



2016-2017 California *wattsmart* Business Program Evaluation

FINAL REPORT

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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 trend data are typically collected during the analysis and 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 1,173 kWh per horsepower for HVAC variable frequency drive fans less than or equal to 100 hp and a deemed value of 0.37 kWh per cubic feet per minute for evaporative cooling measures.

Demand Side Management Central (DSMC)

Demand Side Management Central 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:

$$\text{Evaluated Savings}_i = \text{Verified Installations}_i * \text{Unit Consumption}_i$$

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:

$$\text{Net Savings} = \text{Evaluated Gross Savings} * \text{NTG}$$

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 Pacific Power.

In-Service Rate

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

Net-to-Gross

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

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

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 (TRL)

The Technical Resource Library is the official database repository of measure assumptions, which is linked to Pacific Power's DSMC project database.

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.

Executive Summary

Through its **wattsmart**[®] Business program, Pacific Power offers services and incentives to help commercial, industrial, and irrigation customers maximize the energy efficiency of their equipment and operations through midstream (distributors and suppliers) and downstream (customer) incentive mechanisms. Incentives are available for both retrofit projects and new construction and major renovation projects. During the 2016 and 2017 program years, the **wattsmart** Business program reported electricity savings of 5,739,605 kWh.

Pacific Power offers program measures and services to customers through four delivery channels (Trade Ally, Small Business Enhanced Incentive Offer, Midstream/Lighting Instant Incentive Offer, and Project Manager). Pacific Power contracts with two program administrators (Cascade Energy and Nexant) to manage the day-to-day operations of the Trade Ally, Small Business Enhanced Incentive, and Lighting Instant Incentive delivery channels, where program offerings are primarily marketed and delivered to customers through local trade allies. Through the Project Manager delivery channel, Pacific Power's Energy Efficiency Project Manager delivers, primarily, technical energy analysis services and custom incentives to large managed account customers, engaged in more complex projects that are not covered under one of the other offerings.¹

Pacific Power contracted with the Cadmus team (comprised of Cadmus, ADM Associates, and VuPoint Research) to conduct impact and process evaluations of the California **wattsmart** Business program for the 2016 and 2017 program years. Cadmus subcontracted a portion of the impact evaluation to ADM Associates, and VuPoint Research performed the process evaluation telephone surveys. For the impact evaluation, the team assessed energy impacts, net-to-gross (NTG), and program cost-effectiveness. For the process evaluation, the team assessed program delivery and efficacy, bottlenecks, barriers, and opportunities for improvements. At Pacific Power's request, Cadmus evaluated program participants, and reported the 2016-2017 evaluation findings under the following categories:²

- ***Wattsmart Business (Typical Upgrades and Custom Analysis)***: This category includes projects delivered through the Trade Ally delivery and Project Manager delivery channels. Pacific Power offered customers prescriptive incentives (Typical Upgrades), for measures including irrigation, HVAC, lighting, motors, building shell, food service equipment, and refrigeration, and energy analysis studies. They also offered custom incentives (Custom Analysis), for verified first-year energy savings resulting from the installation of qualifying capital equipment upgrades not covered by the Typical Upgrades incentives, or any other **wattsmart** Business program delivery offering.
- ***Small Business Enhanced Incentive Offer***: Pacific Power provided free facility assessments and incentives for small business customers who installed qualifying LED lighting and lighting

¹ Managed accounts are typically accounts larger than one MW.

² To report NTG, Cadmus surveyed **wattsmart** Business Typical Upgrades and Custom Analysis participants using the same measure strata used by the impact team.

controls upgrades.³ A network of program-approved contractors performed the assessments and installed lighting upgrades for this offer.

- **Midstream/Lighting Instant Incentives (Lighting Instant Incentives):** Pacific Power offered instant point-of-purchase incentives for qualifying LED and reduced wattage fluorescent lamps and retrofit kits purchased from a participating lighting distributor. Customers purchasing from non-participating suppliers may apply for incentives post purchase.

Key Findings

Key Impact Evaluation Findings

For the impact evaluation, the Cadmus team analyzed 46 projects that contributed 22% of the 2016-2017 program savings. Table 1 provides a summary of the evaluation findings, including the number of unique projects, evaluated savings, and precision.

Table 1. 2016 and 2017 wattsmart Business Program Savings

Strata	Unique Projects*	Reported Savings (kWh)	Evaluated Savings (kWh)	Realization Rate	Precision*
Irrigation	69	1,674,616	1,769,677	105.7%	4.0%
Lighting	179	3,542,750	3,361,949	94.9%	7.3%
Other	21	232,439	200,152	86.1%	0.0%
Refrigeration	6	289,800	280,252	96.7%	N/A
Total	275	5,739,605	5,612,029	97.8%	6.0%

* 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 were counted as multiple Unique Projects.

Overall, the realization rate was 97.8% for the two program years, though variability occurred between measure categories. The impact evaluation achieved $\pm 6.0\%$ precision with 90% confidence overall. The report's *Evaluated Gross Savings Results by Strata* section describes specific details and findings per strata. Two strata, Lighting and Irrigation, account for over 91% of the savings. The key findings for those strata are detailed in the following bullet points:

- Lighting accounts for 62% of all reported energy savings. Cadmus evaluated 16 projects accounting for 12% of reported energy savings within the lighting strata resulting in a realization rate of 95% within the lighting strata. The differences in savings resulted from fewer verified lighting installations observed than incentivized and deviations from the reported hours of use.
- Irrigation projects make up the second highest strata with 29% of all reported energy savings. Cadmus evaluated a sample of 18 irrigation projects accounting for 29% of reported energy savings within the irrigation strata. Pacific Power realized 106% of the reported energy savings within the irrigation strata. In general, the quantities and performance characteristics of the

³ Prior to May 2017, Pacific Power incentivized T5 and T8 fluorescent fixture retrofits and T12 conversions through the Small Business Enhanced Incentive Offer.

incentivized equipment matched the incentive documentation. Evaluated energy savings typically deviated from the claimed energy savings because the evaluated energy savings were calculated using site-specific system characteristics (flow rate, system pressure, hours of use) instead of using deemed energy savings per equipment type.

Table 2 and Table 3 show impact evaluation findings by program year, for 2016 and 2017, respectively. The Cadmus team combined the 2016 and 2017 program years to perform the sampling and analysis, and applied the overall realization rates to the reported savings for each year.

Table 2. 2016 wattsmart Business Program Savings*

Strata	Unique Projects	Reported Savings (kWh)	Evaluated Savings (kWh)	Realization Rate
Irrigation	40	993,813	1,050,227	106%
Lighting	104	2,063,387	1,958,387	95%
Other	12	82,053	70,655	86%
Refrigeration	2	134,755	130,315	97%
Total	158	3,274,008	3,209,281	98%

*Totals may not sum due to rounding.

Table 3. 2017 wattsmart Business Program Savings*

Strata	Unique Projects	Reported Savings (kWh)	Evaluated Savings (kWh)	Realization Rate
Irrigation	29	680,803	719,449	106%
Lighting	75	1,479,363	1,403,865	95%
Other	9	150,386	129,497	86%
Refrigeration	4	155,045	149,937	97%
Total	117	2,465,597	2,402,748	98%

*Totals may not sum due to rounding.

Table 4 shows the net energy savings by program strata, for 2016 and 2017 combined. The Cadmus team combined the 2016 and 2017 program years to perform the NTG analysis and applied the overall strata ratios to the gross evaluated savings.

Table 4. 2016-2017 wattsmart Business Program Net Savings*

Strata	Evaluated Gross Savings (kWh)	NTG	Evaluated Net Savings (kWh)
Irrigation	1,769,677	62%	1,097,199
Lighting	3,361,949	79%	2,655,939
Other	200,152	102%	204,155
Refrigeration	280,252	92%	257,832
Total	5,612,029	75%	4,215,156

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

Participant Experience

- Participants receiving Typical Upgrade or Custom Analysis incentives reported high levels of satisfaction with the different elements of the program and with Pacific Power. A high percentage of participants reported being very satisfied with the equipment they installed (95%, n=31), the time required to receive their incentive (83%, n=29), and to a slightly lesser extent, with the program overall (67%, n=29). While 45% of participants reported very satisfied with the amount of their incentive, an additional 42% reported somewhat satisfied, for a total 87% reporting satisfied (n=31). All participants that interacted with Pacific Power during their project reported very satisfied or somewhat satisfied responses (81%, 19% respectively, n=21).
- Thirty of 31 participants reported one or more benefits as a result of the energy-efficient equipment they installed through the program. One half of respondents reported lower energy bills, while 47% reported lower energy consumption, and 43% reported better/brighter light quality. The three most frequently reported benefits were followed by increased productivity and lower maintenance costs.
- Participants are learning about the program incentives from Pacific Power staff and **wattsmart** Business program representatives more often than any other source. Forty percent of participants reported this was how their organizations learned about the incentives. Twenty-percent of participants reported Pacific Power mailings/bill inserts/website. Participants reported these two categories more often than the remaining seven categories combined.
- Participants overwhelmingly prefer to be kept informed about the program via Pacific Power mailing/email/newsletters/bill inserts/website (90%, n=30). This was true for participants utilizing the prescriptive (Typical Upgrade) incentives, as well as those completing custom projects.
- A majority of participants reported no challenges to participating in the program (77%, n=30). Those reporting challenges, most often cited too much paperwork.
- Implementing new standards for designated participating trade allies increased the quality of trade allies associated with the program but reduced the overall number.

