEER), and/or Heating Seasonal Performance Factor (HSPF)	Heat rejection specifications
	Air-Conditioning, Heating, and Refrigeration Institute (AHRI) capacity rating
	AHRI integrated part load value and full-load efficiency
	Facility type

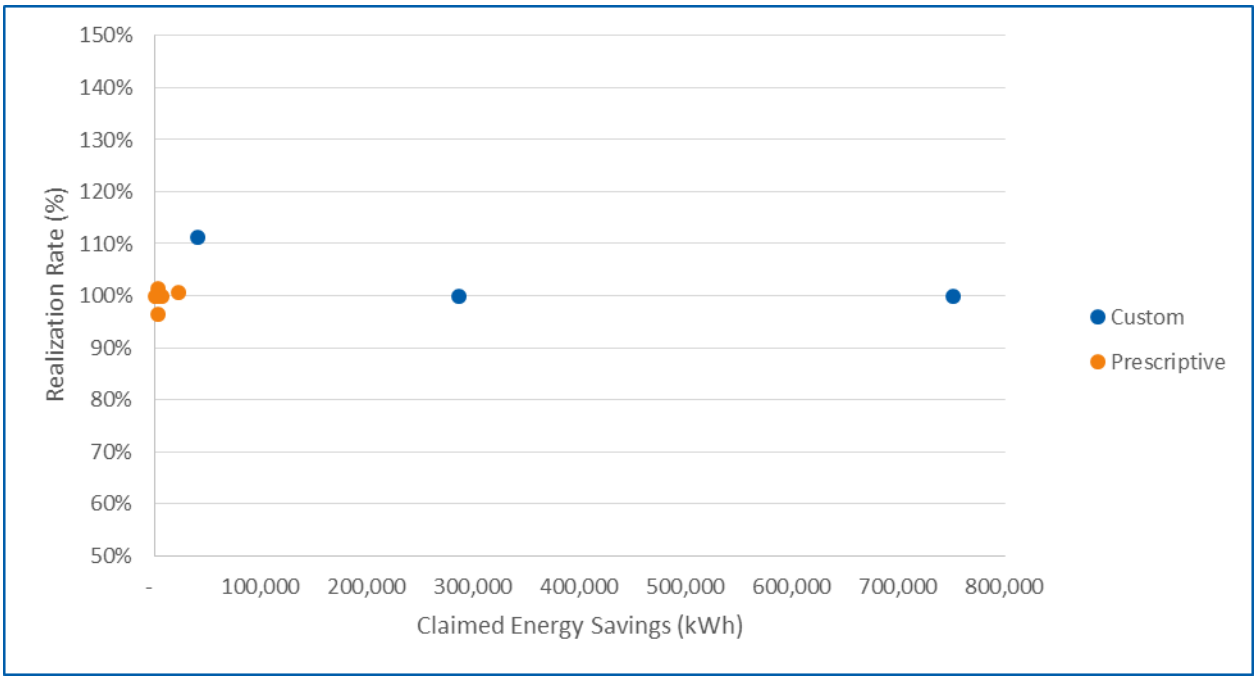
The Cadmus team reviewed the methodology and assumptions for each prescriptive calculator to determine the applicability for each project sampled. Then, for each of the sampled projects, the team performed site visits to inspect and document the installed equipment, interview facility staff, and review the expected performance characteristics. The team then used the collected data to update the prescriptive calculators and determine evaluated savings.

For projects in which the implementer used custom calculations, the team reviewed the energy analysis reports and verification reports for the energy savings methodology, inputs, assumptions, and accuracy. If site findings deviated from claimed equipment quantities, performance specifications, or hours of use, the team recreated the custom calculations with the updated information. The team also installed power metering equipment for one project and analyzed the meter data to develop a load profile and to determine hours of use.

Findings

Figure 4 shows realization rates and associated energy savings for each sampled project.

Figure 4. HVAC Sample Results



All evaluated projects exhibited realization rates between 95% and 111%. The Cadmus team found minimal differences between evaluated savings and reported savings. The project with the greatest deviation from claimed energy savings (i.e., 111% realization rate) involved a VFD installed on an exhaust fan. The team installed power meters for four weeks and determined that the average fan speed was lower than expected, resulting in an increase in energy savings.

Refrigeration

Pacific Power incented 124 refrigeration measures within 53 unique projects, consisting of commercial refrigerators, evaporator and condenser fan VFDs, optimized refrigeration controls, food service refrigeration equipment, fact acting doors (FADs), and process cooling system upgrades. Pacific Power reported energy savings of 15,713,720 kWh, accounting for 32% of all reported energy savings for the 2014 and 2015 program years.

Methodology

The Cadmus team evaluated 10 refrigeration projects, accounting for 46% of all reported energy savings within the refrigeration strata. Pacific Power's energy engineers performed custom project calculations of energy efficiency savings for all evaluated projects. For some complicated and large energy-saving projects, the engineers installed power meters to measure performance before and after measure implementation.

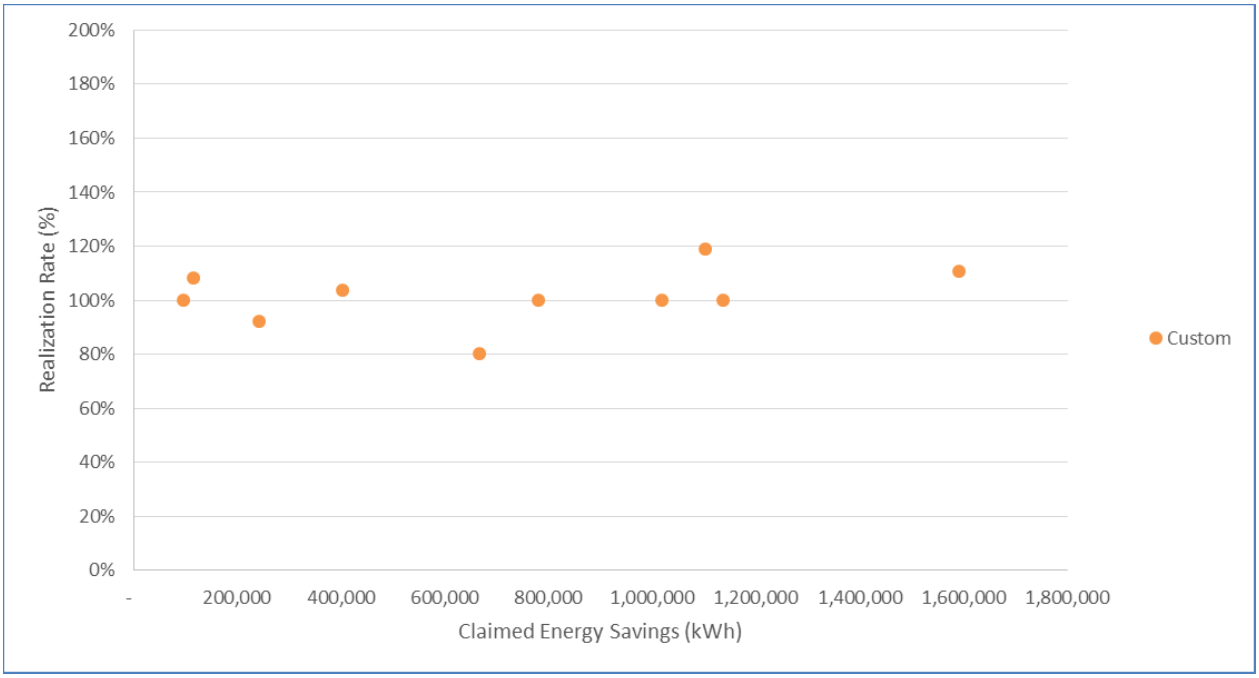
The team reviewed the custom calculation workbooks for the energy savings methodology, inputs, assumptions, and accuracy. Further, the team performed site visits for all evaluated projects and documented equipment specifications and control setpoints. For four projects, the team collected one

year of hourly equipment performance trend data through the facility management system or refrigeration control system. All site-collected documentation was reviewed and compared to the savings verification reports. Where deviations occurred, the team created custom calculations to determine the evaluated energy savings.

Findings

Figure 5 shows realization rates and associated energy savings for each of the sampled projects.

Figure 5. Refrigeration Sample Results



All projects were found to exhibit realization rates greater than 80% and less than 120%. The Cadmus team retrieved one-year of hourly historical trend data for seven of the ten refrigeration projects. Variations in fan speeds, pump speeds, refrigeration load profiles, and pressure setpoints were observed on site and through an analysis of the trend data. Often, these variations in performance occurred after the initial verification site visit and prior to the evaluation site visit. For the remaining sites, the Cadmus team found minimal differences between evaluated savings and reported savings.

Motor Systems

Pacific Power provides incentives for several types of motor systems projects—green motor rewinds, motor upgrades, and HVAC fan motor VFDs. Pacific Power incented 41 measures within 26 projects, and reported 1,270,716 kWh in energy savings for the 2014 and 2015 program years. Incentivized motor systems projects accounted for 3% of all reported energy savings in Washington.

Methodology

The Cadmus team evaluated 12 motor systems projects, accounting for 87% of all reported energy savings within the motor systems strata. Of the 12 evaluated projects, Pacific Power determined the claimed savings using the prescriptive savings for six projects, deemed savings for three projects, and custom calculations for three projects.

For the six green motor rewind projects in which the implementer used prescriptive savings to determine claimed energy savings, the Cadmus team evaluated savings using the most appropriate savings calculation methodology, based on the Regional Technical Forum (RTF) measure database.

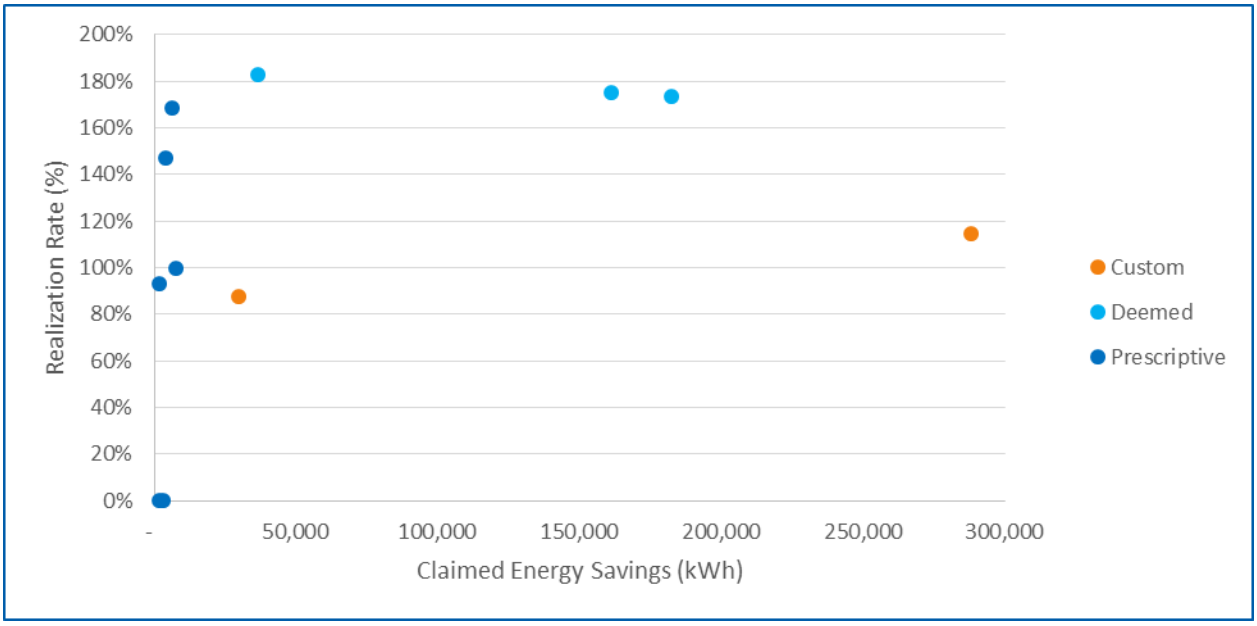
For the three VFD projects installed on HVAC ventilation equipment (e.g., supply fans, return fans, exhaust fans), the team referenced deemed savings amounts identified within the VSD load shape study.[5]

For projects in which Pacific Power's implementation contractor used custom calculations to determine energy savings, the Cadmus team reviewed the energy analysis reports and verification reports for energy savings methodology, inputs, assumptions, and accuracy. If site findings deviated from the claimed equipment quantities, performance specifications, or hours of use, the team recreated the custom calculations with the updated information.

Figure 6 shows the realization rates and associated energy savings for each sampled project.

[5] These deemed savings values are based on the Cadmus *2014 Variable Speed Drive Loadshape Project* report created for NEEP. This report is available online: http://www.neep.org/variable-speed-drive-loadshape-study-final-report

Figure 6. Motor Systems Sample Results



Two sites had realization rates below 80% and five sites had realization rates above 120%. The Cadmus team found minimal differences in reported savings for the remaining sites. Table 15 provides specific details for the seven sites with realization rates greater than 120% or less than 80%.

Table 14. Motor System Sample Results

Project	Project Measure	Reported kWh	Evaluated kWh	Site Realization Rate	Notes
WAFX2_000800	Green motor rewind	3,089	0	0%	Motor found in storage
WAFX2_000702	Green motor rewind	2,005	0	0%	Motor found in storage
WAFX2_000621	Green motor rewind	4,088	6,024	147%	Savings based on RTF calculator
WAFX2_001012	Green motor rewind	6,193	10,429	168%	Savings based on RTF calculator
WAFX2_000987	HVAC VFDs	182,368	316,783	174%	Deemed savings based on VSD load shape study
WAFX2_000844	HVAC VFDs	161,060	281,754	175%	Deemed savings based on VSD load shape study
WAFX2_000968	HVAC VFDs	36,696	67,089	183%	Deemed savings based on VSD load shape study

Further explanation follows for a few of the more atypical measure-level realization rates within the evaluated projects:

- Two motors incentivized for green motor rewind projects were found in storage. Energy savings from these projects were achieved by performing green motor rewinds, resulting in a higher motor efficiency than a normal rewind process. However, savings could only be realized when the motor was placed into service. As no motors were found in service, no savings were being realized.
- For projects where VFDs were applied to HVAC fans, Pacific Power used deemed savings of 1,082 kWh/hp. The Cadmus team evaluated these projects by referencing the 2014 VFD study and applying the deemed savings specific to HVAC supply fans, return fans, and exhaust fans. The revised deemed savings amounts were higher than Pacific Power's deemed savings values.

Compressed Air

Pacific Power provides incentives for several types of compressed air projects: VFDs serving air compressors, refrigerated cycling dryers, compressed air system setpoint and sequence optimizations, low-pressure filters, and zero-loss condensate drains. Pacific Power incented 26 measures within 19 projects, and reported 2,420,219 kWh in energy savings for the 2014 and 2015 program years, accounting for 5% of all reported energy savings in Washington.

Methodology

The Cadmus team evaluated eight compressed air projects, accounting for 58% of all reported energy savings within the strata. For these evaluated projects, Pacific Power used prescriptive calculations for five projects and custom calculations for three projects.

For the five projects claiming savings from prescriptive calculations, the Cadmus team reviewed the prescriptive calculator (NW Regional Compressed Air Tool v3.0) methodology and assumptions to determine their applicability. The prescriptive calculator documents customer information, compressed air system specifications, and expected performance. Critical inputs used to calculate energy savings include the following:

- Compressor type and load control
- Compressor horsepower
- Rated flow
- Receiver volume and dryer specifications
- System pressure setpoints
- Hours of operation

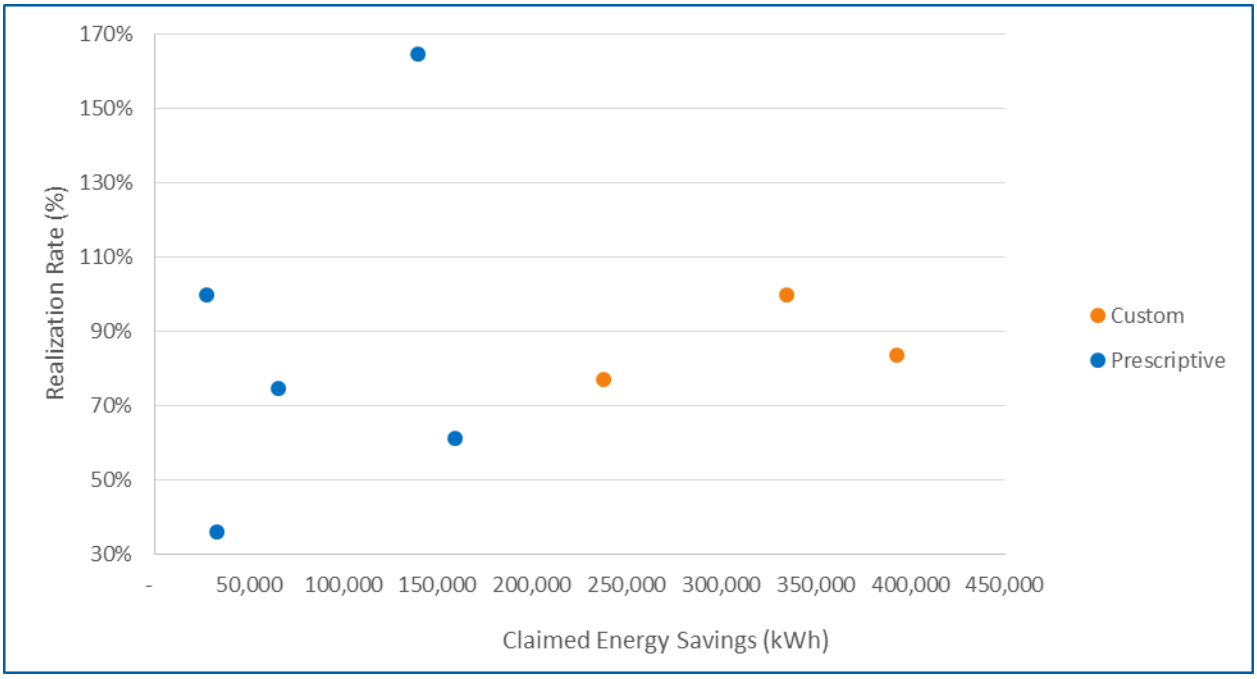
The Cadmus team performed site visits to inspect and document the installed system specifications and operational setpoints. When variations existed between project data and site findings, the team updated the NW Regional Compressed Air Tool v3.0 with the revised inputs to calculate evaluated savings.

The team evaluated projects with claimed savings determined using custom calculations by installing power metering equipment where possible and recreating custom calculations based on trend data and site findings. The team installed power metering equipment on two of the three sampled custom projects. For the one project without power metering equipment installed, the team reviewed the energy analysis report and verification report for methodology and accuracy, and used site findings to revise calculation inputs exhibiting variations.

Findings

Figure 7 shows realization rates and associated energy savings for each sampled project.

Figure 7. Compressed Air Sample Results



Four sites produced realization rates below 80%, and one site produced a realization rate above 120%. The Cadmus team did not find any (or nominal) differences in reported savings for the remaining sites. Table 16 provides specific details for the six sites exhibiting realization rates greater than 120% or less than 80%.

Table 15. Compressed Air System Sample Results

Project	Project Measure	Reported kWh	Evaluated kWh	Site Realization Rate	Notes
WBWA_12634	VFD air compressor	32,880	11,858	36%	Installed a smaller air compressor with a lower system pressure setpoint
WAC01017	VFD air compressor	159,148	97,138	61%	Lower system load, hours of use, and frequent cycling
WAC00247	VFD air compressor	65,938	49,156	75%	Standby mode energy consumption lower than anticipated
WBWA_27805	VFD air compressor, desiccant dryer	238,017	183,442	77%	Power metering indicated higher VFD speeds than expected
WAC00370	VFD air compressors, zero loss drains	139,806	230,577	165%	Trend data indicated higher hours of use and lower pressures

Further explanation follows for a few atypical measure-level realization rates:

- One project (WBWA_12634) installed a smaller air compressor than previously reported. Additionally, during the site visit, the observed system pressure setpoint indicated 98 psi instead of 115 psi. The team updated the NW Regional Compressed Air Tool to determine a 36% realization rate.
- One project (WAC01017) involved installation of a new VFD air compressor. During the site visit, the system exhibited low power demand (35 Hz) and frequent on/off cycling (on for 15–20 seconds, off for 90 seconds). The team observed a very low system pressure deadband, which may cause the excessive cycling. Revised calculations accounted for a lower baseline load, resulting in lower energy savings.
- The compressed air calculation tool for one project (WAC00247) contained an anomaly for the baseline condition in the application documentation. Energy consumption for the baseline compressor, operating in standby mode, was manually overridden to a higher value (50% higher) without justification in the application documentation. Upon setting this input back to the tool-calculated value, the project's energy savings reduced by 25% due to the time that the air compressor spent in standby mode.
- The team installed power meters on one project (WBWA_27805), and the metering analysis indicated higher average speeds from the VFD air compressor, resulting in lower energy savings than expected.
- The last project (WAC00370) achieved greater energy savings than expected. The team installed power meters on the compressed air system, and the meter analysis indicated higher operating

hours, lower VFD speeds, and lower system pressures during the trend period. Lower average VFD speeds achieve greater energy savings.

Agricultural

Pacific Power provides incentives for four types of agricultural projects: dairy farm equipment, irrigation hardware, irrigation pumps, and water distribution equipment. The company provided incentives for 130 measures in 71 unique projects, reporting 2,048,905 kWh in energy savings for the 2014 and 2015 program years. Incented agricultural projects accounted for 4% of all reported energy savings in Washington.

Methodology

To determine savings for incented agricultural projects in Washington, Pacific Power used prescriptive or custom calculations or deemed savings values. The Cadmus team evaluated 20 agricultural projects, accounting for 60% of the reported energy savings within the agricultural strata. From the evaluated projects, Pacific Power used deemed savings for nine projects, prescriptive calculations for nine projects, and custom calculations for two projects.

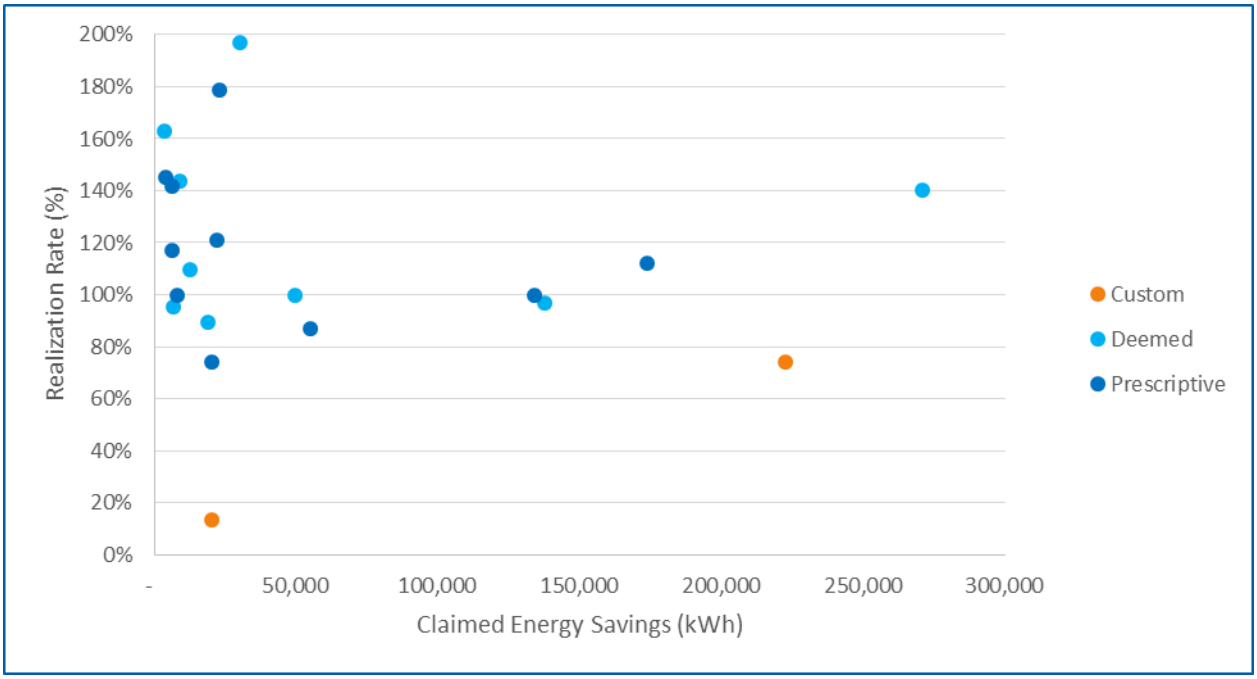
Eight evaluated projects involved upgrading or replacing irrigation hardware equipment, including gaskets, sprinklers, nozzles, hoses, and regulators. These projects claimed savings by using a deemed savings value per unit. The team evaluated these projects by using the savings methodology provided within RTF's irrigation hardware measure. Critical inputs to these calculations included the quantity of equipment, hours of operation per season, and pump pressure.

For the nine projects involving prescriptive calculations for installing VFDs on irrigation pumps, the implementer determined claimed savings using the Irrigation Pump VFD Savings Estimator v1.4 calculator. The Cadmus team evaluated savings for these projects by initially reviewing the Irrigation Pump VFD Savings Estimator calculator tool for its methodology and assumptions. While on site, the team inspected the installed equipment, interviewed farmers, identified crops and irrigated acreage, and developed an understanding of the irrigation control strategy. The team updated the Irrigation Pump VFD Savings Estimator v1.4 calculator with all findings. For systems with incented equipment exclusive to the utility meter, the team conducted a utility billing analysis using billing data from January 2012 to September 2016, in addition to the site data collection activities.

Findings

Figure 8 shows realization rates and associated energy savings for each sampled project.

Figure 8. Agricultural Sample Results



Eight sites achieved realization rates greater than 120%, and two sites' realization rates fell below 80%. Table 17 provides specific details related to these projects.

Table 16. Agricultural Sample Detailed Findings

Project	Project Measures	Reported kWh	Evaluated kWh	Site Realization Rate	Notes
WAC00928	Irrigation Pump relocation	222,785	29,630	13%	Lower increase in pump flow than expected
WAC00437	Irrigation Pump VFD	22,283	27,004	121%	Greater hours of use observed during site visit.
WAC00753	Irrigation Hardware	270,695	380,114	140%	Calculations based on RTF with site visit findings
WAC00270	Irrigation Pump VFD	6,122	8,663	141%	Irrigation pump hours of use higher than expected
WAC00646	Irrigation Hardware	9,232	13,268	144%	Calculations based on RTF
WAC01222	Irrigation Pump VFD	3,988	5,789	145%	VFD fixed at 81% speed instead of modulating; higher hours of use
WAC00935	Irrigation Hardware	3,490	5,679	163%	Calculations based on RTF
WAC00436	Irrigation Pump VFD	22,987	41,134	179%	Lower pressure setpoints and average VFD speeds

Project	Project Measures	Reported kWh	Evaluated kWh	Site Realization Rate	Notes
WAC00729	Irrigation Hardware	30,249	59,586	197%	Calculations based on RTF

Further explanations follow for a few of the more atypical measure-level realization rates:

- Four projects involved installing VFDs to control irrigation pumps. Two projects had VFDs set to manual modes and specific speed setpoints (81% and 100%, respectively). When set to manual modes, VFDs will not modulate based on pressure changes and may not achieve the energy savings desired. Sufficiently high VFD speeds (typically greater than 95%) do not achieve savings with use of a VFD due to efficiencies lost within the VFD itself. Other projects exhibited modified system pressure setpoints or changes in irrigation hours. These factors also changed the energy savings achieved.
- Five projects involved replacing irrigation hardware (e.g., gaskets, sprinklers, nozzles, hoses, and/or regulators). For these projects, the implementer determined savings using deemed values, based on the RTF irrigation hardware calculator. This deemed value assumed hours of use, flow rates, and pump pressure setpoints for all projects. The Cadmus team evaluated these projects using the same RTF irrigation hardware calculator, but updating the calculation inputs based on site-specific findings. The increased savings exhibited by these projects resulted from higher flow rates, more pumping hours, or high system pressures. An increase in any of these factors causes a corresponding increase in pump energy use for both baseline and post-implementation conditions.
- One project involved rebuilding and relocating a pump to increase pump flow from 1,000 gpm to 2,000 gpm. With higher flow, lower operating hours from the pump were expected. Cadmus observed this pump to achieve a small increase in pump flow with minimal changes to total hours of use during the irrigation season resulting in reduced energy savings.

Recommissioning

Pacific Power provided incentives for four recommissioning projects that involved investigation and implementation of multiple energy efficiency measures within each facility. For the 2014 and 2015 program years, Pacific Power reported 1,740,256 kWh in energy savings from these projects. Incented recommissioning projects accounted for 4% of all reported energy savings in Washington.

Methodology

Pacific Power used custom calculations to determine savings for all incented recommissioning projects in Washington. The Cadmus team evaluated two recommissioning projects, accounting for 78% of the reported energy savings within the recommissioning strata. The evaluated projects involved implementing two to ten individual measures within each project. Customers provided spreadsheet calculations and workbooks as well as energy simulation models. All project documentation included an energy analysis report that identified potential energy efficiency measures and associated savings as

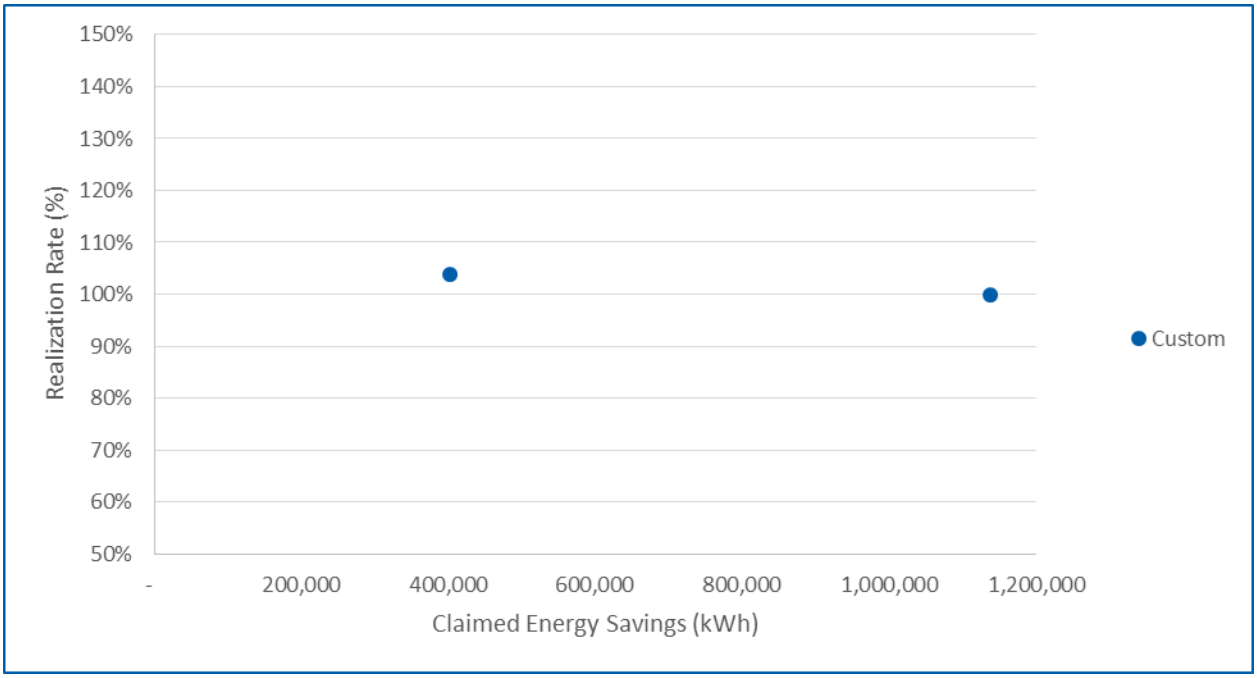
well as a savings verification report that documented the success of implemented measures and associated changes to claimed energy savings.

The Cadmus team evaluated recommissioning measures by reviewing the energy analysis and savings verification reports and identifying equipment quantity, capacity, efficiency, performance characteristics, control strategies, and proposed changes for each energy efficiency measure. The team performed site visits for each sampled project and physically verified all critical information on the site and/or reviewed these data through the building management system. Where possible, the team collected trend data from the building management system to review system performance over an extended period.

Findings

Figure 9 shows realization rates and associated energy savings for each sampled project.

Figure 9. Recommissioning Sample Results



Both sites exhibited 100% realization rates. Setpoint and equipment changes made through the recommissioning effort have been maintained and appeared to operate as intended. Consequently, the team does not expect reductions in performance or energy savings.

Other

Pacific Power provides incentives for projects within the "other" category: building shell measures (insulation, windows); controls; food service equipment (cooking equipment, dishwashers), and office (network personal computer power management). The company incented 320 measures within 157 unique projects, and reported 2,727,246 kWh in energy savings for the 2014 and 2015 program years. Incented other projects accounted for 6% of all reported energy savings in Washington.

Methodology

For other projects incented in Washington, Pacific Power used prescriptive and custom calculators and deemed savings values to determine reported energy savings. The Cadmus team evaluated 14 projects, accounting for 67% of the reported energy savings within the "other" strata. From the evaluated projects, Pacific Power used deemed savings for three projects, prescriptive calculations for eight projects, and custom calculations for five projects (one project used a combination of deemed and custom calculations). Table 18 lists deemed savings sources and evaluation methodologies for projects within the other category.

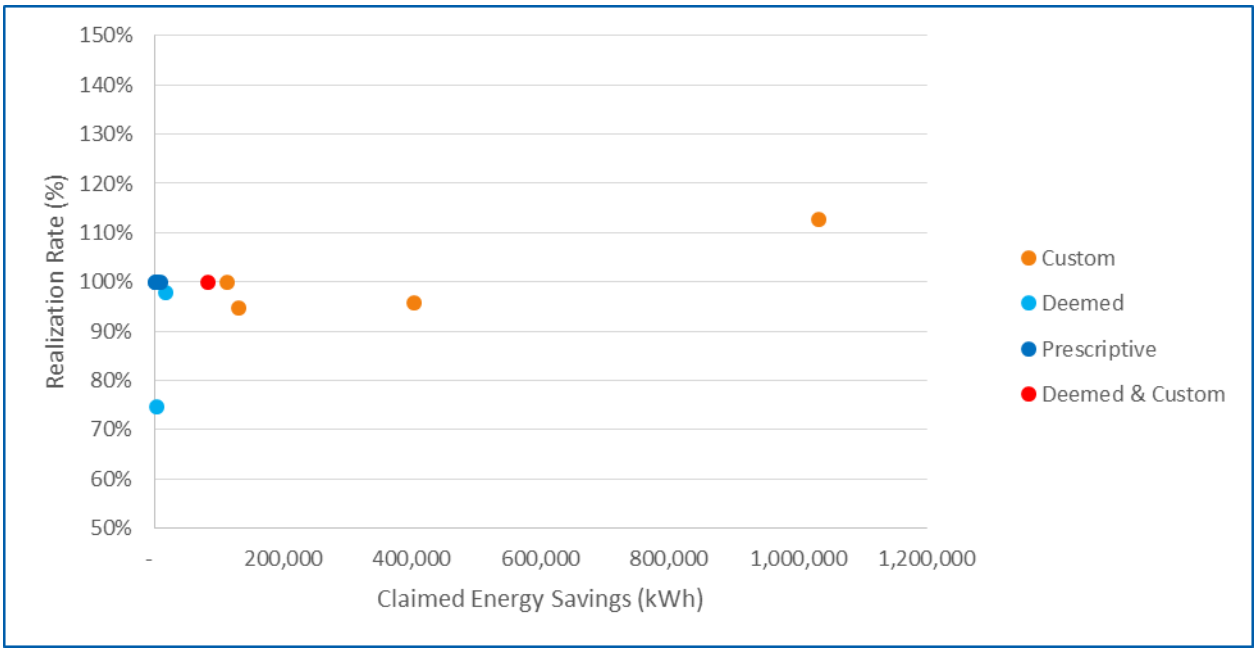
Table 17. Other Sample Energy Savings Methodology

Project Type	Reported Saving Methodology	Evaluation Methodology
Cool Roofs	Deemed savings (0.144 kWh/yr/sq. ft.) based on PacifiCorp demand-side management (DSM) study	ORNL Commercial Roof Savings Calculator (RSC)
Insulation	Deemed savings (0.062 kWh/yr/sq. ft.) based on PacifiCorp and Xcel Energy demand-side management (DSM) studies	Used reported deemed savings and updated quantities based on site observations
High-Efficiency Windows	Deemed savings (kWh/yr/sq. ft.) based on PacifiCorp and Xcel Energy demand-side management (DSM) studies	Used reported deemed savings and updated quantities based on site observations
Network Computer Power Management	Deemed savings (162 kWh/yr/PC) based on RTF	RTF Network Computer Power Management calculator

Findings

Figure 10 shows realization rates and associated energy savings for each sampled project.