Nonparticipants

- Seventy-six percent (n=66) of nonparticipants are unaware of the **wattsmart** Business program. Those aware of the program learned about it from a Pacific Power mailing, bill insert, or the website (44%) or through contact with a **wattsmart** Business representative (25%, n=16)

Marketing and Outreach

- Pacific Power’s business and communication objectives are sound and a good base from which to work. The materials and campaigns represented in the marketing and outreach calendar cover the major business sectors and cost-effective measures offered to participants.
- Pacific Power’s communication strategies and messaging are sound, but not all are reflected in the marketing calendar or materials. For example, these two strategies are not yet evident in the materials:
 - Continue to expand the success Pacific Power has had in partnering with business customers to feature in case studies in advertising and newsletter articles.
 - Incorporate messaging about energy efficiency being good for the state’s environment.
- Program marketing collateral provides necessary information about the program offerings; however, these materials or links within them are generic to **wattsmart** Business overall and do not reflect a California focus or origin.

Cost-Effectiveness Results

As shown in Table 5 and Table 6, the program did not pass several cost-effectiveness tests in the 2016 and 2017 evaluation years. The program was not cost-effective from the Total Resource Cost Test (TRC) perspective, with a benefit/cost ratio of 0.84 for gross and 0.73 for net; however, the program was cost-effective from the Utility Cost Test (UCT) perspective using both gross (1.57) and net (1.11) savings.

Table 5. 2016–2017 Evaluated wattsmart Business Program Gross Cost-Effectiveness Summary

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Pacific Power Total Resource Cost Test (PTRC) (TRC + 10% Conservation Adder)	\$0.081	\$3,936,883	\$3,628,443	(\$308,440)	0.92
Total Resource Cost Test (TRC) No Adder	\$0.081	\$3,936,883	\$3,298,585	(\$638,299)	0.84
Utility Cost Test (UCT)	\$0.043	\$2,094,809	\$3,298,585	\$1,203,775	1.57
Ratepayer Impact Measure (RIM) Test		\$10,100,752	\$3,298,585	(\$6,802,168)	0.33
Participant Cost Test (PCT)		\$2,510,732	\$8,674,601	\$6,163,869	3.46
Lifecycle Revenue Impacts (\$/kWh)					\$0.000729435
Discounted Participant Payback (years)					2.73

Table 6. 2016–2017 Evaluated wattsmart Business Program Net Cost-Effectiveness Summary

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Pacific Power Total Resource Cost Test (PTRC) (TRC + 10% Conservation Adder)	\$0.094	\$3,184,614	\$2,558,599	(\$626,015)	0.80
Total Resource Cost Test (TRC) No Adder	\$0.094	\$3,184,614	\$2,325,999	(\$858,615)	0.73
Utility Cost Test (UCT)	\$0.062	\$2,094,809	\$2,325,999	\$231,190	1.11
Ratepayer Impact Measure (RIM) Test		\$7,681,386	\$2,325,999	(\$5,355,387)	0.30
Participant Cost Test (PCT)		\$2,510,732	\$8,674,601	\$6,163,869	3.46
Lifecycle Revenue Impacts (\$/kWh)					\$0.000574288
Discounted Participant Payback (years)					2.73

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 revising the deemed savings for LED case lighting to match DEER. DEER recommends savings as 102.9 kWh per five-foot door for medium case lighting and 232.5 kWh per five-foot door for low temperature case lighting. This change will reduce the claimed energy savings for LED case lighting.

Marketing and Outreach

Recommendation: Consider the following opportunities and incorporate those that can be done cost-effectively.

- Include California-specific language in electronic communications directed exclusively to California customers.
- Increase the use of case studies.
- If budget will allow, develop and incorporate messaging to support Pacific Power’s goal to appeal to customers based on energy efficiency as good for the environment and the state of California. Calendarize this message with specific campaign efforts throughout the year.
- Communicate program changes that impact the customers’ incentive or program experience, close to when the changes take effect. This could be done via email.
- Increase presence in town events through town chambers of commerce if budget allows.
- If budget and resources allow, increase the frequency of email throughout the year, rather than only to coincide with marketing events.

Nonparticipants

Recommendation: Increase efforts to build awareness of the program and its benefits through regular email marketing and business-to-business outreach. Target nonparticipants with case studies highlighting actual energy cost savings achieved by other small businesses. Continue growing the program approved trade ally network and lighting distributor participation, to extend Pacific Power's outreach to customers, beyond its own marketing efforts.

Introduction

Program Description

Pacific Power offers **watt**smart Business program measures, services, and incentives through these delivery channels:

- Trade Ally (Typical Upgrades and Custom Analysis)
- Small Business Enhanced Incentive Offer
- Midstream/Lighting Instant Incentives (Lighting Instant Incentives)
- Project Manager

Through the Typical Upgrades offering, Pacific Power provides prescriptive incentives primarily for small and midsize customers, although large customers may also receive these incentives. Pacific Power contracted with Nexant and Cascade Energy to coordinate with the trade allies, provide training and support, and conduct application processing services for these prescriptive incentives.

wattsmart Business' Small Business offering is an enhanced incentive for small business customers, delivered through program-approved trade allies. Nexant managed these trade allies for all participants.

Through the Lighting Instant Incentives offering, Pacific Power targets the lighting maintenance market by offering customers instant point-of-purchase incentives on qualified LEDs, reduced wattage fluorescent lamps, and retrofit kits purchased through a participating lighting distributor. Customers purchasing through a nonparticipating distributor do not receive an instant discount, but they may apply to Pacific Power for incentives post-purchase. Nexant also manages the participating distributors delivering this offering.

Pacific Power targets custom incentives to large energy users that generally offer multiple opportunities for energy efficiency upgrades and those with projects that require custom analysis. Midsize and smaller customers, however, may participate in custom incentives. Pacific Power provides energy efficiency analysis and verification of custom savings for large customers through a precontracted group of engineering firms.

Through the Energy Management offering (e.g., Recommissioning, Industrial Recommissioning, Persistent Commissioning, Strategic Energy Management [SEM]), participating customers may receive expertise and custom incentives for verified savings achieved through improved operations, maintenance, and management practices.⁴

⁴ Cadmus evaluated four industrial recommissioning projects (typically categorized as Energy Management) under the **watt**smart Business category for the 2016–2017 evaluation period.

Program Delivery

The Pacific Power program manager who oversees the **wattsmart** Business program in California is responsible for contracting with and managing the program's administrators (i.e., Cascade Energy and Nexant and subcontractor Evergreen Consulting Group). In addition, the program manager oversees in-house delivery and cost-effectiveness, achieves and monitors program performance and compliance, conducts program marketing, and recommends changes to the program's terms and conditions.

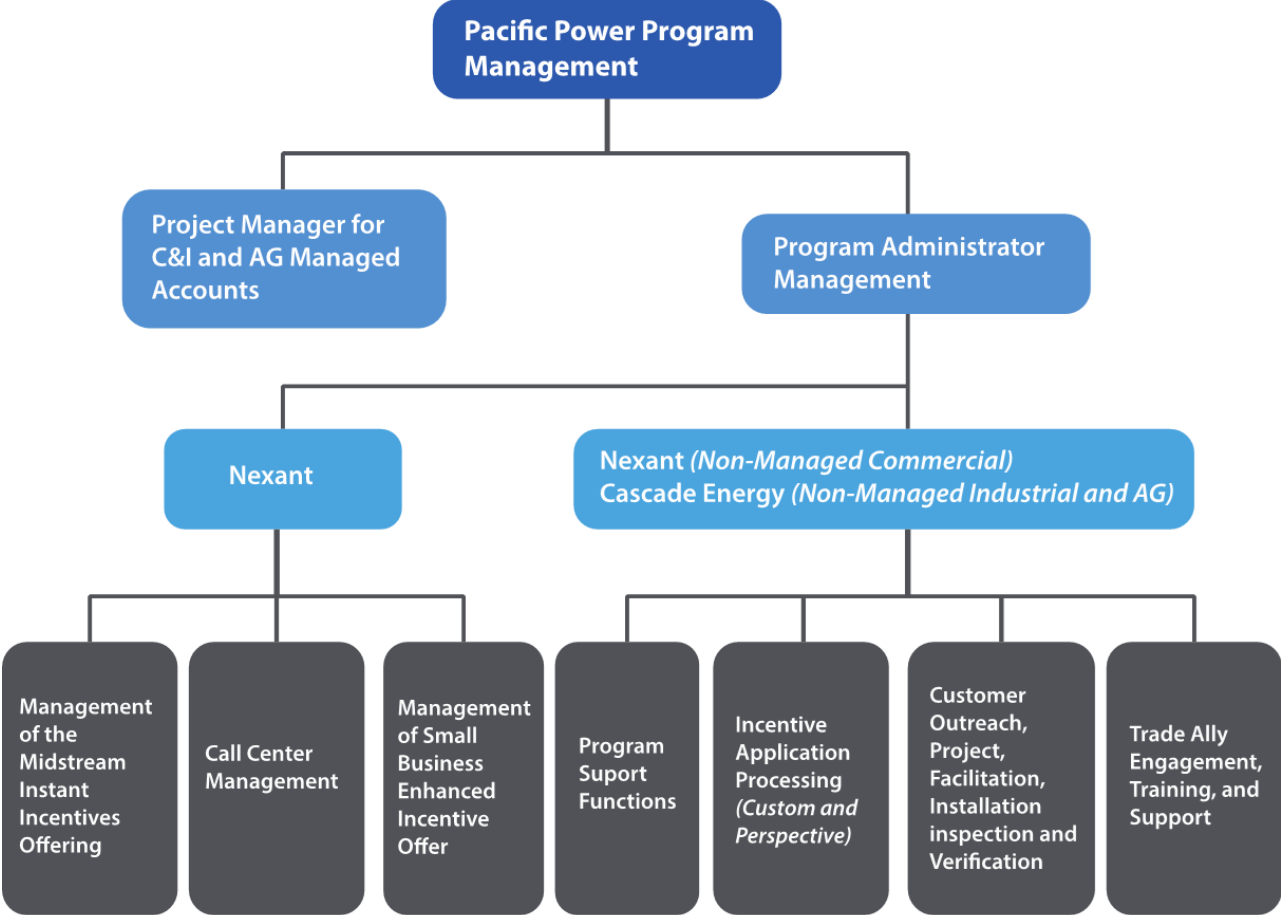
Pacific Power's in-house project manager and regional business managers conduct the outreach and delivery of projects to its managed accounts (typically accounts larger than one MW). Nexant and Cascade also may conduct direct customer outreach, project facilitation, and measurement and verification for custom projects to non-managed accounts, and, on occasion, may provide project facilitation to managed accounts at Pacific Power's request.⁵

Pacific Power delivers the Energy Management offerings through assigned Energy Management Providers. These providers are drawn from contracted third-party engineering services providers with expertise appropriate to individual projects. Nexant and Cascade, are two of the contracted engineering services providers; their focus, when providing these services, would be on non-managed accounts.

⁵ Managed accounts typically are accounts larger than one MW. These accounts are handled individually by a Pacific Power Energy Efficiency Project Manager. Non-managed accounts typically are those less than one MW.

Figure 1 provides an overview of the program management responsibilities.

Figure 1. *watt*smart Business Program Delivery Roles



Evaluation Objectives

The Cadmus team assessed the *watt*smart Business program to determine savings achievements, assess cost-effectiveness, and, where applicable, identify areas for improving program delivery and customer involvement and satisfaction. Table 7 lists evaluation goals, along with the corresponding evaluation activities employed to achieve those goals.

Table 7. 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	NTG Analysis	Reporting
Document and measure program effects	X	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 46 projects to achieve at least 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 administrators 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 and operations.⁶

Impact Sampling and Extrapolation Methodology

Through the California **watt**smart Business program, Pacific Power provides incentives for the seven measure types shown in Table 8. The Cadmus team stratified these seven measure types into the four strata shown in the table, which were designed to account for the largest amount of savings and quantity of projects per strata. The team designed the sampling plan for 2016 and 2017, combining

⁶ Participants are customers completing a project through the program during the 2016 and/or 2017 evaluation period. Partial participants are customers initiating a project through the program in 2016 or 2017, but not completing that project. Nonparticipants are customers who have never initiated or completed a project through the program (or at least not in 2016 or 2017).

participation to achieve approximately $\pm 20\%$ precision at 80% confidence per strata, and to exceed $\pm 10\%$ precision at 90% confidence at the nonresidential portfolio level.

Table 8 shows total project counts in the tracking database, total reported energy savings, and sampled projects.

Table 8. California 2016-2017 wattsmart Business Program Impact Sampling

Strata	Measure Type	Number of Incentivized Projects	Reported Energy Savings (kWh)	Unique Sampled Projects
Irrigation	Irrigation	69	1,674,616	18
Lighting	Lighting	179	3,542,750	16
Refrigeration	Refrigeration	6	289,800	3
Other	HVAC	4	232,439	9
	Motors	5		
	Building Shell	1		
	Food Service Equipment	11		
Total		275	5,739,605	46

The Cadmus team divided sampled projects into two categories: selected and random. Random projects were chosen randomly, and evaluated results were extrapolated to the rest of the population within the stratum. Selected projects were hand-picked from the projects where the project accounted for 10% or more of total stratum savings per program year. The team evaluated these projects individually, and the results were included within each stratum, but associated realization rates were not extrapolated to the population as selected projects are not representative of the population due to the magnitude of reported energy savings.

Table 9 shows the total quantity of projects sampled, the associated reported energy savings, and the percentage this sample represented out of the population.

Table 9. California 2016–2017 wattsmart Business Program Impact Sampling Summary

Strata	Sample Type	Unique Projects Sampled	Reported Energy Savings (kWh)		Percentage kWh Sampled
			Sampled Projects	Full Sample	
Irrigation	Selected	3	158,369	492,813	29.4%
	Random	15	334,444		
Lighting	Selected	0	0	428,104	12.1%
	Random	16	428,104		
Other	Selected	8	149,308	156,613	67.4%
	Random	1	7,305		
Refrigeration	Selected	3	200,229	200,229	69.1%
	Random	0	0		
Total		46	1,277,759	1,277,759	22.3%

Process Sample Design and Data Collection Methods

The Cadmus team conducted the process evaluation by grouping projects into three categories, defined through conversations with Pacific Power, to achieve Pacific Power's reporting objectives for the process evaluation. These categories included the following:

- **wattsmart** Business (including projects receiving Typical Upgrades incentives as well as projects receiving Custom Analysis incentives)
- Small Business Enhanced Incentive Offer
- Lighting Instant Incentives

The team developed samples for three customer populations—participants, partial participants, and nonparticipants—using simple random sampling within each category.⁷ The team defined participants as customers that completed Typical Upgrades, Custom Analysis, Small Business Enhanced Incentive Offer, or Lighting Instant Incentives projects through the program during the evaluation period for program years 2016 and 2017. The team defined partial participants as customers initiating Typical Upgrades or Custom Analysis projects through the program in 2016 or 2017 but did not complete those projects. The team did not stratify these customers by measure category or other strata due to the small population. 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 2016 and 2017. The team selected projects for review using simple random sampling.

Table 10 shows the final sample disposition for each data collection activity.⁸ The partial participants generally were unresponsive to VuPoint's contact attempts, even after dialing five times at different times throughout the week.

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

⁷ At Pacific Power's request, to prevent survey fatigue from other planned or ongoing survey activity, Cadmus removed all managed accounts from the populations prior to stratification or sampling.

⁸ Cadmus contracted with VuPoint Research to conduct the participant, partial participant, and nonparticipant surveys. VuPoint is a third-party research company, experienced in conducting 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 10. California 2016–2017 wattsmart Business Program Data Collection and Sampling

Data Collection Activity	Population	Sampling Frame**	Target Completes	Achieved Completes
Pacific Power Program Staff Interviews	N/A	N/A	N/A	4
Program Administrator Interviews	N/A	N/A	N/A	6
wattsmart Business Participant Surveys (Typical Upgrade or Custom Analysis)	Segmented below	Segmented below	Segmented below	Segmented below
Irrigation	51	51	20	10
Lighting (other than Small Business Enhanced Incentive or (Lighting Instant Incentives)	112	96	23	18
Refrigeration	5	5	5	1
Other*	14	13	9	2
wattsmart Business Online Participant Survey	Included above	Included above	Included above	7***
Participant Surveys (Small Business Enhanced Incentive)	4	4	4	2
Participant Surveys (Lighting Instant Incentives)	4	4	4	1
Participant Subtotal	190	173	65	41
Partial Participant Surveys	93	33	22	0
Nonparticipant Surveys	3,444	2,443	68	68
Total	3,727	2,649	155	109

*Other included HVAC, Motors, Building Shell, and Food Service Equipment.

** The team based the sampling frame on unique customers with contact information, after removing duplicates and managed accounts.

***Six lighting participants and one irrigation participant (used in NTG analysis only). Participants responding to the online survey were asked the freeridership and spillover sections of the original telephone survey guide. Results from these seven online surveys are included in the *Evaluated Net Savings* section of this evaluation report but not in the *Customer Response—Participants* section.

Impact Evaluation

This chapter provides the **wattsmart** Business program impact evaluation findings that resulted from the Cadmus team’s data analysis. The team incorporated the following activities:

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

Reported savings are electricity savings (kWh) that Pacific Power reported in the 2016 and 2017 *California Annual Reports on Conservation Acquisition* (annual reports).⁹ To determine evaluated savings, the Cadmus team applied step 1 through step 5 shown in Table 11.

Table 11. Impact Steps to Determine Evaluated Savings

Savings Estimate	Step	Action
Evaluated Gross 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, meter data).
	4	Realization Rates: Extrapolate realization rates to the population.
Net Savings	5	Net-to-gross: Use self-reported surveys to determine freeridership and spillover.

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, irrigation, and other measures. The team completed 96 site visits as part of the 2016 and 2017 program evaluation. Site visits were performed to verify measure installations.

⁹ These reports are available online:
http://www.pacificorp.com/content/dam/pacificorp/doc/Energy_Sources/Demand_Side_Management/2017/CA_2016_DSM_Annual_Report.pdf
http://www.pacificorp.com/content/dam/pacificorp/doc/Energy_Sources/Demand_Side_Management/2017/CA_2017_DSM_Annual_Report_FINAL.pdf

Step 3: The team completed the following: reviewed all project documentation; developed an evaluation, measurement, and verification plan; and performed site visits to verify the installation, specifications, and operations of incented measures. The team installed light loggers at seven sites and power metering equipment at 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 with light loggers or power meters installed, the team used logger data to determine hours-of-use or power consumption for 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.

Step 5: Lastly, the Cadmus team used participant surveys to calculate freeridership and participant spillover using industry standard self-report methodology. We also surveyed nonparticipants to determine if any nonparticipant spillover was credited to the program.

Site Visits and Engineering Measurements

The Cadmus team reviewed all project documentation available from Pacific Power, which included project applications, equipment invoices, reports published by the pre-contracted group of energy engineering consultants, and savings calculation spreadsheets.