Figure 10. Other Sample Results*



*Two projects not shown: Prescriptive #1 claimed 4,047 kWh and 238% Realization Rate, Prescriptive #2 claimed 6,750 kWh and 367% Realization Rate

Two projects achieved realization rates above 120%, and one project fell below 80%. Table 19 provides specific details related to projects with high and low realization rates.

Table 18. Other Sample Detailed Findings

Project	Project Measures	Reported kWh	Evaluated kWh	Site Realization Rate	Notes
WAFX2_000964	Cool roof	3,393	2,536	75%	Calculations based on ORNL Commercial RSC
SBWA_29184	Occupancy sensors	4,047	9,632	238%	Light loggers indicate lower hours of use than expected
WAFX2_000598	Occupancy sensors	6,750	24,761	367%	Light loggers indicate lower hours of use than expected

*Cool roofs only save energy above mechanically cooled spaces.

Further explanation follows for a few atypical measure-level realization rates:

- Both projects (SBWA_29184 and WAFX2_000598) involved implementation of occupancy sensors to control existing or new light fixtures. The occupancy sensors, which were not integrated with the fixture, were identified as a *Measure Type: Controls* within Pacific Power's database. The Cadmus team installed light loggers in spaces where controlled fixtures operated. Both projects exhibited lower hours of use than expected, resulting in increased energy savings.

Process Evaluation

This section outlines the detailed findings from the Cadmus team's process evaluation of the SBL, Typical Upgrades, and Custom Analysis delivery channels for the Washington ***watt***smart Business Program. The team bases these findings on analysis of data collected through program staff interviews and through participant and nonparticipant surveys.[6] In conducting the evaluation, the team focused on assessing the following:

- Effectiveness of the program design, marketing, and processes
- Participant and partial participant customer experience and satisfaction
- Barriers to customer participation

The Cadmus team focused its research activities on key research topics identified during the evaluation kick-off meeting as well as on topics of interest identified by program stakeholders. Table 20 lists primary research questions used.

Table 19. Research Areas and Questions

Research Areas	Researchable Questions and Topics
Program Status	How did the program perform in 2014 and 2015, and what opportunities and challenges do program staff foresee for future program years?
Satisfaction	How satisfied are participants with the program and with the program measures, incentives, and services?
Awareness	Are customers aware of the Pacific Power ***watt***smart Business Program? If so, how did they learn about the program?
Motivations and Barriers	What are the key factors influencing participants' and partial participants' decisions to participate in the program? What are the key factors in any customers' decision to install energy efficiency improvements? What are the barriers to participation for participants, partial participants, and nonparticipants?
Freeridership and Spillover	How influential was the program on participants' and partial participants' decisions to participate? How influential was the program on any customers' decision to install energy efficiency equipment without program incentives or services?
Firmographics	What are the business characteristics of participants in each program delivery channel? How do participant awareness and business size compare by program delivery channel?

[6] The Cadmus team did not report findings from the LED Instant Incentives delivery channel or from partial participants or nonparticipants with managed accounts, given the lack of completed surveys for these three groups. See the Process Sample Design and Data Collection Methods section for specific details.

Methodology

During program years 2014 and 2015, Pacific Power consolidated the Energy FinAnswer and FinAnswer Express programs under the ***watt***smart Business Program name. The following sections provide an overview of the methodology used by the Cadmus team for process evaluation research of program years 2014 and 2015, which occurred during the transition period.

Materials and Database Review

The Cadmus team conducted a program materials review of the following: past evaluation reports for Washington's Energy FinAnswer and FinAnswer Express programs (in program years 2012 and 2013); marketing materials (e.g., ***watt***smart Business marketing overview for 2015–Pacific Power, and 2015 ***watt***smart Business and FinAnswer advertising calendar by state); the ***watt***smart Business Program website; the contractor manual; participant and partial participant databases; and the Pacific Power nonresidential customer database.

This report includes the results from these reviews within the applicable subsections (e.g., Design and Implementation, Marketing and Outreach, and Database Interface and Data Management) in the Program Implementation and Delivery section below.

Utility and Administrator Staff Interviews

The Cadmus team developed stakeholder interview guides and collected information about key topics from program management staff. The team conducted one interview with program staff at Pacific Power and two interviews with program staff at Cascade and Nexant (the program administrators for the portions of the program that are outsourced). These interviews covered the following topics:

- Changes in stakeholder roles and responsibilities
- Program design and implementation changes
- Marketing and outreach
- Trade ally roles
- Data management and quality control processes
- Barriers and areas for improvement

Surveys

The Cadmus team surveyed three customer populations: participants, partial participants, and nonparticipants.

Participant Telephone Surveys

The team conducted telephone surveys with 56 participants who installed measures through four program delivery channels. The surveys included 18 participants in SBL, 28 in the Typical Upgrades channel, eight in the Custom Analysis channel, and two in the LED Instant Incentives delivery channel (as noted, due to the small number of completed surveys, the evaluation team did not report findings from

the LED channel). The survey instrument's design collected data about the following process evaluation topics:

- ***Customer perceptions and motivations***
  - Program awareness
  - Reasons and motivations for participation
  - Perceived value of the program
- ***Customer experience***
  - Effectiveness of the program delivery, including marketing materials and delivery channels
  - Customer interaction with trade allies and program staff
  - Customer satisfaction on specific program elements for each delivery channel, and the ***watt***smart Business Program overall
- ***Customer information***: firmographic information

Participant Sample Detail

The participant databases provided by Pacific Power contained projects under the older program names (e.g., Energy FinAnswer, FinAnswer Express) and the ***watt***smart Business Program projects. To sort all projects into one of four delivery channels for evaluation, the Cadmus team first assigned Energy FinAnswer projects to the Custom Analysis delivery channel, and FinAnswer Express to the Typical Upgrades delivery channel. The team further sorted ***watt***smart Business Program projects into those with custom measures and those with measures other than custom, based on the measure name. The team assigned any project with both custom measures and measures other than custom as Custom Analysis to ensure that the sample include enough from that delivery channel.

After assigning all projects to a delivery channel, the Cadmus team reviewed projects for participants who completed more than one project within that delivery channel, and kept the single project with the highest kWh savings. For projects with more than one installed measure type, the team kept the two non-identical measures with the highest energy savings. The team then randomly selected participants for surveys within each delivery channel. Table 21 shows each project's program or measure designation mapped to its respective delivery channel.

Table 20. Programs and Measures Reported by Delivery Channel

Delivery Channel	Program(s)/Measures
Small Business Lighting	Small Business Lighting
Typical Upgrades	***watt***smart Business (measures other than custom)
	FinAnswer Express
Custom Analysis	***watt***smart Business (custom measures)
	Energy FinAnswer
LED Instant Incentives	wattsmart Business (midstream lighting measures)

Nonparticipant and Partial Participant Telephone Surveys

The Cadmus team conducted telephone surveys with 88 nonparticipants (two with managed accounts and 86 with non-managed accounts) and with one partial participant regarding projects they had started but not completed. The surveys addressed the following process evaluation topics:

- ***Customer perceptions and motivations***
  - Program awareness
  - Reasons for and barriers to make energy-efficient improvements
- ***Customer experience***
  - Reasons partial participants did not complete specific projects
- ***Customer information***: firmographic information

Nonparticipant Sample Detail

The Cadmus team removed participants and partial participants from the master list of nonresidential customers provided by Pacific Power. The team then segmented the nonparticipant population into managed accounts (i.e., those with a dedicated Pacific Power account manager and higher energy usage) and non-managed accounts. From each of these two subpopulations, the team randomly called nonparticipants for surveys.

Partial Participant Sample Detail

Pacific Power, Nexant, and Cascade provided the Cadmus team with lists of 2014 and 2015 partial participants from each of their respective program areas of responsibility. The team checked this list against the list of program participants and removed any customers who appeared on the participant list for another project during that same timeframe; this eliminated any possibility of double sampling these individuals. For partial participants who began but did not complete multiple projects during the evaluation period, the team included the project with the greatest estimated kWh savings in the sample, and then randomly selected partial participants from the sampling frame for surveys.

Program Implementation and Delivery

Drawing on stakeholder interviews and participant survey data, this section outlines the ***watt***smart Business Program's implementation and delivery.

Program Overview

Pacific Power consolidated the previous energy efficiency programs under the ***watt***smart Business Program umbrella to offer a portfolio of incentives to its customers through a reduced and simplified application process and an improved customer experience. Program staff reported that the consolidation worked well, and that it was the "right thing to do." During this time, Pacific Power also increased its focus on the Washington lighting maintenance market, adding the LED Instant Incentives delivery channel on June 1, 2015.

In 2013, Nexant took over the ***watt***smart Business Program's customer service call management from Pacific Power. Previously, Pacific Power maintained a single person to route calls on their business energy efficiency hotline. Nexant said that Pacific Power person was not dedicated to the task; so most calls were managed by voicemail. Nexant took on these calls, either answering them live or routing them to an appropriate person. This position is staffed by a team of knowledgeable agents who answers calls from customers and vendors as well as misdirected calls about residential programs and customers asking about their bills.

The Pacific Power business website provides the customer service phone number, which was developed for commercial energy efficiency calls. The phone line is staffed by Nexant during normal business hours (8:00 a.m. to 5:00 p.m., Monday through Friday) by those also processing projects and handling online and email inquiries, making them very familiar with the appropriate questions and answers.

Design and Implementation

Pacific Power reassigned utility staff who had previously managed the individual DSM programs across the parent company's (i.e., PacifiCorp's) multistate territory to manage the ***watt***smart portfolio of programs, within either the Rocky Mountain Power division or the Pacific Power division. Pacific Power program management staff said the program delivery worked well with in-house managed accounts, as did outreach to the trade allies.

Cascade staff noted that approximately 10% of customers that installed irrigation hardware equipment through the Typical Upgrades delivery channel anticipated higher incentives than they qualified for. Pacific Power caps incentives at 70% of cost or a one-year payback (whichever is less). This one-year cap means that the incentives are not available to shorten a project's simple payback to less than one year. Although the general application states these incentive limits, staff said customers did not know when they exceeded incentive limits until after they submitted an application and the implementer completed the energy savings and incentive calculations. Pacific Power recommends that customers prequalify for these incentives prior to purchasing equipment, but prequalification is not mandatory.

Review of Contractor Manual

The Cadmus team reviewed the ***watt***smart Business *Program Guidelines for Contractors* manual and found it comprehensive in scope, well organized, and easy to search, and it provided detailed information necessary to understand the program's organization and offerings, the incentive calculator and analysis tools required by each delivery channel, contractor engagement and communication processes, program evaluation requirements, and the savings verification and reporting frameworks.[7]

Marketing and Outreach

During the stakeholder interviews, Pacific Power said the outreach strategy did not change following the program's consolidation: it remains a function of in-house Pacific Power staff, who conduct one-on-one

[7] Pacific Power and Rocky Mountain Power. ***watt****smart Business Program Guidelines for Contractors*-Version 1.1. November 1, 2016.

outreach to their largest customers, and customer-facing trade allies supported by Pacific Power and the program implementers. Pacific Power said it develops marketing collateral and manages co-branding to maintain quality control. Pacific Power also extended the ***watt***smart Business Program vendor logo (previously limited for use in advertising residential offerings across the portfolio).

In addition to the stakeholder interviews, the evaluation team conducted a high-level review of the ***watt***smart marketing plan for the Typical Upgrades, Custom Analysis, SBL, and LED Instant Incentives delivery channels. The team looked at the overall strategy, communications and key messages, marketing calendar, and budget, intending to highlight potential areas to optimize the program marketing.

Marketing Strategy

The program's 2015 marketing strategy reflected a strong delivery channel focus with different marketing touchpoints, as required. The program utilized a diverse mix of marketing touchpoints, including but not limited to trade ally networks, paid searches, newsletters, radio, print, bill inserts, and outreach events. Each specific marketing touchpoint served as a different, nuanced approach to reaching customers. For example, newsletters showcased actual customer program implementations to show potential customers other, similar customers that had benefited from the program.

Pacific Power also utilized a network of trade allies, contractors, and vendors, broadening the program's reach through program and non-program contractors, with whom customers may have existing relationships. This mix of marketing offered Pacific Power multiple touchpoints with key business customers.

Marketing Communications & Messaging

Pacific Power utilized communication featuring real business customers, marketed at the measure or business sector level, and leveraged trade allies to integrate marketing outreach efforts. Some communication strategies were missing, however, particularly around the mix of marketing touchpoints to be employed. While Pacific Power laid out a strong mix of touchpoints in the program marketing calendar, they did not reference these as a communication strategy.

Pacific Power also outlined its key marketing messages in the marketing calendar, though these messages focused on the overall program, leaving some delivery channels (e.g., the SBL delivery channel), without targeted messages. Most of Pacific Power's marketing messages focused on highlighting how energy can also help customers save money—a key reason many business customers say they pursue efficiency upgrades.

Marketing Calendar

In general, Pacific Power employed a well-planned and organized overall marketing calendar, with a variety of touchpoints utilized throughout the year. Pacific Power marketed different measures or marketed to specific business sectors at times of year appropriate to the types of projects customers would be looking to implement. As reflected in the calendar, Pacific Power scheduled email blasts, some direct mail, and outreach events throughout the year, but scheduled paid media (newspaper, radio,

digital ads, and magazines) only four months, during the spring and fall seasons (March–April, and Sept–October). For example, Pacific Power promoted HVAC through its owned media during May through August, but did not match this with paid media.

Budget

At a high level, the budget looks appropriate for the program offerings.

Delivery Channel Marketing Focus

In this section, the evaluation team provides a more detailed discussion of the marketing focus for each delivery channel, as presented below.

Small Business Lighting

Pacific Power's marketing for this delivery channel relied heavily on the network of approved trade allies to improve customer awareness. While the approved trade allies were valuable partners, the marketing mix should include some other outreach efforts (e.g., bill inserts, email blasts, case studies) to supplement trade ally marketing.

Pacific Power included questions on the SBL webpage to help customers engage and navigate the delivery channel. Customers could receive these same questions as a handout provided by trade allies; so customers could access this information without going online.

Typical Upgrades

Pacific Power's marketing of the Typical Upgrades channel included the most complete set of marketing touchpoints for the four delivery channels (e.g., SBL, Typical Upgrades, Custom Analysis, LED Instant Incentives). Pacific Power customized program materials for the different measure-incentives types available, with a corresponding calendar showing when each measure's incentives should be promoted.

Custom Analysis

Pacific Power relies on in-house program managers to market the Custom Analysis delivery channel to its managed accounts, while program implementers and trade allies market the channel to smaller, non-managed accounts. The evaluation team reviewed the channel webpage, which provided comprehensive information about the overall ***watts***mart Business Program and the Custom Analysis channel.

Outside of the webpage, the evaluation team did not find a detailed marketing plan specifically for the Custom Analysis delivery channel. While Pacific Power may determine a detailed marketing plan is not required for this channel that relies heavily on the personal sales approach between account manager and customer, additional marketing support could increase customer awareness.

LED Instant Incentives

As designed, Pacific Power utilizes participating LED lighting distributors as its main touchpoint to reach customers.

Evaluation of the Program Website

On multiple occasions, the Cadmus team referenced information provided on the program website. The team considered the site visually easy to navigate, and found each state and delivery channel quickly. The team also found information provided within each delivery channel useful in achieving a high-level understanding of the steps necessary to initiate a project.

When reviewing measure level information, the team found the Typical Upgrades channel more difficult to follow when trying to understand which measures qualified and how incentives were calculated—particularly lighting measures. (This was a function of the many incentive categories into which lighting was segmented and unfamiliar terms such as "general Illuminance" and "non-general illuminance.") The team also found that, for all delivery channels, questions had to be directed to customer service staff through a phone call or email, which did not allow the customer to access information quickly and seamlessly while directly engaged with the site.

Trade Allies

Pacific Power developed the Energy Efficiency Alliance to provide customers with a trained pool of local trade allies (e.g., designers, contractors, distributors, manufacturers, vendors) to assist them in identifying and implementing energy efficiency projects. ***watt***smart Business Program vendors promoted the program to their customers, assisted customers with their projects, provided recommended upgrades, created proposals and bids, assisted with the paperwork, and supplied and/or installed the upgrades.

Cascade and Nexant manage this alliance, each in their respective markets. Trade allies joining Pacific Power's Energy Efficiency Alliance sign an agreement, then receive incentive program training and calculation tools, introductions to local business prospects through organized meet-and-greet events, marketing support, and notifications about program updates. The program implementers post business information for Energy Efficiency Alliance members on the program website's searchable database.

Nexant, which works with commercial trade allies, said it is considering grouping these trade allies into tiers, allowing Nexant to highlight them for good program performance, based on a high number of projects completed, good accuracy, and high customer satisfaction scores and based on their qualifications (e.g., training, certifications, experience with specific measures). This would allow customers to better differentiate between contractors when selecting help for a specific project.

Except for SBL projects, Pacific Power did not require customers to use an Energy Efficiency Alliance member. For SBL projects, Nexant trained and managed a select group of approved contractors that promoted the SBL services and measures, and required that customers use one of these contractors to receive the SBL incentives.

Cascade, which works with agricultural and industrial customers, recruits trade allies but does not require them to join the Energy Efficiency Alliance. Cascade finds it more effective to work in support of trade allies in Washington rather than conduct a great deal of direct outreach. Rather than Cascade

engineers taking the lead role with a customer when a trade ally provides a program lead, Cascade provides engineering support to assist the trade ally in reaching out to the customer, prepares the necessary calculations to show customers potential savings, and advises the trade ally on how to achieve higher savings from a project.

Database Interface and Data Management

Pacific Power uses two software programs —DSMC and the Technical Resource Library (TRL)—for project management, data warehousing, and reporting. As described in the ***watt***smart Business Program Guidelines for Contractors,[8] the TRL houses a program database of measure definitions, which the DSMC draws upon when Pacific Power performs validation checks to ensure incentives and savings submitted by engineer and trade allies correspond with values and caps defined by tariff.

TRL measures are built into the Incentive Calculator Tool, which Pacific Power provides to program energy engineers to ensure consistency in incentive calculations. When preparing offers for customers or calculating savings and incentives, the energy engineers and trade allies use pull-down menus within the tool to select measures only included in ***watt***smart Business Program. Implementation staff who oversee the trade allies cited this as providing a major benefit in preventing trade allies from selecting ineligible equipment. When a new measure appears, Pacific Power must update the TRL and the calculator. Implementation staff said this works fairly well, but noted that custom measure descriptions must be reviewed and revised, and some custom measures must be added.

The two program implementers maintain project databases from which they review, upload to DSMC, and process projects on a weekly basis (i.e., weekly batch). The implementers expressed different experiences with this interface process, with one calling it efficient "now"—indicating it had improved over time; another found it somewhat laborious. Although the process is automated, Pacific Power and Nexant reported challenges remain with data exchange, indicating that inputs of measure names, project savings, and incentive amounts must be error free to be accepted by DSMC. This indicates that the data exchange still requires improvement.

Additionally, Nexant said the data reconciliation process could be streamlined by allowing implementation contractors (e.g. Nexant and Cascade Energy) to enter project data directly into Pacific Power's system. Though this was successfully tested during the SBL pilot, expanding this to all ***watt***smart Business Program delivery channels may require system modifications to limit the data access. Such modifications may be limited by budgets and by Pacific Power restrictions.

Through the weekly batch, implementers submit invoices to Pacific Power for payment of approved incentives, with an intention of Pacific Power providing funding within 10 days. Currently, this is

[8] Pacific Power and Rocky Mountain Power. ***watt****smart Business Program Guidelines for Contractors*. Version 1.1. November 1, 2016. http://www.pacificorp.com/content/dam/pacificorp/doc/Energy_Sources/Demand_Side_Management/WSB_Contractor_Tools/wattsmart_Program_Guidelines_for_Contractors_v1-1_2016-11-1_Final.pdf

reported taking 10 to 15 days, challenging implementers to deliver checks within the trade allies' expectations.

Data Quality Assurance

Though Pacific Power's DSMC is considered the database of record, both implementers, as noted above, maintain their own databases. Nexant reported they spend significant time transferring data between the two systems on a weekly basis, that variances found during weekly batch uploads are very small—sometimes as little as $0.15, and that 99% of the time they match exactly. If a variance is found, they will identify and correct it until the two systems match exactly. Nexant suggested that, in the future, the benefit of this effort level should be evaluated relative to the amount of potential savings.

Pacific Power also performs quarterly and annual reconciliations between the DSMC and implementer databases, which are also time consuming and require significant effort. Given the checks and balances that occur weekly between the two systems, Nexant suggested that these quarterly or annual reconciliations might not be necessary.

Before full launch of the SBL delivery channel (administered by Nexant), Pacific Power and Nexant ran a pilot to build Nexant's project data forms into Pacific Power's DSMC system. This gave Pacific Power immediate and total visibility into everything Nexant was doing, and Nexant said this worked well.

Project Quality Control

The program's quality control function is located in an online database, accessible to the Nexant implementation team. This function includes checklists of steps for reviewing and submitting projects for approval. First, the trade ally submits information to Nexant's processing group, which does final reviews and checks the project for program compliance; it then submits the project for payment to Pacific Power (which funds the incentives while Nexant writes the checks). Every project contains these checklists.

Evaluation of the Program Database

While evaluating the program, the Cadmus team identified a number of inconsistencies in the participant databases. These included the following:

- Inconsistent measure name entries between the Pacific Power, Nexant, and Cascade databases
- Inconsistent data reporting categories between 2014 and 2015
- Incomplete customer contact, project site data, and equipment measure information

The Cadmus team considers inconsistencies in data reporting categories between 2014 and 2015 to result from the ongoing consolidation of programs. Evidence of this being resolve will likely appear in data extracts from 2016 onward.

Program Challenges and Successes

Pacific Power program management staff and the program implementers reported that, for the most part, they had the resources needed to deliver the program in 2014 and 2015. Staff from both Pacific Power and the implementers cited the following program strengths:

- A well-functioning, well supported ***watt***smart Business Program network of trade allies, which are ingrained in the local communities. Trade allies have their own contacts for questions, and relationships are fostered over time. Nexant and Cascade provide proactive local, outsourced delivery staff who are available for site visits or trade ally visits.
- Strong relationships with large customers, whose projects deliver large savings.
- Project-level incentives for lighting retrofits and custom projects that encourage comprehensive projects and simplify delivery.
- Pacific Power, through third-party contractors, provides robust energy engineering services for custom projects, providing customers with high-quality site evaluations or savings and incentive reports prior to any investment. These services facilitate informed decision making. Additionally, Pacific Power hires a second engineer to QC review the savings and incentive report before it is presented to the customer. The same engineer who completed the up-front report normally is hired for the Savings Verification Report after project installation.
- The personal attention that implementation staff have provided to customers has contributed to year-over-year participation growth, despite boom and bust economic cycles.
- There has been continuous refinement and improvement in targeting and recruiting customers.

Program management and implementation staff also noted the following challenges that they anticipate will affect the program going forward:

- Reaching the small business sector cost-effectively.
- Staying ahead of rapid changes in lighting and lighting controls, especially for the SBL delivery channel, and keeping lighting equipment and incentives coordinated between the different delivery channels.
- Continuing to improve outreach and increase awareness of the program.
- Needing to generate more projects to achieve escalating savings goals without matching increases in the incentive and delivery budgets.
- Declining project savings amounts (the average kWh savings per project has decreased for several years for lighting projects).
- Staying ahead of advancing energy codes and standards.
- Providing customers and trade allies with online projects and project tracking.

Implementation staff said integration into the ***watt***smart Business Program addressed many prior issues with various programs. For example, Pacific Power wrote a new program manual (including ***watt***smart Business Program guidelines), simplified the process and reporting templates, and provided

measurement and verification guidance. Pacific Power also scaled measurement and verification—which are labor and data intensive for all projects—to be commensurate with the project size. The company also simplified customer reports.

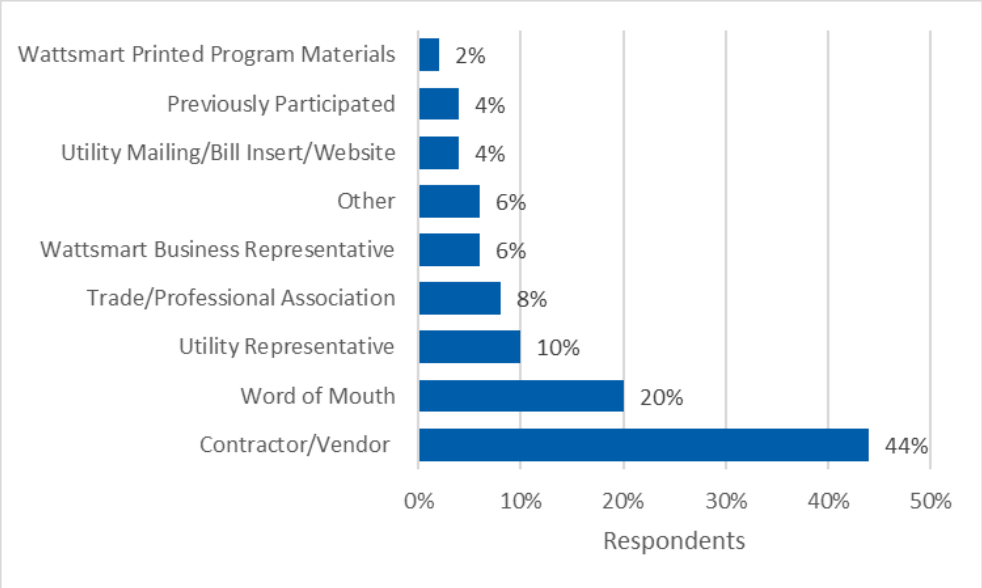
Customer Response

The Cadmus team surveyed 56 ***watt***smart Business Program participants. The team removed two participant surveys (e.g., LED Instant Incentives), resulting in a final count of 54. This section first presents combined findings regarding awareness and communication, then provides separate findings for each program delivery channel. Occasionally (as with Awareness and Communication, below), the report presents findings for the separate delivery channels and for the program overall. As noted, insufficient data were available to report findings for the LED Instant Incentives channel.

Awareness and Communication

Participants in all delivery channels most frequently learned about available incentives through their contractors or vendors (mean combined 44%, n=50).[9] Figure 11 shows the frequency of all information sources for all delivery channels combined. Information sources reported in the "other" channel included general contractors, electrical contractors and suppliers, media such as newspapers and radio, and Pacific Power's website.

Figure 11. Source of Information—All Delivery Channels Combined



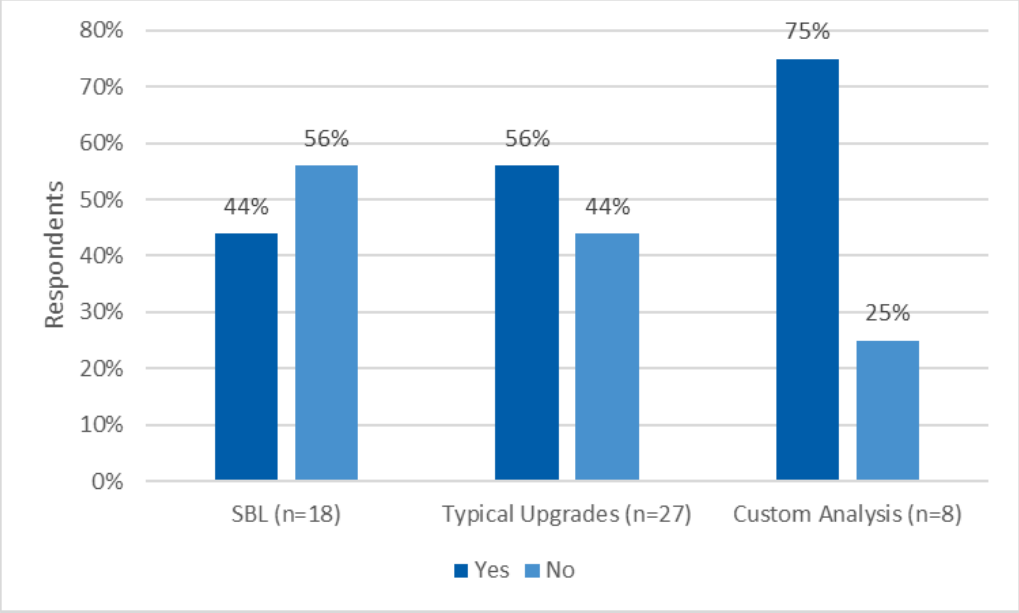
Source: PacifiCorp ***watt***smart Business Program 2014–2015 Participant Survey QB3. Don't know and refused responses removed. Multiple responses allowed. (n=50)

[9] This "n" represents the number of respondents or responses to the question. For example, if the reference is 20% (n=100), this indicates 100 responses or respondents were included after removing nonrelevant answers (e.g., "don't know" or "refused").

As noted, program consolidation under ***watt***smart Business was ongoing during the evaluation period, and customers were still learning about the consolidation. During the participant surveys (September and October 2016), 55% of participant survey respondents (mean combined n=53) had heard of the ***watt***smart Business Program name before the survey call. As shown in Figure 12, Custom Analysis delivery channel participants displayed the highest program name awareness.

At 90% confidence, the Cadmus team did not find a statistically significant difference in awareness of the ***watt***smart Business Program name between delivery channels.[10]

Figure 12. Customer Awareness of *watt*smart Business Program by Delivery Channel

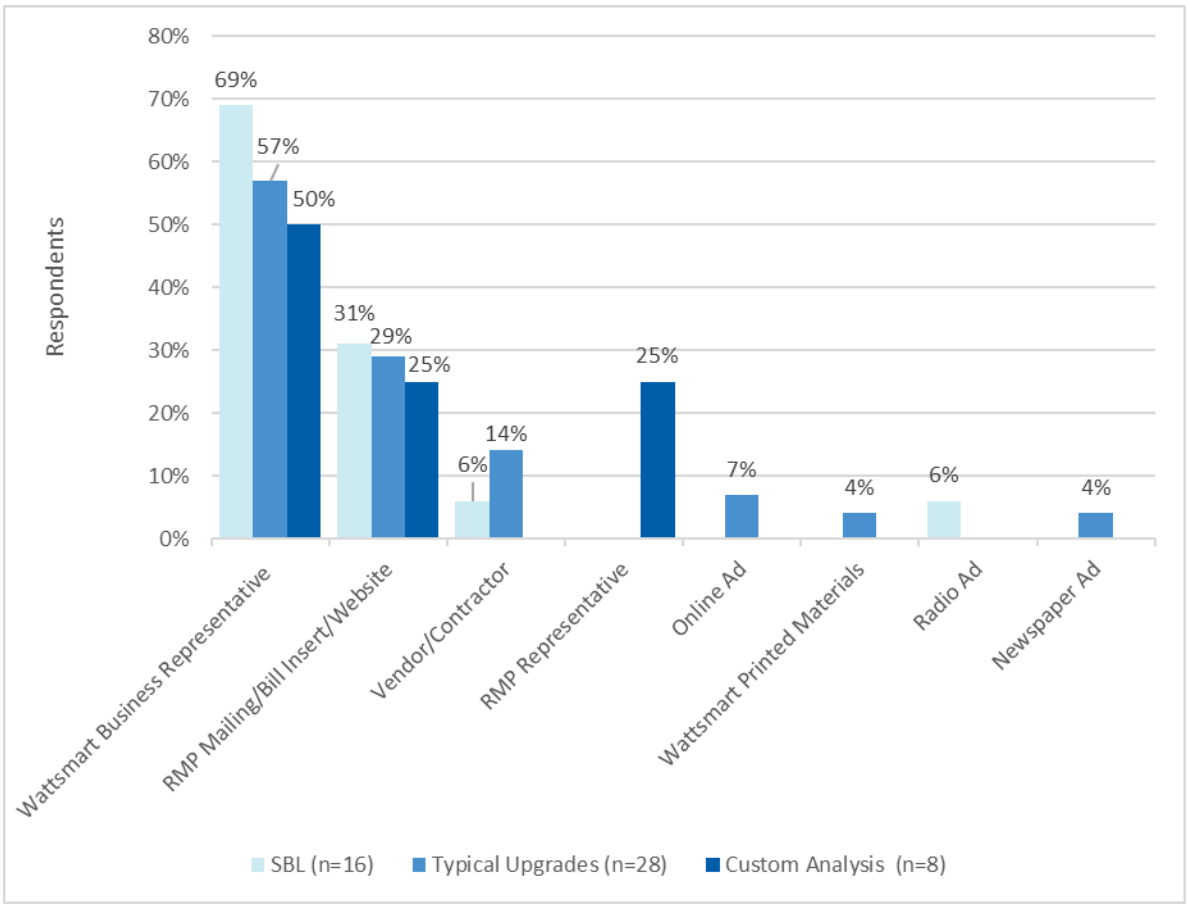


Source: PacifiCorp ***watt***smart Business Program 2014–2015 Participant Survey QB4. Don't know and refused responses removed.

Although participants most frequently learned about program incentives from a contractor or vendor, the majority of customers in the SBL, Typical Upgrades, and Custom Analysis delivery channels said they preferred to be kept informed about the program through a ***watt***smart representative, and a smaller proportion of participants in these same three channels said they preferred to be kept informed through a Pacific Power mailing, bill insert, or the website. Twenty-five percent of Custom Analysis participants also cited a Pacific Power representative as their preferred source.

[10] Lack of a statistically significant difference is based on a two-sample t-test for proportions, using a Bonferroni correction for multiple comparisons.

Figure 13. Preferred Method of Communication to Stay Informed



Source: PacifiCorp ***watt***smart Business Program 2014–2015 Participant Survey QJ4. Don't know and refused responses removed. Multiple responses allowed.

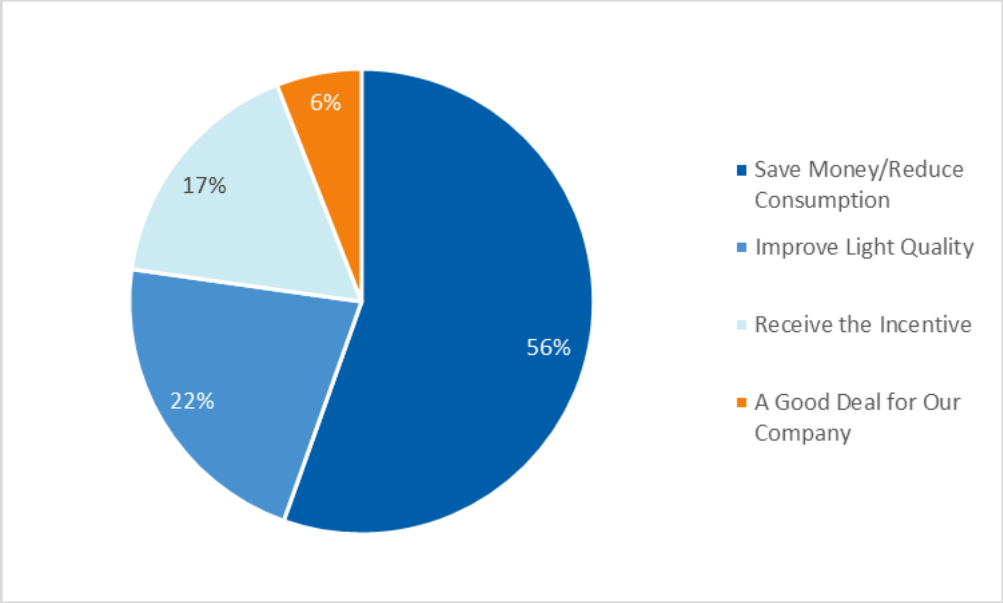
Small Business Lighting Delivery Channel

Overall, SBL participants reported high satisfaction levels with program elements and only a few challenges. As detailed below, some offered suggestions to improve their program experience.

Motivation

SBL participants said saving money and reducing their energy consumption were the most important reasons they decided to participate in the offering, followed by improving light quality (56% and 22%, respectively [n=18]). As shown in Figure 14, four additional participants said they were motivated by the incentives (3) or because the offering was "a good deal" for their company (1).

Figure 14. Motivation for SBL Participation



Source: PacifiCorp ***watt***smart Business Program 2014–2015 Participant Survey QD1. Don't know and refused responses removed. May not total 100% due to rounding. (n=18)

Satisfaction

All SBL participants said it was very or somewhat easy to find an approved contractor to conduct their free site assessment (n=18), although one said it would have been easier to find an approved contractor had the contractor advertised or approached them; this participant had to seek out the contractor.

Fifteen of 18 participants who met with a contractor said they received a lighting proposal following their facility assessment, and 13 of the 15 said they were very satisfied with that proposal; two of the 15 said they were somewhat satisfied. One of these latter two participants expressed some reservations about the first two contractors they considered, saying only the third contractor knew what they were doing. The other somewhat satisfied participant asked for more options in their proposal, but did not specify if they meant equipment options.

Eleven respondents who received the proposal said they were influenced by projections for reduced costs when deciding whether to proceed with their projects, while three other respondents were most influenced by energy savings, and one was influenced to proceed by their need for better lighting.