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

- Verified the installation and operation of equipment receiving 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., equipment types replaced, hours-of-operation) that could not be verified on site or through documentation reviews or metering.

Engineering Analysis

In general, Cadmus referenced current measure workbooks and savings estimation methodologies from the Database for Energy Efficient Resources (DEER) and the Regional Technical Forum (RTF). The DEER, developed by the California Public Utilities Commission (CPUC), provides estimates of the energy-saving potential for typical energy-efficiency technologies and measures. 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.

Overall Evaluated Savings Results

Table 12 presents reported and evaluated savings for the 2016 and 2017 program years, with a 96.8% overall realization rate.

Table 12. Reported and Evaluated Savings by Program Year

Program Year	Program Savings (kWh)		Program Realization Rate
	Reported	Evaluated	
2016	3,274,008	3,209,281	98.0%
2017	2,465,597	2,402,748	97.5%
Total	5,739,605	5,612,029	97.8%

*Totals may not sum due to rounding.

Table 13 provides evaluation results for reported and evaluated savings, along with realization rates by measure type.

Table 13. Reported and Evaluated wattsmart Business Program Savings by Strata (2016–2017)

Strata	Program Savings (kWh)		Realization Rate	Precision*
	Reported	Evaluated		
Irrigation	1,674,616	1,769,677	105.7%	4.0%
Lighting	3,542,750	3,361,949	94.9%	7.3%
Other	232,439	200,152	86.1%	0.0%
Refrigeration	289,800	280,252	96.7%	N/A
Total	5,739,605	5,612,029	97.8%	6.0%

*Precision was calculated at 80% confidence per strata and 90% confidence for the program overall. “Other” precision is calculated at 0% because the evaluation had only one random project, and Refrigeration had no random projects.

Evaluated Gross Savings Results by Strata

Irrigation

Pacific Power provided incentives for four types of irrigation measures: water distribution equipment, variable frequency drives (VFDs), pump upgrades, and system redesigns. The company provided incentives for 156 measures in 69 unique projects, reporting 1,674,616 kWh in energy savings for the 2016 and 2017 program years. Incented irrigation projects accounted for 29% of all reported energy savings in Pacific Power’s California territory.

Methodology

To determine savings for incented irrigation projects in the California territory, Pacific Power used prescriptive or custom calculations or deemed savings values. The Cadmus team evaluated 18 irrigation

projects, accounting for 29% of reported energy savings within the irrigation strata. From the evaluated projects, Pacific Power used deemed savings for five projects, prescriptive calculations for seven projects, and custom calculations for six projects.

Seven 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 pressures.

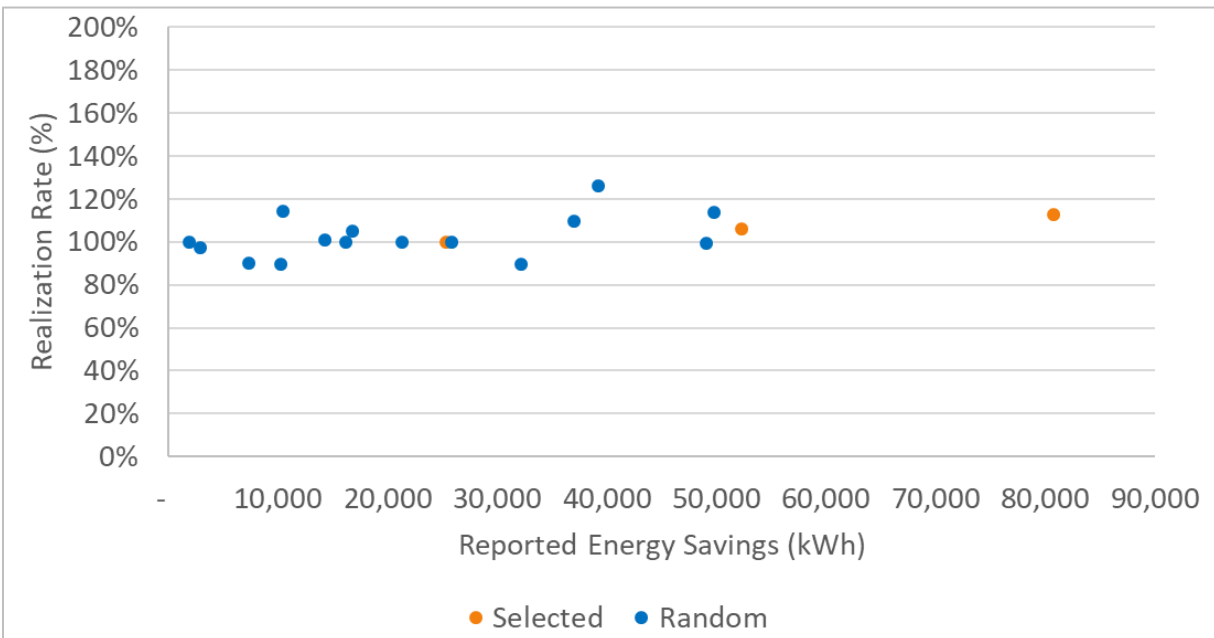
For the seven projects involving prescriptive calculations for installing VFDs on irrigation pumps, the administrator determined claimed savings using the Irrigation Pump VFD Savings Estimator v1.4 calculator. The team evaluated savings for these projects by initially reviewing the Irrigation Pump VFD 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.

Four projects involved pump station upgrades, where custom calculations were generated to determine claimed energy savings. The Cadmus team reviewed custom calculations for accuracy and appropriateness. Where site findings deviated from expected operations, the team created custom calculations to determine evaluated savings.

Findings

Figure 2 shows realization rates and associated energy savings for each sampled project.

Figure 2. Irrigation Sample Results



Seventeen of the 18 sampled projects were evaluated to have savings within 20% of the claimed value. One site achieved realization rates greater than 120%. Table 14 provides specific details related to this project.

Table 14. Irrigation Sample Detailed Findings

Project	Project Measures	Reported kWh	Evaluated kWh	Site Realization Rate	Notes
CAC01629	Irrigation hardware	39,192	49,449	126%	Observed system flowrate was higher than the flowrate used to determine deemed savings, resulting in higher evaluated savings

Claimed energy savings for irrigation hardware were deemed per equipment type. These deemed savings were based on average values and assumptions in the irrigation hardware measure from the RTF. The Cadmus team evaluated these projects using the same RTF irrigation hardware calculator, but updated the calculation inputs based on site-specific findings. Evaluated savings typically fell within 15% of the deemed value, and variation in savings resulted from differences in site-specific flow rates, hours-of-use, or system pressures.

Lighting

Pacific Power provides incentives for five types of lighting projects: controls, exterior lighting, general illuminance, lighting, and non-general illuminance. These projects include retrofits, major renovations, or new construction, and they involve high-efficient lighting technologies, such as LEDs and Consortium for Energy Efficiency (CEE) T8s.

Pacific Power incented 521 lighting measures within 179 unique projects, and reported 3,542,750 kWh in energy savings for the 2016 and 2017 years. The incented lighting projects accounted for 62% of all reported lighting energy savings by Pacific Power in California.

Methodology

The Cadmus team evaluated 16 lighting projects, accounting for 12% of all reported energy savings within the lighting strata. Pacific Power used the prescriptive **wattsmart** Business Lighting Calculator to determine incentive amounts for all lighting projects in the California territory. 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:

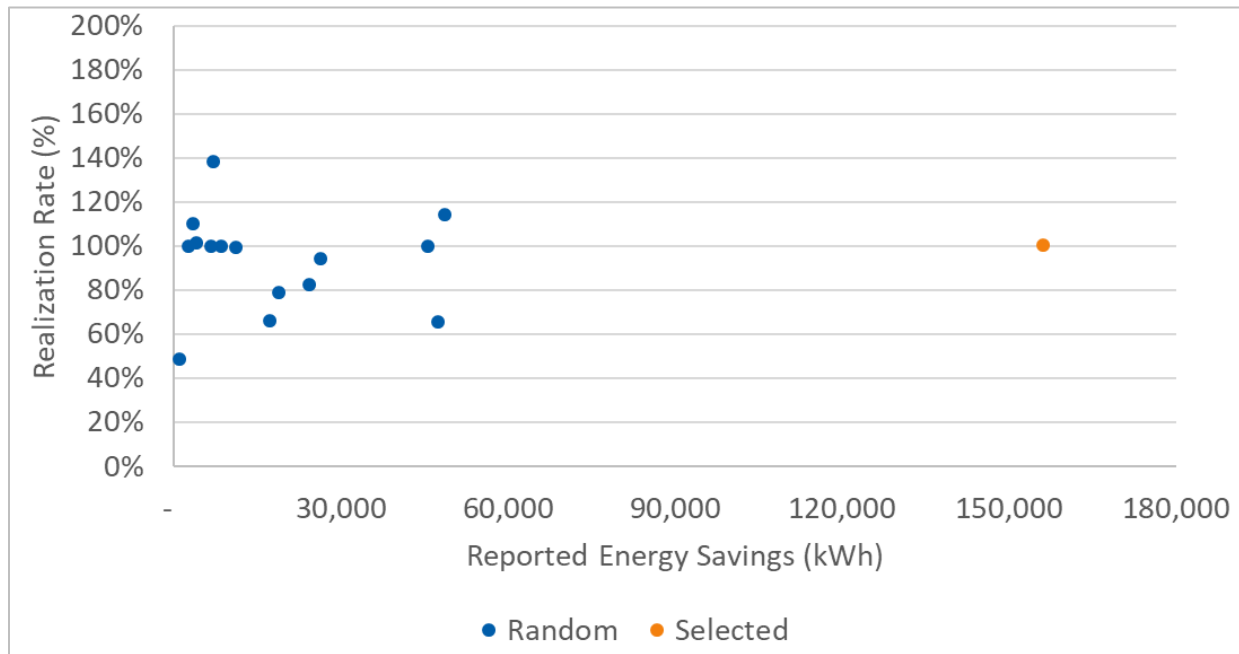
- Lighting operation schedules
- Space names, types, and area
- Baseline lighting fixture locations, types, quantities, controls, and wattages
- Proposed lighting fixture locations, types, quantities, controls, and wattages

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 sampled project to inspect and document the installed lighting equipment. For two 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 that these representative spaces were areas with fixtures where the highest energy savings were claimed. The team left 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 prescriptive calculators with revised values.

Findings

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

Figure 3. Lighting—Sample Results



Five sites exhibited a realization rate less than 80%, 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 15 provides specific details.

Table 15. Lighting—Sample Detailed Findings

Project	Project Measures	Reported kWh	Evaluated kWh	Site Realization Rate	Notes
CAFX2_000292	Lighting	898	438	49%	Fixtures installed on site were 22 W instead of 14.5 W
CAFX2_000329	Lighting	17,107	11,316	66%	Seven of the 36 incentivized fixtures were not replaced
CAFX2_000340	Lighting	47,411	31,064	66%	Light loggers indicated lower hours-of-use than claimed
WSBCA_72208	Lighting	18,782	14,778	79%	Five of the 28 incentivized fixtures were not replaced
CAFX2_000330	Lighting	7,081	9,801	138%	Light Loggers indicated higher hours-of-use than claimed

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

- Incentivized fixtures were not found at two facilities (CAFX2_000329, and WBSA_72208). For two facilities, lighting fixtures matched the incentive equipment, but the total quantity of fixtures were fewer than claimed.
- Light loggers were installed to monitor lighting hours-of-use at two facilities (CAFX2_000340 and CAFX2_000330). The analyzed data indicated hours-of use did not match the project documentation. One project realized higher savings due to increased hours of use. One project realized lower savings.
- Fixtures found at one facility (CAFX2_000292) did not match the incentive documentation. The application was correct, but the installed wattages indicated on the bulbs were higher (22W) than claimed (14.5W).

Other

Pacific Power provides incentives for projects within the Other category: building shell measures (insulation); food service equipment (freezers, case lighting, refrigeration), HVAC (heat pumps, controls) and motors (green motor rewinds, custom). The company incented 34 measures within 21 unique projects and reported 232,439 kWh in energy savings for the 2016 and 2017 program years. Other incented projects accounted for 4% of all reported energy savings by Pacific Power in California.

Methodology

For Other projects incented, Pacific Power used prescriptive and custom calculators and deemed savings values to determine reported energy savings. The Cadmus team evaluated nine projects, accounting for 67% of reported energy savings within the Other strata. From the evaluated projects, Pacific Power used deemed savings for six projects, prescriptive calculations for two projects, and custom calculations for one project. Table 16 lists deemed savings sources and evaluation methodologies for projects within the Other category.

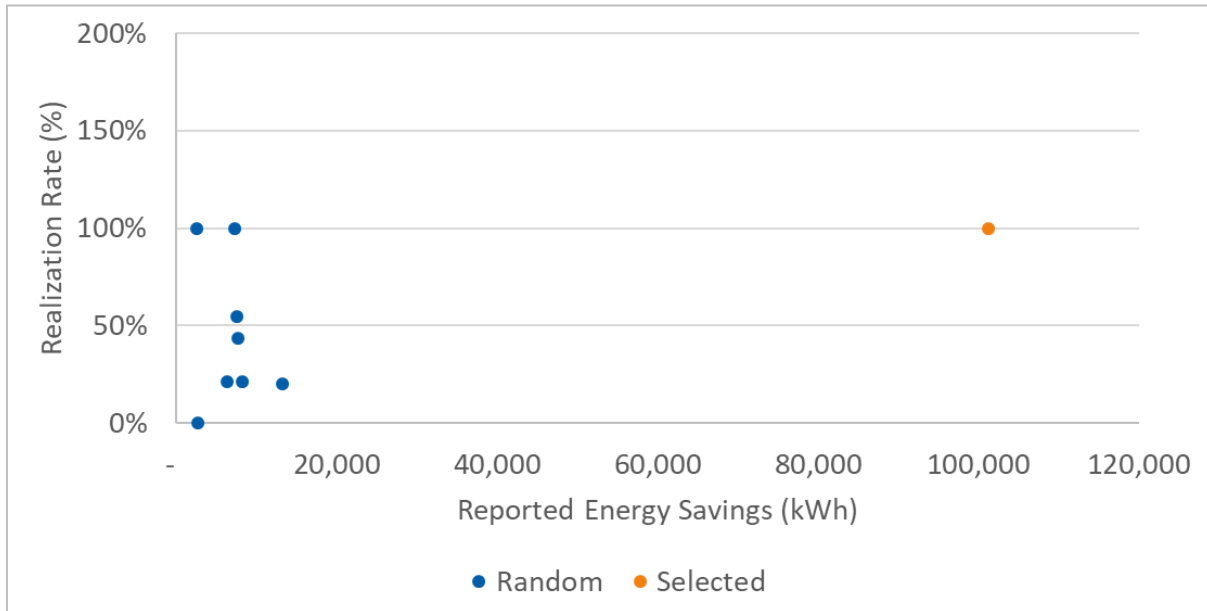
Table 16. Other Sample Energy Savings Methodology

Project Type	Reported Saving Methodology	Evaluation Methodology
LED Case Lighting	Deemed savings (0.096 kWh/yr/lamp ft), based on RTF.	DEER Database: LED case lighting measure-deemed savings DEER workpaper Work Paper SCE17LG098: “Fluorescent to LED Retrofits in Reach-in Display Cases”
HVAC	Prescriptive calculations based on Pacific Power’s HVAC Calculator	Prescriptive calculator and updated quantities and system characteristics, based on site observations
Custom	Custom calculations for non-irrigation irrigation pump	Custom calculations

Findings

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

Figure 4. Other Sample Results



Six projects attained realization rates below 80%. Table 17 provides specific details related to these projects.

Table 17. Other Sample Detailed Findings

Project	Project Measures	Reported kWh	Evaluated kWh	Site Realization Rate	Notes
CAFX2_000246	Green Motor Rewind	2,598	0	0%	Motor found as spare and not in use
CAFX2_000229, CAFX2_000197, CAFX2_000293, CAFX2_000298, CAFX2_000310	LED case lighting	8,582 (avg)	2,645 (avg)	31% (avg)	Claimed Deemed savings higher than DEER

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

- The motor incentivized for the green motor rewind project was found as a spare and had not been installed. No savings were realized for this project as savings are based on hours of use and energy consumption of a regularly rewound motor compared to a green rewind motor.
- Five sampled projects involved installations of LED case lighting on refrigerated display cases. The installed lamps matched the incentive documentation. However, the DEER database for LED case lighting established lower deemed savings for both low-temperature case lighting and medium-temperature case lighting. Deemed savings were based on a five-foot lamp length, while Pacific Power’s deemed savings for case lighting were based on a value per foot of lamp. The 20% and 54% evaluated realization rates were based on a mixture of evaluated savings from low-temperature and medium-temperature cases.

Refrigeration

Pacific Power incented 13 refrigeration measures within six unique projects. All projects had reported energy savings of 289,800 kWh, accounting for 5% of all reported energy savings for Pacific Power in California.

Methodology

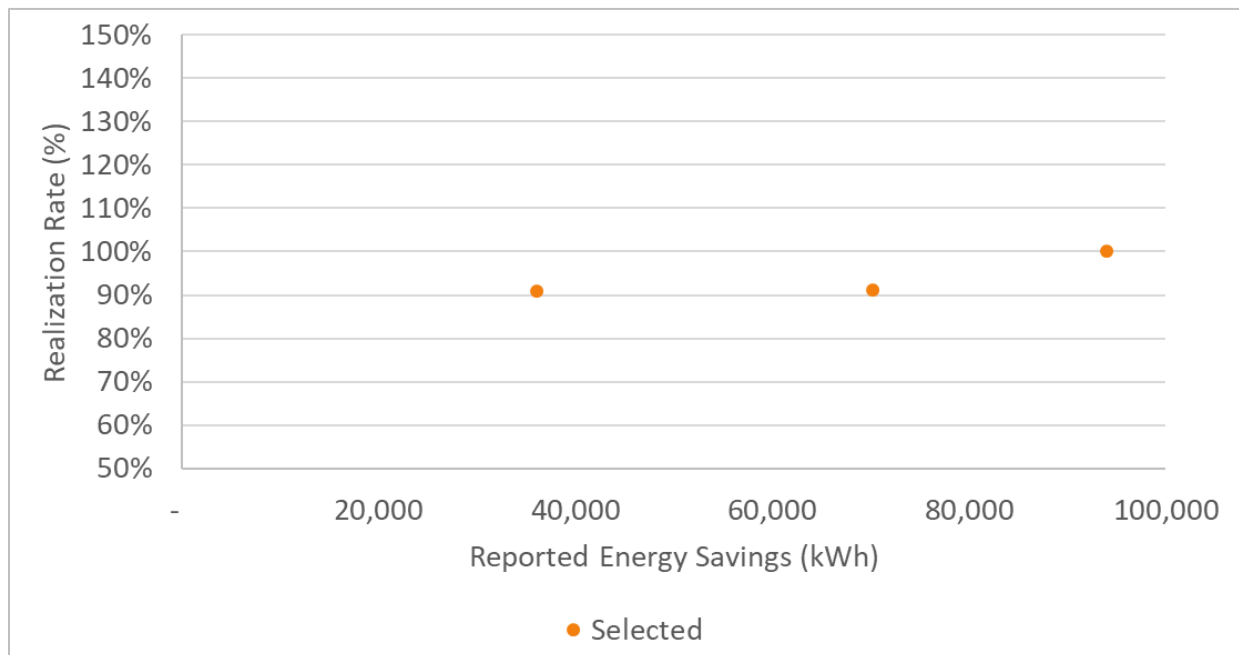
The Cadmus team evaluated three refrigeration projects, accounting for 69% of all reported energy savings within the refrigeration strata. Pacific Power’s energy engineers performed custom project calculations of energy efficiency savings for all evaluated projects. For some complicated and large energy-saving projects, the pre-contracted group of energy engineering consultants installed power meters to measure performance before and after measure implementation.