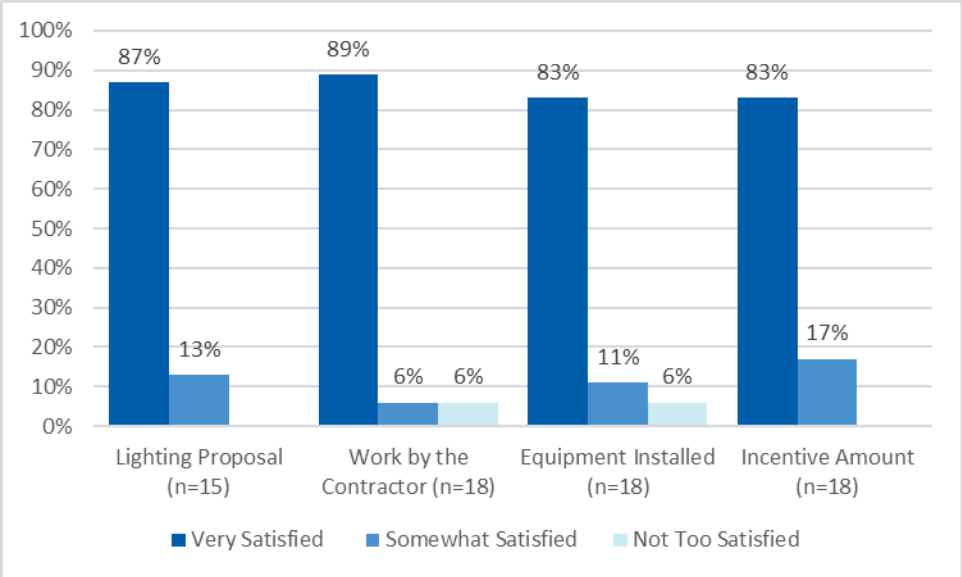
Most SBL participants (83% up to 89%, n=18) also were very satisfied with other elements of the channel, including work provided by the contractor, equipment installed—and the incentives. Upon drilling down to examine contractor service delivery, 77% percent (14 of 18) said they were very satisfied with both the contractor's work and the equipment. Customers less than very satisfied with both contractor's work and the equipment said their contractors did not do a thorough job or the equipment was not satisfactory. One said their contractor never explained how the work would be

done, and they replaced lamps while leaving old fixtures in place, which did not look right. Another customer said their contractor did not want to replace some ballasts, meaning some lights would be brighter and others more "yellow." Two other customers added comments, with one saying the new lamps burned out faster than the lamps they replaced, and one having starter problems with their lamps.

Two SBL respondents said they would like Pacific Power to offer outdoor lighting. While incentives for outdoor lighting presently (2017) are not offered through the SBL channel, small business customers may receive incentives for qualifying outdoor lighting products through the Typical Upgrades delivery channel.

Most SBL participants also were satisfied with the incentive amount they received for their projects. Eighty-three percent (n=18) said they were very satisfied; the remaining 17% said they were somewhat satisfied. Of three participants who rated their satisfaction as somewhat satisfied, one asked for higher incentives (enough to pay their entire cost) and one asked for 25% more, saying they had not noticed a lot [of savings]. The third did not specify an amount that would have earned a very satisfied rating. Figure 15 shows participant satisfaction levels with SBL.

Figure 15. Customer Satisfaction Levels with SBL Elements

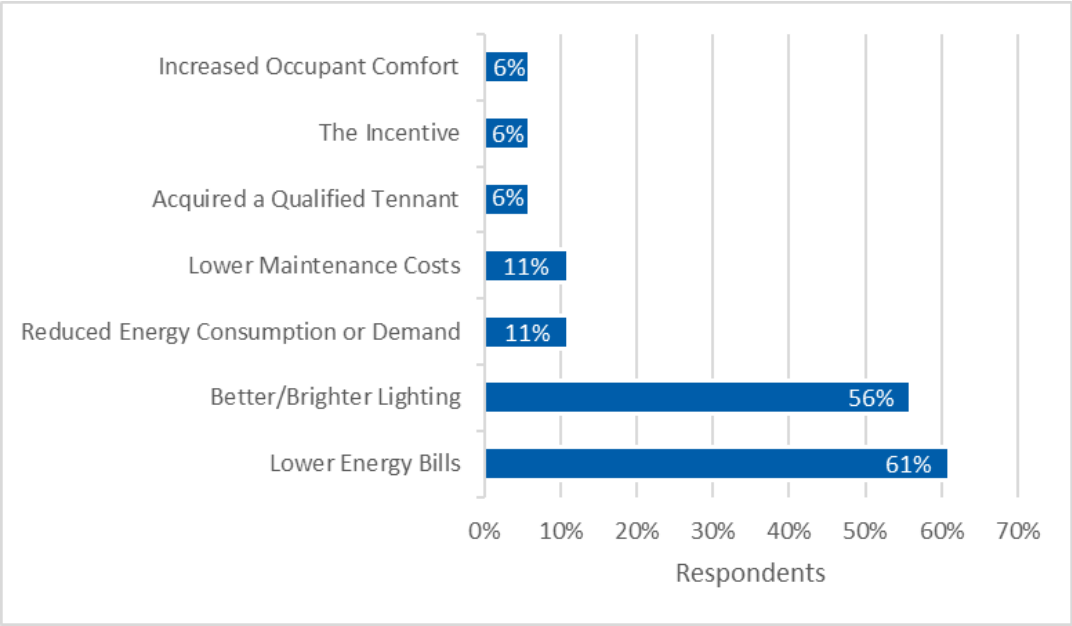


Source: PacifiCorp ***watt***smart Business Program 2014–2015 Participant Survey QD2, QD7, QD10, and QD12. Refused responses removed.

Benefits and Challenges

Overall, all SBL participants (n=18) said they received one or more benefits due to installing the lighting equipment. As shown in Figure 16, respondents most frequently cited lower energy bills, followed closely by better or brighter lighting quality.

Figure 16. Benefits of Equipment Installed Through the SBL Delivery Channel



Source: PacifiCorp ***watt***smart Business Program 2014–2015 Participant Survey QD16. Don't know and refused responses removed. Multiple responses allowed. (n=18)

While 78% of SBL delivery channel participants did not report challenges with their participation, 22% (four of 18) noted the following challenges (one each):

- The time required to receive the incentive
- The time required for the contractor to finish the work
- A change in the contractor's representative and difficulty reaching them
- The upfront project costs

One respondent encountering challenges said Pacific Power could help by offering a low-interest loan or extending the time to make payments, and by helping them select a contractor. A participant who did not cite challenges also asked for help in selecting a contractor.

Finally, when asked if they had recommendations to improve the SBL delivery channel, participants offered the following suggestions:

- Speed up paperwork processing
- Provide lighting samples or addresses where customers can go see them
- Improve the accuracy of the projected savings and verify savings after the installation
- Improve the ballasts' quality

One participant who installed T8 fixtures asked for the program to be available "for a longer period of time," but did not indicate if they thought the program was ending.

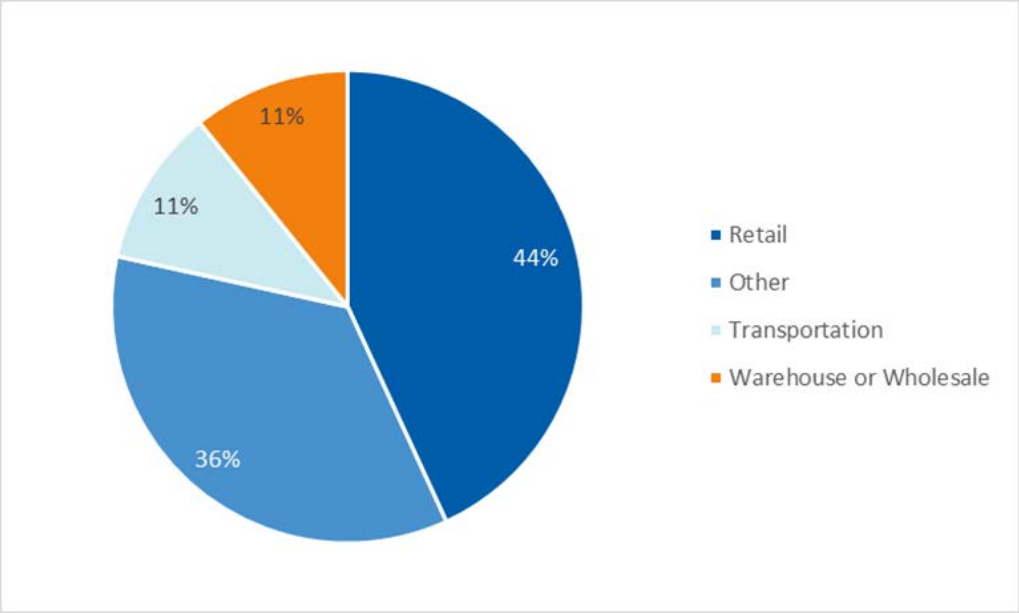
When asked if Pacific Power could do anything to improve the respondents' overall experience with the ***watt***smart Business Program, 89% said nothing was needed. One participant asked for more program support from their representative, and one, as noted above, asked for faster processing of paperwork.

Firmographics

As seen in Figure 17, the majority of SBL surveyed participants (12 of 18) fell into three business sectors, the largest of which was Retail (44%). The remaining surveyed participants (36%) comprised the group "other," consisting of six business sectors representing one participant each. These "other" sectors include the following:

- Construction
- Food Service
- Manufacturing
- Professional/Scientific/Technical Services
- Public Administration/Government
- Real Estate/Property Management

Figure 17. SBL Delivery Channel Survey Participants by Business Sector



Source: PacifiCorp ***watt***smart Business Program 2014–2015 Participant Survey QI1. Don't know and refused responses removed. May not total 100% due to rounding. (n=18)

Eight of the 18 surveyed SBL delivery channel participants shared three characteristics: they occupied a single location, they owned that location, and they employed one to 10 people. Details for the overall population of SBL delivery channel participants include the following:

- Seventy-two percent operate a single facility in Washington
- Sixty-seven percent employ between one and 10 people

- Sixty-seven percent own their facilities, 28% lease, and one participant (6%) owns and leases facilities.

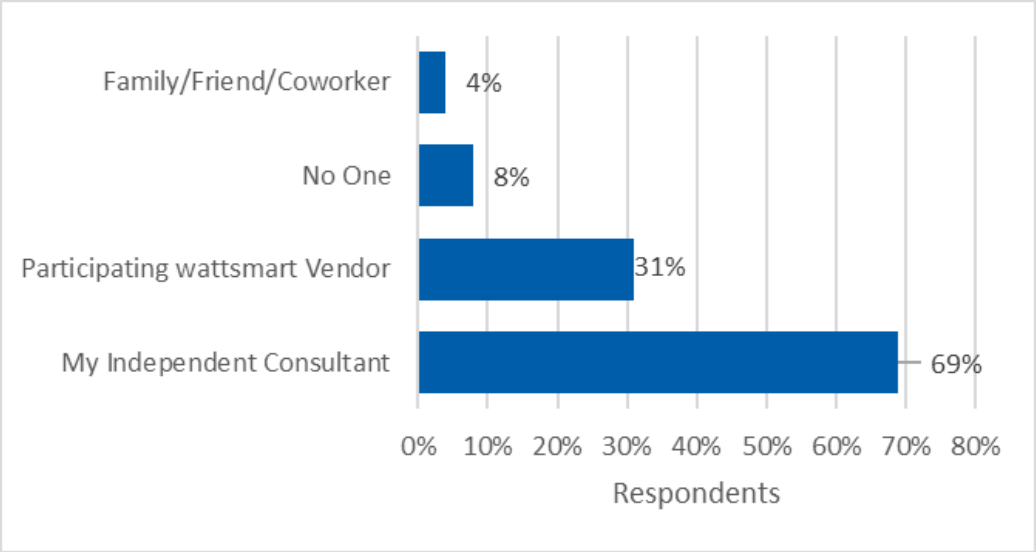
Typical Upgrades Delivery Channel

The Cadmus team surveyed 28 participants who received program incentives through the Typical Upgrades delivery channel. Overall, they represent a wide array of business sectors, with the highest percentage in Dairy/Agriculture, followed by Retail. They range in size from less than 10 employees to more than 500, with 63% (n=27) employing 25 or fewer people. Participants generally were satisfied with the equipment installed, and fewer (although still a majority) were satisfied with incentives they received. More details follow.

Motivation

The Cadmus team asked participants in the Typical Upgrades delivery channel about who helped them initiate their project. Twenty-four of the 28 participants said they were helped by one or more people, most frequently an independent consultant or a participating ***watt***smart vendor, as shown in Figure 18. These consultants included electrical contractors or an electrical supply house. Two participants initiated their own projects without outside assistance, and two participants could not specify whether they had received help.

Figure 18. Typical Upgrade Participants' Source of Assistance



Source: PacifiCorp ***watt***smart Business Program 2014–2015 Participant Survey QE1. Don't know and refused responses removed. Multiple responses allowed. (n=26)

Participation and Satisfaction

Most Typical Upgrades participants found it easy to complete their project applications: 68% said it was very easy, while 32% said it was somewhat easy, and none found it difficult (n=28). Five people had suggestions about making the process easier, focusing on simplifying the application form (saying it was

complex and could be difficult to understand what information had to be provided) and on the difficulty in calculating labor and costs, particularly if the applicant was unfamiliar with the equipment. During the evaluation period, Pacific Power simplified the ***watt***smart Business analysis tool and added functionality to auto-populate the application and supplements, addressing these participant-reported concerns.

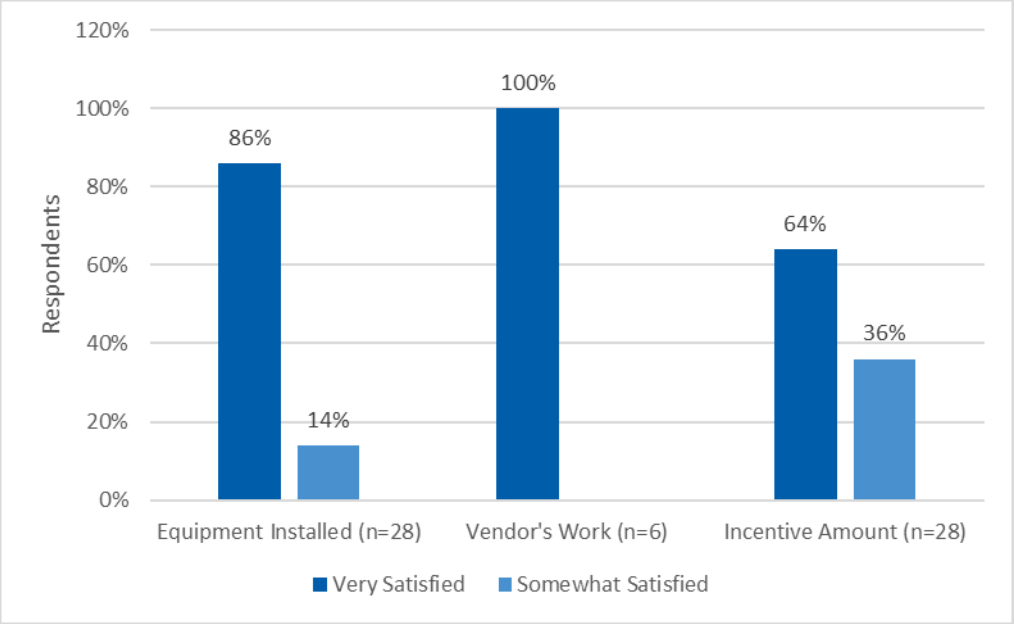
Figure 19 shows satisfaction levels with three elements of the Typical Upgrades delivery channel: equipment installed; participating vendor's work; and incentives. A majority of participants (86%, n=28) were very satisfied with the equipment they installed, and, of the eight participants that said they used a ***watt***smart vendor, six reported being very satisfied with the vendor's work, one person did not know, and one did not answer the question.

The Cadmus team did not find a statistical difference between the percentage of participants who said they were very satisfied with equipment installed in the 2012 and 2013 FinAnswer Express Program, and those reporting the same for the 2014 and 2015 ***watt***smart Business Program Typical Upgrades delivery channel. Differences in survey questions or large differences in response sizes between the 2012/2013 evaluation and the 2014/2015 evaluation precluded the team from calculating the statistical significance for incentive amounts or participant satisfaction with their vendor's work.

Five participants said they would like to install additional equipment that did not qualify for incentives through the ***watt***smart Business Program. These included outdoor LED landscape and signage lighting, energy-efficient pumps, irrigation gaskets, motor starters, and VFD motors. Given the additional measures added to the Typical Upgrades incentives in 2016 and 2017, products in several of these categories have become available to customers.

All participants (n=28) responded they were either very satisfied (64%) or somewhat satisfied (36%) with the incentive they received. Five of the 10 somewhat satisfied participants would have liked higher incentives. When the Cadmus team asked what incentive amount would have elicited a very satisfied response, two respondents said the program should pay at least 50% of the project costs, one said 60%, one asked for 75%, and one participant thought Pacific Power should pay the full cost. The remaining five somewhat satisfied participants did not specify an amount.

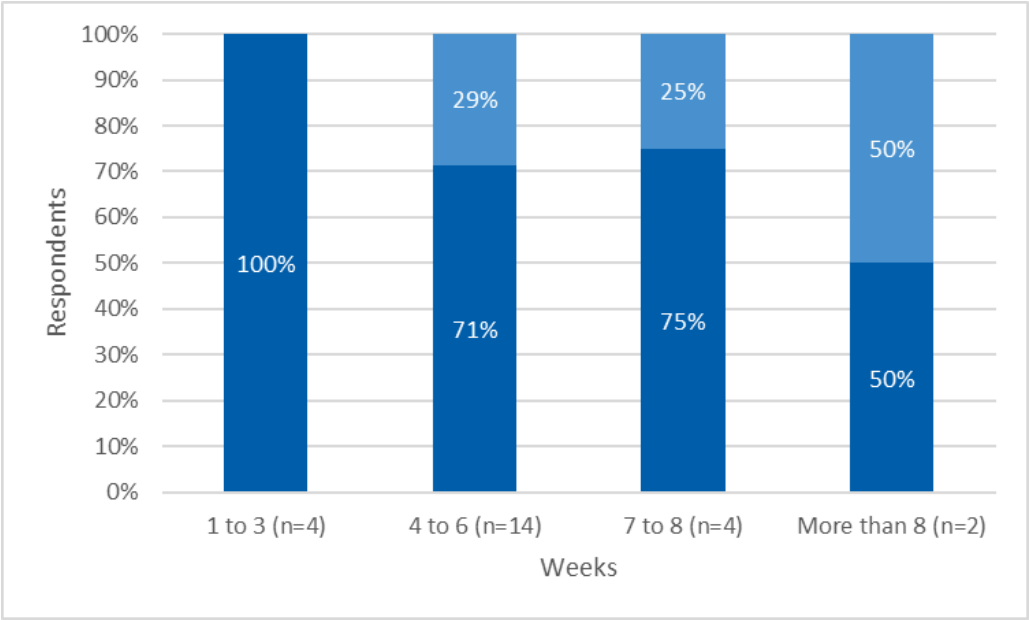
Figure 19. Participant Satisfaction Levels with Typical Upgrades Elements



Source: PacifiCorp ***watt***smart Business Program 2014–2015 Participant Survey QE4, QE9, and QE11. Don't know and refused responses removed.

Participant satisfaction varied regarding the time required for their incentives to arrive. The Cadmus team asked participants how long (in weeks) it took to receive their incentives. The team grouped the responses into four categories, from one week to more than eight weeks. All participants receiving their incentives within three weeks said they were very satisfied, and a large percentage of participants receiving their incentives within four to six weeks also reported being very satisfied. Figure 20 shows participant satisfaction within the different timeframes in which they received their incentives.

Figure 20. Customer Satisfaction with Time to Receive Incentive



Source: PacifiCorp ***watt***smart Business Program 2014–2015 Participant Survey QE6 and QE7. Don't know, has not arrived, and refused responses removed. (n=24)

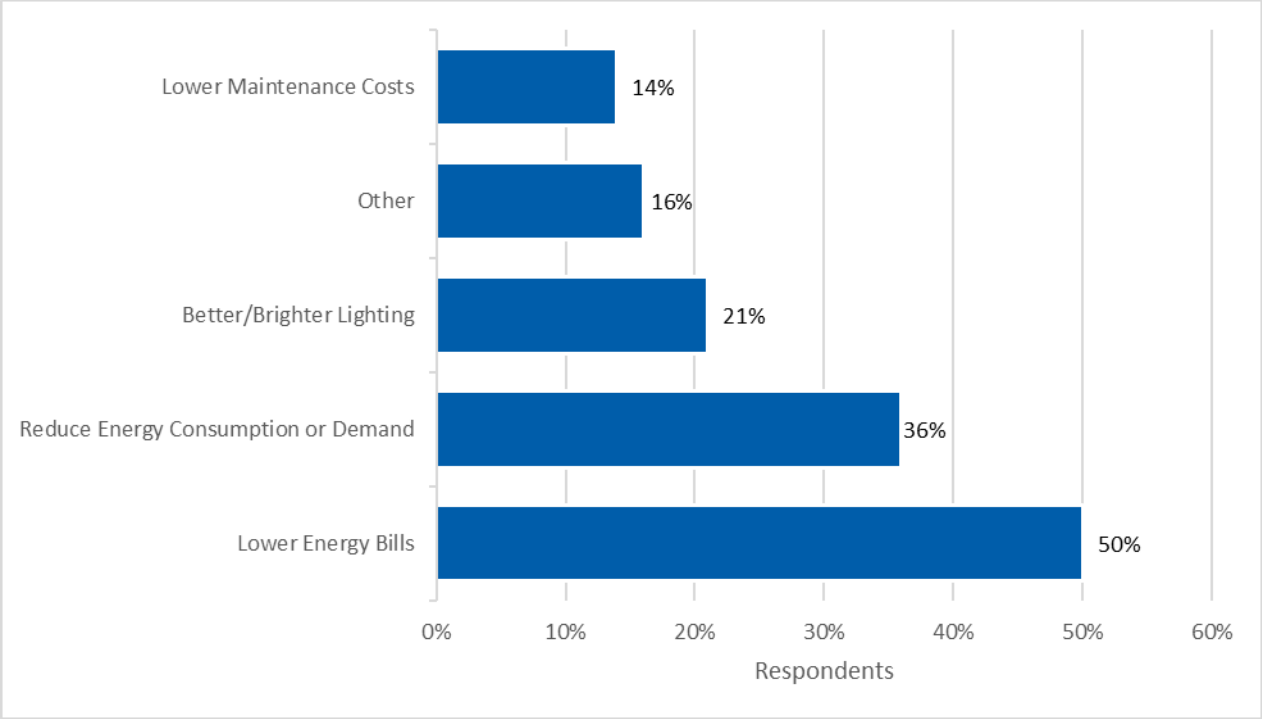
Benefits and Challenges

All 28 participants in the Typical Upgrades delivery channel said they received benefits, including lower energy bills and reduced energy consumption, due to installing the program equipment, as shown in Figure 21. Similar to that seen for the SBL and Custom Analysis delivery channels, Typical Upgrades participants listed better and brighter lighting among their top three benefits.

The "other" category consisted of four responses (one each):

- Increased Occupant Comfort
- Increased Productivity
- Equipment Reliability/Consistency/Longevity
- Better Irrigation Pattern

Figure 21. Benefits of Equipment Installed Through the Typical Upgrades Delivery Channel



Source: PacifiCorp ***watt***smart Business Program 2014–2015 Participant Survey QE15. Don't know and refused responses removed. Multiple responses allowed. (n=28)

Of the 28 participants shown in Figure 21, 11 solely installed non-lighting measures. Among those 11 participants, six cited reduced consumption or demand as a benefit they received, five cited lower energy bills, two cited lower maintenance costs, and one cited increased productivity.

Ninety-seven percent of participants (26 of 27) did not report challenges to participating in the Typical Upgrades delivery channel, with only one person (an irrigation customer) saying they experienced challenges with the qualification process for their VFD equipment.

When asked if Pacific Power could do anything to improve the participant's overall experiences with the ***watt***smart Business Program, 25 of 28 participants (89%) said nothing was needed to improve their experiences. The evaluation team found no statistically significant difference in this participant satisfaction level when compared to participant satisfaction with the 2013 and 2014 FinAnswer Express Program (86%, n=214). Similarly, participants in both evaluations expressed some dissatisfaction with energy rates and incentive levels. Three participants in the 2014 and 2015 Typical Upgrades channel offered the following suggestions for improving the ***watt***smart Business Program:

- Lowering energy prices
- Increasing incentives
- Providing an application for past purchases[11]

Firmographics

The 2014 and 2015 surveyed Typical Upgrades participants represent 14 different business sectors. While not all business sectors represented in the 2012 and 2013 FinAnswer Express program were represented in the 2014 and 2015 Typical Upgrades delivery channel, participation was comparable in business sectors appearing in both evaluations; no statistically significant differences occurred.[12]

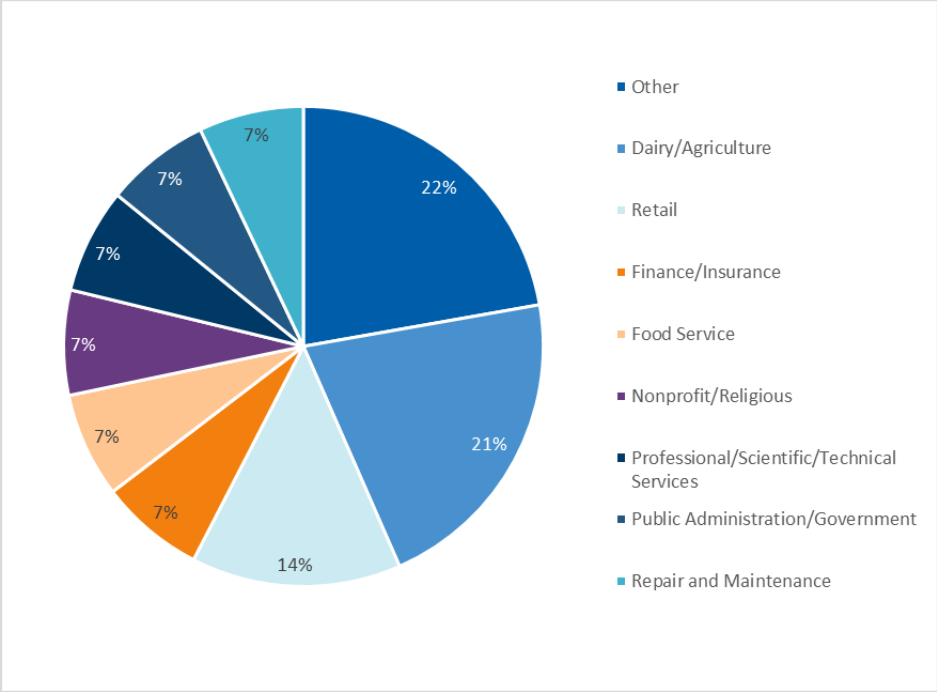
Figure 22 shows the distribution of 2014 and 2015 surveyed participants by business sector. The "other" reported business sectors shown represent one participant (3.6% of the total), but, when combined, represent almost one-quarter of the total surveyed population:

- Arts/Entertainment/Recreation
- Construction
- Health Care
- Hospitality
- Real Estate/Property Management
- Transportation

[11] Pacific Power currently provides an application for customers who did not prequalify their equipment, but who want to apply for an incentive after the fact. Pacific Power requires prequalification for some measures in the Typical Incentives channel, and recommends—but does not require it—for other measures.

[12] Navigant Consulting, Inc., in partnership with EMI Consulting. *Evaluation Report for Washington's Energy FinAnswer Express Program (PY 2012 through 2013).* March 19, 2015. Available online: http://www.pacificorp.com/content/dam/pacificorp/doc/Energy_Sources/Demand_Side_Management/2015/FinAnswer_Express_Program_Evaluation_2012-2013_WA_6-2-15.pdf

Figure 22. Typical Upgrades Delivery Channel Survey Participants by Business Sector



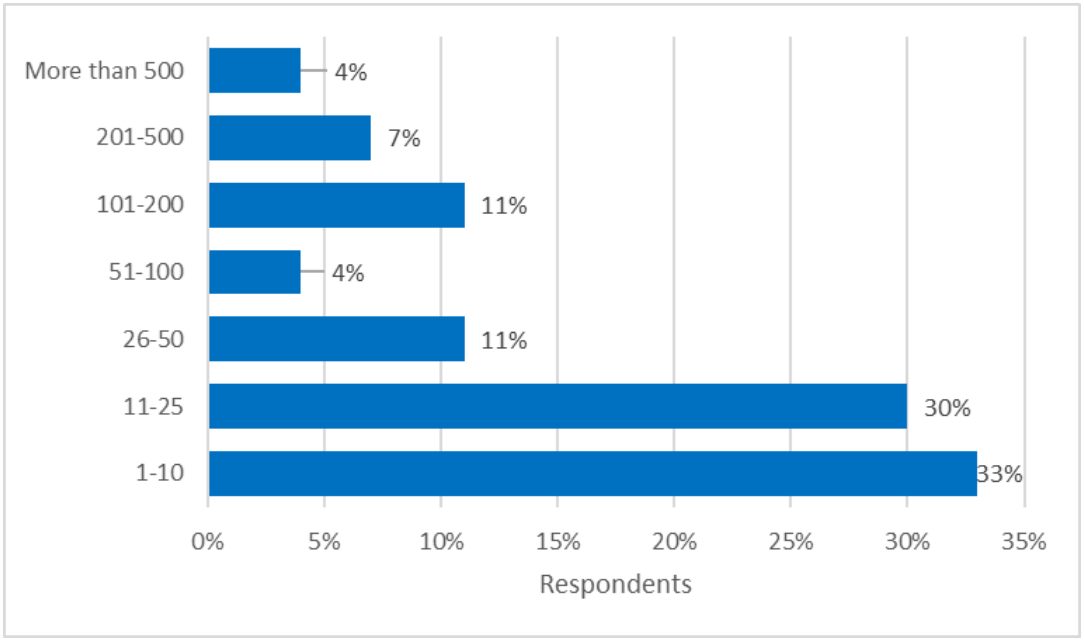
Source: PacifiCorp ***watt***smart Business Program 2014–2015 Participant Survey: QI1. Don't know and refused responses removed. Total may not equal 100% due to rounding. (n=28)

Fifty-two percent of Typical Upgrades participants (14 out of 27) operate a single location in Washington, which they own.

The majority (63%, n=27) employ 25 or fewer people: 33% employ one to 10, and 30% employ 11 to 25. Only one participant fell into the category of 51 to 100 employees.

Five of the six participants employing more than 100 people operate 10 to 50 facilities in Washington. The largest (by employee count)—a participant in the Health Care business sector—operates 25 locations in Washington, and employees more than 500 people in their combined locations combined. Figure 23 provides more detail on employee count distributions for surveyed participants in the Typical Upgrades delivery channel.

Figure 23. Typical Upgrades Delivery Channel Employee Count Distribution



Source: PacifiCorp ***watt***smart Business Program 2014–2015 Participant Survey: QI4. Don't know and refused responses removed. (n=27)

Custom Analysis Delivery Channel

The Cadmus team surveyed eight participants who received incentives through the ***watt***smart Business Program Custom Analysis delivery channel. The Custom Analysis participants represented fewer business sectors than participants in the 2012 and 2013 FinAnswer Program. The single largest sector, Dairy/Agriculture, represents three of surveyed participants (n=8).

Motivation

Seven participants offered responses about aspects of their custom energy analysis reports that most influenced them to complete their projects. Three cited the opportunity to install more efficient equipment, resulting in better lighting and water savings; three cited energy savings; and one cited the analysis itself, in which they could see the payback period of their investment.

Participation and Satisfaction

Participants in the Custom Analysis delivery channel did not report problems with completing the application paperwork for their projects. Seven said it was very easy; one said it was somewhat easy.

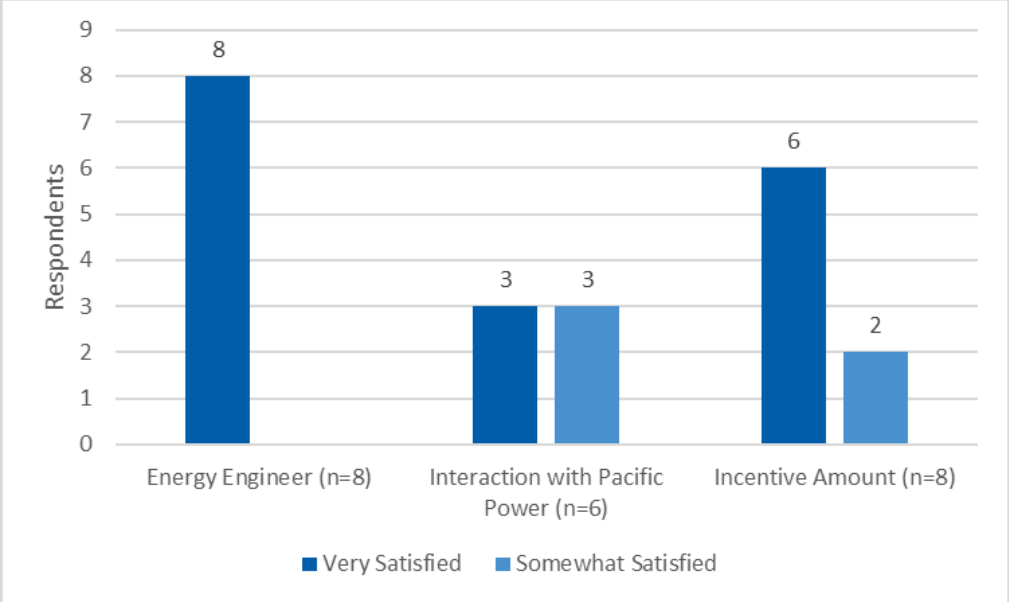
All eight respondents said they participated in a pre-inspection of their site, and they received a custom energy analysis report that identified efficiency measure opportunities, energy savings, costs, incentives, and paybacks. Six of these participants said the analysis was very useful; only one said it could have been improved, noting that the savings estimate could have been more precise. One participant did not have knowledge about the report's usefulness.

The Cadmus team also asked participants to rate their satisfaction with three program elements: their experiences with the energy engineer provided through the ***watt***smart Business Program; their interactions with Pacific Power; and the incentive amounts they received. All eight surveyed participants were very satisfied regarding their experiences with the energy engineer. Six participants split evenly between very satisfied and somewhat satisfied regarding their experiences with Pacific Power (three each). Those participants who were somewhat satisfied indicated initial difficulties, which they considered not significant, had improved, or were unrelated to the ***watt***smart Business Program or the Custom Analysis delivery channel.

Six of eight surveyed participants also were very satisfied with the incentive amount they received for their projects. Both participants saying they were somewhat satisfied asked for higher incentives, one specifically asking for 100% of the cost. This participant indicated that the incentive proved less important than the energy savings in their decision about which equipment to install; they also, however, said that without the incentive or technical assistance provided by the program, they would not have installed any equipment for at least two years after their actual participation date.

Figure 24 shows satisfaction levels with each program element.

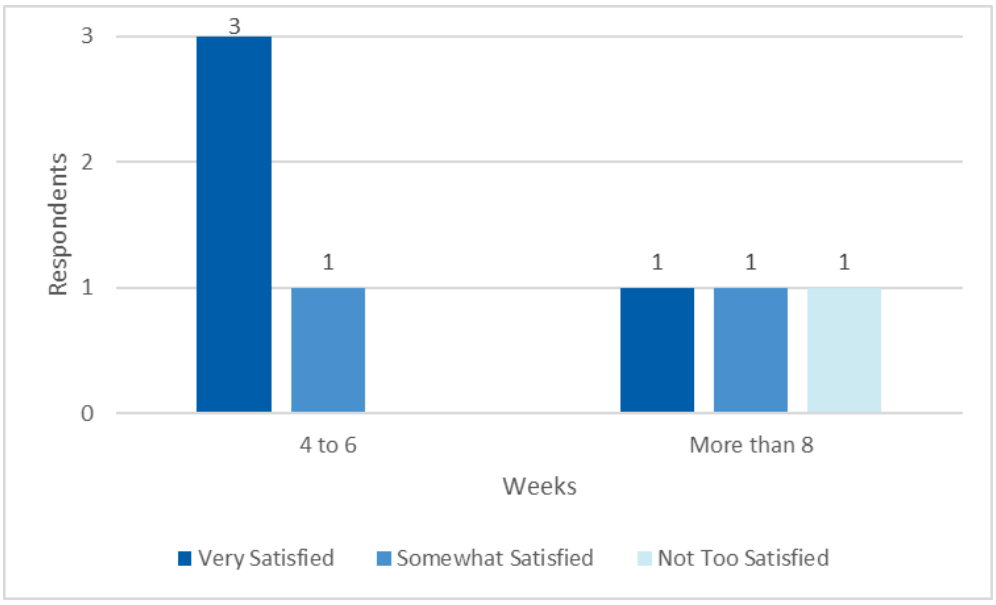
Figure 24. Customer Satisfaction Levels with Custom Analysis Delivery Channel Elements



Source: PacifiCorp ***watt***smart Business Program 2014–2015 Participant Survey: QF2, QF3, and QF12. Don't know and refused responses removed.

Surveyed Custom Analysis participants received their incentives in four to six weeks or longer. One participant, who received their incentive in more than eight weeks, said receiving it within one month would have been more satisfactory. Figure 25 shows the reported time required to receive an incentive in relation to participant satisfaction.

Figure 25. Customer Satisfaction with Time to Receive Incentive



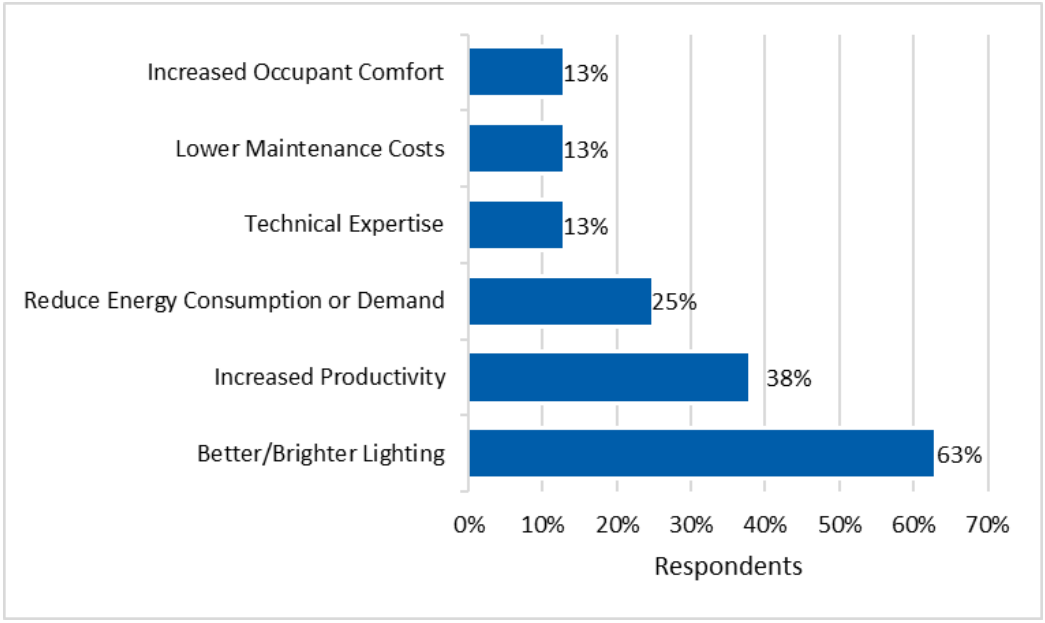
Source: PacifiCorp ***watt***smart Business Program 2014–2015 Participant Survey: QF14 and F15. Don't know and refused responses removed. (n=7)

When asked, three participants said other energy efficiency measures or equipment they wanted to install did not qualify for the ***watt***smart Business Program. These participants, however, named equipment for which Pacific Power already provided incentives in 2015: high-speed rollup doors (aka fast-acting doors); and sprinkler heads, drains, and gaskets. The third respondent indicated they wanted to upgrade equipment and lamps, but did not know what equipment was available through the program.

Benefits and Challenges

Each participant in the Custom Analysis delivery channel (n=8) said they received one or more benefits due to their energy efficiency upgrades. As shown in Figure 26, respondents most frequently cited better or brighter lighting, followed by increased productivity and reduced energy consumption or demand. To a lesser extent, participants mentioned technical expertise provided through the program, lower maintenance costs, and increased occupant comfort.

Figure 26. Benefits of Equipment Installed through the Custom Analysis Delivery Channel



Source: PacifiCorp ***watt***smart Business Program 2014–2015 Participant Survey: QF19. Don't know and refused responses removed; multiple responses allowed. (n=8)

While six of the eight participants did not report challenges in participating in the Custom Analysis delivery channel, two noted the following:

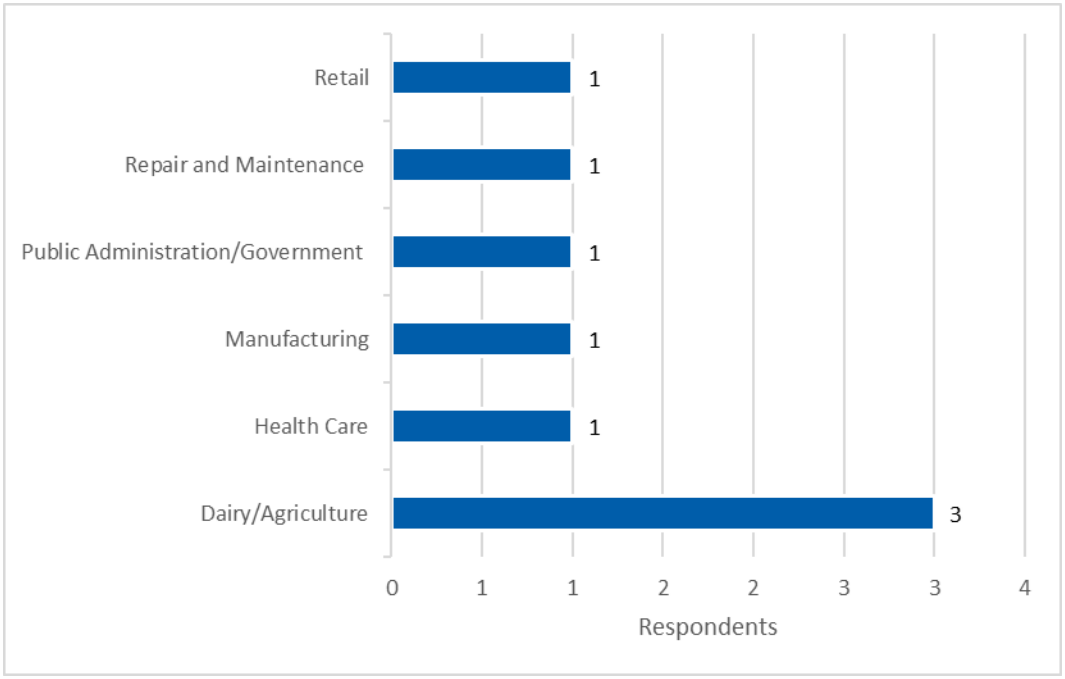
- Determining the scope, cost, and savings of the project (n=1)
- Getting the installation completed while they worked in the building (n=1)

When asked if Pacific Power could do anything to improve their overall experience with the ***watt***smart Business Program, one respondent in the Dairy/Agriculture business sector asked for lower energy rates. The remaining seven participants said no: nothing.

Firmographics

As shown in Figure 27, of the eight surveyed participants in the Custom Analysis delivery channel, three are in the Dairy/Agriculture business sector.

Figure 27. Custom Analysis Survey Participants by Business Sector

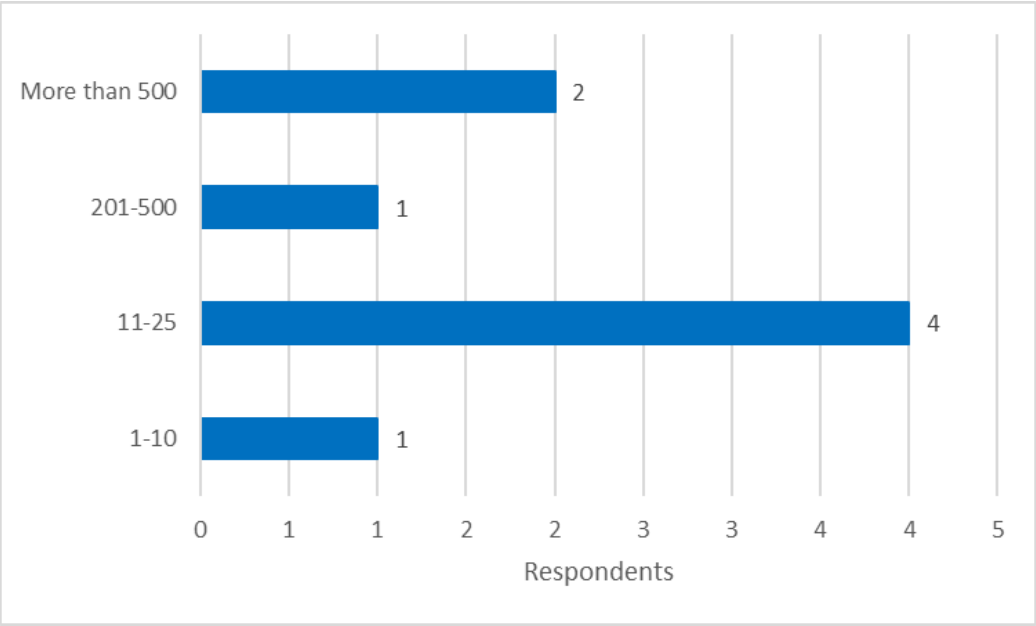


Source: PacifiCorp ***watt***smart Business Program 2014–2015 Participant Survey: QI1. Don't know and refused responses remove.

Three of the eight Custom Analysis participants occupy a single location, which they own. The remaining five occupy from three to 37 facilities in Washington. Four of these five remaining participants own all or a portion of their building(s) (two participants both own and lease facilities), and one participant leases.

As shown in Figure 28, participants in the Custom Analysis delivery channel clustered at the extremes of the employee count spectrum (employing fewer than 25 people or more than 200), although a larger sample population would likely show scattered participation in the midrange companies.

Figure 28. Custom Analysis Delivery Channel Employee Count Distribution

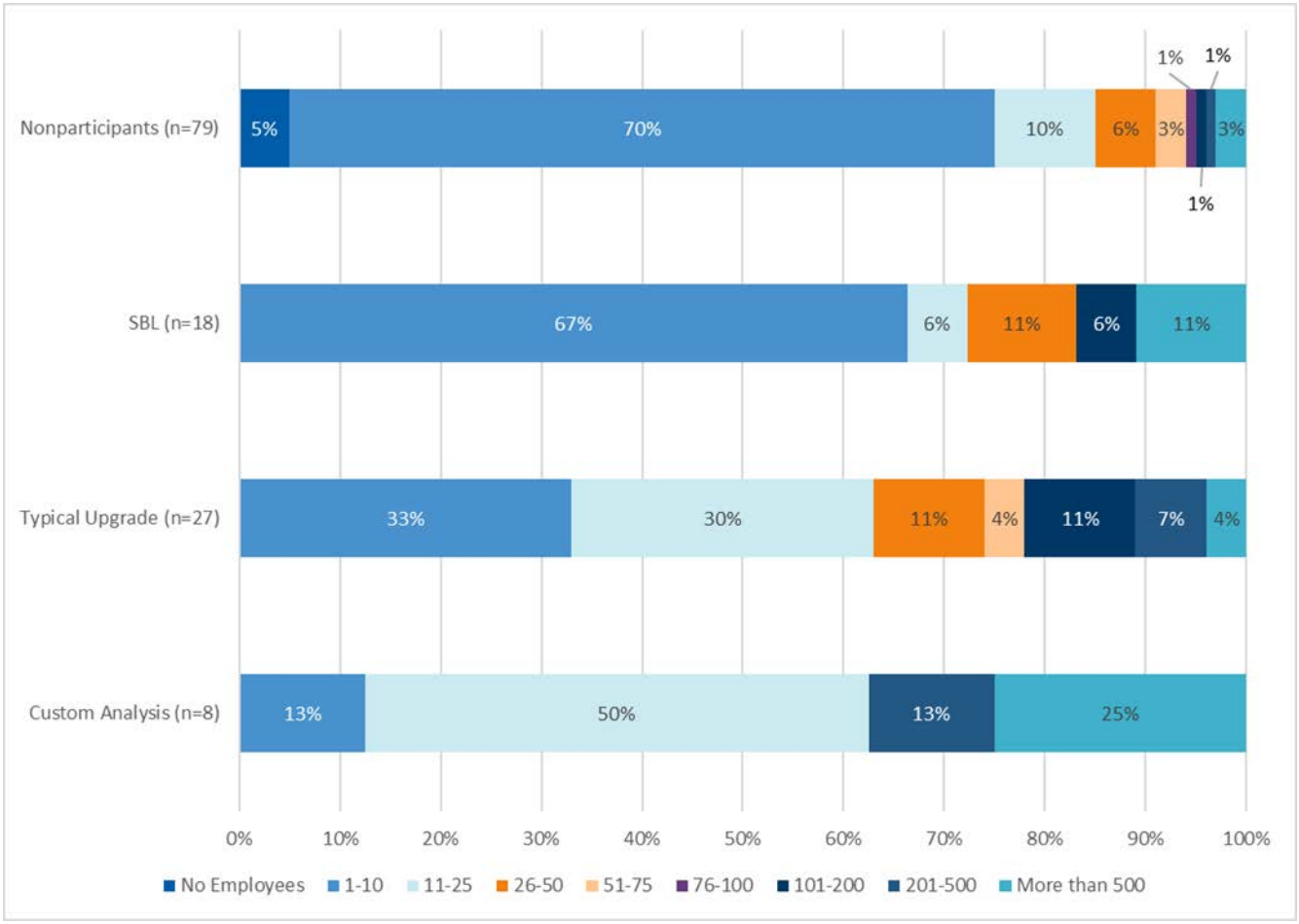


Source: PacifiCorp ***watt***smart Business Program 2014–2015 Participant Survey: QI4. Don't know and refused responses removed. (n=8)

Comparison of Employee Count Distribution by Delivery Channel

In closing the evaluation's participant section, Figure 29 compares the percentage of businesses employing a given number of people, segmented by the three program delivery channels (SBL, Typical Upgrades, Custom Analysis) and by nonparticipants. As shown, the number of employees varies (as expected) by the delivery channel. Nonparticipants (i.e., nonparticipants with non-managed accounts) are largely comprised of smaller businesses, with one to 10 employees.

Figure 29. Employee Count Distribution: SBL, Typical Upgrades, and Custom Analysis Program Delivery Channels Plus Nonparticipants



Source: PacifiCorp ***watt***smart Business Program 2014–2015 Participant Survey: QI4. PacifiCorp ***watt***smart Business Program 2014–2015 Partial Participant/Nonparticipant Survey: QF4. Don't know and refused responses removed. Total may not equal 100% due to rounding.

Nonparticipants

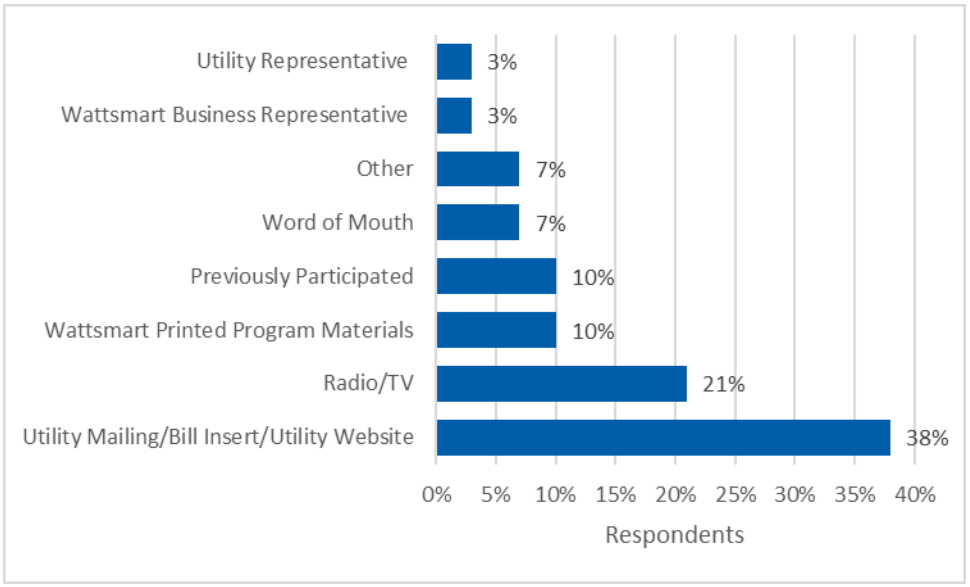
The Cadmus team surveyed 88 nonparticipants who either never completed a project through the program or had not completed a project through the program in 2014 or 2015. Two of the 88 respondents were managed accounts—larger usage accounts managed in-house by Pacific Power. The team also surveyed one partial participant who, during the evaluation period, initiated but did not compete a project through the program. Due to low response rates for nonparticipants with managed accounts and partial participants, the team focuses this evaluation section on nonparticipants with non-managed accounts. To avoid unnecessary repetition, unless noted otherwise in this section, the term nonparticipant refers to nonparticipants with non-managed accounts.

The largest single group of surveyed nonparticipants (23%, n=84) operate in the Retail business sector. Respondents represented 18 business sectors. The majority of nonparticipants (72%, n=81) operate a single facility in Washington, and 72% (n=83) own all or a portion of their facilities.

Awareness and Communication

When asked if they had heard of the ***watt***smart Business Program prior to the survey call, 35% of nonparticipants, (n=86) said they had. Of 30 nonparticipants who had heard of the program, 29 could recall the source of that information. Nonparticipants most frequently heard about the program from a Pacific Power mailing, bill insert, or the website, or—next most frequently—through an advertisement on radio or TV, as shown in Figure 30.

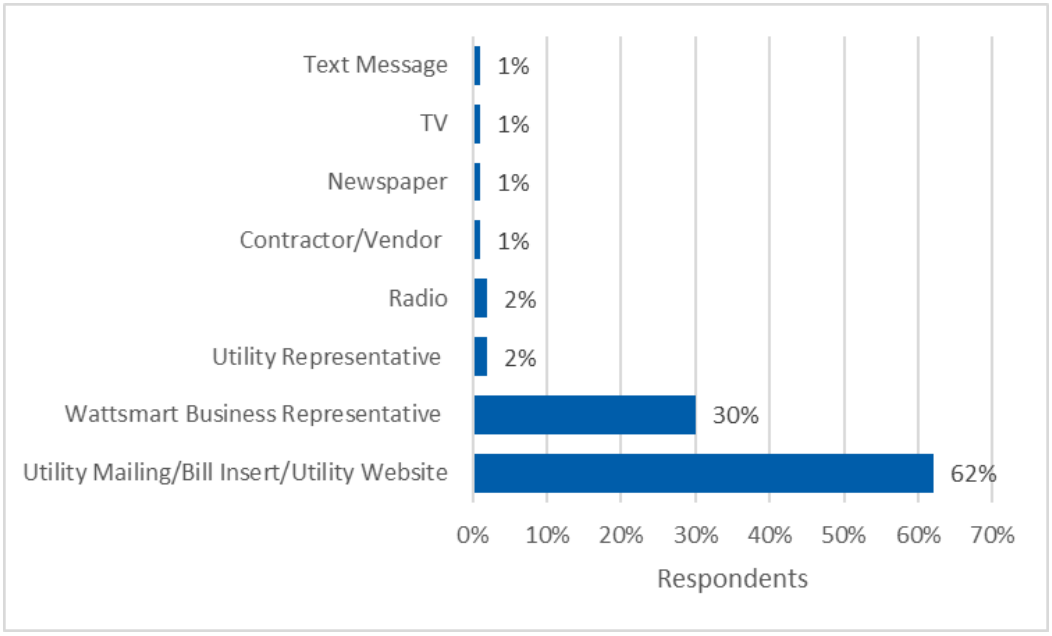
Figure 30. How Nonparticipants Learned About the *watt*smart Business Program



Source: PacifiCorp ***watt***smart Business Program 2014–2015 Partial Participant/Nonparticipant Survey: QC3. Don't know and refused responses removed. Total may not equal 100% due to rounding. (n=29)

The majority of nonparticipants said they wanted Pacific Power to inform them about incentives for energy efficiency improvements through a utility mailing, a bill insert, the website, or through a ***watt***smart Business representative, as shown in Figure 31.

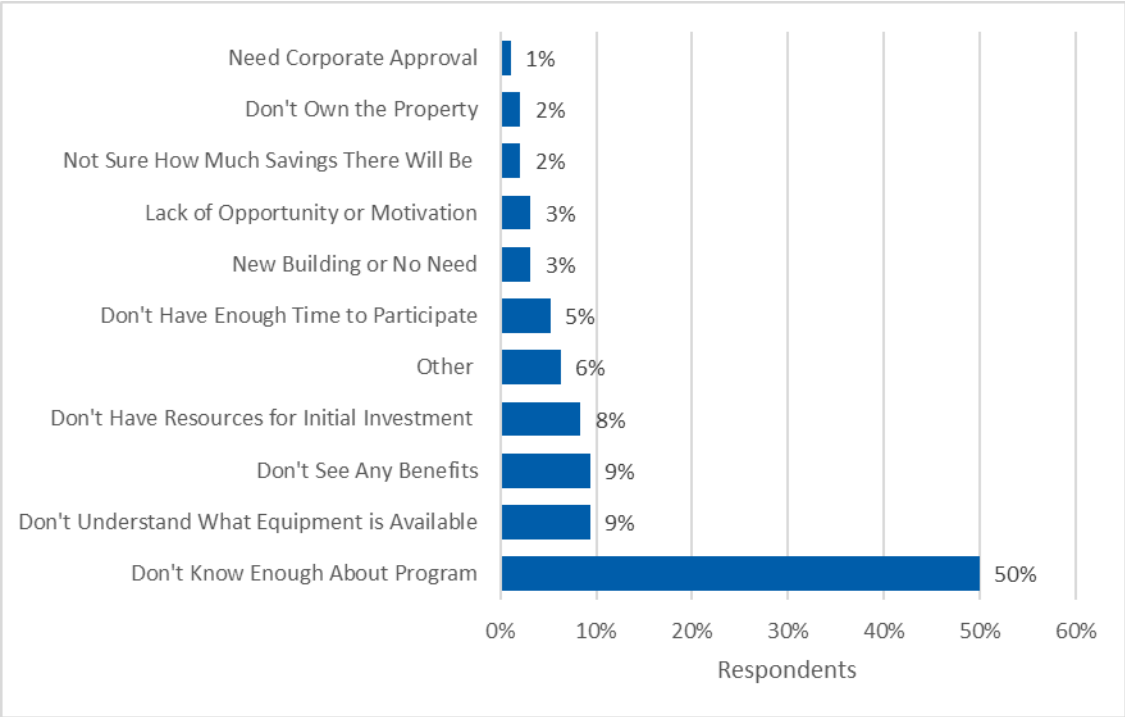
Figure 31. Preferred Method to Stay Informed for Nonparticipants and Partial Participants



Source: PacifiCorp ***watt***smart Business Program 2014–2015 Partial Participant/Nonparticipant Survey: QC5. Don't know and refused responses removed. Multiple responses allowed. (n=94)

In assessing nonparticipants' reasons for not using the ***watt***smart Business Program, the Cadmus team found they did not do so primarily because they did not know enough about it, as shown in Figure 32. The "other" category shown in the figure includes three customers who considered the rebate too low, the program not applicable, or were unsure of economic markets.

Figure 32. Reasons for Not Participating



Source: PacifiCorp ***watt***smart Business Program 2014–2015 Partial Participant/Nonparticipant Survey: QD13. Don't know and refused responses removed. Multiple responses allowed. (n=96)

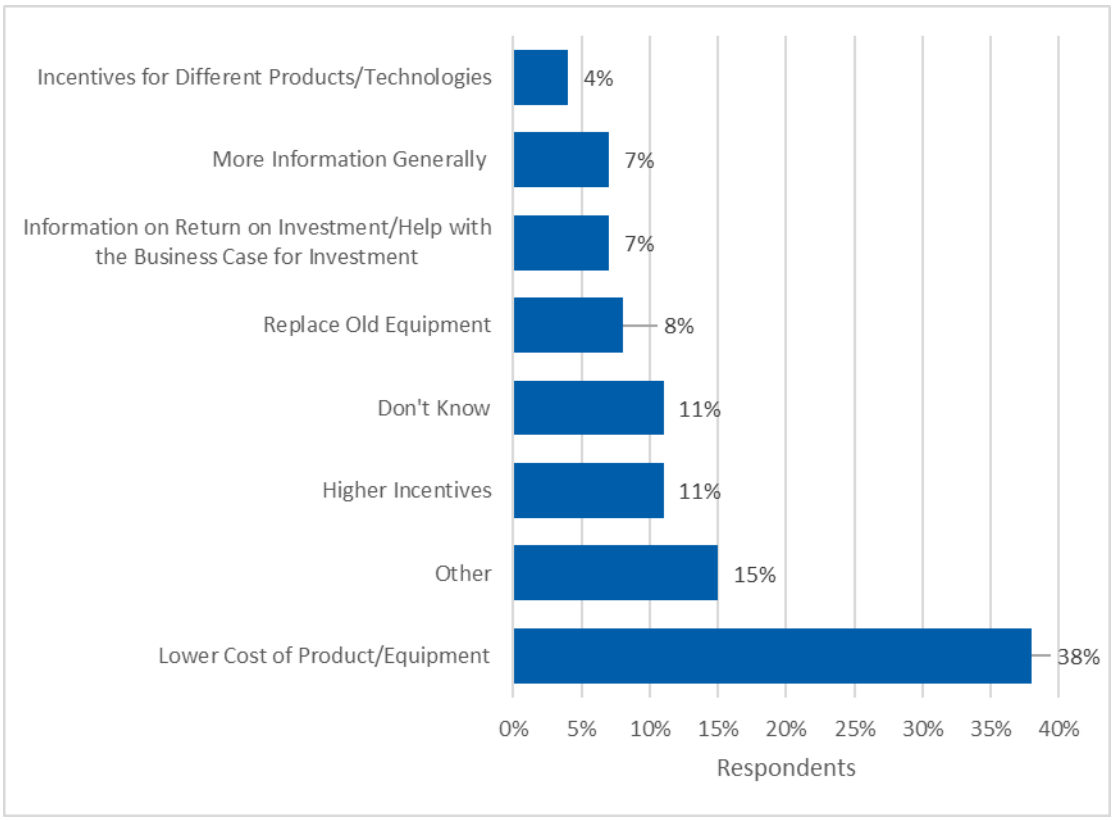
Motivation

More than any other reason given, nonparticipants said, when considering energy efficiency upgrades, that they were primarily motivated by the opportunity to save money on energy bills or to reduce energy consumption or energy demand (77%, n=75). As shown in Figure 33, however, they also said they would be further motivated to make more energy-efficient upgrades to their current equipment by lower product costs, higher incentives, and a wide variety of other factors. Nonparticipant responses categorized as "other" included the following:

- The opportunity to lower their utility bills, improve security, or reduce their environmental impacts
- The opportunity to obtain tax credits or obtain grants for low-income housing projects
- Building Ownership or higher energy rates/costs
- Point-of-sale incentives (this participant did not designate the equipment type; Pacific Power offers lighting point-of-sale incentives through its LED Instant Incentives delivery channel)
- Less confusing program information

Two nonparticipants simply said they had no funds available or upgrades to their current location did not prove feasible; 11% (n=92) did not know what would motivate their companies to upgrade existing equipment.

Figure 33. Motivations to Upgrade Existing Equipment



Source: PacifiCorp ***watt***smart Business Program 2014–2015 Partial Participant/Nonparticipant Survey: QD9. Multiple responses allowed. (n=92)

Nonparticipants offered the following suggestions for ways Pacific Power could help them participate in the program. While one or two respondents cited most suggestions, 58% (n=82) asked for more information about the program, and 13% asked for higher incentives:

- Expand technologies covered by the program (e.g., commercial greenhouse pumps, lines and lighting)
- Help customers find vendors more easily
- Provide more information on program savings, costs, and customized benefits
- Provide more program detail on the website
- Offer grants or financing to help with upfront costs
- Provide a veterans' bonus discount
- Visit participants in person or by phone to discuss options

The Cadmus team further explored nonparticipants' attitudes about making energy efficiency upgrades at their facilities. The team asked these customers to what extent they agreed with the following series

of statements (note: not all statements applied to every customer, and the team removed responses of "don't know" and "not applicable"):

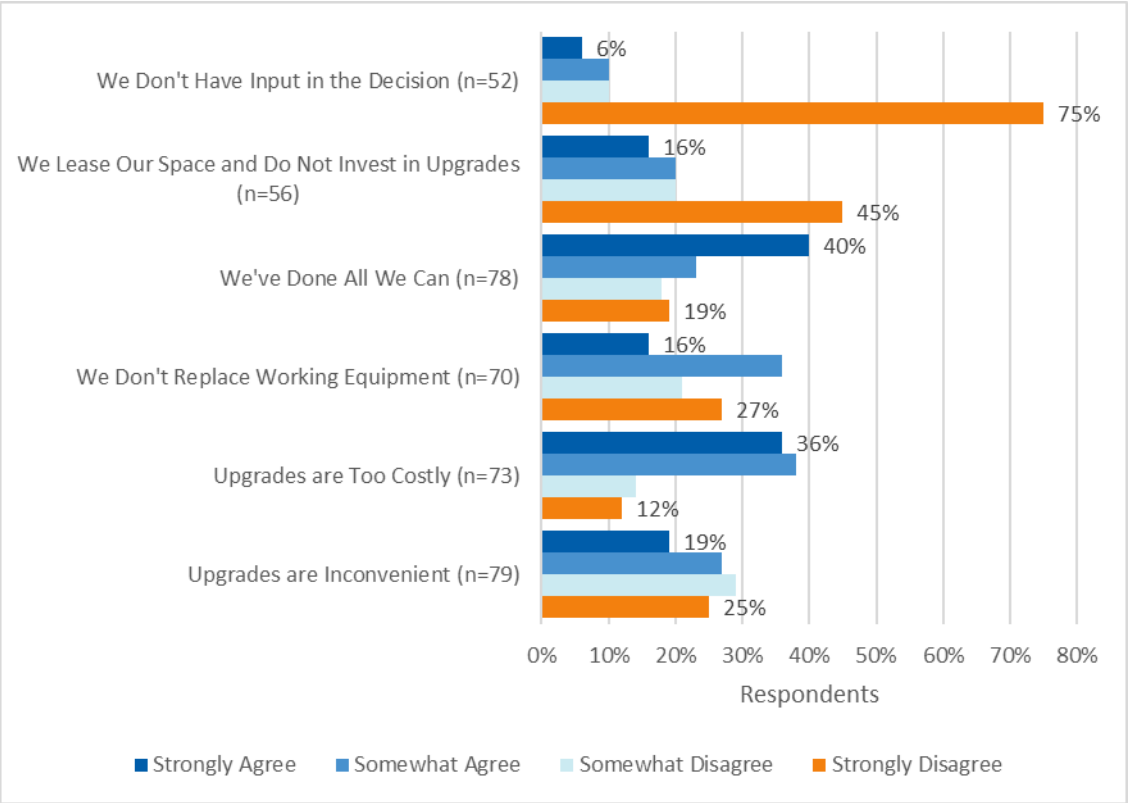
- Making upgrades at our facility is an inconvenience.
- Making energy efficiency upgrades to this facility is too costly.
- We don't replace working equipment even if it is not energy efficient.
- My company has made all the energy efficiency improvements we can without a substantial investment.
- My company leases space; we do not want to invest in energy efficiency upgrades.
- Decisions about equipment upgrades are made at a corporate office, and we don't have much input at this facility.

As the final question in this series, the Cadmus team asked nonparticipants: "When calculating the return on investment for proposed capital upgrades, does your company include savings gained from energy efficiency?"

Nonparticipants offered mixed responses with one exception: respondents clearly have input into decisions about energy efficiency upgrades; 75% of respondents strongly disagreed with the statement that they did not. Though 45% percent of participants were not opposed to investing in upgrades, even in leased spaces, 74% strongly agreed or somewhat agreed that upgrades were too costly (36% and 38%, respectively [n=73]). Figure 34 shows all nonparticipant responses.

Nonparticipants also split when asked if included savings gained from energy efficiency when calculating return on investments for capital upgrades (56% said yes and 44% said no [n=80]).

Figure 34. Nonparticipants' Attitudes About Energy Efficiency Improvements



Source: PacifiCorp ***watt***smart Business Program 2014–2015 Partial Participant/Nonparticipant Survey: QD7a-QD7e. Not applicable, don't know, and refused responses were removed.

Among nonparticipants who had heard of the ***watt***smart Business Program prior to the survey call, 21% said they were very likely or somewhat likely to request an incentive from the program in the next six months, while 79% said they were not too likely or not at all likely to do so.

Firmographics

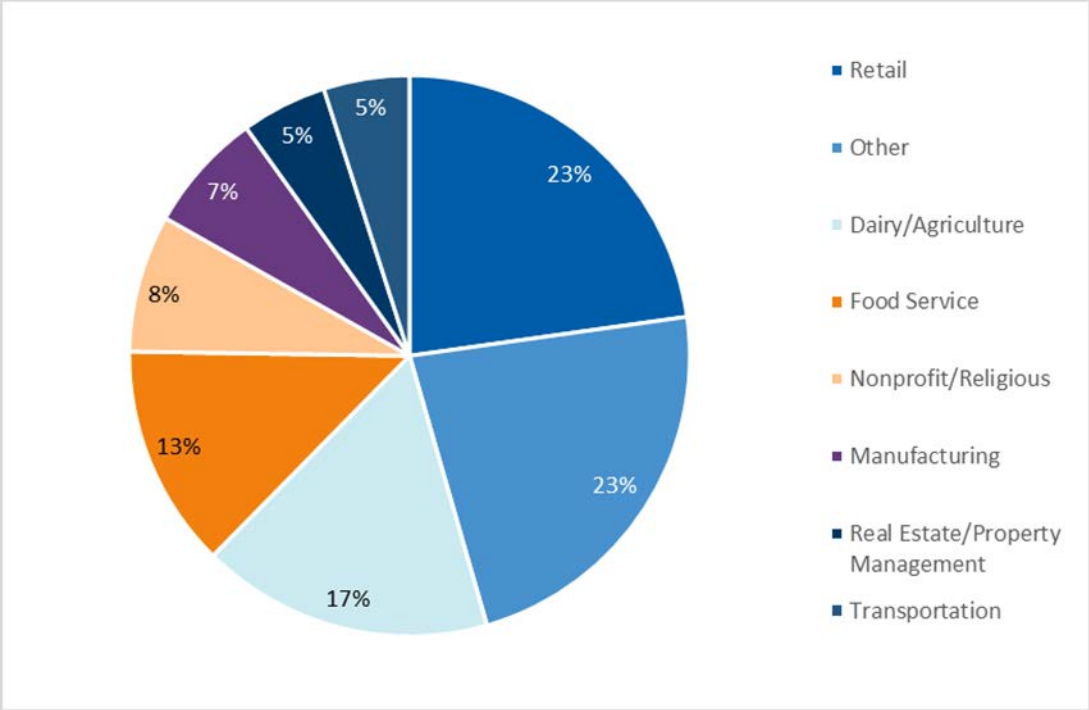
Surveyed nonparticipants were scattered across 18 business sectors, 11 of which Figure 35 groups under the heading "other." Each of these 11 business sectors represents less than 5% of the total surveyed nonparticipant population, but represents 23% when combined. The Retail business sector, also at 23%, represents the largest individual business sector of nonparticipant respondents. As Figure 35 also shows, the Dairy/Agriculture and Food Service business sectors (17% and 13%, respectively) represents the next largest sectors; the remaining categories then drop significantly in size.

The following sectors make up the "other" category:

- Accommodation
- Construction
- Educational Services
- Health Care

- Museums
- Professional/Scientific/Technical Services
- Public Administration/Government Services
- Rental Business
- Repair and Maintenance
- Veterans Release
- Warehouses/Wholesaler

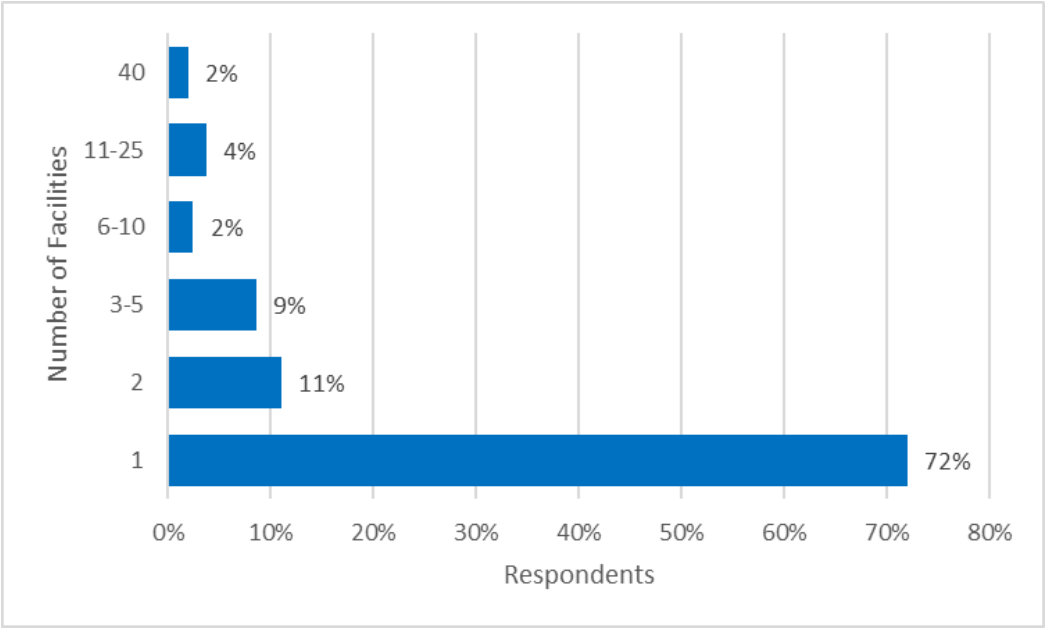
Figure 35. Survey Nonparticipants by Business Sector



Source: PacifiCorp ***watt***smart Business Program 2014–2015 Partial Participant/Nonparticipant Survey: QF1. Don't know and refused responses removed. Total may not equal 100% due to rounding. (n=84)

Nonparticipants operate a varied number of facilities in Washington. As shown in Figure 36, however, a large majority operate a single facility (72%, n=81).