Cadmus reviewed the custom calculation workbooks for the energy savings methodology, inputs, assumptions, and accuracy. The team reviewed and compared all site-collected documentation to the savings verification reports. Where deviations occurred, the team created custom calculations to determine evaluated energy savings. For one project, the interactive effects for the refrigeration system upgrade were sufficiently significant to be evaluated using a utility bill analysis.

Findings

Figure 5 shows realization rates and associated energy savings for each sampled project.

Figure 5. Refrigeration Sample Results



All projects exhibited realization rates between 90% and 100%. One project involved installation of strip curtains on the walk-in cooler doors. Cadmus found two of 22 strip curtains had been removed due to ice sheets forming at door entrances. This finding reduced energy savings, resulting in a 91% realization

rate. One other project, evaluated using a utility bill analysis, exhibited higher energy use than expected. No deviations from performance expectations were found for the last sampled project.

Evaluated Net Savings

The Cadmus team evaluated net savings by conducting a freeridership and spillover analysis using responses from the participant surveys and nonparticipant surveys. Detailed information about the net savings methodology is provided in *Appendix A. Self-Report NTG Methodology* of this report. This net savings approach aligns with industry best practices summarized in the Uniform Methods Project (UMP).¹⁰

Further, in estimating non-participant spillover (NPSO), Cadmus included a series of questions from the 2016–2017 general population survey of California Pacific Power customers. This addressed savings generated by customers who, motivated by the program’s reputation and marketing, conducted energy efficiency installations without receiving incentives. Cadmus estimated NPSO as 5% of the 2016-2017 **wattsmart** Business program gross savings, applying the 5% NPSO equally across the program measure strata. *Appendix B. Nonparticipant Spillover* provides a detailed explanation of the estimated NPSO.

Table 18 provides the net savings evaluation results, shown as evaluated gross and net savings and NTG by program measure strata. Measure strata freeridership estimates were weighted by their evaluated program energy savings to arrive at the overall 75% NTG estimate for the program.

Table 18. wattsmart Business Program NTG Results for 2016–2017

Measure Strata	Measure Responses (n)	Gross Program Savings (kWh)	NTG*	Evaluated Net Savings (kWh)**
Irrigation	11	1,769,677	62%	1,097,200
Lighting	27	3,361,949	79%	2,655,939
Other	2	200,152	102%	204,155
Refrigeration	1	280,252	92%	257,832
Overall	41	5,612,029	75%	4,215,156

*Freeridership weighted by evaluated program savings.

**Totals may not sum due to rounding.

The following sections describe the NTG methodology the team used and the results for the 2016-2017 **wattsmart** Business program.

Methodology

This section contains a brief overview of the NTG methodology (a more detailed explanation is provided in *Appendix A. Self-Report NTG Methodology*). To determine the net savings, the Cadmus team used a

¹⁰ The UMP chapter covering estimation of net savings is available online:

<http://www.nrel.gov/docs/fy14osti/62678.pdf>

self-report approach and analyzed collected data to estimate freeridership and participant spillover. This approach is typically the most cost-effective, transparent, and flexible method for estimating NTG. Consequently, it is the most frequently employed NTG methodology.

Freeridership and participant and nonparticipant spillover constitute the NTG. The Cadmus team used the following formula to determine the final NTG ratio for the 2016 and 2017 program:

$$\text{Net-to-gross ratio} = (1 - \text{Freeridership Percentage}) + \text{Participant Spillover Percentage} + \text{Nonparticipant Spillover Percentage}$$

The team then weighted each measure strata NTG ratio by the category's evaluated gross population energy savings to arrive at the overall NTG estimate for the program.

Estimation of Freeridership

The Cadmus team determined freeridership based on an approach previously developed for Pacific Power that aligns with UMP best practices, which ascertained freeridership using responses to a series of survey questions. These questions asked whether participants would have installed the same equipment in the program's absence, at the same time, and in the same amount and efficiency. As the first step in freeridership scoring, the Cadmus team reviewed the participant survey 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 was scored as a complete freerider. 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 was scored as a non-freerider. If the project would have occurred within the same 12-month period, but altered in respect to its size or efficiency level, the respondent was scored as a partial freerider. The team then weighted the measure strata-specific freeridership estimates by the evaluated energy savings achieved by respondents within the sample to calculate the weighted freeridership estimate for each strata.

Estimation of Spillover

The Cadmus team also estimated the indirect program influence on the broader market as a result of the program activities. This estimate of program spillover represents the energy savings attributable to the program's intervention and influence but that is not currently reported in program tracking data. Spillover savings can come from participants and nonparticipants. Participant spillover occurs when the program influences program participants to install additional energy-efficient equipment-beyond what was incentivized by the program, while nonparticipant spillover savings occur when market allies influenced by the program install or influence nonparticipants to install energy-efficient equipment.

The Cadmus team determined participant spillover and nonparticipant spillover by estimating the savings derived from additional measures installed and whether respondents credited Pacific Power with influencing their decisions to install additional measures. The team included measures eligible for program incentives, provided the respondent did not request or receive the incentive.

Freeridership Findings

After conducting 41 surveys, the Cadmus team converted the responses to the freeridership questions into a freeridership estimate for each participant, using the approach described in *Appendix A*.

To determine the extent to which the program affected installation decisions, the Cadmus team asked respondents what would have been different about their installations if the program were not an option. A summary of participant measure responses is shown in Table 19, along with the initial calculated freeridership estimate for each respondent.

Table 19. Measure Installations in Absence of wattsmart Business Program

Respondent Category	Measure Responses (n)	Percentage of Total*	Initial Freeridership Estimate
Would have been installed at the same efficiency and scope within the same year	13	32%	100%
Would not have been installed at all	15	37%	0%
Would have installed more than 12 months later	8	20%	0%
Would have installed 90% of equipment at the same level of efficiency within the same year	1	2%	90%
Would have installed 75% of equipment at the same level of efficiency within the same year	2	5%	75%
Would have installed 60% of equipment at the same level of efficiency within the same year	1	2%	75%
Would have installed 25% of equipment at a lower efficiency than installed through the program (but better than standard efficiency) within the same year	1	2%	37.5%

*Totals may not sum due to rounding.

The Cadmus team credited the influence of past participation, due to the portfolio nature of the program delivery, by reducing freeridership if past program participation was important in the participant’s decision. Because of Pacific Power’s efforts to cross-promote its entire portfolio of energy efficiency programs, a respondent’s prior participation in a Pacific Power program may have influenced the decision to participate in the current program.

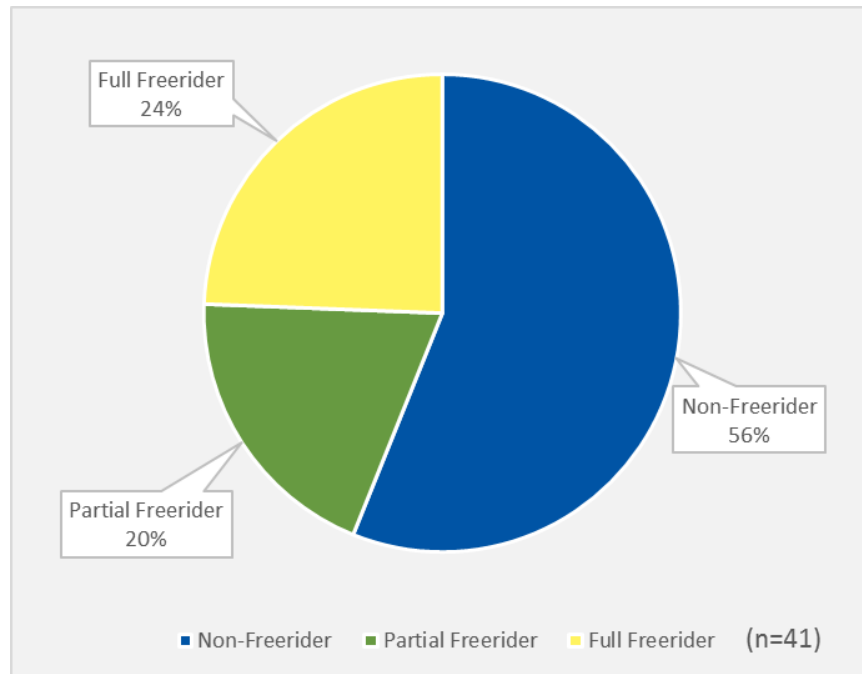
To calculate this credit, the Cadmus team reviewed respondents’ ratings of the influence of the prior program on a scale of 1 to 5, where 1 indicated “not important at all” and 5 indicated “extremely important.” For those who rated their previous participation as a 4 or 5, the team reduced their freeridership score by either 50% or 75%, respectively. This affected three projects that received an initial freeridership estimate of 100%; the team reduced freeridership for measures installed through these projects—two by 75% and one by 50%. As such, the team reduced overall freeridership for two projects initially estimated at 100% by 75% (5 rating), for an adjusted freeridership score of 25%, and for one project initially estimated at 100% by 50% (4 rating), for an adjusted freedridership score of 50%.