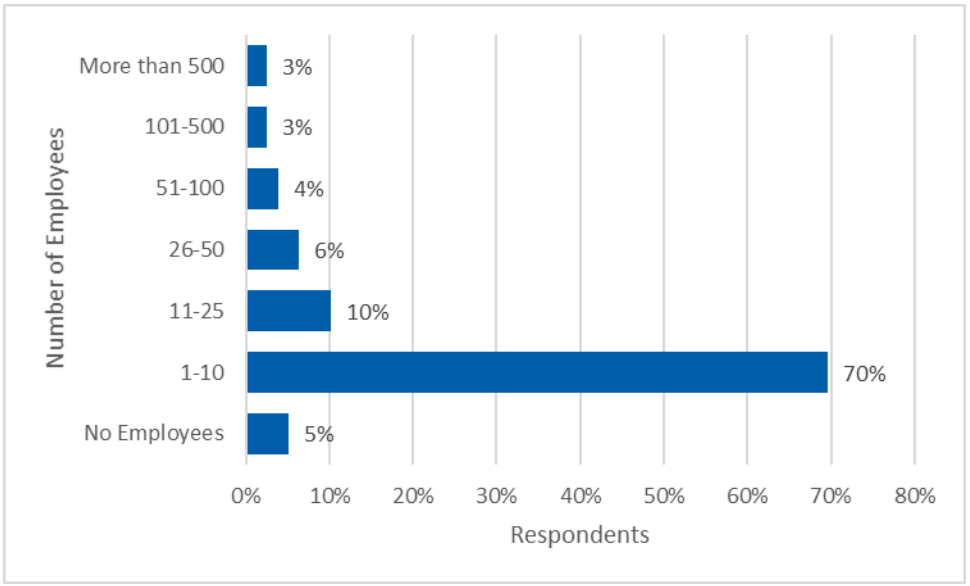
Figure 36. Number of Facilities in Washington



Source: PacifiCorp ***watt***smart Business Program 2014–2015 Partial Participant/Nonparticipant Survey: QF2. Don't know and refused responses removed. (n=81)

A majority of all nonparticipants (72%, n=83) own all or a portion their facilities (through four nonparticipants both own and lease). As shown in Figure 37, 70% (n=79) the nonparticipants also work at companies that employ 10 or fewer people.

Figure 37. Nonparticipant Employee Count Distribution



Source: PacifiCorp ***watt***smart Business Program 2014–2015 Partial Participant/Nonparticipant QF4. Total may not equal 100% due to rounding. (n=79)

Cost-Effectiveness

In assessing the ***watt***smart Business Program's cost-effectiveness, the Cadmus team analyzed program benefits and costs from five different perspectives, using Cadmus' DSM Portfolio Pro model.[13] The California Standard Practice Manual for assessing DSM program cost-effectiveness describes benefit/cost ratios for the following five tests:

- **PacifiCorp Total Resource Cost (PTRC) Test:** This test examines program benefits and costs from Pacific Power and Pacific Power's customers' perspectives (combined). On the benefit side, it includes avoided energy costs, capacity costs, and line losses, plus a 10% adder to reflect non-quantified benefits. On the cost side, it includes costs incurred by both the utility and participants.
- **Total Resource Cost (TRC) Test:** This test also examines program benefits and costs from Pacific Power and Pacific Power's customers' perspectives (combined). On the benefit side, it includes avoided energy costs, capacity costs, and line losses. On the cost side, it includes costs incurred by both the utility and participants.
- **Utility Cost Test (UCT):** This test examines program benefits and costs solely from Pacific Power's perspective. The benefits include avoided energy, capacity costs, and line losses. Costs include program administration, implementation, and incentive costs associated with program funding.
- **Ratepayer Impact Measure (RIM) Test:** All ratepayers (participants and nonparticipants) may experience rate increases designed to recover lost revenues. The benefits include avoided energy costs, capacity costs, and line losses. Costs include all Pacific Power program costs and lost revenues.
- **Participant Cost Test (PCT):** From this perspective, program benefits include bill reductions and incentives received. Costs include the measure incremental cost (compared to the baseline measures), plus installation costs incurred by the customer.

Table 22 summarizes the five tests' components.

[13] DSM Portfolio Pro has been independently reviewed by various utilities, their consultants, and a number of regulatory bodies, including the Iowa Utility Board, the Public Service Commission of New York, the Colorado Public Utilities Commission, and the Nevada Public Utilities Commission.

Table 21. Benefits and Costs Included in Various Cost-Effectiveness Tests

Test	Benefits	Costs
PTRC	Present value of avoided energy and capacity costs,* with a 10% adder for non-quantified benefits	Program administrative and marketing costs, and costs incurred by participants
TRC	Present value of avoided energy and capacity costs*	Program administrative and marketing costs, and costs incurred by participants
UCT	Present value of avoided energy and capacity costs*	Program administrative, marketing, and incentive costs
RIM	Present value of avoided energy and capacity costs*	Program administrative, marketing, and incentive costs, plus the present value of lost revenues
PCT	Present value of bill savings and incentives received	Incremental measure and installation costs

*These tests include avoided line losses.

Table 23 provides selected cost analysis inputs for each year, including evaluated energy savings, discount rates, line losses, inflation rates, and total program costs. Pacific Power provided all of these values, except for energy savings and the discount rate, which the Cadmus team derived from the Pacific Power 2013 and 2015 Integrated Resource Plans.

Table 22. Selected Cost Analysis Inputs

Input Description	2014	2015	Total
Evaluated Energy Savings (kWh/year)*	25,863,128	23,418,406	49,281,534
Discount Rate	6.88%	6.66%	N/A
Commercial Line Loss	9.53%	9.53%	N/A
Industrial Line Loss	8.16%	8.16%	N/A
Irrigation Line Loss	9.67%	9.67%	N/A
Inflation Rate**	1.9%	1.9%	N/A
Total Program Costs	$6,637,898	$5,809,546	$12,447,444

*Savings are realized at the meter, while benefits account for line loss.

**Based on PacifiCorp's 2015 Integrated Resource Plan, Volume I; Chapter 7—Modeling and Portfolio Evaluation. Available online: https://www.rockymountainpower.net/content/dam/pacificorp/doc/Energy_Sources/Integrated_Resource_Plan/2015IRP/PacifiCorp_2015IRP-Vol1-MainDocument.pdf. The Cadmus team determined future retail rates using a 1.9% annual escalator.

The ***watt***smart Business Program benefits included energy savings and their associated avoided costs. For the cost-effectiveness analysis, the Cadmus team used this study's evaluated energy savings and

measure lives from sources such as the RTF.[14] For all analyses, the team used avoided costs associated with the Pacific Power 2013 and 2015 IRP Westside Class 2 DSM Decrement Values.[15, 16]

Table 24 presents the 2014 and 2015 program years' cost-effectiveness analysis results, not accounting for non-energy benefits (except those represented by the 10% conservation adder included in the PTRC test). For this scenario, the ***watt***smart Business Program proved cost-effective from all perspectives, except the RIM test. The primary criterion for assessing cost-effectiveness in Washington is the PTRC, which achieved a 1.53 benefit/cost ratio for the combined years' evaluated savings.

The RIM test measures program impacts on customer rates. Most programs do not pass the RIM test because, while energy efficiency programs reduce costs, they also reduce energy sales. As a result, the average rate per unit of energy may increase. Passing a RIM test indicates that rates as well as costs decrease due to the program. Typically, this only happens for demand response programs or programs targeting the highest marginal cost hours (when marginal costs are greater than rates).

Table 23. *watt*smart Business Program Cost-Effectiveness Summary of 2014 and 2015 Evaluated Savings*

Cost-Effectiveness Test	Levelized $/kWh	Costs	Benefits	Net Benefits	Benefit/ Cost Ratio
PTRC	$0.048	$20,014,026	$30,552,070	$10,538,044	1.53
TRC	$0.048	$20,014,026	$27,774,609	$7,760,583	1.39
UCT	$0.029	$12,086,361	$27,774,609	$15,688,248	2.30
RIM		$46,249,923	$27,774,609	($18,475,313)	0.60
PCT		$15,156,738	$41,392,634	$26,235,897	2.73
Lifecycle Revenue Impacts ($/kWh)					$0.000397392
Discounted Participant Payback (years)					2.78

*The cost-effectiveness calculations assume a net to gross of 1.0.

Table 25 presents the 2014 program cost-effectiveness analysis results, not accounting for non-energy benefits (except those represented by the 10% conservation adder included in the PTRC test). For this scenario, the ***watt***smart Business Program proved cost-effective from all perspectives, except for the RIM test.

[14] See Appendix E for detailed cost-effectiveness inputs and results at the measure category level.

[15] Appendix N of PacifiCorp's *2013 Integrated Resource Plan, Volume II—Appendices* details the IRP decrements; the report is available online: http://www.pacificorp.com/content/dam/pacificorp/doc/Energy_Sources/Integrated_Resource_Plan/2013IRP/PacifiCorp-2013IRP_Vol2-Appendices_4-30-13.pdf

[16] PacifiCorp's *Class 2 DSM Decrement Study* details IRP decrements. Dated April 20, 2015, this report is available online: http://www.pacificorp.com/content/dam/pacificorp/doc/Energy_Sources/Demand_Side_Management/2015/2015_Class_2_DSM_Decrement_Study.pdf

Table 24. *watts*mart Business Program Cost-Effectiveness Summary of 2014 Evaluated Savings

Cost-Effectiveness Test	Levelized $/kWh	Costs	Benefits	Net Benefits	Benefit/ Cost Ratio
PTRC	$0.051	$11,023,443	$16,438,009	$5,414,566	1.49
TRC	$0.051	$11,023,443	$14,943,644	$3,920,201	1.36
UCT	$0.030	$6,637,898	$14,943,644	$8,305,746	2.25
RIM		$23,506,323	$14,943,644	($8,562,679)	0.64
PCT		$8,646,853	$21,129,733	$12,482,880	2.44
Lifecycle Revenue Impacts ($/kWh)					$0.000180196
Discounted Participant Payback (years)					2.27

Table 26 presents the 2015 program cost-effectiveness analysis results, not accounting for non-energy benefits (except those represented by the 10% conservation adder included in the PTRC test). For this scenario, the ***watt***smart Business Program also proved cost-effective from all perspectives except the RIM test.

Table 25. *watts*mart Business Program Cost-Effectiveness Summary of 2015 Evaluated Savings

Cost-Effectiveness Test	Levelized $/kWh	Costs	Benefits	Net Benefits	Benefit / Cost Ratio
PTRC	$0.046	$9,589,356	$15,054,058	$5,464,702	1.57
TRC	$0.046	$9,589,356	$13,685,508	$4,096,152	1.43
UCT	$0.028	$5,811,331	$13,685,508	$7,874,177	2.35
RIM		$24,258,324	$13,685,508	($10,572,816)	0.56
PCT		$6,943,443	$21,612,411	$14,668,967	3.11
Lifecycle Revenue Impacts ($/kWh)					$0.000247527
Discounted Participant Payback (years)					2.08

Conclusions and Recommendations

Pacific Power, in collaboration with its implementers, Cascade Energy and Nexant, Inc., successfully deliver energy efficiency incentives and services to their customers across a large number of business sectors through the ***watt***smart Business Program. Customers recognize and report benefits from participation in the program. With some exceptions, customers report satisfaction with incentives and measures offered as well as with vendors/contractors/engineers involved in their individual projects. Overall, customers also report few challenges with the program, though some customers in SBL and Typical Upgrades requested more help in selecting contractors, and Typical Upgrades participants asked for further simplification of the application process.

The Cadmus team found that most nonparticipants (i.e., those with non-managed accounts) did not participate, primarily as they did not know of the program or they did not understand the benefits of participation. Opportunities exist for Pacific Power to grow segments of the ***watt***smart Business Program-if desired, through enhanced marketing and outreach that provides a more personal touch.

The 2014 and 2015 program evaluation yielded a 99.3% overall realization rate, with a precision of ±4.2% at 90% confidence. Within each of the eight measure categories, varying degrees of realization rates and precision emerged.

This section provides the team's conclusions and recommendations, based on this report's findings.

Savings Considerations

Conclusion—HVAC interactive effects

Lighting calculations within the Washington territory currently do not use a HVAC interactive effect factor. Such factors account for reduction in heat produced by high-efficiency lighting, which otherwise would contribute to space heating. HVAC interactive effects vary depending on the HVAC system, facility type, and climate.

Recommendation—HVAC interactive effects

Consider adding an HVAC interactive effect factor consistent with the Non-Residential Lighting Standard Protocol approved on December 14, 2016. The protocol defines HVAC heating and cooling interactive effects for each of the twenty-seven commercial and industrial building types. Cadmus recommends incorporating the HVAC interactive effects into the existing Pacific Power wattsmart Business prescriptive lighting calculator.

Conclusion—Prescriptive VFDs

Pacific Power's deemed savings value for prescriptive VFD projects does not account for motor service. All prescriptive VFD motor system projects in the evaluation sample used Pacific Power's deemed value to determine savings. To evaluate energy savings for these projects, the Cadmus team used the deemed savings values from Cadmus' *2014 Variable Speed Drive Loadshape Project* report, created for the NEEP

and which led to realization rates greater than 100% for all HVAC fan VFD projects. Deemed values from Cadmus' study vary based on motor use (e.g., supply, return, or exhaust).

Recommendation—Prescriptive VFDs

Based on the report's findings, the Cadmus team recommends increasing deemed savings for prescriptive VFDs serving HVAC fan projects, thus matching Cadmus' *2014 Variable Speed Drive Loadshape Project* report. Table 27 shows the savings.

Table 26. Deemed Energy Savings for HVAC Fan Projects

HVAC Fan Motor Type	Deemed Energy Savings (kWh/year/hp)*
Supply Fan Motor	2,033
Return Fan Motor	1,788
Exhaust Fan Motor	1,788

*These deemed savings values are based on the Cadmus 2014 *Variable Speed Drive Loadshape Project* report created for NEEP. This report is available online: http://www.neep.org/variable-speed-drive-loadshape-study-final-report

For central equipment (e.g., hot/chilled water pumps, condenser water pumps, cooling tower fans), the quantity of evaluated projects were insufficiently high to draw conclusions on the current deemed savings value.

Conclusion—Green Motor Rewinds

Green motor rewinds are typically performed on motors that fail or require service. Typically, while being rewound, motors are replaced by spares. After rewinding, motors can be reinstalled or kept as spares to replace other failed motors. Rewound motors can remain uninstalled for months or years. Two of the six green motor rewind projects included in the evaluation sample resulted in a 0% realization rate due to motors found in storage rather than in use.

Recommendation—Green Motor Rewinds

The Cadmus team recommends Pacific Power consider additional training to participating motor service centers regarding the need to provide more accurate estimates for when motors will be installed, as opposed to reverting to six months from the time of service. After the training or new instructions have been delivered, the Cadmus team recommends that the program begins reviewing applications and tracking estimated reinstall dates to make sure the motor service centers provide a more reliable estimate and better understand when savings may be realized. If motor replacements are estimated to occur beyond a year, the Cadmus team recommends considering prorating energy savings by project or based on an average of applications submitted.

Overall Program Management

Conclusion

Pacific Power currently provides ***watt***smart Business participants with a list of participating vendors. While useful, an opportunity exists for Pacific Power to further help participants—particularly those in the SBL channel and nonparticipants interested in the program—select the best contractors for their projects without Pacific Power recommending one contactor over another.

Recommendation

Continue enhancing the existing, customer-facing vendor search tool. This could include a rating system of participating contractors for various measure categories, based on the quality of work performed, and including ratings from program participants (similar to Yelp).

Additionally, Pacific Power could add a note or (if acceptable) a link to the Washington State Department of Labor and Industries website, where participants can search by a contractor's name to verify the contractor's licensing and worker's compensation status, and to view any infractions tracked by the state. The Cadmus team recommends Pacific Power visit the Energy Trust of Oregon website (http://www.energytrust.org/find-a-contractor/commercial/) for an example of its contractor selection tips.

Program Data Interface

Conclusion

Opportunities exist to further streamline the data exchange process between Pacific Power and the implementers, and to potentially reduce time-consuming and periodic system reconciliations.

Recommendation

Assess the size of any data exchange inconsistencies and associated impacts, and identify the most appropriate solution, which could include the following:

- Continue the same process
- Revise the implementers' databases to use drop-down menus with precise measure names and formulas, or provide look-up tables of saving/incentive amounts, and update this as needed
- Have Pacific Power revise the DSMC batch process to allow some room for variations in DSMC uploads
- Have Pacific Power provide implementers with a direct interface to the DSMC rather than using their own databases
- Have Pacific Power provide trade allies with direct access to the DSMC

Small Business Lighting

Conclusion

SBL participants stated preferences for ongoing communications about the program do not align with the most cost-effective program design for this delivery channel. Participants prefer to receive updates through ***watt***smart Business Program representatives rather than through the more cost-effective interaction method with contractors and vendors.

Recommendation

While an account management approach may not prove cost-effective, if Pacific Power chooses to grow participation in the SBL delivery channel, consider methods for increasing direct contact from Pacific Power or implementer staff. These could include expanding the "Targeted town" luncheon event format to other small business associations.

Nonparticipants

Conclusion

While Pacific Power provides partial participants and nonparticipants with program information through ***watts***mart Business Program representatives or through utility mailings, bill inserts, and the website (which matches these customers' preferred methods of being kept informed), it appears that contractor or vendor contacts more effectively drive participation. The Cadmus team speculates that contractor or vendor contacts can discuss the program and benefits in greater detail than generalized, less direct marketing provides.

Having Pacific Power or implementer staff increase one-to-one contacts with customers does not prove cost-effective because nonparticipants with non-managed accounts are frequently smaller energy users, and nonparticipants with managed and non-managed accounts are dispersed across a large number of business sectors, making them more difficult to reach them through industry-centric events.

Recommendation

Talk to contractors, vendors and distributors to gain insights into their penetration of the small business target market and to determine additional resources Pacific Power could provide to help them increase outreach to customers without an active ongoing project.

Conclusion

There is significant potential for Pacific Power to increase participation among small business owners. While these customers are situated to benefit from the program (as most own their facilities and less than one-third reported having maximized their energy efficiency), these nonparticipants with non-managed accounts appear to lack a reason to participate. Only 35% know about the program, and 70% reported barriers to participation that Pacific Power and the implementers may reduce or overcome by effectively engaging these customers.

Recommendation: If additional program growth is desired in any of the program delivery channels, consider performing a comprehensive marketing effectiveness assessment to both evaluate the impact of existing marketing and outreach activities, and to investigate how to better reach and motivate these customers.

Appendices

CADMUS

Appendix A. Self-Reported Net-to-Gross Methodology

Net-to-gross (NTG) estimates are a critical part of demand-side management program impact evaluations, because they allow utilities to determine portions of gross energy savings that were influenced by and are attributable to their DSM programs. Freeridership and participant spillover are the two NTG components calculated in this evaluation. True freeriders are customers who would have purchased an incented appliance or equipment without any support from the program (e.g. taking the incentive). Participant spillover is the amount of additional savings obtained by customers investing in additional energy-efficient measures or activities due to their program participation. Various methods can be used to estimate program freeridership and spillover; for this evaluation, the Cadmus team used self-reports from survey participants to estimate NTG for the Small Business Lighting, Prescriptive, and Custom program categories, as this method can gauge net effects for different program categories at once and enables the team to monitor freeridership and spillover over several evaluation efforts. The Cadmus team used the same net savings methodology used for the 2009-2011 and 2012-2013 Energy FinAnswer Program Evaluations and described in detail in Appendix B of the 2009-2011 evaluation report.[1] This net savings approach aligns with industry best practices summarized in the Uniform Methods Project (UMP) section discussing net savings.[2] This appendix provides a detailed description of how the evaluation team estimated NTG for the 2014-2015 ***watt***smart Business Program.

Survey Design

Using self-reported responses, the Cadmus team estimated net savings first by assessing the program's influence on the participant's decision to implement an energy efficiency project and what would have occurred absent the program's intervention. This estimation includes an examination of the program's influence on three key characteristics of the project: its timing, its level of efficiency, and it's scope (ie., size of the project). This estimate represents the amount of savings attributed to the program that would have occurred without its intervention and is often referred to as "freeridership." Cadmus then estimated program influence on the broader market as a result of the indirect effects of the program's activities. This estimate, often referred to as "spillover," represents the amounts of savings that occurred because of the program's intervention and influence but that is not currently claimed by the program. Spillover savings can be broken into two categories of savings: "participant" spillover and "non-participant" spillover. Participant spillover savings occur directly (i.e., program participants install additional energy efficient equipment), while non-participant spillover savings occur indirectly (i.e.,

[1] Final Evaluation Report For Washington's Energy FinAnswer Program (PY 2009-2011) – Appendix B: http://www.pacificorp.com/content/dam/pacificorp/doc/Energy_Sources/Demand_Side_Management/2013/WA_Energy_FinAnswer_Program_Evaluation_2009-2011.pdf

[2] The UMP chapter covering estimation of net savings is available online: http://www.nrel.gov/extranet/ump/pdfs/20131120_estimating_net_energy_savings.pdf. See also: http://ump.pnnl.gov/showthread.php/5238-Estimating-Net-Energy-Savings-Methods-and-Practices

trade allies install additional energy efficiency equipment for customers that choose not to participate as a results of the program).

Freeridership Calculation

To determine freeridership, the interview presented respondents with a series of questions regarding their decision to install the equipment promoted by the program. The Cadmus team then scored the responses to these questions to determine the level of freeridership. A score of 1.0 indicates the respondent is a complete free-rider; they would have installed the exact same equipment at the same time and in the same quantity without the program's assistance. A score of 0.0 (zero) indicates the respondent is not a free-rider; that is, without the program they either would not have installed any equipment within 12 months of when they did or they would have installed baseline efficient equipment.

As the first step in scoring, the Cadmus team reviewed the interview responses to determine if the exact same project (in terms of scope and efficiency level) would have occurred at the same time without the program. If so, the respondent is scored as a complete free-rider. If not, the team reviewed the responses to determine whether the project would have occurred at all within the same 12 month period. If not, the respondent is scored as a non-free-rider. If the project would have occurred within the same 12 month period but altered in respect to its size or efficiency level, the respondent is scored as a partial free-rider. To assess the level of partial free-ridership, the Cadmus team used the respondents' estimates of the percentage of the installed equipment that would have been high efficiency equipment (the efficiency score) and the percentage of high efficiency equipment that would have been installed within 12 months without the program (the quantity score). If the project would have occurred with some changes absent the program, the product of these two estimates is the initial free-ridership ratio or:

$$Initial\ Freeridership\ Ratio = Efficiency\ Score\ x\ Quantity\ Score$$

After scoring the initial freeridership ratio, a series of consistency check questions were reviewed. These questions asked about the influence of the program's interventions (e.g., financial incentives, technical assistance) and address the counter-factual (e.g., what would have happened without the program). For example, if the respondent stated that the financial incentive was extremely important to their decision (G9.2 = 5 – extremely important) but that they would have installed the exact same equipment at the same time without the program (G2 = Yes and G1= Yes), the interviewer asks them to describe in their own words what impact the program had on their decision (G8). During the scoring process, these responses were reviewed by analysts to determine which scenario is correct and are scored accordingly to create an adjusted freeridership score.

Finally, the freeridership score was adjusted to account for prior program participation. Given Pacific Power's efforts to cross-promote their entire portfolio of energy efficiency programs, a respondent's prior participation in a Pacific Power program may have been influential in their decision to participate in the current program. Ideally, this influence would be attributed to the prior program as spillover

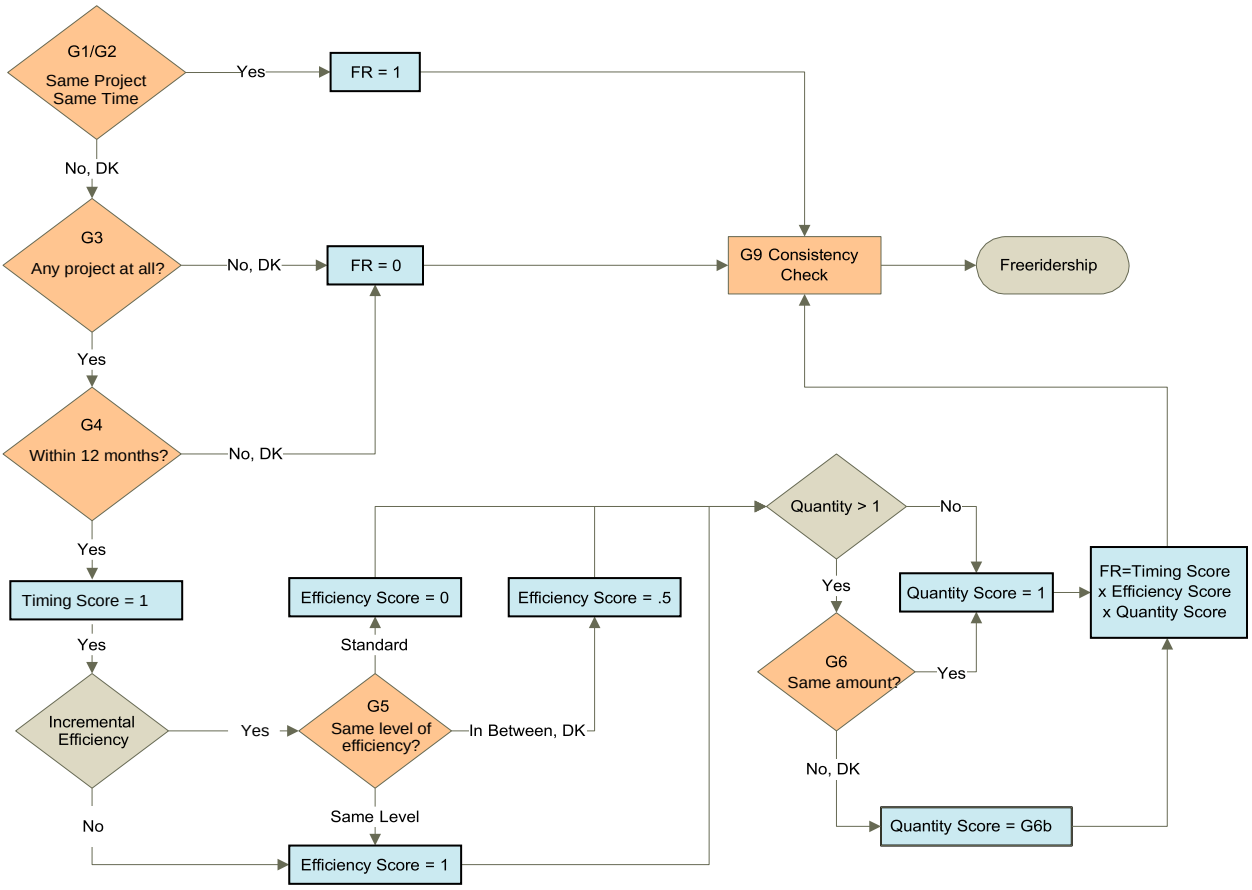
savings since that program was responsible for the influence. However, given the portfolio-level marketing approach that Pacific Power implements, respondents are unlikely to be able to identify the prior program by name. Therefore, the Cadmus team attributed the savings credit to the current program. To calculate this credit, the team reviewed the respondents' rating of the influence of the prior program. If the respondent rates their previous participation as a "4" or "5," their adjusted freeridership was reduced by either 50 percent or 75 percent respectively.

Table 1 provides detailed scoring and descriptions of each question.

Table 1. Freeridership Calculation Approach

Question	Question Text	Scoring
G1	Without the program, meaning without either the technical assistance or the financial incentive, would you have still completed the exact same [MEASURE] project?	None; qualifying question
G2	Without the program, meaning without either the technical assistance or the financial incentive, would you have still installed the [MEASURE] at the same time?	If G2=yes and G1=yes then freeridership = 1
G3	Without the program, would you have installed any [MEASURE] equipment?	If G4=no, freeridership = 0
G4	Without the program, in terms of timing, when would you have installed the [MEASURE]?	If not within 12 months of original purchase date, freeridership = 0
G5	Relative to the energy efficiency of [MEASURE] installed through the program, how would you characterize the efficiency of equipment you would have installed without the program?	If high efficiency, efficiency score = 1 If between high efficiency and baseline, efficiency score = 0.5 If baseline efficiency, efficiency score = 0
G6	Would you have installed more, less, or the same amount of [MEASURE] without the program?	If same or more, quantity score = 1 If less, quantity score = percentage of equipment not installed
G9.2	On a scale from 1 to 5, with 1 being not important at all and 5 being extremely important, how important was each of the following factors in deciding which equipment to install: information provided by Pacific Power on energy saving opportunities	Consistency Check
G9.4	On a scale from 1 to 5, with 1 being not important at all and 5 being extremely important, how important was each of the following factors in deciding which equipment to install: The Pacific Power incentive or discount	Consistency Check
G8	In your own words, can you please describe what impact the program had on your decision to complete these energy efficiency improvements for [MEASURE]?	Considered if '4' or '5-extremely important' rating from G9.2 or G9.4 Initial freeridership score is reduced by 50% if G8 response merits an adjustment
G9.6	On a scale from 1 to 5, with 1 being not important at all and 5 being extremely important, how important was each of the following factors in deciding which equipment to install: Previous participation with a Pacific Power program	If G9.6 = 5, reduce adjusted free-ridership by 75% If G9.6 = 4, reduce adjusted free-ridership by 50%

Figure 1. Freeridership Calculation Approach



Participant Spillover Calculation

For the ***watt***smart Business Program, the Cadmus team measured participant spillover by asking a sample of participants about their purchases and whether they received an incentive for a particular measure (if they installed another efficient measure or undertook another energy-efficiency activity because of their program participation). We also asked these respondents to rate the ***watt***smart Business Program's (and incentives) relative importance on their decisions to pursue additional energy-efficient activities.

The Cadmus team used a top-down approach to calculate spillover savings. We began our analysis with a subset of data containing only survey respondents who indicated they installed additional energy-savings measures after participating in the ***watt***smart Business Program. From this subset, we removed participants who said the program had little influence on their decisions to purchase additional measures, thus retaining only participants who rated the program as highly important. We also removed participants who applied for a ***watt***Smart Business Program incentive for the additional measures they installed.

The Cadmus team used evaluated program savings as a proxy to estimate the savings associated with "like" spillover projects. "Like" spillover is associated with equipment that is not similar to the equipment that is incentivized by the program. Table 1 provides detailed scoring and descriptions of each "like" spillover question.

Table 2. Participant Spillover Calculation Approach

Question	Question Text	Scoring
H1	Since participating in this program, have you purchased and installed any additional energy efficiency improvements on your own without any assistance from a utility or other organization?	If no, potential spillover savings = 0
H2	Did you purchase and install any energy efficient improvements that are the same as the [MEASURE] you installed through the program?	If no, potential spillover savings = 0
H3	How many did you purchase and install?	H3 x program-evaluated per-unit savings = potential spillover savings
H4	H4. Relative to the energy efficiency of the equipment installed through the program, how would you characterize the efficiency of this equipment?	If same as program but higher than standard, full potential spillover savings. If lower than program but higher than standard, reduce potential spillover savings by half. If standard efficiency, potential spillover savings = 0.
H5	Did you receive an incentive from Pacific Power or another organization for this equipment?	If yes, potential spillover savings = 0.
H7	On a scale from 1 to 5, with 1 being not important at all and 5 being extremely important, please rate how important your experience with the [UTILITY] [CATEGORY] program was in your decision to install [this/these] energy efficient product(s).	"4" or 5" rating results in potential spillover savings attributed to program.

As it has no comparative program savings data, "unlike" spillover can often only be characterized qualitatively. The Cadmus team asked detailed follow up questions for "unlike" spillover responses that allowed the potential for them to be credited to the program as participant spillover if adequate information was provided to estimate savings by an engineer on the team.

The Cadmus team calculated the program level spillover percentages by dividing the sum of additional spillover savings by the total incentivized gross savings achieved for all respondents in the program category:

$$Spillover\ \% = \frac{\sum Spillover\ Measure\ kWh\ Savings\ for\ All\ Program\ Category\ \ Respondents}{\sum Program\ Measure\ kWh\ Savings\ for\ All\ Program\ Category\ Respondents}$$

Appendix B. Nonparticipant Spillover

Effective program marketing and outreach generates program participation and increases general energy efficiency awareness among customers. The cumulative effect of sustained utility program marketing can affect customers' perceptions of their energy usage and, in some cases, motivate customers to take efficiency actions outside of the utility's program. This is generally called nonparticipant spillover (NPSO)—results in energy savings caused by, but not rebated through, utilities' demand-side management activities.

To understand whether Pacific Power's general and program marketing efforts generated energy efficiency improvements outside of the company's incentive programs, the Cadmus team collected spillover data through a nonparticipant survey, conducted with randomly selected nonresidential, nonparticipating customers.

Methodology

The Cadmus team randomly selected and surveyed 86 nonparticipating customers from a sample of 4,880 randomly generated nonresidential nonparticipant accounts provided by Pacific Power.

Using a 1 to 5 scale, with 1 meaning "not important at all" and 5 meaning "very important," the survey asked customers to rate the importance of several factors on their decisions to install energy efficient equipment without receiving an incentive from Pacific Power. This question determined whether Pacific Power's energy efficiency initiatives motivated energy-efficient purchases. The surveys asked respondents to address the following factors:

- General information about energy efficiency provided by Pacific Power
- Information from Pacific Power program staff or contractors
- Past participation experience participating in a Pacific Power energy efficiency program

The Cadmus team estimated NPSO savings from respondents who rated any of the above factors as "very important" for any energy-efficient actions or installations reported.

The Cadmus Team leveraged estimated gross savings for the reported measures using 2014-2015 ***watt***Smart Business Program evaluation activities.

Using the variables shown in Table 1, the Cadmus team determined total NPSO generated by Pacific Power's marketing and outreach efforts during the 2014 and 2015 program years.

Table 1. NPSO Analysis Method

Variable	Metric	Source
A	Total kWh Spillover Savings from Survey Respondents	Survey data / Engineering Analysis
B	Total Nonparticipant Customers Surveyed	Survey disposition

Variable	Metric	Source
C	Average kWh Spillover Savings Per Nonparticipant Surveyed	A ÷ B
D	Total Pacific Power Nonresidential Population - minus 2014-2015 ***watt***Smart Business Participants	Pacific Power Customer Database
E	NPSO kWh Savings Applied to Population	C x D
F	Total Gross Program Evaluated kWh Savings	2014-2015 ***watt***Smart Business Evaluation
G	NPSO as a Percentage of Total 2014-2015 ***watt***Smart Business Evaluated kWh Savings	E ÷ F

Results

Of 86 Pacific Power nonparticipant customers surveyed, five nonparticipant respondents reported installing LED lighting measures attributed to Pacific Corp's influence. Table 2 presents measures types and gross evaluated kWh savings the Cadmus team attributed to Pacific Power, generating total savings of 14,415 kWh.

Table 2. NPSO Response Summary

Reported Spillover Measure Type	Quantity	Unit Energy Savings (kWh)[1]	Total Savings (kWh)
LED Lighting	96	150.2 per unit	14,415
Total	**96**		**14,415**

[1] Unit energy savings (kWh) estimated for each measure were generated from the 2014-2015 ***watt***Smart Business program evaluated gross savings analysis. Unit energy savings represents the average savings per unit for all attributable measures for a given measure type.

Table 3 presents variables used to estimate overall NPSO for the Pacific Power nonresidential portfolio, a figure the Cadmus team estimated as 1.7% of total 2014-2015 ***watt***Smart *Business* Program evaluated savings.

Table 3. NPSO Analysis Results

Variable	Metric	Value	Source
A	Total kWh Spillover Savings from Survey Respondents	14,415	Survey data / Engineering Analysis
B	Total Nonparticipant Customers Surveyed	86	Survey disposition
C	Average kWh Spillover Savings Per Nonparticipant Surveyed	168	A ÷ B
D	Total Pacific Power Nonresidential Population - minus 2014-2015 ***watt***Smart Business Participants	4,880	Pacific Power Customer Database
E	NPSO kWh Savings Applied to Population	817,966	C x D
F	Total Gross Program Evaluated kWh Savings	49,281,534	2014-2015 ***watt***Smart Business Evaluation

G	NPSO as a Percentage of Total 2014-2015 ***watt***Smart Business Evaluated kWh Savings	1.7%	E ÷ F

CADMUS

Pacificorp *watt*smart Business Program
(2014 - 2015) Participant Survey

Researchable Questions		
Key Research Topics	**Areas of Investigation**	**Related Questions**
Screening	Project initiation process	E1
Marketing and Outreach	Program Awareness	B2-B4
	Future communication preferences	J4
Barriers	Obstacles to installing high-efficiency equipment	C2, C4, D4, D14-D15, D17-0, E2, E13-E14, E16, E17
Satisfaction	Assess satisfaction with Program application process, various program components and reasons for dissatisfaction among participants	C6-C7, D2-D3, D7-D13, E4-E5, E7-E12, F1-F4, F12-F16, J1-J3
Firmographics	Determine building and company characteristics of participants	Section I
Decision Making	Key factors influencing customers' decision to participate in program	D1, D9, D16, E1, E15, F11, F19
Freeridership and Spillover	Assess net savings	Sections G and H

Target Quota = [Up to 80 per state stratified by channel as sample population will support.]

General Instructions

- Interviewer instructions are in green **[LIKE THIS]** (the style is "Survey: Interviewer Instructions").
- CATI programming instructions are in red **[LIKE THIS]** (the style is "Survey: Programming").
- Items that should not be read by the interviewer are in parentheses like this ( ).

Variables to be pulled into Survey

- **[CONTACT NAME] CONTACT NAME**
- **[COMPANY NAME] CUSTOMER NAME**
- **[SITE ADDRESS] SITE ADDRESS**
- **[PROJECT STATE] PROJECT STATE**
- **[UTILITY] UTILITY**
- **[CHANNEL] (*WATT*SMART PROGRAM DELIVERY CHANNEL)**
- **[PROGRAM YEAR] PROGRAM YEAR**
- **[MEASURE_1] UPDATED MEASURE NAME 7/12**
- **[MEASURE_2] UPDATED MEASURE NAME 7/12 (TO BE INCLUDED FOR THOSE CUSTOMERS WITH TWO MEASURES)**
- **[INCENTIVE_1] (FOR MEASURE 1)**
- **[INCENTIVE_2] (FOR MEASURE 2)**
- **[BILL_CREDIT1] (FOR MEASURE 1)**

- **[BILL_CREDIT2] (FOR MEASURE 2)**
- [MULT_MEASURES] Flag for multiple measure participant

A. Introduction

Hello, I'm **[INSERT NAME]** calling on behalf of **[INSERT UTILITY].** May I speak with **[INSERT CONTACT NAME]**? OR **[IF NO NAME OR NAMED RESPONDENT NO LONGER WORKS FOR COMPANY]** May I speak with the FACILITY MANAGER, ENERGY MANAGER OR SOMEONE WHO IS FAMILIAR WITH THEIR PARTICIPATION IN THE PACIFIC POWER INCENTIVE FOR **[INSERT COMPANY NAME]**? **[IF THAT PERSON IS NOT AT THIS PHONE NUMBER, ASK FOR THEIR NAME AND PHONE NUMBER AND START AGAIN]**

1. **Respondent not available**: **ASK IF YOU CAN LEAVE A MESSAGE ON THEIR VM**
98. (Don't know) **[ASK TO SPEAK WITH SOMEONE WHO KNOWS AND BEGIN AGAIN]**

A1. Hello, I'm **[INSERT NAME]** calling on behalf of **[INSERT UTILITY].** Are you the person who handles energy decisions for **[INSERT COMPANY NAME]**? **[IF THAT PERSON IS NOT AT THIS PHONE NUMBER, ASK FOR THEIR NAME AND PHONE NUMBER AND START AGAIN]**

1. (Yes)
2. (No or not a convenient time) **[ASK IF RESPONDENT WOULD LIKE TO ARRANGE A MORE CONVENIENT TIME OR IF YOU CAN LEAVE A MESSAGE FOR A MORE APPROPRIATE PERSON]**
98. (Don't know) **[ASK TO SPEAK WITH SOMEONE WHO KNOWS AND BEGIN AGAIN]**
99. (Refused) **[THANK AND TERMINATE]**

A2. . Are you the person responsible for making energy-efficiency decisions for your company at the **[SITE ADDRESS]** location?

1. (Yes)
2. (No, person is able to come to phone) **[ASK FOR PERSON WHO IS AND START AGAIN]**
3. (No, person is not able to come to phone) **[GET NAME AND PHONE NUMBER, SCHEDULE CALL BACK]**
98. (Don't know) **[ASK TO SPEAK WITH SOMEONE WHO KNOWS AND BEGIN AGAIN]**
99. (Refused) **[THANK AND TERMINATE]**

A3. We are conducting an important survey today about **[INSERT UTILITY]'S *WATT*SMART BUSINESS PROGRAM**. **[INSERT UTILITY]** is actively seeking your opinions to help improve their business efficiency programs and to better understand how to assist customers in saving money and energy. This call may be monitored or recorded for quality assurances purposes. Anything you share with us today will be confidential and not attributed to any one individual or business.

1. **[IF RESPONDENT ASKS HOW LONG, SAY "Approximately 20 minutes."]**
2. **[IF NEEDED, STATE "this survey is for research purposes only and this is not a marketing call. This is the primary way for customers to provide input into the incentive programs [UTILITY] offers. Your perspectives help [UTILITY] design energy-efficiency programs to help their customers save money and energy."]**
3. **[IF CUSTOMER IS UNFAMILIAR WITH "*WATT*SMART" STATE "between 2013 and 2015 the programs energy Finanswer, Finanswer Express, Recommissioning, Self-Direction Credit, and Irrigation Energy Services, were combined under one umbrella, the W*att*smart Business Program."]**
4. **[ONLY IF ASKED FOR A [UTILITY] CONTACT TO VERIFY THE SURVEY AUTHENTICITY, offer NIKKI KARPAVICH, 801-220-4439.**

B. Screeners

B1. Our records show that you installed energy efficient equipment including **[MEASURE1]**, and **[MEASURE2]**, at **[INSERT SITE ADDRESS]** in **[INSERT PROGRAM YEAR]**? Is this correct? **[IF NEEDED:** "General Illuminance includes interior or exterior lighting and controls." **OR** "NON-general illuminance includes exit signs, LED signs, LED case lighting, and refrigerator case occupancy sensors."**]**

1. (Yes)
2. (No, wrong year) [RECORD CORRECT YEAR IF POSSIBLE]
3. (No, wrong address) [RECORD CORRECT ADDRESS]
4. (No, wrong measure) [CORRECT BELOW]
   (MEASURE1 IS INCORRECT [Correct: _____]) [CALL THIS VARIABLE C_MEASURE1]
   (MEASURE2 IS INCORRECT [Correct: _____]) [CALL THIS VARIABLE C_MEASURE2]
5. (No, I did not participate) [THANK AND TERMINATE]

98. (Don't know) [ask to speak with someone who would know and start again **AT A2. IF NO ONE, THEN** THANK AND TERMINATE**]**
99. (Refused) [THANK AND TERMINATE]

B2. To ensure our records are correct, can you confirm that you received an incentive for [If 1 measure insert: this / If 2 measures insert: these] upgrades? The incentive may have been in the form of a check from the utility, a utility bill credit, an instant incentive on the product you purchased or a discount applied to your project invoice.

1. (Yes)
2. (No) [THANK AND TERMINATE]
98. (Don't know) **[ASK TO SPEAK WITH SOMEONE WHO WOULD KNOW AND START AGAIN AT A2. IF NO ONE, THEN** THANK AND TERMINATE**]**
99. (Refused) [THANK AND TERMINATE]

B3. How did your organization learn about the incentives or discounts available for this project? **[DO NOT READ LIST; MULTIPLE RESPONSES POSSIBLE]**

1. (Contact with *watt*smart Business representative through phone, email, or in person)
2. (*watt*smart printed program materials)
3. (*watt*smart sponsored workshop or event)
4. (Contact with utility representative)
5. (Utility mailing, bill insert, or utility Website)
6. (I contacted my contractor/vendor to ask)
7. (My contractor/vendor let me know about them)
8. (Previously participated in program/received an incentive)
9. (Through a trade association or professional organization) [SPECIFY: _____])
10. **[IF CHANNEL = MIDSTREAM]** (Through the store where I purchased the LEDs)
11. (Word of mouth (family, friend, or business colleague)
12. (Other [SPECIFY: _____])
98. (Don't know)
99. (Refused)

B4. **[UTILITY]** recently combined its business energy efficiency incentive programs under one name—*watt*smart Business. Before this call today had you heard of the *watt*smart Business program? **[IF NEEDED: THE PROGRAMS COMBINED INTO WATTSMART BUSINESS ARE: ENERGY FINANSWER, FINANSWER EXPRESS, RECOMMISSIONING, SELF-DIRECTION CREDIT, AND IRRIGATION ENERGY SERVICES]**

1. (Yes)
2. (No)
98. (Don't know)
99. (Refused)

[IF CHANNEL = MIDSTREAM ASK SECTION C]

C. *Midstream (LED Instant Incentives) SECTION C –MIDSTREAM NOT ASKED THIS VERSION*

Thank you. I'd like to ask you about the LEDs you purchased through the LED Instant Incentive program. This is the midstream program where you may have purchased LEDs through an electrical or lighting distributor or supplier.

C1. Did your company purchase your LED lighting direct from a retailer or a distributor? **[DO NOT READ LIST; RECORD ONE ANSWER]**?

1. (Retailer)
2. (Distributor)
3. (Other) **[SPECIFY: _____]**

98. (Don't know)
99. (Refused)

[IF C1=1, 2, OR 3]

C2. How easy was it to find a **[INSERT ANSWER FROM C1]** offering the instant incentive? Would you say…? **[READ LIST]**

1. Very easy
2. Somewhat easy
3. Not too easy
4. Not at all easy

98. (Don't know)
99. (Refused)

[IF C2=2, 3 OR 4]

C3. What would have made it easier?

1. **[RECORD VERBATIM: _____]**

98. (Don't know)
99. (Refused)

C4. How easy was it to find the LED product you wanted to purchase? Would you say…? **[READ LIST]**

1. Very easy
2. Somewhat easy
3. Not too easy
4. Not at all easy

98. (Don't know)
99. (Refused)

[IF C4=2, 3 OR 4]

C5. What would have made it easier?

1. **[RECORD VERBATIM: _____]**
98. (Don't know)
99. (Refused)

C6. Thinking about the instant incentive you received, how satisfied were you with the amount of the instant incentive? Would you say you were…? **[READ LIST]**

1. Very satisfied
2. Somewhat satisfied
3. Not too satisfied
4. Not satisfied at all
98. (Don't know)
99. (Refused)

[IF C6=2, 3 OR 4]

C7. Because you responded that you are less than very satisfied, we'd like to ask you three follow-up questions.

C7.1 What incentive amount would have been enough for you to say you were very satisfied?

[RECORD VERBATIM: _____

98. (Don't know)
99. (Refused)

C7.2 What return on investment does your company typically look for on these kinds of projects?

[RECORD VERBATIM: _____

98. (Don't know)
99. (Refused)

C7.3 What payback period does you company typically look for on these kinds of projects?

[RECORD VERBATIM: _____

98. (Don't know)
99. (Refused)

[IF CHANNEL = SMALL BUSINESS-LIGHTING (SBL) ASK SECTION D]

D. Small Business-Lighting (SBL) Incentives

Thank you. I'd like to ask you about your participation in the Small Business lighting incentives.

D1. What factor was most important to your company's decision to participate in the Small Business lighting incentives? **[DO NOT READ LIST; RECORD ONE RESPONSE]**

1. (To save money on energy bills, reduce energy consumption or energy demand)
2. (To obtain a program incentive)
3. (To obtain a tax credit)
4. (To replace old (but still functioning) equipment)
5. (To replace broken equipment)
6. (To improve productivity)
7. (To improve lighting quality)
8. (Other **[SPECIFY_____]**)

98. (Don't know)
99. (Refused)

D2. Thinking about the incentive or discount that was applied to your project invoice by the approved contractor, how satisfied were you with the amount of the incentive or discount? Would you say you were…? **[READ LIST]**

1. Very satisfied
2. Somewhat satisfied
3. Not too satisfied
4. Not satisfied at all

98. (Don't know)
99. (Refused)

[IF D2=2, 3 OR 4]

D3. Because you responded that you are less than very satisfied, we'd like to ask you three follow-up questions.

D3.1 What incentive or discount amount would have been enough for you to say you were very satisfied?

RECORD VERBATIM: _____

98. (Don't know)
99. (Refused)

[NOT ASKED] D3.2 What return on investment does your company typically look for on these kinds of projects?

RECORD VERBATIM: _____

98. (Don't know)
99. (Refused)

D3.3 What payback period does you company typically look for on these kinds of projects?

RECORD VERBATIM: _____

98. (Don't know)
99. (Refused)

D4. How easy was it to find a *watt*smart Small Business approved contractor to conduct your free facility assessment? Would you say…? **[READ LIST]**

1. Very easy
2. Somewhat easy
3. Not too easy
4. Not at all easy
98. (Don't know)
99. (Refused)

[IF D4=2, 3 OR 4]

D5. What would have made it easier to find a *watt*smart Small Business approved contractor?

1. **[RECORD VERBATIM: _____]**
98. (Don't know)
99. (Refused)

D6. After the free facility assessment, did you receive a lighting proposal with estimates of your energy incentive and cost savings?

1. (Yes)
2. (No**) [SKIP TO D10]**
98. (Don't know) **[SKIP TO D10]**
99. (Refused) **[SKIP TO D10]**

[IF D6=1]

D7. How satisfied were you with the lighting proposal provided by the contractor? Would you say…? **[READ LIST]**

1. Very satisfied
2. Somewhat satisfied
3. Not too satisfied
4. Not satisfied at all
98. (Don't know)
99. (Refused)

[IF D7=2, 3 OR 4]

D8. How could the lighting proposal be improved? **[RECORD VERBATIM: _____]**

98. (Don't know)
99. (Refused)

[IF D6=1]

D9. What information in the lighting proposal was most influential in your decision to proceed with your project….? **[PROBE FOR SPECIFICS OF WHAT WAS INFLUENTIAL]**

1. **[RECORD VERBATIM: _____]**
2. Nothing

98. (Don't know)
99. (Refused)

D10. How satisfied were you with the work provided by the contractor? Would you say…? **[READ LIST]**

1. Very satisfied
2. Somewhat satisfied
3. Not too satisfied
4. Not satisfied at all

98. (Don't know)
99. (Refused)

[IF D10=2, 3 OR 4]

D11. Why do you say you were **[INSERT ANSWER FROM D10]** with the work provided by the contractor?

1. **[RECORD VERBATIM: _____]**

98. (Don't know)
99. (Refused)

D12. How satisfied were you with the equipment provided by the contractor? Would you say…? **[READ LIST]**

1. Very satisfied
2. Somewhat satisfied
3. Not too satisfied
4. Not satisfied at all

98. (Don't know)
99. (Refused)

[IF D12=2, 3 OR 4]

D13. Why do you say you were **[INSERT ANSWER FROM D12]** with the equipment provided by the contractor?

1. **[RECORD VERBATIM: _____]**
98. (Don't know)
99. (Refused)

D14. Was there other lighting equipment you wanted to install, which did not qualify for Small Business-Lighting incentives?

1. (Yes)
2. (No)
98. (Don't know)
99. (Refused)

[IF D14=1]

D15. What equipment?

1. **[RECORD VERBATIM: _____]**
98. (Don't know)
99. (Refused)

D16. What would you say are the main benefits your company has experienced as a result of the lighting equipment installed? [DO NOT READ LIST; RECORD ALL THAT APPLY; PROBE FOR MULTIPLE RESPONSES]

1. (The incentive)
2. (Using less energy, reducing energy consumption or energy demand)
3. (Saving money on our utility bills; lower energy bills)
4. (Increased occupant comfort)
5. (Better aesthetics/better or brighter lighting)
6. (Increased productivity)
7. (Saving money on maintenance costs)
8. (Other **[SPECIFY: _____]**)
9. (NO BENEFITS)
98. (Don't know)
99. (Refused)

D17. What challenges, if any, did you encounter participating in the Small Business-Lighting incentives?

1. **[SPECIFY: _____]**
2. (No challenges)
98. (Don't know)
99. (Refused)

[ASK IF D17=1]

D18. What could [UTILITY] do to help your company overcome these challenges? [DO NOT READ LIST, ALLOW MULTIPLE RESPONSES]

1. (Nothing)
2. (Higher incentives)
3. (Offer low-interest loans/financing)
4. (Simplify the paperwork)
5. (Provide better/more information about program
6. (Other [RECORD VERBATIM ANSWER_____])
98. (Don't know)
99. (Refused)

[ASK IF D18=5]

D18.5 You mentioned providing better information about the program. What type of information do you need? **[SPECIFY: _____]**

D19. Do you have any suggestions for improving the Small Business-Lighting incentives?

1. (Yes) **[SPECIFY: _____]**
2. (No)
98. (Don't know)
99. (Refused)

[IF CHANNEL = PRESCRIPTIVE AND B1=1, 2, 3, OR 4 ASK SECTION E]

E. Prescriptive Lighting and Equipment Upgrades

Thank you. I'd like to ask you about your project where you installed [INSERT MEASURE1 AND MEASURE2].

E1. I'm going to read you a short list. Please tell me who, if anyone, was involved in helping you initiate your project where you installed [INSERT MEASURE1 OR C_MEASURE1, AND MEASURE2 OR C_MEASURE2]. **[READ LIST AND MARK 1= YES, 2=NO, 98=DON'T KNOW; 99 REFUSED FOR EACH] [RANDOMIZE LIST]**

1. A *watt*smart Business participating vendor
2. Your independent consultant
3. Other **[SPECIFY: _____]**
98. (Don't know)
99. (Refused)

E2. Thinking about the general application and any supplemental equipment applications you submitted, how easy would you say this paperwork was to complete? Would you say…? [READ LIST]

1. Very easy,
2. Somewhat easy,
3. Not too easy, or
4. Not at all easy?
98. (Don't know)
99. (Refused)

[ASK IF E2=2, 3 OR 4]

E3. What would have made this paperwork easier to complete?

1. **[RECORD VERBATIM: _____]**
98. (Don't know)
99. (Refused)

E4. Thinking about the incentive you received for this project, were you satisfied with the amount of the incentive? Would you say…? **[READ LIST]**

1. Very satisfied
2. Somewhat satisfied
3. Not too satisfied
4. Not satisfied at all
98. (Don't know)
99. (Refused)

[IF E4=2, 3 OR 4]

E5. Because you responded that you are less than very satisfied, we'd like to ask you three follow-up questions.

E5.1 What incentive amount would have been enough for you to say you were very satisfied?

[RECORD VERBATIM: _____

98. (Don't know)
99. (Refused)

[NOT ASKED] E5.2 What return on investment does your company typically look for on these kinds of projects? **[RECORD VERBATIM: _____]**

98. (Don't know)
99. (Refused)

E5.3 What payback period does you company typically look for on these kinds of projects? **[RECORD VERBATIM: _____]**

98. (Don't know)
99. (Refused)

E6. About how long did it take the incentive to arrive? **[READ LIST]**

1. 1-3 weeks
2. 4-6 weeks
3. 7-8 weeks
4. Over 8 weeks
5. (Has not yet arrived?)
98. (Don't know)
99. (Refused)

[IF E6=1, 2, 3, OR 4]

E7. How satisfied were you with the amount of time it took to receive the incentive? Would you say...? **[READ LIST]**

1. Very satisfied
2. Somewhat satisfied
3. Not too satisfied
4. Not satisfied at all
98. (Don't know)
99. (Refused)

[IF E7=2, 3 OR 4]

E8. What amount of time would have been appropriate? **[RECORD VERBATIM: _____]**

98. (Don't know)
99. (Refused)

Thank you, now I'd like to ask you a few questions about the implementation of your project.

[IF E1=1] [ASK E9-E12 FOR EACH MEASURE]

E9. How satisfied were you with the work provided by the **PARTICIPATING VENDOR FOR MEASURE]**? Would you say…? **[READ LIST]**

1. Very satisfied
2. Somewhat satisfied
3. Not too satisfied
4. Not satisfied at all
98. (Don't know)
99. (Refused)

[IF E9=2, 3 OR 4]

E10. Why do you say that?

1. **[RECORD VERBATIM: _____]**
98. (Don't know)
99. (Refused)

E11. How satisfied were you with the **[MEASRURE]** you installed? Would you say…? **[READ LIST]**

1. Very satisfied
2. Somewhat satisfied
3. Not too satisfied
4. Not satisfied at all
98. (Don't know)
99. (Refused)

[IF E11=2, 3 OR 4]

E12. Why do you say that?

1. **[RECORD VERBATIM: _____]**
98. (Don't know)
99. (Refused)

E13. Was there other energy-efficient equipment you wanted to install, which did not qualify for *watt*smart Business prescriptive incentives?

1. (Yes)
2. (No)
98. (Don't know)
99. (Refused)

[IF E13=1]

E14. What equipment?

1. **[RECORD VERBATIM: _____]**
98. (Don't know)
99. (Refused)

E15. What would you say are the main benefits your company has experienced as a result of the energy-efficient equipment installed? [DO NOT READ LIST; RECORD ALL THAT APPLY; PROBE FOR MULTIPLE RESPONSES]

1. (The incentive)
2. (Using less energy, reducing energy consumption or energy demand)
3. (Saving money on our utility bills; lower energy bills)
4. (Increased occupant comfort)
5. (Better aesthetics/better or brighter lighting)
6. (Increased productivity)
7. (Saving money on maintenance costs)
8. (Other **[SPECIFY: _____]**)
9. (NO BENEFITS)
98. (Don't know)
99. (Refused)

E16. What challenges, if any, did you encounter participating in the *watt*smart Business program prescriptive incentives?

1. **[SPECIFY: _____]**
2. (No challenges)
98. (Don't know)
99. (Refused)

[IF E16=1]

E17. What could [UTILITY] do to help your company overcome these challenges? [DO NOT READ LIST, ALLOW MULTIPLE RESPONSES]

1. (Nothing)
2. (Higher incentives)
3. (Offer low-interest loans/financing)
4. (Simplify the paperwork)
5. (Provide better/more information about program)
6. (Other [RECORD VERBATIM ANSWER_____])
98. (Don't know)
99. (Refused)

[ASK IF E17=5]

E17.5 You mentioned you would like more information. What type of information do you need? **[RECORD VERBATIM: _____]**

[IF CHANNEL = CUSTOM AND B1=1, 2, 3 OR 4 ASK SECTION F] OR [IF CHANNEL = CUSTOM-RECOMMISSIONING AND B1=1, 2, 3 OR 4 ASK SECTION F]

F. Custom and Custom-Recommissioning Projects

Thank you. I'd like to ask you about your **[IF CUSTOM CHANNEL INSERT "CUSTOM ENERGY EFFICIENCY". IF CUSTOM-RECOMMISSIONING CHANNEL INSERT "RECOMMISSIONING"]** project.

F1. Thinking about your project, how satisfied are you with your experience with the Energy Engineer provided by **[UTILITY]**? Are you … **[READ LIST]**

1. Very satisfied
2. Somewhat satisfied
3. Not too satisfied
4. Not satisfied at all

98. (Don't know)
99. (Refused)

[IF F1=2, 3, OR 4]

F2. Why do you say you were **[INSERT ANSWER FROM F1]** with the Energy Engineer?

1. **[RECORD VERBATIM: _____]**

98. (Don't know)
99. (Refused)

F3. Thinking about your project, how satisfied are you with your interaction with **[UTILITY]**? Are you … **[READ LIST]**

1. Very satisfied
2. Somewhat satisfied
3. Not too satisfied
4. Not satisfied at all

98. (Don't know)
99. (Refused)

[IF F3=2, 3, OR 4]

F4. Why do you say you were **[INSERT ANSWER FROM F3]** with **[UTILITY]**?

1. **[RECORD VERBATIM: _____]**

98. (Don't know)
99. (Refused)

F5. Thinking about the general application you submitted, how easy would you say this paperwork was to complete? Would you say…? [READ LIST]

1. Very easy,
2. Somewhat easy,
3. Not too easy
4. Not at all easy
98. (Don't know)
99. (Refused)

[ASK IF F5=2, 3 or 4]

F6. What would have made this paperwork easier to complete?

1. **[RECORD VERBATIM: _____]**
98. (Don't know)
99. (Refused)

F7. Did your company participate in a pre-inspection to identify the equipment options available to receive incentives?

1. (Yes)
2. (No)
98. (Don't know)
99. (Refused)

[IF F7=1]

F8. Following the pre-inspection, the Program provides a custom energy analysis to identify efficiency measures, energy savings, costs, incentives and payback. Did your company receive this custom energy analysis?

1. (Yes)
2. (No)
98. (Don't know)
99. (Refused)

[IF F8=1]

F9. And thinking about the custom energy analysis, how useful was the information you received? Would you say…? **[READ LIST]**

1. Very useful,
2. Somewhat useful,
3. Not too useful, or
4. Not useful at all?

98. (Don't know)
99. (Refused)

[IF F9=2, 3 or 4]

F10. What would have made the information more useful to you? **[RECORD VERBATIM: _____]**

98. (Don't know)
99. (Refused)

[IF F8=1]

F11. What information in the custom energy analysis was most influential in your decision to proceed with your project….? **[PROBE FOR SPECIFICS OF WHAT WAS INFLUENTIAL]**

1. **[RECORD VERBATIM: _____]**
2. (Nothing)

98. (Don't know)
99. (Refused)

F12. And now thinking about the incentive you received, how satisfied were you with the amount of the incentive? Would you say…? **[READ LIST]**

1. Very satisfied
2. Somewhat satisfied
3. Not too satisfied
4. Not satisfied at all

98. (Don't know)
99. (Refused)

[IF F12=2, 3 OR 4]

F13. Because you responded that you are less than very satisfied, we'd like to ask you three follow-up questions.

F13.1 What incentive amount would have been enough for you to say you were very satisfied?

RECORD VERBATIM: _____

98. Don't know)
99. (Refused)

[NOT ASKED] F13.2 What return on investment does your company typically look for on these kinds of projects?

RECORD VERBATIM: _____

98. (Don't know)
99. (Refused)

F13.3 What payback period does you company typically look for on these kinds of projects?

RECORD VERBATIM: _____

98. (Don't know)
99. (Refused)

F14. About how long did it take the incentive to arrive? **[READ LIST]**

1. 1-3 weeks
2. 4-6 weeks
3. 7-8 weeks
4. Over 8 weeks
5. (Has not yet arrived?)

98. (Don't know)
99. (Refused)

[IF F14=1, 2, 3, or 4]

F15. How satisfied were you with the amount of time it took to receive the incentive? Would you say…? **[READ LIST]**

1. Very satisfied
2. Somewhat satisfied
3. Not too satisfied
4. Not satisfied at all

98. (Don't know)
99. (Refused)

[IF F15=2, 3 or 4]

F16. What amount of time would have been appropriate? **[RECORD VERBATIM: _____]**

98. (Don't know)
99. (Refused)

F17. Were there other energy-efficiency measures or equipment you wanted to install, which did not qualify for *watt*smart Business **[IF CUSTOM CHANNEL INSERT "CUSTOM INCENTIVES". IF CUSTOM-RECOMMISSIONING CHANNEL INSERT "RECOMMISSIONING INCENTIVES"]**?

1. (Yes)
2. (No)
98. (Don't know)
99. (Refused)

[IF F17=1]

F18. What equipment?

1. **[RECORD VERBATIM: _____]**
98. (Don't know)
99. (Refused)

F19. What would you say are the main benefits your company has experienced as a result of the energy efficiency upgrades we've discussed? [DO NOT READ LIST; RECORD ALL THAT APPLY; PROBE FOR MULTIPLE RESPONSES]

1. (The incentive)
2. (Using less energy, reducing energy consumption or energy demand)
3. (Saving money on our utility bills; lower energy bills)
4. (Increased occupant comfort)
5. (Better aesthetics/better or brighter lighting)
6. (Increased productivity)
7. (Saving money on maintenance costs)
8. (Technical expertise provided by the Program)
9. (Recommendations and information contained in the energy analysis)
10. (Other **[SPECIFY: _____]**)
11. (NO BENEFITS)
98. (Don't know)
99. (Refused)

F20. What challenges, if any, did you encounter participating in the *watt*smart Business Program **[IF CUSTOM CHANNEL INSERT "CUSTOM INCENTIVES". IF CUSTOM-RECOMMISSIONING CHANNEL INSERT "RECOMMISSIONING INCENTIVES"]** ?

1. **[SPECIFY: _____]**
2. (No challenges)
98. (Don't know)
99. (Refused)

[ASK IF F20=1]

F21. What could [UTILITY] have done to help your company overcome these challenges? [DO NOT READ LIST, ALLOW MULTIPLE RESPONSES]

1. (Nothing)
2. (Higher incentives)
3. (Offer low-interest loans/financing)
4. (Simplify the paperwork)
5. (Provide better/more information about program)
6. (Other [RECORD VERBATIM ANSWER_____])
98. (Don't know)
99. (Refused)

[ASK IF F21=5]

F21.5 You mentioned you would like more information. What type of information do you need?

F22. **[RECORD VERBATIM_____]**

[ASK ALL SURVEY RESPONDENTS SECTIONS G, H, I AND J]

G. Freeridership

[IF MULT_MEASURES=1, say "I'll be asking the next questions first about [MEASURE_1/C_MEASURE1 and again for MEASURE_2/C_MEASURE2] **[IF NEEDED:** "General Illuminance includes interior or exterior lighting and controls." **OR** "NON-general illuminance includes exit signs, LED signs, LED case lighting, and refrigerator case occupancy sensors."**]**

[ASK QUESTIONS G1 TO G8 FOR EACH MEASURE_# (MEASURE_1/C_MEASURE1 AND MEASURE_2/C_MEASURE2]

G1. Without the program, meaning without either the technical assistance or the financial incentive, would you have still completed the exact same [MEASURE_#] project?

1. (Yes)
2. (No) [SKIP TO G3]
98. (Don't know) [SKIP TO G3]
99. (Refused) [SKIP TO G3]

G2. Without the program, meaning without either the technical assistance or the financial incentive, would you have still installed the [MEASURE _#] at the same time?

1. (Yes) [SKIP TO G7]
2. (No) [SKIP TO G4]
98. (Don't know) [SKIP TO G4]
99. (Refused) [SKIP TO G4]

G3. Without the program, would you have installed any [MEASURE _#] equipment?

1. (Yes)
2. (No) [SKIP TO G8]
98. (Don't know) [SKIP TO G8]
99. (Refused) [SKIP TO G8]

G4. Without the program, in terms of timing, when would you have installed the [MEASURE _#]?

1. Within one year from original participation date
2. In one to two years from original participation date
3. More than two years from original participation date [SKIP TO G8]
98. (Don't know)
99. (Refused)

G5. Relative to the energy efficiency of [MEASURE _#] installed through the program, how would you characterize the efficiency of equipment you would have installed without the program?

1. Just as efficient as installed with the program
2. Lower than installed through the program, but better than standard efficiency
3. Standard efficiency
98. (Don't know)
99. (Refused)

G6. Would you have installed more, less, or the same amount of [MEASURE _#] without the program?

1. (More)
   G6a. Compared to the installed amount, how much more?
   [RECORD PERCENTAGE: _____]
2. (Less)
   G6b. Compared to the installed amount, how much less?
   [RECORD PERCENTAGE: _____]
98. (Don't know)
99. (Refused)

G7. Prior to hearing about the program, was the cost of [MEASURE _#] included in your organization's most recent capital budget?

1. (Yes)
2. (No)
98. (Don't know)
99. (Refused)

G8. In your own words, can you please describe what impact the program had on your decision to complete these energy efficiency improvements for [MEASURE _#]?
[REPEAT QUESTIONS G1 TO G8 FOR MEASURE2/C_MEASURE2 IF MULT_MEASURES=1]

G9. With the [CHANNEL] program, your company received financial incentives, or credits, or discounts **[IF INCENTIVES/BILL CREDIT ARE PROVIDED IN DATA BASE READ,** "of [INCENTIVE 1] or [BILL CREDIT1] and [INCENTIVE 2] or [BILL CREDIT2] for installing [MEASURE_1/C_MEASURE1] and [MEASURE_2/C_MEASURE2]. [IF CHANNEL=PRESCRIPTIVE add "You may have also received technical assistance identifying energy saving opportunities"].

For the [MEASURE_1/C_MEASURE1] and [MEASURE_2/C_MEASURE2] purchases, on a scale from 1 to 5, with 1 being not important at all and 5 being extremely important, how important was each of the following factors in deciding which equipment to install. If a factor is not applicable to you, please say so. [NOTE: Respondents can also state that a particular factor is Not Applicable, please code N/A as 6]

1. Recommendation from contractor or vendor
2. Information provided by **[UTILITY]** on energy saving opportunities
3. Information on payback
4. The [UTILITY] incentive or discount
5. Familiarity with this equipment
6. Previous participation with a [UTILITY] program

H. Spillover

H1. Now I'd like to ask about energy efficiency improvements other than those you installed through the program. Since participating in this program, have you purchased and installed any additional energy efficiency improvements on your own without any assistance from a utility or other organization?

1. (Yes)
2. (No) **[SKIP TO SECTION I]**
98. (Don't know) **[SKIP TO SECTION I]**
99. (Refused) **[SKIP TO SECTION I]**

[IF MULT_MEASURES=1, say "I'll be asking the next questions first about MEASURE_1 OR C_MEASURE1 and again for MEASURE_2 OR C_MEASURE2]

[ASK QUESTIONS H2 TO H8 FOR EACH MEASURE_# (MEASURE_1/C_MEASURE1 AND MEASURE_2/C_MEASURE2)]

H2. Did you purchase and install any energy efficient improvements that are the same as the [MEASURE _#] you installed through the program?

1. (Yes)
2. (No) [IF MULTI_MEASURES=1 SET MEASURE_#=MEASURE_2 AND GO BACK/RE-ASK H2; ELSE GO TO H9]
98. (Don't know) [IF MULTI_MEASURES=1 SET MEASURE_#=MEASURE_2 AND GO BACK/RE-ASK H2; ELSE GO TO H9]
99. (Refused) [IF MULTI_MEASURES=1 SET MEASURE_#=MEASURE_2 AND GO BACK/RE-ASK H2; ELSE GO TO H9]

H3. How many did you purchase and install?

1. [RECORD RESPONSE]
98. (Don't know)
99. (Refused)

H4. Relative to the energy efficiency of the equipment installed through the program, how would you characterize the efficiency of this equipment?

1. Just as efficient as installed through the program
2. Lower than installed through the program, but better than the standard efficiency
3. Standard efficiency
98. (Don't know)
99. (Refused)

H5. Did you receive an incentive from [UTILITY] or another organization for this equipment?

1. (Yes)
2. (No)
98. (Don't know)
99. (Refused)

[ASK IF H5=1]

H6. What program or sponsor provided the incentive?

1. **[ENTER PROGRAM OR UTILTIY]**
98. (Don't know)
99. (Refused)

H7. On a scale from 1 to 5, with 1 being not important at all and 5 being extremely important, please rate how important your experience with the [UTILITY] [CHANNEL] program was in your decision to install [this/these] energy efficient product(s).

1. RECORD RATING: _____]
98. (Don't know)
99. (Refused)

[ASK IF H5=2]

H8. Why did you not apply for an incentive from [UTILITY] for this equipment?

1. [RECORD RESPONSE]
98. (Don't know)
99. (Refused)

[REPEAT H2 TO H8 FOR MEASURE_2/C_MEASURE2 IF MULT_MEASURES=1]

H9. In **[PROGRAM YEAR]** did you purchase and install any ***other*** energy efficiency improvements on your own without any assistance (financial or technical) from a utility, vendor or other organization?