Cadmus also reduced a project's freeridership that was initially estimated at 75% by 75% (5 rating) resulting in a 18.75% adjusted freeridership score for the project.

In addition, the Cadmus team compared participants' statements about what they would have done in absence of the program to their statements about factors influencing their project. Several participants' measure-specific responses (n=14) indicated that they found the program incentive or program assistance important in their decision, but then said they would have installed a similar project at the same time. The team considered these responses inconsistent and requested that participants explain the program's influence on their projects in their own words. Four respondents provided descriptions that warranted freeridership adjustments. For example, when asked about the impact of the program on the decision to complete the energy efficiency improvement, one participant stated, "without [the] incentive [it] wouldn't have been completed." Based on this response, the team adjusted this project freeridership from 90% to 45%. Another respondent stated, "[it] helped make [the] decision quicker; incentives did help [me] make [the] decision" and rated the importance of information provided by Pacific Power on energy savings opportunities and the program incentive as incentive "extremely important." As such, the team adjusted the freeridership for this respondent from 50% to 25%. The team adjusted another respondent's freeridership from 25% to 12.5% based on the response "[the incentive had a] huge impact, everything happened a lot quicker" and a rating of "extremely important" when asked about the importance of the program incentive.

Based on participant responses and after adjusting for prior program experience and inconsistencies, the Cadmus team determined freeridership by respondent type, as shown in Figure 6. Overall, the team determined that 24% of participants were full freeriders, 56% were non-freeriders, and 20% were partial freeriders.

Figure 6. Freeridership by Respondent Type



Participant Spillover Findings

The Cadmus team asked participants if they installed additional energy-efficient measures after participating in the **wattsmart** Business program. To be considered for attribution to the **wattsmart** Business program as spillover, participants had to indicate the additional purchases were significantly influenced by **wattsmart** Business program participation and not already reported through the program. Respondents indicated the level of influence on a 1- to 5-point scale, where 1 indicated being not important at all and 5 indicated being extremely important, when asked “please rate how important your experience with the Pacific Power program was in your decision to install this energy-efficient product.” A respondent had to indicate a rating of 5 for a measure to be considered spillover attributable to the Pacific Power program. None of the respondents provided a rating of 5, which resulted in a 0% participant spillover estimate for all measure strata.

Nonparticipant Spillover Findings

The Cadmus team used a series of questions included in the nonparticipant surveys to estimate nonparticipant spillover. Nonparticipant spillover refers to savings generated by customers who were motivated by Pacific Power program’s reputation, past Pacific Power program participation, and/or Pacific Power program marketing to conduct energy efficiency installations for which they did not receive an incentive. The team estimated nonparticipant spillover to be 5% of total 2016-2017 **wattsmart** Business Program savings and applied the 5% NPSO estimate to each measure strata’s NTG. *Appendix B. Nonparticipant Spillover* provides detailed nonparticipant spillover analysis methods and results.

NTG Findings

The Cadmus team calculated a program-weighted NTG of 75%, shown in Table 20, by weighting each measure strata NTG percentage by the evaluated gross population energy savings for each measure strata.

Table 20. NTG Percentages by Measure Strata

Measure Strata	Measure Responses (n)	Freeridership Percentage	Spillover Percentage	NPSO	NTG	Evaluated Gross Program Population Savings (kWh)
Irrigation	11	43%*	0%	5%	62%	1,769,677
Lighting	27	26%*	0%	5%	79%	3,361,949
Other	2	3%*	0%	5%	102%	200,152
Refrigeration	1	13%*	0%	5%	92%	280,252
Overall	41	30%**	0%	5%	75%	5,612,029

*Weighted by evaluated gross program savings.

**Weighted by evaluated gross program population savings.

Benchmarking NTG

The Cadmus team benchmarked Pacific Power’s program against similar nonresidential programs. Table 21 shows freeridership, spillover, and NTG estimates for nonresidential programs reported for prior Pacific Power program years as well as for other utilities with similar programs and measure offerings.

Table 21. NTG Comparisons*

Utility/Region	Reported Year	Responses (n)	Freeridership %	Spillover %	NPSO	NTG
Pacific Power California 2016–2017 wattsmart Business Evaluation	2018	41	30%	0%	5%	75%
Pacific Power California 2009–2011 FinAnswer Express Evaluation	2012	26	12%	0%	NA	88%
Northeast Utility – C&I Prescriptive	2016	77	23%	0%	NA	77%
CY2016 Focus on Energy Nonresidential Evaluation Report - Wisconsin Statewide	2017	434	28%	1%	NA	73%
2014-2015 Massachusetts C&I Natural Gas Freeridership and Spillover Study - Statewide	2015	901	18%	4%	NA	86%

*NTG values derive from self-response surveys, though differences in analysis and scoring methodologies may vary across evaluations.

The 2016–2017 **wattsmart** Business program freeridership estimate of 30% is higher than the 12% freeridership estimate from the 2009-2011 Pacific Power FinAnswer Express Evaluation.¹¹ These Pacific Power program evaluations used the same NTG methodology, which was modeled after the 2014-2015 Massachusetts C&I Natural Gas Freeridership and Spillover Study methodology framework.

The Northeast Utility C&I Prescriptive and CY 2016 Focus on Energy nonresidential evaluations used NTG methodologies comparable to those used for the 2016-2017 **wattsmart** Business program, though they are different in design. The 2016–2017 **wattsmart** Business program freeridership estimate of 30% is the highest of the compared programs, but is similar to the CY 2016 Focus on Energy nonresidential evaluation.

¹¹ PacifiCorp combined two programs under the **wattsmart** Business umbrella. The Energy FinAnswer and FinAnswer Express programs were rolled into the Custom Analysis and Typical Upgrades offerings, respectively, within the **wattsmart** Business program.

Process Evaluation

This section outlines the detailed findings from the Cadmus team’s process evaluation of the **wattsmart** Business program. The Cadmus evaluation team based these findings on analysis of data, collected through program staff interviews and through participant and nonparticipant surveys.¹² In conducting the evaluation, the team focused on assessing the following:

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

Table 22 lists the primary research questions used.

Table 22. Research Areas and Questions

Research Areas	Researchable Questions and Topics
Program Status	How did the program perform in 2016 and 2017, and what opportunities and challenges do program staff foresee for future program years?
Awareness	How did customers learn about the Pacific Power wattsmart Business program incentives?
Participation/Motivations and Barriers	What are the key factors influencing participants’ decisions to participate in the program? What are the key factors in any customers’ decision to install energy efficiency improvements? What are the participation barriers for participants, and nonparticipants?
Satisfaction	How satisfied are participants with the program and with the program measures, incentives, and services?
Freeridership and Spillover	How influential was the program on participants’ decisions to participate? How influential was the program on any customer’s decision to install energy efficiency equipment without program incentives or services?
Firmographics	What are the business characteristics of participants in each program offering? How do participant awareness and business size compare by program delivery channel?

Methodology

The following sections provide an overview of the methodology that the Cadmus team used for process evaluation research of PY 2016 and 2017.

¹² Although Cadmus reports survey results for two participants in the Small Business Enhanced incentive offer and one participant in Lighting Instant incentives, it did not report conclusions or findings for these offerings, due to the small number of survey respondents. Cadmus also attempted to survey **wattsmart** Business partial participants; however, this group was nonresponsive after five attempts, therefore there are no survey results or findings to report for partial participants.

Materials and Database Review

The Cadmus team conducted a program materials review of the following:

- The California Annual Review of Energy Efficiency Programs (for January 1, 2016, to December 31, 2016; and for January 1, 2017, to December 31, 2017)
- Exhibits that Pacific Power provided to Cadmus; originally provided to the CPUC, these exhibits described planned program updates during the 2016–2017 evaluation period
- The **wattsmart** Business program website
- Participant and partial participant databases
- Pacific Power’s nonresidential customer database

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

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 four interviews with program staff at Pacific Power and six interviews with program staff at Cascade and Nexant (i.e., the program administrators for the program’s contracted delivery portions). These interviews covered the following topics:

- Changes in stakeholder roles and responsibilities
- Program goals and performance
- Program design and implementation changes
- Marketing and outreach
- Program delivery and management
- Data management and quality assurance
- Barriers and areas for improvement

Surveys

The Cadmus team surveyed two customer populations—participants and nonparticipants—and attempted to survey partial participants. Following the initial telephone surveys of participants, Cadmus initiated an online survey of Typical Upgrades and Custom Analysis participants not reached during the telephone surveys. This was done to improve precision for the NTG calculations. Participants responding to the online survey were asked a limited battery of questions including the freeridership and spillover sections of the original survey guide, plus one question about program awareness and firmographics questions to identify their business type and size. Results from those online surveys are included in the *Evaluated Net Savings* section of this evaluation report but not in the *Customer Response—Participants* section below.