1. (Yes)
2. (No) **[SKIP TO SECTION I]**
98. (Don't know) **[SKIP TO SECTION I]**
99. (Refused) **[SKIP TO SECTION I]**

H10. What type of equipment did you install? **[DO NOT READ LIST. RECORD ALL THAT APPLY]**

1. (Lighting equipment)
2. (HVAC equipment (heating and cooling))
3. (Water heating equipment)
4. (Variable drive)
5. (Efficient motor)
6. (Refrigeration equipment)
7. (Building envelope measure)
8. (Compressed air equipment)
9. (Chiller)
10. (Pump)
11. (Irrigation equipment (gaskets, drains, sprinklers))
12. (Other) **[SPECIFY]**: _____
13. (None of the above) **[SKIP TO SECTION I]**
98. (Don't know) **[SKIP TO SECTION I]**
99. (Refused) **[SKIP TO SECTION I]**

[ASK H10.11-H10.14 AND H11-H15 if H10=1]

H10.11 What type of lighting was purchased and installed? **[SPECIFY TYPE EXAMPLE: CFL, LED, FLUORESCENT]**: _____
H10.12 What is the wattage of the lighting? **[SPECIFY]**: _____
H10.13 In what location was it installed (Wall/Ceiling/Outdoors)? **[SPECIFY]**: _____
H10.14 What type of equipment was removed or replaced? **[SPECIFY]**: _____

[ASK H10.21-H10.24 AND H11-H15 if H10=2]

H10.21 What type of HVAC equipment was purchased and installed? **[SPECIFY TYPE]**: _
H10.22 What Fuel type is used? **[SPECIFY]**: _____
H10.23 What is the efficiency rating of the equipment? **[SPECIFY]**: _____
H10.24 What is the capacity of the equipment? **[SPECIFY]**: _____

[ASK H10.31-H10.34 AND H11-H15 if H10=3]

H10.31 What type of water heating equipment was purchased and installed? **[SPECIFY TYPE]**: _____
H10.32 What Fuel type is used? **[SPECIFY]**: _____
H10.33 What is the efficiency rating of the equipment? **[SPECIFY]**: _____
H10.34 (If water heater with storage) What is the capacity of the equipment? **[SPECIFY]**:

[ASK H10.41-H10.42 AND H11-H15 if H10=4]

H10.41 What type of motor was it installed on? **[SPECIFY TYPE]**: _____
H10.42 What is the horsepower of the motor? **[SPECIFY]**: _____

[ASK H10.51-H10.52 AND H11-H15 if H10=5]

H10.51 What equipment was the motor installed on? **[SPECIFY TYPE]**: _____
H10.52 What is the horsepower of the motor? **[SPECIFY]**: _____

[ASK H10.61 AND H11-H15 if H10=6]

H10.61 What type of refrigeration equipment was purchased and installed? **[SPECIFY TYPE]**: _____

[ASK H10.71-H10.73 AND H11-H15 if H10=7]

H10.71 What building envelope measure was purchased and installed? **[SPECIFY TYPE]**:
H10.72 What is the efficiency (R-value) of the measure? **[SPECIFY]**: _____
H10.73 In what location was it installed (Wall/Roof/Floor)? **[SPECIFY]**: _____

[ASK H10.81-H10.82 AND H11-H15 if H10=8]

H10.81 FOR What type of application was the compressed air equipment purchased and installed? **[SPECIFY APPLICATION]**: _____
H10.82 What is the horsepower of the compressor motor? **[SPECIFY]**: _____

[ASK H10.91-H10.92 AND H11-H15 if H10=9]

H10.91 FOR What type of application was the chiller purchased and installed? **[SPECIFY APPLICATION]**: _____
H10.92 What size chiller did you install? **[SPECIFY]**: _____

[ASK H10.101-H10.103 AND H11-H15 if H10=10]

H10.101 FOR What type of application was the pump purchased and installed? **[SPECIFY APPLICATION]**: _____
H10.102 What is the horsepower of the motor for the pump? **[SPECIFY]** _____
H10.103 What is the efficiency rating of the pump? **[SPECIFY]**: _____

[ASK H10.111 AND H11-H15 if H10=11]

H10.111 WHAT IRRIGATION EQUIPMENT DID YOU purchase and install? **[SPECIFY GASKETS, DRAINS, SPRINKLERS, ETC.]**: _____

[ASK IF H10=1-12] [ASK ABOUT EACH ITEM MENTIONED IN H10]

H11. How many did you purchase and install? [ASK FOR EACH MEASURE MENTIONED IN H10] [IF H10 MEASURE = 'BUILDING ENVELOPE' THEN ASK HOW MANY 'SQUARE FEET']

1. [RECORD RESPONSE]
98. (Don't know)
99. (Refused)

[ASK IF H10=1-12] [ASK ABOUT EACH ITEM MENTIONED IN H10]

H12. Just to confirm, did you receive an incentive from [UTILITY] or another organization for this equipment? [ASK FOR EACH MEASURE MENTIONED IN H10]

1. (Yes)
2. (No)
98. (Don't know)
99. (Refused)

[ASK FOR EACH YES IN H12]

H13. What utility or organization provided the incentive? [ASK FOR EACH MEASURE MENTIONED IN H10]

1. **[RECORD UTILITY OR ORGANIZATION]**
98. (Don't know)
99. (Refused)

[ASK IF H10=1-12] [ASK ABOUT EACH ITEM MENTIONED IN H10]

H14. What information did you rely upon to determine that the equipment installed was energy efficient? [ASK FOR EACH MEASURE MENTIONED IN H10]

1. **[RECORD RESPONSE]**
98. (Don't know)
99. (Refused)

[ASK IF H10=1-12] [ASK ABOUT EACH ITEM MENTIONED IN H10]

H15. On a scale from 1 to 5, with 1 being not important at all and 5 being extremely important, please rate how important your experience with the [UTILITY] *watt*smart Business program was in your decision to install [this/these] energy efficient product(s). [ASK FOR EACH MEASURE MENTIONED IN H10]

1. **[RECORD RATING: _____]**
98. (Don't know)
99. (Refused)

[ASK SECTION I TO ALL SURVEY RESPONDENTS]

I. Firmographics

Finally, I have a few general questions about your business.

I1. What industry is your company in? **[DON'T READ RESPONSES UNLESS NECESSARY]**

1. (Accommodation)
2. (Arts, Entertainment and Recreation)
3. (Construction)
4. (Dairy, Agricultural)
5. (Educational Services)
6. (Finance, Insurance)
7. (Food Service)
8. (Food Processing)
9. (Health Care)
10. (Manufacturing)
11. (Mining)
12. (Nonprofit and Religious Organizations)
13. (Oil and Gas)
14. (Professional, Scientific and Technical Services)
15. (Public Administration/Government Services)
16. (Retail)
17. (Refrigerated Warehouse)
18. (Real Estate/Property Management)
19. (Repair and Maintenance Service)
20. (Transportation)
21. (Warehouses or Wholesaler)
22. (Other **[SPECIFY: _____]**)
98. (Don't know)
99. (Refused)

I2. How many locations does your company operate in **[PROJECT STATE]**?

1. **[RECORD NUMBER: _____]**
98. (Don't know)
99. (Refused)

I3. Does your organization lease or own the facility or facilities?

1. (Lease)
2. (Own)
3. (Other) **[RECORD VERBATIM: _____]**
98. (Don't know)
99. (Refused)

I4. How many people are employed by your company at all locations?

1. (1-10)
2. (11-25)
3. (26-50)
4. (51-75)
5. (76-100)
6. (101-200)
7. (201-500)
8. More than 500
98. (Don't know)
99. (Refused)

I5. **[NOT ASKED]** What type of fuel is used for space heating at your facility where the [MEASURE 1] was installed?

1. Electric
2. Gas
3. (Other) **[RECORD VERBATIM: _____]**
98. (Don't know)
99. (Refused)

I6. **[NOT ASKED]** What type of fuel is used for water heating at your facility where the [MEASURE 1] was installed?

1. Electric
2. Gas
3. (Other) **[RECORD VERBATIM: _____]**
98. (Don't know)
99. (Refused)

J. Closing

J1. **[NOT ASKED]** Overall, how satisfied would you say you are with the *watt*smart Business program? Would you say: **[READ LIST]**

1. Very satisfied
2. Somewhat satisfied
3. Not too satisfied
4. Not satisfied at all
98. (Don't know)
99. (Refused)

J2. Is there anything that **[UTILITY]** could have done to improve your overall experience with the *watt*smart Business program? **[DO NOT READ THE LIST, RECORD ALL THAT APPLY]**

1. (Better/more communication])
2. (Quicker response time)
3. (Larger selection of eligible equipment)
4. (Increasing the incentive amount)
5. (Simplify the application process)
6. (Simplify the website)
7. (Provide quicker approval on applications)
8. (Send incentive check out faster)
9. (Other **[SPECIFY: _____]**)
10. (No, nothing)
98. (Don't know)
99. (Refused)

J2.1 **[ASK IF J2 = 1]** You mentioned you would like better communication. Who would you like more communication from? **[RECORD RESPONSE_____]**

J2.2 **[ASK IF J2 = 2]** You mentioned a quicker response time. Who would you like a quicker response time from? **[RECORD RESPONSE_____]**

J2.3 **[ASK IF J2 = 3]** What other energy-efficient equipment should *watt*smart business offer incentives for? **[RECORD RESPONSE_____]**

J2.5 **[ASK IF J2=5]** In what way would you like them to simply the application process? **[RECORD RESPONSE_____]**

J2.6 **[ASK IF J2 = 6]** In what way would you like them to simplify the website? **[RECORD RESPONSE_____]**

J3. **[NOT ASKED]** Other than what we've already talked about, do you have any suggestions for improving the *watt*smart Business program?

1. (Yes) **[SPECIFY: _____]**
2. (No)
98. (Don't know)
99. (Refused)

J4. In the future, how would you like to stay informed about opportunities available through the wattsmart Business Program? **[DO NOT READ LIST; MULTIPLE RESPONSES POSSIBLE]**

1. (Contact with *watt*smart Business representative through phone, email, or in person)
2. (*watt*smart printed program materials)
3. (*watt*smart sponsored workshop or event)
4. (Contact with utility representative)
5. (Utility mailing, bill insert, or utility Website)
6. (Contact with a vendor/contractor)
7. (Through a trade association, trade publication or professional organization) [SPECIFY: _____])
8. (Newspaper ad)
9. (Radio ad)
10. (TV ad)
11. (Social Media (e.g., Facebook, Twitter, YouTube))
12. (Online ads)
13. (Other [SPECIFY: _____])

98. (Don't know)
99. (Refused)

This completes the survey. Your responses are very important to [UTILITY]. We appreciate your participation and thank you for your time. Have a good day.

CADMUS

Appendix D. Pacificorp *watt*smart Business Program (2014/2015) Nonparticipant/Partial Participant Survey

Researchable Questions		
Key Research Topics	**Areas of Investigation**	**Related Questions**
Marketing and Outreach	Program Awareness	C1-C4, D10-D11
	Future communication preferences	C5
Motivation and Barriers	Reasons to make energy-efficient improvements; Obstacles to installing high-efficiency equipment	D1-D9, D12-D14, G1-G3
Spillover	Assess savings spillover	Section E
Firmographics	Determine building and company characteristics of participants	Section F

Target Quota:
Nonparticipants:
Utah Managed (20), Nonmanaged (50)
Washington Managed (20), Nonmanaged (50)
Idaho Managed (20), Nonmanaged (50)
Wyoming Managed (20), Nonmanaged (50)

Partial participants: (Utah =26, Washington =19, Idaho =21, Wyoming =18)

General Instructions

- Interviewer instructions are in green **[LIKE THIS]** (the style is "Survey: Interviewer Instructions").
- CATI programming instructions are in red **[LIKE THIS]** (the style is "Survey: Programming").
- Items that should not be read by the interviewer are in parentheses like this ( ).

Variables to be Pulled into Nonparticipant Survey

- **[CUSTOMER NAME]**
- **[STANDARD INDUSTRIAL CLASS CODE]**
- **[ADDRESS] CITY NAME, STATE CODE**
- **[PROJECT STATE] STATE CODE**
- **[UTILITY]**
- NONPARTICIPANT OR PARTIAL PARTICIPANT
- MANAGED ACCOUNT

Variables to be Pulled into Partial Participant Survey

- **[CONTACT NAME]**
- **[CUSTOMER NAME]**
- **[ADDRESS] SITE ADDRESS 1, CITY, STATE**
- **[PROJECT STATE]**
- **[UTILITY]**

- **[MEASURE]**
- NONPARTICIPANT OR PARTIAL PARTICIPANT

A. Introduction

A1. Hello, I'm **[INSERT NAME]** calling on behalf of **[UTILITY].** May I speak with **[CONTACT NAME]**? OR **[IF NO NAME OR NAMED RESPONDENT NO LONGER WORKS FOR COMPANY]** May I speak with the person who handles energy decisions for **[CUSTOMER NAME]**? **[IF THAT PERSON IS NOT AT THIS PHONE NUMBER, ASK FOR THEIR NAME AND PHONE NUMBER AND START AGAIN]**

1. (Yes) **[IF CORRECT PERSON, SKIP TO A3. IF TRANSFERRED TO SOMEONE ELSE, READ A2]**
2. (No or not a convenient time) **[ASK IF RESPONDENT WOULD LIKE TO ARRANGE A MORE CONVENIENT TIME OR IF YOU CAN LEAVE A MESSAGE FOR A MORE APPROPRIATE PERSON]**

98. (Don't know) **[ASK TO SPEAK WITH SOMEONE WHO KNOWS AND BEGIN AGAIN]**
99. (Refused) **[THANK AND TERMINATE]**

A2. Hello, I'm **[INSERT NAME]** calling on behalf of **[UTILITY]**. Are you the person responsible for making energy-efficiency decisions for your company at the **[ADDRESS]** location?

1. (Yes)
2. (No, person is able to come to phone) **[ASK FOR PERSON WHO IS AND START AGAIN]**
3. (No, person is not able to come to phone) **[GET NAME AND PHONE NUMBER, SCHEDULE CALL BACK]**

98. (Don't know) **[ASK TO SPEAK WITH SOMEONE WHO KNOWS AND BEGIN AGAIN]**
99. (Refused) **[THANK AND TERMINATE]**

A3. We are conducting an important survey today about **[UTILITY]**'s wattsmart Business program. [UTILITY] is actively seeking your opinions to help improve their business efficiency programs and to better understand how to assist customers in saving money and energy. This call may be monitored or recorded for quality assurances purposes. Anything you share with us today will be confidential and not attributed to any one individual or business.

1. **[IF RESPONDENT ASKS HOW LONG, SAY "Approximately 5 to 7 minutes."]**
2. **[IF NEEDED, STATE "this survey is for research purposes only and this is not a marketing call. This is the primary way for customers to provide input into the incentive programs** [UTILITY] **offers. Your perspectives help** [UTILITY] **design energy-efficiency programs to help their customers save money and energy."]**
3. **[IF CUSTOMER IS UNFAMILIAR WITH "*WATT*SMART" STATE "between 2013 and 2015 the programs energy Finanswer, Finanswer express, Recommissioning and Self-Direction Credit, and Irrigation Energy Services, were combined under one umbrella, the W*att*smart Business Program."]**
4. **[ONLY IF ASKED FOR A** [UTILITY] **CONTACT TO VERIFY THE SURVEY AUTHENTICITY, OFFER** [NIKKI KARPAVICH, 801-220-4439]

B. Screeners

[ASK PARTIAL PARTICIPANTS]

B1. Our records show that you initiated **[DEPENDING ON MEASURE NAME READ** "a" or "an"**]** **[MEASURE]** project at **[ADDRESS]** with **[UTILTY]** in 2014 or 2015, but did not complete this project through the wattsmart Business program? Is this correct? **[IF CUSTOMER IS UNFAMILIAR WITH WATTSMART BUSINESS OR UNSURE, READ:** You may know the program by another name: Energy Finanswer, Finanswer Express, Recommissioning and Self-Direction Credit, and Irrigation Energy Services.]

1. (Yes)
2. (No, wrong year) **[RECORD CORRECT YEAR, IF POSSIBLE]**
3. (No, wrong address) **[RECORD CORRECT ADDRESS]**
4. (No, I did not participate) **[THANK AND TERMINATE]**

98. (Don't know) **[ASK TO SPEAK WITH SOMEONE WHO WOULD KNOW AND START AGAIN AT A2. IF NO ONE, THEN THANK AND TERMINATE]**

99. (Refused) **[THANK AND TERMINATE]**

[THANK AND TERMINATE TEXT] Those are all the questions we have for you today. Thank you for your help. Have a nice day!

[ASK EVERYONE]

B2. Did your company receive an incentive from **[UTILITY]**'s *watt*smart Business program for installing energy efficient equipment in 2014 or 2015? By energy-efficient equipment, I mean high efficiency lighting, HVAC equipment, irrigation or dairy equipment, variable speed drives, building envelope or other energy efficient equipment. **[IF CUSTOMER IS UNFAMILIAR WITH WATTSMART BUSINESS OR UNSURE, READ:** You may know the program by another name: Energy Finanswer, Finanswer Express, Recommissioning and Self-Direction Credit, and Irrigation Energy Services.]

1. (Yes) **[READ:** For this survey, we are seeking those companies who did not receive an incentive. We will not take any more of your time today. Thank you.**]** **[TERMINATE]**
2. (No)

98. (Don't know) **[ASK TO SPEAK WITH SOMEONE WHO WOULD KNOW AND START AGAIN AT A2. IF NO ONE, THEN THANK AND TERMINATE]**

99. (Refused) **[THANK AND TERMINATE]**

[THANK AND TERMINATE TEXT] Those are all the questions we have for you today. Thank you for your help. Have a nice day!

C. Awareness

[ASK PARTIAL PARTICIPANTS]

C1. Even though you did not receive an incentive; how did your organization learn about the incentives available for this project? **[DO NOT READ LIST; MULTIPLE RESPONSES POSSIBLE]**

1. (Contact with *watt*smart Business representative through phone, email, or in person)
2. (*watt*smart printed program materials)
3. (*watt*smart sponsored workshop or event)
4. (Contact with utility representative)
5. (Utility mailing, bill insert, or utility website)
6. (I contacted my contractor/vendor to ask)
7. (My contractor/vendor let me know about them)
8. (Previously participated in program/received an incentive)
9. (Through a trade association or professional organization) **[SPECIFY: _____])**
10. (Word of mouth (family, friend, or business colleague)
11. (Other **[SPECIFY: _____])**

98. (Don't know)
99. (Refused)

[ASK EVERYONE]

C2. **[UTILITY]** recently combined its business energy efficiency incentive programs under one name—*watt*smart Business. Before this call today had you heard of the *watt*smart Business program? **[IF NEEDED: THE PROGRAMS COMBINED INTO WATTSMART BUSINESS ARE: ENERGY FINANSWER, FINANSWER EXPRESS, RECOMMISSIONING, SELF-DIRECTION CREDIT, AND IRRIGATION ENERGY SAVERS]**

1. (Yes) **[PARTIAL PARTICIPANTS SKIP TO C4] [NONPARTICIPANTS CONTINUE TO C3]**
2. (No) **[SKIP TO C5]**

98. (Don't know) **[SKIP TO C5]**
99. (Refused) **[SKIP TO C5]**

C3. How did your organization learn about the *watt*smart Business Program? **[DO NOT READ LIST; MULTIPLE RESPONSES POSSIBLE]**

1. (Contact with *watt*smart Business representative through phone, email, or in person)
2. (*watt*smart printed program materials)
3. (*watt*smart sponsored workshop or event)
4. (Contact with utility representative)
5. (Utility mailing, bill insert, or utility website)
6. (I contacted my contractor/vendor to ask)
7. (My contractor/vendor let me know about them)
8. (Previously participated in program/received an incentive)
9. (Through a trade association or professional organization) **[SPECIFY: _____])**
10. (Word of mouth (family, friend, or business colleague)
11. (Other **[SPECIFY: _____])**

98. (Don't know)
99. (Refused)

C4. How likely is it that your business will request an incentive from the *watt*smart Business program for an energy efficiency project in the next 6 months? Would you say … [READ LIST]

1. Very likely
2. Somewhat likely
3. Not too likely
4. Not at all likely

98. (Don't know)
99. (Refused)

C5. What's the best way for **[UTILITY]** to inform you about their incentives for energy-efficient improvements? **[DO NOT READ. RECORD UP TO THREE RESPONSES]**

1. (Contact with *watt*smart Business representative through phone, email, or in person)
2. (*watt*smart printed program materials)
3. (*watt*smart sponsored workshop or event)
4. (Contact with utility representative)
5. (Utility mailing, bill insert, or utility website)
6. (Contact with a vendor/contractor)
7. (Through a trade association, trade publication or professional organization) **[SPECIFY:_____])**
8. (Newspaper ad)
9. (Radio ad)
10. (TV ad)
11. (Social Media (e.g., Facebook, Twitter, YouTube))
12. (Online ads)
13. (Other **[SPECIFY: _____])**
14. (Not interested in being informed about incentives for energy-efficient improvements)

98. (Don't know)
99. (Refused)

D. Motivation and Barriers

[ASK EVERYONE D1]

Thank you. The next few questions are about making energy-efficient improvements for your business.

D1. What factor is the <u>most</u> important to motivate your company to make energy-efficient upgrades? **[DO NOT READ LIST; RECORD ONE RESPONSE]**

1. (To save money on energy bills, reduce energy consumption or energy demand)
2. (To obtain a program incentive)
3. (To obtain a tax credit)
4. (To replace old (but still functioning) equipment)
5. (To replace broken equipment)
6. (To improve productivity)
7. (To improve lighting quality)
8. (Other **[SPECIFY_____]**)

98. (Don't know)
99. (Refused)

[NONPARTICIPANTS SKIP TO D7]

[PARTIAL PARTICIPANTS ASK D2-D6]

D2. Did your company complete the **[MEASURE]** project you initiated with **[UTILITY]** even though you did not receive a *watt*smart Business incentive?

1. (Yes) **[SKIP TO D4]**
2. (No)

98. (Don't know) **[SKIP TO D4]**
99. (Refused) **[SKIP TO D4]**

D3. Why did you not complete the project?

1. **[RECORD RESPONSE]** **[SKIP TO E1]**

98. (Don't know) **[SKIP TO E1]**
99. (Refused) **[SKIP TO E1]**

D4. Did your company apply for a *watt*smart Business incentive? **[IF NEEDED**: You may have applied under one of the programs that became *watt*smart Business. These include Energy FinAnswer, FinAnswer Express, Recommissioning, Self-Direction Credit, and Irrigation Energy Services.]

1. (Yes)
2. (No) **[SKIP TO D6]**

98. (Don't know) **[SKIP TO E1]**
99. (Refused) **[SKIP TO E1]**

D5. Why did your project not receive an incentive?

1. **[RECORD RESPONSE]** **[SKIP TO E1]**

98. (Don't know) **[SKIP TO E1]**
99. (Refused) **[SKIP TO E1]**

D6. Why did you not apply for an incentive?

1. (Project did not qualify) **[SKIP TO E1]**
2. (Other) **[RECORD RESPONSE]** **[SKIP TO E1]**

98. (Don't know) **[SKIP TO E1]**
99. (Refused) **[SKIP TO E1]**

[NONPARTICIPANT ASK D7-D14]

D7. I'm going to read you six statements describing situations companies experience when considering energy-efficient improvements. Please tell me to what extent you agree with each statement. If it doesn't apply to you, please let me know that. The first statement is: **[RANDOMIZE, READ STATEMENT; THEN JUST FOR THE FIRST STATEMENT READ THE FOLLOWING**: Would you say you strongly agree, somewhat agree, somewhat disagree, or strongly disagree?
[READ LIST AND RECORD 1=STRONGLY AGREE, 2=SOMEWHAT AGREE, 3=SOMEWHAT DISAGREE, AND 4=STRONGLY DISAGREE; 97= NOT APPLICABLE, 98=DON'T KNOW, AND 99=REFUSED]

- D2a. Making upgrades at our facility is an inconvenience.
- D2b. Making energy efficiency upgrades to this facility is too costly.
- D2c. We don't replace working equipment even if it is not energy efficient.
- D2d. My company has made all the energy efficiency improvements we can without a substantial investment.
- D2e. My company leases space, we do not want to invest in energy efficiency upgrades.
- D2f. Decisions about equipment upgrades are made at a corporate office, and we don't have much input at this facility.

D8. When calculating the return on investment for proposed capital upgrades, does your company include savings gained from energy efficiency?

1. (Yes)
2. (No)
98. (Don't know)
99. (Refused)

D9. What would motivate your business to make more energy-efficient purchases or upgrades to your current equipment? **[DO NOT READ LIST; RECORD UP TO 3 RESPONSES]**

1. (Lower costs of product/equipment)
2. (Information on return on investment/help with the business case for investment)
3. (More information generally)
4. (Higher incentives)
5. (Incentives on different products/technologies)
6. (Other) **[SPECIFY]**
98. (Don't know)
99. (Refused)

[ASK IF D9=3]

D10. When you say you would like more information, what kind of information is most useful?

1. **[RECORD RESPONSE]**
98. (Don't know) **[SKIP TO D13]**
99. (Refused) **[SKIP TO D13]**

[ASK IF D10=1]

D11. Who could best to provide you with this information? For example, a *watt*smart Business representative, someone like your contractor, or a product manufacturer?

1. (*watt*smart Business)
2. (Contractor/Distributor/Vendor)
3. (Store staff)
4. (Product Manufacturer)
5. (Something else) **[SPECIFY: _____]**

98. (Don't know)
99. (Refused)

[ASK IF D9=5]

D12. When you say incentives on different products or technologies, what kind of products or technologies?

1. [RECORD RESPONSE]

98. (Don't know)
99. (Refused)

D13. What are the reasons you have not yet participated in a *watt*smart Business program? [DO NOT READ LIST; MULTIPLE CHOICES POSSIBLE]

1. (Don't know enough about program)
2. (Don't understand what equipment/measures are available)
3. (Don't have resources for initial investment)
4. (Don't have enough time to participate)
5. (Not sure how much savings there will be)
6. (Don't see any benefits)
7. (Have participated in past and do not see a need)
8. (Other) [SPECIFY]

98. (Don't know) **[SKIP TO E1]**
99. (Refused) **[SKIP TO E1]**

D14. What could **[UTILITY]** do to help your business participate in the *watt*smart Business program?

1. [RECORD ANSWER]

98. (Don't know)
99. (Refused)

[ASK EVERYONE]

E. Spillover

E1. In 2014 or 2015, did you purchase and install any energy efficiency improvements on your own without any assistance (financial or technical) from a utility, vendor or other organization?

1. (Yes)
2. (No) **[SKIP TO SECTION F]**
98. (Don't know) **[SKIP TO SECTION F]**
99. (Refused) **[SKIP TO SECTION F]**

E2. What type of equipment did you purchase and install?

1. (Lighting) **[SPECIFY TYPE EXAMPLE: CFL, LED, FLUORESCENT]**: _____
   a. How many did you purchase and install **[SPECIFY]**: _____
   b. What is the wattage of the installed equipment **[SPECIFY]**: _____
   c. Where is the equipment installed? (Wall/Ceiling/Outdoors) **[SPECIFY]**: _____
   d. What type of equipment was removed or replaced **[SPECIFY]**: _____
2. (HVAC (heating and cooling)) **[SPECIFY EQUIPMENT]**: _____
   a. How many did you purchase and install **[SPECIFY]**: _____
   b. What fuel type does this equipment use **[SPECIFY]**: _____
   c. What is the efficiency rating of the equipment **[SPECIFY]**: _____
   d. What is the equipment's rated capacity **[SPECIFY]**: _____
3. (Water heating) **[SPECIFY EQUIPMENT]**: _____
   a. How may did you purchase and install **[SPECIFY]**: _____
   b. What fuel type does this equipment use **[SPECIFY]**: _____
   c. What is the efficiency rating of the equipment **[SPECIFY]**: _____
   d. What is the capacity of the water heater (if water heater with storage) **[SPECIFY]**: _____
4. (Variable drives)
   a. How may did you purchase and install **[SPECIFY]**: _____
   b. What type of motor was it installed on **[SPECIFY]**: _____
   c. What is the horsepower of the motor **[SPECIFY]**: _____
5. (Efficient motors)
   a. How many did you purchase and install **[SPECIFY]**: _____
   b. What type of equipment is the motor installed on **[SPECIFY]**: _____
   c. What is the horsepower of the motor **[SPECIFY]**: _____
6. (Refrigeration) **[SPECIFY EQUIPMENT]**: _____
   a. How much did you purchase and install **[SPECIFY]**: _____
7. (Building envelope) **[SPECIFY TYPE]**: _____
   a. How may square feet did you purchase and install **[SPECIFY]**: _____
   b. What is the efficiency (R-value, thickness) **[SPECIFY]**: _____
   c. Where was it installed (Wall/Roof/Floor) **[SPECIFY]**: _____
8. (Compressed air) **[SPECIFY TYPE OF PROJECT]**: _____
   a. How many did you purchase and install **[SPECIFY]**: _____
   b. What is the horsepower of the compressor motor **[SPECIFY]**: _____
9. (Chillers) **[SPECIFY TYPE OF EQUIPMENT]**: _____
   a. How many did you purchase and install **[SPECIFY]**: _____
   b. What size unit did you install **[SPECIFY]**: _____
10. (Pumps) **[SPECIFY WHAT IS IT INSTALLED ON)]**: _____
    a. How many did you purchase and install **[SPECIFY]**: _____
    b. What is the horsepower of the pump motor **[SPECIFY]**: _____

c. What is the efficiency rating of the pump **[SPECIFY]**: _____

11. (Irrigation (gaskets, drains, sprinklers)) **[SPECIFY]**: _____
    a. How many did you purchase and install **[SPECIFY]**: _____
12. (Other) **[SPECIFY]**: _____
    a. How many did you purchase and install **[SPECIFY]**: _____
98. (Don't know) **[SKIP TO F1]**
99. (Refused) **[SKIP TO F1]**

[ASK IF E2=1-12]

E3. Just to confirm, did you receive an incentive from **[UTILITY]** or another organization for any of these measures? **[RECORD FOR EACH MEASURE MENTIONED IN E2]?**

1. (Yes)
2. (No) **[SKIP TO E5]**
98. (Don't know) **[SKIP TO E5]**
99. (Refused) **[SKIP TO E5]**

[ASK FOR EACH YES IN E3]

E4. What program or sponsor provided the incentive(s)? **[RECORD FOR EACH MEASURE MENTIONED IN E2]**

1. **[UTILITY]**
98. (Don't know)
99. (Refused)

[ASK IF E2=1-12]

E5. For these purchases, on a scale from 1 to 5, with 1 being not important at all and 5 being very important, please rate how important were each of the following on your decision to purchase and install [this/these] energy efficient improvement(s). If a factor is not applicable to you, please say so. **[NOTE: RESPONDENTS CAN ALSO STATE THAT A PARTICULAR FACTOR IS NOT APPLICABLE, PLEASE CODE N/A AS 6]**

E5.1 General information about energy efficiency provided by **[UTILITY]** ____
If needed: on a scale from 1 to 5, with 1 being not important at all and 5 being very important
If a factor is not applicable to you, please say so

E5.1a [ASK IF 5E.1 = 1-3] Does this rating differ for any of the improvements you mentioned?

1. YES
2. NO
3. Don't Know

E5.1b [ASK IF E5.1a=1] Which of the following equipment would you rate differently on the General information about energy efficiency provided by **[UTILITY]**? [Display equipment mentioned in E2. Multiple Response Allowed]

ASK RATING FOR EACH EQUIPMENT SELECTED. [If needed read: On a scale from 1 to 5, with 1 being not important at all and 5 being very important].

Lighting
HVAC (heating and cooling)
Water heating
Variable drives
Efficient motors
Refrigeration
Building envelope
Compressed air
Chillers
Pumps
Irrigation
[Other Specify]
None of the above

E5.2 Information from **[UTILITY]** program staff or contractors. ___
If needed: on a scale from 1 to 5, with 1 being not important at all and 5 being very important
If a factor is not applicable to you, please say so

E5.2a [ASK IF E52 =1-3] Does this rating differ for any of the other improvements you mentioned?
YES
NO
Don't Know

ASK RATING FOR EACH EQUIPMENT SELECTED. [If needed read: On a scale from 1 to 5, with 1 being not important at all and 5 being very important].

E5.2b [ASK IF E52a = 1] Which of the following equipment would you rate differently on the Information from **[UTILITY]** program staff or contractors? [Display equipment mentioned in E2. Multiple Response Allowed]

[If needed read: If needed: on a scale from 1 to 5, with 1 being not important at all and 5 being very important]. If needed, record rating 1 to 5 for each response.

Lighting
HVAC (heating and cooling)
Water heating
Variable drives
Efficient motors
Refrigeration
Building envelope
Compressed air
Chillers
Pumps
Irrigation
[Other Specify]
None of the above

E5.3 Your experience with a past **[UTILITY]** energy efficiency program. ___
If needed: on a scale from 1 to 5, with 1 being not important at all and 5 being very important
If a factor is not applicable to you, please say so

E5.3a [ASK IF E53=1-3] Does this rating differ for any of the other improvements you mentioned?
YES
NO
Don't Know

ASK RATING FOR EACH EQUIPMENT SELECTED. [If needed read: On a scale from 1 to 5, with 1 being not important at all and 5 being very important].

E5.3b [ASK IF E53a = 1] Which of the following equipment would you rate differently on your experience with a past **[UTILITY]** energy efficiency program? [Display equipment mentioned in E2. Multiple Response Allowed]

Lighting
HVAC (heating and cooling)
Water heating
Variable drives
Efficient motors
Refrigeration
Building envelope
Compressed air
Chillers
Pumps
Irrigation
[Other Specify]
None of the above

[ASK SECTION F TO ALL SURVEY RESPONDENTS]

F. Firmographics

Finally, I have a few general questions about your business.

F1. What industry is your company in? **[DON'T READ RESPONSES UNLESS NECESSARY]**

1. (Accommodation)
2. (Arts, Entertainment and Recreation)
3. (Construction)
4. (Dairy, Agricultural)
5. (Educational Services)
6. (Finance, Insurance)
7. (Food Service)
8. (Food Processing)
9. (Health Care)
10. (Manufacturing)
11. (Mining)
12. (Nonprofit and Religious Organizations)
13. (Oil and Gas)
14. (Professional, Scientific and Technical Services)
15. (Public Administration/Government Services)
16. (Retail)
17. (Refrigerated Warehouse)
18. (Real Estate/Property Management)
19. (Repair and Maintenance Service)
20. (Transportation)
21. (Warehouses or Wholesaler)
22. (Other **[SPECIFY: _____]**)

98. (Don't know)
99. (Refused)

F2. How many locations does your company operate in **[PROJECT STATE]**?

1. **[RECORD VERBATIM: _____]**

98. (Don't know)
99. (Refused)

F3. Does your organization lease or own the facilities or facilities?

1. Lease
2. Own
3. Other **[RECORD VERBATIM: _____]**

98. (Don't know)
99. (Refused)

F4. How many people are employed by your company at all locations?

1. (1-10)
2. (11-25)
3. (26-50)
4. (51-75)
5. (76-100)
6. (101-200)
7. (201-500)
8. More than 500
9. (Other) **[RECORD VERBATIM: _____]**

98. (Don't know)
99. (Refused)

F5. What type of fuel is used for space heating at your facility?

1. Electric
2. Gas
3. (Other) **[RECORD VERBATIM:_____]**

98. (Don't know)
99. (Refused)

F6. What type of fuel is used for water heating at your facility?

1. Electric
2. Gas
3. (Other) **[RECORD VERBATIM:_____]**

98. (Don't know)
99. (Refused)

G. Closing

[PARTIAL PARTICIPANTS ONLY: ASK G1-G3] [NONPARTICIPANTS GO TO CLOSING STATEMENT]

G1. Overall, how satisfied would you say you are with the *watt*smart Business program? Would you say: **[READ LIST]**

1. Very satisfied
2. Somewhat satisfied
3. Not too satisfied
4. Not satisfied at all

98. (Don't know)
99. (Refused)

[IF G1=3 OR 4]

G2. Why do you say you were **[INSERT ANSWER FROM G1]** with the program?

1. **[RECORD VERBATIM: _____]**
98. (Don't know)
99. (Refused)

G3. Is there anything that **[UTILITY]** could have done to improve your overall experience with the *watt*smart Business program? **[DO NOT READ THE LIST, RECORD ALL THAT APPLY]**

1. (Better/more communication **[SPECIFY: WHO WOULD YOU LIKE MORE COMMUNICATION FROM? _____]**)
2. (Quicker response time **[SPECIFY: WHO WOULD YOU LIKE A QUICKER RESPONSE TIME FROM? __]**)
3. (Larger selection of eligible equipment **[ASK: WHAT ENERGY-EFFICIENT EQUIPMENT SHOULD WATTSMART BUSINESS OFFER INCENTIVES FOR? _____]**)
4. (Increasing the incentive amount)
5. (Simplify the application process) **[ASK: IN WHAT WAY? _____]**)
6. (Simplify the website) **[ASK: IN WHAT WAY? _____]**)
7. (Provide quicker approval on applications)
8. (Send incentive check out faster)
9. (Other **[SPECIFY: _____]**)
10. (No, nothing)
98. (Don't know)
99. (Refused)

This completes the survey. Your responses are very important to [UTILITY]. We appreciate your participation and thank you for your time. Have a good day.

Appendix E. Measure Category Cost-Effectiveness

Completed at the end-use category level, cost-effectiveness was reported for evaluated net savings. Net results apply the evaluated NTG to evaluated gross savings. Table E1 shows cost-effectiveness inputs for gross and net results.

Table E1. Washington *watts*mart Business End-Use Category Cost-Effectiveness Inputs

Input Description	2014	2015	Total
Average Measure Life*			
Lighting	6	14	10
HVAC	15	15	15
Refrigeration	14	14	14
Motor Systems	14	11	12
Compressed Air	12	13	12
Agricultural	13	9	11
Recommissioning	3	3	3
Other	14	12	13
Evaluated Energy Savings (kWh/year)**			
Lighting	9,180,702	10,683,199	19,863,901
HVAC	2,519,555	112,057	2,631,612
Refrigeration	9,110,833	6,913,407	16,024,241
Motor Systems	614,462	1,030,546	1,645,008
Compressed Air	949,899	1,299,254	2,249,153
Agricultural	961,370	1,235,978	2,197,348
Recommissioning	539,546	1,200,710	1,740,256
Other	1,991,698	951,924	2,943,621
Total Utility Cost (including incentives)***			
Lighting	$2,372,096	$3,091,122	$5,463,218
HVAC	$678,810	$32,407	$711,217
Refrigeration	$2,325,504	$1,515,333	$3,840,837
Motor Systems	$128,735	$163,904	$292,639
Compressed Air	$268,716	$322,628	$591,344
Agricultural	$214,638	$224,349	$438,987
Recommissioning	$89,281	$158,295	$247,576
Other	$560,119	$303,291	$863,410
Incentives			
Lighting	$1,480,939	$1,822,145	$3,303,084
HVAC	$448,874	$19,909	$468,783
Refrigeration	$1,507,976	$757,156	$2,265,132
Motor Systems	$84,607	$75,726	$160,333
Compressed Air	$175,185	$166,275	$341,460
Agricultural	$133,425	$94,467	$227,892

Recommissioning	$39,910	$24,014	$63,924
Other	$390,393	$205,726	$596,118
Commercial Retail Rate	**$0.0778**	**$0.0820**	**N/A**
Industrial Retail Rate	**$0.0655**	**$0.0666**	**N/A**
Irrigation Retail Rate	**$0.0815**	**$0.0836**	**N/A**

*Weighted average measure category lives are based on individual measure lifetimes and weighted by savings and the frequency of installations.

**Evaluated savings reflect impacts at the customer meter.

***Pacific Power provided program costs and incentives in annual report data, allocating program costs by weighted savings.

Lighting

Table E2, Table E3, Table E4, Table E5, Table E6, and Table E7 show the lighting end-use category cost-effectiveness results for net and gross evaluated savings. The lighting end-use category proved cost-effective from the PTRC, UCT, and PCT perspectives (Table E2 and Table E5); however in 2014 lighting was only cost effective from the UCT, and PCT perspectives, and in 2015 lighting was cost effective from all perspectives except for the RIM.

Table E2. Washington Lighting 2014-2015 Gross
(2014 Decrement West System 71% – Load Shape Lighting)
(2015 Decrement West Commercial Lighting 46% – Load Shape Lighting)

Cost-Effectiveness Test	Levelized $/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	$0.064	$9,395,923	$10,275,319	$879,396	1.09
TRC	$0.064	$9,395,923	$9,341,199	($54,724)	0.99
UCT	$0.036	$5,270,204	$9,341,199	$4,070,995	1.77
RIM		$17,810,123	$9,341,199	($8,468,924)	0.52
PCT		$7,315,026	$15,729,226	$8,414,200	2.15
Lifecycle Revenue Impacts ($/kWh)					$0.000212980
Discounted Participant Payback (years)					3.54

Table E3. Washington Lighting 2014 Gross
(2014 Decrement West System 71% – Load Shape Lighting)

Cost-Effectiveness Test	Levelized $/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	$0.082	$4,230,197	$3,584,502	($645,695)	0.85
TRC	$0.082	$4,230,197	$3,258,638	($971,558)	0.77
UCT	$0.046	$2,372,096	$3,258,638	$886,542	1.37

RIM		$6,219,709	$3,258,638	($2,961,070)	0.52
PCT		$3,339,040	$5,328,552	$1,989,512	1.60
Lifecycle Revenue Impacts ($/kWh)					$0.000071828
Discounted Participant Payback (years)					2.70

Table E4. Washington Lighting 2015 Gross
(2015 Decrement West Commercial Lighting 46% – Load Shape Lighting)

Cost-Effectiveness Test	Levelized $/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	$0.054	$5,509,763	$7,136,425	$1,626,662	1.30
TRC	$0.054	$5,509,763	$6,487,659	$977,896	1.18
UCT	$0.030	$3,091,122	$6,487,659	$3,396,537	2.10
RIM		$12,362,336	$6,487,659	($5,874,677)	0.52
PCT		$4,240,787	$11,093,359	$6,852,573	2.62
Lifecycle Revenue Impacts ($/kWh)					$0.000147739
Discounted Participant Payback (years)					2.88

Table E5. Washington Lighting 2014-2015 Net
(2014 Decrement West System 71% – Load Shape Lighting)
(2015 Decrement West Commercial Lighting 46% – Load Shape Lighting)

Cost-Effectiveness Test	Levelized $/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	$0.066	$8,371,819	$8,836,774	$464,955	1.06
TRC	$0.066	$8,371,819	$8,033,431	($338,388)	0.96
UCT	$0.042	$5,270,204	$8,033,431	$2,763,227	1.52
RIM		$16,054,535	$8,033,431	($8,021,103)	0.50
PCT		$7,315,026	$15,729,226	$8,414,200	2.15
Lifecycle Revenue Impacts ($/kWh)					$0.000201718
Discounted Participant Payback (years)					3.54

Table E6. Washington Lighting 2014 Net
(2014 Decrement West System 71% – Load Shape Lighting)

Cost-Effectiveness Test	Levelized $/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	$0.085	$3,762,731	$3,082,672	($680,059)	0.82
TRC	$0.085	$3,762,731	$2,802,429	($960,302)	0.74
UCT	$0.054	$2,372,096	$2,802,429	$430,333	1.18
RIM		$5,681,043	$2,802,429	($2,878,614)	0.49

PCT		$3,339,040	$5,328,552	$1,989,512	1.60
Lifecycle Revenue Impacts ($/kWh)					$0.000069828
Discounted Participant Payback (years)					2.70

Table E7. Washington Lighting 2015 Net
(2015 Decrement West Commercial Lighting 46% – Load Shape Lighting)

Cost-Effectiveness Test	Levelized $/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	$0.056	$4,916,053	$6,137,326	$1,221,272	1.25
TRC	$0.056	$4,916,053	$5,579,387	$663,334	1.13
UCT	$0.035	$3,091,122	$5,579,387	$2,488,265	1.80
RIM		$11,064,366	$5,579,387	($5,484,979)	0.50
PCT		$4,240,787	$11,093,359	$6,852,573	2.62
Lifecycle Revenue Impacts ($/kWh)					$0.000137938
Discounted Participant Payback (years)					2.88

HVAC

Table E8, Table E9, Table E10, Table E11, Table E12, and Table E13 show the HVAC end-use category cost-effectiveness results for net evaluated savings. The HVAC end-use category proved cost-effective from all perspectives except for the RIM (Table E8, and Table E11); however, in 2015 the category was only cost-effective from the UTC and PCT perspective.

Table E8. Washington HVAC 2014-2015 Gross
(2014 Decrement West System 71% – Load Shape HVAC)
(2015 Decrement West Commercial Cooling 13% – Load Shape HVAC)

Cost-Effectiveness Test	Levelized $/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	$0.044	$1,252,283	$2,249,534	$997,251	1.80
TRC	$0.044	$1,252,283	$2,045,031	$792,748	1.63
UCT	$0.025	$709,194	$2,045,031	$1,335,837	2.88
RIM		$2,963,641	$2,045,031	($918,611)	0.69
PCT		$1,010,629	$2,721,987	$1,711,358	2.69
Lifecycle Revenue Impacts ($/kWh)					$0.000022250
Discounted Participant Payback (years)					2.83

Table E9. Washington HVAC 2014 Gross
(2014 Decrement West System 71% – Load Shape HVAC)

Cost-Effectiveness Test	Levelized $/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	$0.043	$1,173,506	$2,165,503	$991,997	1.85
TRC	$0.043	$1,173,506	$1,968,639	$795,133	1.68
UCT	$0.025	$678,810	$1,968,639	$1,289,829	2.90
RIM		$2,837,546	$1,968,639	($868,906)	0.69
PCT		$943,570	$2,607,609	$1,664,039	2.76
Lifecycle Revenue Impacts ($/kWh)					$0.000021078
Discounted Participant Payback (years)					2.62

Table E10. Washington HVAC 2015 Gross
(2015 Decrement West Commercial Cooling 13% – Load Shape HVAC)

Cost-Effectiveness Test	Levelized $/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	$0.070	$84,023	$89,627	$5,604	1.07
TRC	$0.070	$84,023	$81,479	($2,544)	0.97
UCT	$0.027	$32,407	$81,479	$49,072	2.51
RIM		$134,494	$81,479	($53,014)	0.61
PCT		$71,525	$121,995	$50,470	1.71
Lifecycle Revenue Impacts ($/kWh)					$0.000001284
Discounted Participant Payback (years)					6.37

Table E11. Washington HVAC 2014-2015 Net
(2014 Decrement West System 71% – Load Shape HVAC)
(2015 Decrement West Commercial Cooling 13% – Load Shape HVAC)

Cost-Effectiveness Test	Levelized $/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	$0.046	$1,110,795	$1,934,599	$823,804	1.74
TRC	$0.046	$1,110,795	$1,758,726	$647,931	1.58
UCT	$0.029	$709,194	$1,758,726	$1,049,533	2.48
RIM		$2,648,019	$1,758,726	($889,292)	0.66
PCT		$1,010,629	$2,721,987	$1,711,358	2.69
Lifecycle Revenue Impacts ($/kWh)					$0.000021540
Discounted Participant Payback (years)					2.83

Table E12. Washington HVAC 2014 Net
(2014 Decrement West System 71% – Load Shape HVAC)

Cost-Effectiveness Test	Levelized $/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	$0.045	$1,041,406	$1,862,333	$820,926	1.79
TRC	$0.045	$1,041,406	$1,693,030	$651,623	1.63
UCT	$0.029	$678,810	$1,693,030	$1,014,220	2.49
RIM		$2,535,323	$1,693,030	($842,293)	0.67
PCT		$943,570	$2,607,609	$1,664,039	2.76
Lifecycle Revenue Impacts ($/kWh)					$0.000020432
Discounted Participant Payback (years)					2.62

Table E13. Washington HVAC 2015 Net
(2015 Decrement West Commercial Cooling 13% – Load Shape HVAC)

Cost-Effectiveness Test	Levelized $/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	$0.072	$74,010	$77,079	$3,069	1.04
TRC	$0.072	$74,010	$70,072	($3,938)	0.95
UCT	$0.031	$32,407	$70,072	$37,665	2.16
RIM		$120,201	$70,072	($50,129)	0.58
PCT		$71,525	$121,995	$50,470	1.71
Lifecycle Revenue Impacts ($/kWh)					$0.000001214
Discounted Participant Payback (years)					6.37

Refrigeration

Table E14, Table E15,Table E16, Table E17, Table E18, and Table E19 show the motor systems end-use category cost-effectiveness results for net evaluated savings. The motor systems end-use category proved cost-effective from all perspectives except for the RIM (Table E14 and Table E17).

Table E14. Washington Refrigeration 2014-2015 Gross
(2014 Decrement West System 71% – Large Office Refrigeration)
(2015 Decrement West Industrial 44% – Large Office Refrigeration)

Cost-Effectiveness Test	Levelized $/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	$0.034	$5,272,860	$11,619,021	$6,346,161	2.20
TRC	$0.034	$5,272,860	$10,562,747	$5,289,886	2.00
UCT	$0.024	$3,746,218	$10,562,747	$6,816,529	2.82
RIM		$16,733,546	$10,562,747	($6,170,799)	0.63
PCT		$3,744,497	$15,205,182	$11,460,685	4.06
Lifecycle Revenue Impacts ($/kWh)					$0.000155186
Discounted Participant Payback (years)					1.85

Table E15. Washington Refrigeration 2014 Gross
(2014 Decrement West System 71% – Large Office Refrigeration)

Cost-Effectiveness Test	Levelized $/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	$0.033	$3,059,530	$7,211,151	$4,151,621	2.36
TRC	$0.033	$3,059,530	$6,555,592	$3,496,062	2.14
UCT	$0.025	$2,325,504	$6,555,592	$4,230,088	2.82
RIM		$9,727,705	$6,555,592	($3,172,113)	0.67
PCT		$2,242,002	$8,910,177	$6,668,175	3.97
Lifecycle Revenue Impacts ($/kWh)					$0.000079897
Discounted Participant Payback (years)					1.03

Table E16. Washington Refrigeration 2015 Gross
(2015 Decrement West Industrial 44% – Large Office Refrigeration)

Cost-Effectiveness Test	Levelized $/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	$0.036	$2,360,738	$4,701,434	$2,340,696	1.99
TRC	$0.036	$2,360,738	$4,274,031	$1,913,293	1.81
UCT	$0.023	$1,515,333	$4,274,031	$2,758,699	2.82
RIM		$7,472,430	$4,274,031	($3,198,399)	0.57
PCT		$1,602,561	$6,714,253	$5,111,692	4.19
Lifecycle Revenue Impacts ($/kWh)					$0.000080435

Discounted Participant Payback (years)	1.52

Table E17. Washington Refrigeration 2014-2015 Net (2014 Decrement West System 71% – Large Office Refrigeration) (2015 Decrement West Industrial 44% – Large Office Refrigeration)

Cost-Effectiveness Test	Levelized $/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	$0.036	$4,748,631	$9,992,358	$5,243,728	2.10
TRC	$0.036	$4,748,631	$9,083,962	$4,335,331	1.91
UCT	$0.028	$3,746,218	$9,083,962	$5,337,745	2.42
RIM		$14,915,320	$9,083,962	($5,831,358)	0.61
PCT		$3,744,497	$15,205,182	$11,460,685	4.06
Lifecycle Revenue Impacts ($/kWh)					$0.000146649
Discounted Participant Payback (years)					1.85

Table E18. Washington Refrigeration 2014 Net (2014 Decrement West System 71% – Large Office Refrigeration)

Cost-Effectiveness Test	Levelized $/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	$0.034	$2,745,650	$6,201,590	$3,455,940	2.26
TRC	$0.034	$2,745,650	$5,637,809	$2,892,159	2.05
UCT	$0.029	$2,325,504	$5,637,809	$3,312,305	2.42
RIM		$8,691,397	$5,637,809	($3,053,587)	0.65
PCT		$2,242,002	$8,910,177	$6,668,175	3.97
Lifecycle Revenue Impacts ($/kWh)					$0.000076912
Discounted Participant Payback (years)					1.03

Table E19. Washington Refrigeration 2015 Net (2015 Decrement West Industrial 44% – Large Office Refrigeration)

Cost-Effectiveness Test	Levelized $/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	$0.038	$2,136,380	$4,043,233	$1,906,854	1.89
TRC	$0.038	$2,136,380	$3,675,667	$1,539,287	1.72
UCT	$0.027	$1,515,333	$3,675,667	$2,160,334	2.43
RIM		$6,638,436	$3,675,667	($2,962,770)	0.55
PCT		$1,602,561	$6,714,253	$5,111,692	4.19
Lifecycle Revenue Impacts ($/kWh)					$0.000074509
Discounted Participant Payback (years)					1.52

Motor Systems

Table E20, Table E21, Table E22, Table E23, Table E24, and Table E25 show the motor systems end-use category cost-effectiveness results for net evaluated savings. The motor systems end-use category proved cost-effective from all perspectives except for the RIM (Table E20 and Table E23).

Table E20. Washington Motor Systems 2014-2015 Gross (2014 Decrement West System 71% – Industrial Machinery General) (2015 Decrement West Industrial 44% – Industrial Machinery General)

Cost-Effectiveness Test	Levelized $/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	$0.028	$398,457	$1,032,941	$634,484	2.59
TRC	$0.028	$398,457	$939,037	$540,580	2.36
UCT	$0.020	$282,404	$939,037	$656,633	3.33
RIM		$1,244,260	$939,037	($305,223)	0.75
PCT		$271,657	$1,117,460	$845,803	4.11
Lifecycle Revenue Impacts ($/kWh)					$0.000007393
Discounted Participant Payback (years)					1.88

Table E21. Washington Motor Systems 2014 Gross (2014 Decrement West System 71% – Industrial Machinery General)

Cost-Effectiveness Test	Levelized $/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	$0.031	$198,595	$486,860	$288,265	2.45
TRC	$0.031	$198,595	$442,600	$244,005	2.23
UCT	$0.020	$128,735	$442,600	$313,865	3.44
RIM		$558,996	$442,600	($116,396)	0.79
PCT		$154,467	$514,868	$360,401	3.33
Lifecycle Revenue Impacts ($/kWh)					$0.000002823
Discounted Participant Payback (years)					1.23

Table E22. Washington Motor Systems 2015 Gross (2015 Decrement West Industrial 44% – Industrial Machinery General)

Cost-Effectiveness Test	Levelized $/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	$0.025	$213,173	$582,450	$369,277	2.73
TRC	$0.025	$213,173	$529,500	$316,327	2.48
UCT	$0.020	$163,904	$529,500	$365,595	3.23
RIM		$730,902	$529,500	($201,402)	0.72
PCT		$124,995	$642,724	$517,729	5.14
Lifecycle Revenue Impacts ($/kWh)					$0.000004878

Discounted Participant Payback (years)	0.87

Table E23. Washington Motor Systems 2014-2015 Net (2014 Decrement West System 71% – Industrial Machinery General) (2015 Decrement West Industrial 44% – Industrial Machinery General)

Cost-Effectiveness Test	Levelized $/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	$0.029	$360,425	$888,329	$527,904	2.46
TRC	$0.029	$360,425	$807,572	$447,147	2.24
UCT	$0.023	$282,404	$807,572	$525,167	2.86
RIM		$1,109,600	$807,572	($302,028)	0.73
PCT		$271,657	$1,117,460	$845,803	4.11
Lifecycle Revenue Impacts ($/kWh)					$0.000007316
Discounted Participant Payback (years)					1.88

Table E24. Washington Motor Systems 2014 Net (2014 Decrement West System 71% – Industrial Machinery General)

Cost-Effectiveness Test	Levelized $/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	$0.032	$176,970	$418,700	$241,730	2.37
TRC	$0.032	$176,970	$380,636	$203,666	2.15
UCT	$0.024	$128,735	$380,636	$251,901	2.96
RIM		$498,760	$380,636	($118,124)	0.76
PCT		$154,467	$514,868	$360,401	3.33
Lifecycle Revenue Impacts ($/kWh)					$0.000002865
Discounted Participant Payback (years)					1.23

Table E25. Washington Motor Systems 2015 Net (2015 Decrement West Industrial 44% – Industrial Machinery General)

Cost-Effectiveness Test	Levelized $/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	$0.027	$195,674	$500,907	$305,233	2.56
TRC	$0.027	$195,674	$455,370	$259,696	2.33
UCT	$0.023	$163,904	$455,370	$291,465	2.78
RIM		$651,522	$455,370	($196,153)	0.70
PCT		$124,995	$642,724	$517,729	5.14
Lifecycle Revenue Impacts ($/kWh)					$0.000004751
Discounted Participant Payback (years)					0.87

Compressed Air

Table E26, Table E27, Table E28, Table E29, Table E30, and Table E31 show the compressed air end-use category cost-effectiveness results for net evaluated savings. The compressed air end-use category proved cost-effective from all perspectives except the RIM (Table E26 and Table E29).

Table E26. Washington Compressed Air 2014-2015 Gross
(2014 Decrement West System 71% – Load Shape Industrial Machinery General)
(2015 Decrement West Industrial 44% – Load Shape Industrial Machinery General)

Cost-Effectiveness Test	Levelized $/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	$0.043	$877,072	$1,473,940	$596,868	1.68
TRC	$0.043	$877,072	$1,339,946	$462,873	1.53
UCT	$0.028	$571,199	$1,339,946	$768,747	2.35
RIM		$1,952,546	$1,339,946	($612,600)	0.69
PCT		$636,951	$1,712,424	$1,075,473	2.69
Lifecycle Revenue Impacts ($/kWh)					$0.000014838
Discounted Participant Payback (years)					2.89

Table E27. Washington Compressed Air 2014 Gross
(2014 Decrement West System 71% – Load Shape Industrial Machinery General)

Cost-Effectiveness Test	Levelized $/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	$0.054	$479,241	$653,568	$174,326	1.36
TRC	$0.054	$479,241	$594,152	$114,911	1.24
UCT	$0.031	$268,716	$594,152	$325,437	2.21
RIM		$857,468	$594,152	($263,315)	0.69
PCT		$385,710	$763,937	$378,226	1.98
Lifecycle Revenue Impacts ($/kWh)					$0.000006914
Discounted Participant Payback (years)					3.57

Table E28. Washington Compressed Air 2015 Gross
(2015 Decrement West Industrial 44% – Load Shape Industrial Machinery General)

Cost-Effectiveness Test	Levelized $/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	$0.034	$424,326	$875,009	$450,683	2.06
TRC	$0.034	$424,326	$795,463	$371,137	1.87
UCT	$0.026	$322,628	$795,463	$472,835	2.47
RIM		$1,168,010	$795,463	($372,547)	0.68
PCT		$267,973	$1,011,657	$743,684	3.78
Lifecycle Revenue Impacts ($/kWh)					$0.000009024
Discounted Participant Payback (years)					1.18

Table E29. Washington Compressed Air 2014-2015 Net (2014 Decrement West System 71% – Load Shape Industrial Machinery General) (2015 Decrement West Industrial 44% – Load Shape Industrial Machinery General)

Cost-Effectiveness Test	Levelized $/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	$0.045	$787,899	$1,267,589	$479,690	1.61
TRC	$0.045	$787,899	$1,152,353	$364,454	1.46
UCT	$0.032	$571,199	$1,152,353	$581,154	2.02
RIM		$1,759,157	$1,152,353	($606,804)	0.66
PCT		$636,951	$1,712,424	$1,075,473	2.69
Lifecycle Revenue Impacts ($/kWh)					$0.000014698
Discounted Participant Payback (years)					2.89

Table E30. Washington Compressed Air 2014 Net (2014 Decrement West System 71% – Load Shape Industrial Machinery General)

Cost-Effectiveness Test	Levelized $/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	$0.056	$425,242	$562,068	$136,826	1.32
TRC	$0.056	$425,242	$510,971	$85,729	1.20
UCT	$0.035	$268,716	$510,971	$242,255	1.90
RIM		$775,042	$510,971	($264,071)	0.66
PCT		$385,710	$763,937	$378,226	1.98
Lifecycle Revenue Impacts ($/kWh)					$0.000006934
Discounted Participant Payback (years)					3.57

Table E31. Washington Compressed Air 2015 Net (2015 Decrement West Industrial 44% – Load Shape Industrial Machinery General)

Cost-Effectiveness Test	Levelized $/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	$0.036	$386,810	$752,508	$365,698	1.95
TRC	$0.036	$386,810	$684,098	$297,288	1.77
UCT	$0.030	$322,628	$684,098	$361,470	2.12
RIM		$1,049,657	$684,098	($365,559)	0.65
PCT		$267,973	$1,011,657	$743,684	3.78
Lifecycle Revenue Impacts ($/kWh)					$0.000008854
Discounted Participant Payback (years)					1.18

Agricultural

Table E32, Table E33, Table E34, Table E35, Table E36, and Table E37 show the agriculture end-use category cost-effectiveness results for net evaluated savings. The agricultural end-use category proved

cost-effective from the RIM perspective (Table E32 and Table E35); however, in 2014 the category wasn't cost-effective from either the TRC or RIM perspective.

Table E32. Washington Agricultural 2014-2015 Gross
(2014 Decrement West System 71% – Load Shape Irrigation)
(2015 Decrement West Commercial Cooling 40% – Load Shape Irrigation)

Cost-Effectiveness Test	Levelized $/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	$0.058	$1,002,675	$1,548,921	$546,247	1.54
TRC	$0.058	$1,002,675	$1,408,110	$405,436	1.40
UCT	$0.025	$424,979	$1,408,110	$983,132	3.31
RIM		$1,902,981	$1,408,110	($494,871)	0.74
PCT		$799,689	$1,699,996	$900,307	2.13
Lifecycle Revenue Impacts ($/kWh)					$0.000012445
Discounted Participant Payback (years)					4.21

Table E33. Washington Agricultural 2014 Gross
(2014 Decrement West System 71% – Load Shape Irrigation)

Cost-Effectiveness Test	Levelized $/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	$0.068	$609,992	$652,394	$42,402	1.07
TRC	$0.068	$609,992	$593,085	($16,907)	0.97
UCT	$0.024	$214,638	$593,085	$378,447	2.76
RIM		$951,949	$593,085	($358,864)	0.62
PCT		$528,779	$870,736	$341,957	1.65
Lifecycle Revenue Impacts ($/kWh)					$0.000008705
Discounted Participant Payback (years)					5.73

Table E34. Washington Agricultural 2015 Gross
(2015 Decrement West Commercial Cooling 40% – Load Shape Irrigation)

Cost-Effectiveness Test	Levelized $/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	$0.048	$418,835	$956,236	$537,401	2.28
TRC	$0.048	$418,835	$869,306	$450,470	2.08
UCT	$0.026	$224,349	$869,306	$644,957	3.87
RIM		$1,014,371	$869,306	($145,065)	0.86
PCT		$288,953	$884,488	$595,535	3.06
Lifecycle Revenue Impacts ($/kWh)					$0.000003648
Discounted Participant Payback (years)					1.92

Table E35. Washington Agricultural 2014-2015 Net
(2014 Decrement West System 71% – Load Shape Irrigation)
(2015 Decrement West Commercial Cooling 40% – Load Shape Irrigation)

Cost-Effectiveness Test	Levelized $/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	$0.060	$890,718	$1,332,072	$441,354	1.50
TRC	$0.060	$890,718	$1,210,975	$320,257	1.36
UCT	$0.029	$424,979	$1,210,975	$785,996	2.85
RIM		$1,696,061	$1,210,975	($485,086)	0.71
PCT		$799,689	$1,699,996	$900,307	2.13
Lifecycle Revenue Impacts ($/kWh)					$0.000012153
Discounted Participant Payback (years)					4.11

Table E36. Washington Agricultural 2014 Net
(2014 Decrement West System 71% – Load Shape Irrigation)

Cost-Effectiveness Test	Levelized $/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	$0.069	$535,963	$561,058	$25,096	1.05
TRC	$0.069	$535,963	$510,053	($25,910)	0.95
UCT	$0.028	$214,638	$510,053	$295,415	2.38
RIM		$848,726	$510,053	($338,672)	0.60
PCT		$528,779	$870,736	$341,957	1.65
Lifecycle Revenue Impacts ($/kWh)					$0.000008215

Discounted Participant Payback (years)	5.73

Table E37. Washington Agricultural 2015 Net
(2015 Decrement West Commercial Cooling 40% – Load Shape Irrigation)

Cost-Effectiveness Test	Levelized $/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	$0.050	$378,382	$822,363	$443,981	2.17
TRC	$0.050	$378,382	$747,603	$369,221	1.98
UCT	$0.030	$224,349	$747,603	$523,254	3.33
RIM		$903,768	$747,603	($156,165)	0.83
PCT		$288,953	$884,488	$595,535	3.06
Lifecycle Revenue Impacts ($/kWh)					$0.000003927
Discounted Participant Payback (years)					1.92

Recommissioning

Table E38, Table E39, Table E40, Table E41, Table E42, and Table E43 show the motor systems end-use category cost-effectiveness results for net evaluated savings. The motor systems end-use category proved cost-effective from all perspectives except for the RIM and UTC (Table E38 and Table E41).

Table E38. Washington Motor Systems 2014-2015 Gross
(2014 Decrement West System 71% – Industrial Machinery General)
(2015 Decrement West Industrial 44% – Industrial Machinery General)

Cost-Effectiveness Test	Levelized $/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	$0.041	$208,264	$305,429	$97,165	1.47
TRC	$0.041	$208,264	$277,663	$69,399	1.33
UCT	$0.047	$237,692	$277,663	$39,971	1.17
RIM		$554,655	$277,663	($276,992)	0.50
PCT		$32,996	$379,388	$346,392	11.50
Lifecycle Revenue Impacts ($/kWh)					$0.000018966
Discounted Participant Payback (years)					0.32

Table E39. Washington Motor Systems 2014 Gross
(2014 Decrement West System 71% – Industrial Machinery General)

Cost-Effectiveness Test	Levelized $/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	$0.045	$73,408	$105,531	$32,123	1.44
TRC	$0.045	$73,408	$95,937	$22,529	1.31
UCT	$0.054	$89,281	$95,937	$6,656	1.07

RIM		$191,211	$95,937	($95,274)	0.50
PCT		$24,037	$141,840	$117,803	5.90
Lifecycle Revenue Impacts ($/kWh)					$0.000006527
Discounted Participant Payback (years)					0.32

Table E40. Washington Motor Systems 2015 Gross
(2015 Decrement West Industrial 44% – Industrial Machinery General)

Cost-Effectiveness Test	Levelized $/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	$0.039	$143,837	$213,212	$69,375	1.48
TRC	$0.039	$143,837	$193,829	$49,992	1.35
UCT	$0.043	$158,295	$193,829	$35,533	1.22
RIM		$387,650	$193,829	($193,821)	0.50
PCT		$9,556	$253,369	$243,813	26.51
Lifecycle Revenue Impacts ($/kWh)					$0.000013271
Discounted Participant Payback (years)					0.09

Table E41. Washington Motor Systems 2014-2015 Net
(2014 Decrement West System 71% – Industrial Machinery General)
(2015 Decrement West Industrial 44% – Industrial Machinery General)

Cost-Effectiveness Test	Levelized $/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	$0.047	$203,644	$262,669	$59,025	1.29
TRC	$0.047	$203,644	$238,790	$35,146	1.17
UCT	$0.055	$237,692	$238,790	$1,098	1.00
RIM		$510,280	$238,790	($271,490)	0.47
PCT		$32,996	$379,388	$346,392	11.50
Lifecycle Revenue Impacts ($/kWh)					$0.000018589
Discounted Participant Payback (years)					0.32

Table E42. Washington Motor Systems 2014 Net
(2014 Decrement West System 71% – Industrial Machinery General)

Cost-Effectiveness Test	Levelized $/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	$0.050	$70,043	$90,756	$20,714	1.30
TRC	$0.050	$70,043	$82,506	$12,463	1.18
UCT	$0.063	$89,281	$82,506	($6,775)	0.92
RIM		$176,940	$82,506	($94,435)	0.47
PCT		$24,037	$141,840	$117,803	5.90
Lifecycle Revenue Impacts ($/kWh)					$0.000006470

Discounted Participant Payback (years)	0.32

Table E43. Washington Motor Systems 2015 Net
(2015 Decrement West Industrial 44% – Industrial Machinery General)

Cost-Effectiveness Test	Levelized $/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	$0.045	$142,499	$183,362	$40,863	1.29
TRC	$0.045	$142,499	$166,693	$24,193	1.17
UCT	$0.050	$158,295	$166,693	$8,397	1.05
RIM		$355,540	$166,693	($188,848)	0.47
PCT		$9,556	$253,369	$243,813	26.51
Lifecycle Revenue Impacts ($/kWh)					$0.000012931
Discounted Participant Payback (years)					0.09

Other

Table E44, Table E45, Table E46, Table E47, Table E48, and Table E49 show the other end-use category cost-effectiveness results for gross and net evaluated savings. The other end-use category proved cost-effective from all perspectives except for the RIM (Table E44 and Table E47).

Table E44. Washington Other 2014-2015 Gross
(2014 Decrement West System 71% – Load Shape Commercial Plug Load)
(2015 Decrement West Plug Loads 61% – Load Shape Commercial Plug Load)

Cost-Effectiveness Test	Levelized $/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	$0.059	$1,606,492	$2,046,965	$440,473	1.27
TRC	$0.059	$1,606,492	$1,860,877	$254,385	1.16
UCT	$0.031	$844,472	$1,860,877	$1,016,405	2.20
RIM		$3,088,170	$1,860,877	($1,227,293)	0.60
PCT		$1,345,292	$2,826,971	$1,481,678	2.10
Lifecycle Revenue Impacts ($/kWh)					$0.000026398
Discounted Participant Payback (years)					3.25

Table E45. Washington Other 2014 Gross
(2014 Decrement West System 71% – Load Shape Commercial Plug Load)

Cost-Effectiveness Test	Levelized $/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	$0.059	$1,198,973	$1,578,500	$379,526	1.32
TRC	$0.059	$1,198,973	$1,435,000	$236,026	1.20
UCT	$0.028	$560,119	$1,435,000	$874,881	2.56
RIM		$2,161,740	$1,435,000	($726,740)	0.66

PCT		$1,029,247	$1,992,014	$962,767	1.94
Lifecycle Revenue Impacts ($/kWh)					$0.000015294
Discounted Participant Payback (years)					4.49

Table E46. Washington Other 2015 Gross
(2015 Decrement West Plug Loads 61% – Load Shape Commercial Plug Load)

Cost-Effectiveness Test	Levelized $/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	$0.057	$434,660	$499,665	$65,005	1.15
TRC	$0.057	$434,660	$454,241	$19,581	1.05
UCT	$0.040	$303,291	$454,241	$150,949	1.50
RIM		$988,130	$454,241	($533,890)	0.46
PCT		$337,094	$890,564	$553,471	2.64
Lifecycle Revenue Impacts ($/kWh)					$0.000012499
Discounted Participant Payback (years)					1.74

Table E47. Washington Other 2014-2015 Net
(2014 Decrement West System 71% – Load Shape Commercial Plug Load)
(2015 Decrement West Plug Loads 61% – Load Shape Commercial Plug Load)

Cost-Effectiveness Test	Levelized $/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	$0.060	$1,418,151	$1,760,390	$342,239	1.24
TRC	$0.060	$1,418,151	$1,600,354	$182,203	1.13
UCT	$0.036	$844,472	$1,600,354	$755,882	1.90
RIM		$2,774,053	$1,600,354	($1,173,698)	0.58
PCT		$1,345,292	$2,826,971	$1,481,678	2.10
Lifecycle Revenue Impacts ($/kWh)					$0.000025245
Discounted Participant Payback (years)					5.01

Table E48. Washington Other 2014 Net
(2014 Decrement West System 71% – Load Shape Commercial Plug Load)

Cost-Effectiveness Test	Levelized $/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	$0.061	$1,054,879	$1,357,510	$302,631	1.29
TRC	$0.061	$1,054,879	$1,234,100	$179,221	1.17
UCT	$0.032	$560,119	$1,234,100	$673,981	2.20
RIM		$1,937,513	$1,234,100	($703,413)	0.64
PCT		$1,029,247	$1,992,014	$962,767	1.94
Lifecycle Revenue Impacts ($/kWh)					$0.000014803
Discounted Participant Payback (years)					4.49

Table E49. Washington Other 2015 Net
(2015 Decrement West Plug Loads 61% – Load Shape Commercial Plug Load)

Cost-Effectiveness Test	Levelized $/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	$0.059	$387,466	$429,712	$42,245	1.11
TRC	$0.059	$387,466	$390,647	$3,181	1.01
UCT	$0.046	$303,291	$390,647	$87,356	1.29
RIM		$892,253	$390,647	($501,606)	0.44
PCT		$337,094	$890,564	$553,471	2.64
Lifecycle Revenue Impacts ($/kWh)					$0.000011743
Discounted Participant Payback (years)					1.74

Net Portfolio

Table E50, Table E51, and Table E52 show the WattSmart portfolio level cost-effectiveness results for net evaluated savings. The net portfolio proved cost-effective from all perspectives except for the RIM (Table E50).

Table E50. Washington Portfolio 2014-2015 Net

Cost-Effectiveness Test	Levelized $/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	$0.050	$17,892,083	$26,274,781	$8,382,698	1.47
TRC	$0.050	$17,892,083	$23,886,164	$5,994,081	1.34
UCT	$0.034	$12,086,361	$23,886,164	$11,799,803	1.98
RIM		$41,467,024	$23,886,164	($17,580,860)	0.58
PCT		$15,156,738	$41,266,341	$26,109,603	2.72
Lifecycle Revenue Impacts ($/kWh)					$0.000378153
Discounted Participant Payback (years)					2.78

Table E51. Washington Portfolio 2014 Net

Cost-Effectiveness Test	Levelized $/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	$0.052	$9,812,884	$14,136,687	$4,323,804	1.44
TRC	$0.052	$9,812,884	$12,851,534	$3,038,650	1.31
UCT	$0.035	$6,637,898	$12,851,534	$6,213,636	1.94
RIM		$21,144,744	$12,851,534	($8,293,210)	0.61
PCT		$8,646,853	$21,129,733	$12,482,880	2.44
Lifecycle Revenue Impacts ($/kWh)					$0.000174525
Discounted Participant Payback (years)					2.27

Table E52. Washington Portfolio 2015 Net

Cost-Effectiveness Test	Levelized $/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	$0.048	$8,617,274	$12,946,490	$4,329,216	1.50
TRC	$0.048	$8,617,274	$11,769,537	$3,152,262	1.37
UCT	$0.032	$5,811,331	$11,769,537	$5,958,206	2.03
RIM		$21,675,744	$11,769,537	($9,906,208)	0.54
PCT		$6,943,443	$21,612,411	$14,668,967	3.11
Lifecycle Revenue Impacts ($/kWh)					$0.000231921
Discounted Participant Payback (years)					2.08