Participant Telephone Surveys

The team conducted telephone surveys with 34 participants who installed measures through the **wattsmart** Business program. The surveys included 28 participants in Typical Upgrades, three in Custom Analysis, two in the Small Business Enhanced Incentives Offer, and one in the Lighting Instant Incentives. The team designed survey instruments for each participant group, collecting 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 program delivery, including marketing, outreach, and delivery channels
 - Customer interactions with trade allies, program staff, and program-funded, third-party technical service providers
 - Customer satisfaction regarding specific program elements, and the **wattsmart** Business program overall
 - Customers' participation challenges
- ***Program influence***: freeridership and spillover
- ***Customer information***: firmographic information

Participant Sample Detail

To ensure the maximum possible sample in the categories with fewer participants, the team prioritized participants into the measure category or offering with the smallest populations. Participants who installed more than one measure type were selected into the measure type for which they showed the largest kWh savings. This prioritization from highest priority (smallest population) to lowest priority (largest population) was:

- Refrigeration
- Small Business Enhanced Incentive Offer
- Lighting Instant Incentives
- Other
- Irrigation
- Lighting

VuPoint then randomly selected participants for surveys within each reporting category, attempting to fulfill individual quotas for each category.

Nonparticipant Telephone Surveys

The Cadmus team conducted telephone surveys with 68 nonparticipants. The surveys addressed the following process evaluation topics:

- ***Customer perceptions and motivations***
 - Program awareness
 - Reasons for and barriers to making energy-efficient improvements
 - Likelihood of requesting an incentive in the future
- ***Program influence:*** spillover
- ***Customer information:*** firmographic information

Nonparticipant Sample Detail

The team removed participants, partial participants, and managed accounts from the master list of nonresidential customers provided by Pacific Power.¹³ From the remaining population, the team randomly called nonparticipants for surveys.

Partial Participant Sample Detail

Pacific Power, Nexant, and Cascade provided the Cadmus team with lists of 2016 and 2017 partial participants from each of their respective program responsibility areas. The team checked this list against the list of program participants, removing any customers who, within that same timeframe, appeared on the participant list for another project; this eliminated any possibility of double-sampling these individuals. The team also removed any managed accounts identified by Pacific Power. 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.

Cadmus attempted to survey partial participants, however, this group was nonresponsive after five attempts, therefore no survey results or findings for Partial Participants are reported.

Program Implementation and Delivery

Drawing on stakeholder interviews and participant survey data, this section outlines changes that occurred in the **wattsmart** Business program's implementation and delivery during the 2016–2017 evaluation period.

Program Overview

As a result of the program's declining avoided costs the **wattsmart** Business program utility and administrator staff focused on the program's cost-effectiveness in 2016 and 2017. In 2017, Pacific Power adjusted some lighting and HVAC incentives down to align with cost reductions; under a managed

¹³ Managed accounts are typically accounts larger than one MW. These accounts are handled individually by a Pacific Power Energy Efficiency Project Manager.

transition to the new incentives, customers were given a 45-day notice of the impending change and had 90 days to build and finish projects; this, according to Pacific Power, brought in some projects from customers wanting to receive the older incentive rates.

Pacific Power and administrators also reported that staff prioritized customer satisfaction during this period, with Nexant conducting satisfaction surveys beginning in June 2017. Customers provided feedback on their satisfaction with the following:

- Vendor’s knowledge about the program incentives and information provided (i.e., energy savings options, project costs and benefits)
- Vendor communications
- Product/project installations

Participants were asked whether they would participate in the program again or recommend it to others. Nexant collected, monitored, and used customer responses to provide performance feedback and coaching to vendors, and, beginning in October 2017, began providing quarterly survey results reports to Pacific Power.

As shown in this report’s *Customer Response—Participants* section, customers receiving Typical Upgrades and Custom Analysis incentives reported high satisfaction levels with the program overall.

Design

Effective May 1, 2017, Pacific Power added several new measures, including tubular LEDs (TLED) and reduced wattage T5s for relamp projects, and exterior lighting dimming controls and advanced rooftop unit controls; both control measures are solely for retrofit applications.

To align with California Title 24, 2016 (effective January 1, 2017), Pacific Power removed an exterior lighting control measure, used for new/construction/major renovation, increased efficiency requirements for some HVAC measures, and adjusted incentives.

To further increase small business customer participation, Pacific Power added two non-lighting measures to the Small Business Enhanced Incentives Offer; smart plug strips and thermostat reprogramming. However, as explained by Nexant, “The availability of smart plug strip technology changed drastically due to the introduction of more expensive, but more controllable, wireless plug strip replacements.” This resulted in Nexant focusing on lighting measures to ensure they achieved the annual program targets.

Pacific Power also added the Lighting Instant Incentives offering, effective May 1, 2017, to complement the Typical Upgrades incentives and Small Business Enhanced Incentives Offer, to capture savings from the Commercial and Industrial lighting replacement market, and to encourage purchases of higher efficiency lighting than those typically selected by customers purchasing replacement lamps. Pacific Power contracted Nexant to administer the Lighting Instant Incentives offering; this included identifying, qualifying, approving, supporting, and processing payments to distributors primarily responsible to market and deliver lighting instant incentives through discounts on the customer’s invoice. Nexant

screened Lighting Instant Incentive sites against other active **wattsmart** Business projects to prevent duplicate incentive payments for the same measure through other **wattsmart** Business downstream incentive offerings. Through telephone calls to a sample of participants, Nexant confirmed participant eligibility, verified types and quantities of equipment purchased and installed, and surveyed customer satisfaction. On a random basis, Nexant conducted site inspections for lamp orders exceeding a specific threshold.

Implementation

In March 2017, Pacific Power launched the **wattsmart** Business Vendor Network, replacing the Energy Efficiency Alliance, and enforcing stricter requirements for program vendors (i.e., increased minimum participation requirements, industry training, proof of insurance).

The Network provided customers with a trained pool of local trade allies (e.g., architects, contractors, distributors, manufacturers, engineers, other vendors) to assist them in identifying and implementing energy efficiency projects. **wattsmart** Business program vendors promoted the program to their customers, assisted customers with their projects, provided recommended upgrades, created proposals and bids, assisted with paperwork, and supplied and/or installed the upgrades.

Cascade and Nexant recruited and managed trade allies, each in their respective markets. For Cascade, these were trade allies delivering industrial and irrigation measures. For Nexant, these were trade allies delivering commercial measures, vendors delivering the Small Business Enhanced Incentive offering, and lighting distributors participating in the Lighting Instant Incentives offering.

Administrator staff noted that the reregistration process caused some confusion, and elicited a negative response from trade allies already approved by the program. Some trade allies and projects were lost in the transition, but staff worked with trade allies to reregister and said some trade allies came back to the program, and they now had a reliable and engaged group, especially for lighting. Trade allies who did not reregister and received the designation of a **wattsmart** Business vendor could submit projects to the program, but they are not listed as **wattsmart** Business vendors on the customer-facing Find a Vendor search on the program website.

As Cascade's trade allies deliver prescriptive and custom non-lighting measures, and Cascade prepares all savings and incentive calculations for its trade allies to insure quality control, Cascade did not require its trade allies to register with the program.

Cascade noted that in 2016 and 2017 they assisted industrial and irrigation customers in completing applications for some non-lighting Typical Upgrades measures (e.g., variable speed air compressors, fast-acting doors), requiring savings calculations to determine the incentive. Cascade explained, however, that its process was built to provide such assistance, and applications for typical measures not requiring these calculations (i.e., those using deemed savings) were processed easily.

Marketing and Outreach

Pacific Power, Nexant, and Cascade shared responsibilities for marketing and outreach to customers in Pacific Power's territory during the 2016–2017 evaluation period. In addition to radio, print, paid digital

display, and search advertising, direct mail, email, and social media deployed by Pacific Power, the company's project manager provided direct outreach to managed accounts. Trade ally partners, managed by program administrators, were responsible for direct boots-on-the-ground marketing of the program to small and midsized customers as well as to large customers other than those managed directly by Pacific Power account managers.

With the introduction of the Lighting Instant Incentives offering, Pacific Power began marketing these incentives directly to end users to ensure customers purchasing this lighting knew of incentives provided by Pacific Power, and that they were Pacific Power customers. Additionally, lighting distributors were responsible for marketing Lighting Instant Incentives to their customers, although administrator staff noted some distributors did not promote Lighting Instant Incentives to end users at the expense of upsetting trade allies (installation contractors), which also were their customers and may sell lighting to the same end users.

Nexant (in conjunction with its subcontractor) provided marketing communications and materials to Trade Allies registered with the program, and coordinated messaging with Pacific Power communication staff. Nexant also hosted annual events for non-lighting, program trade allies delivering the program in other states, and opened these events to California trade allies that wanted to attend.

Somewhat different than Nexant's broad marketing to many trade allies, Cascade conducts direct business-to-business and face-to-face outreach to industrial and irrigation trade allies, and often identifies new trade allies through networking with the area U.S. Department of Agriculture office, agricultural expositions, networking with customers, or a Google search. Given the number of trade allies in, for example, compressed air, dairy, and irrigation pumping, tend to be fewer and farther between than lighting and HVAC contractors, Cascade found it more effective to develop one-on-one relationships with trade allies through repeated personal visits, phone calls, and sometimes joint-visits with trade allies to their customers, than from organizing formal training sessions for each group.

Cascade also conducted outreach directly to customers, locating project leads for trade allies or offering scoping services to identify savings opportunities for customers. Likewise, when a trade ally identified a potential customer for the **watt**smart Business incentives, Cascade provided engineering support to assist the trade ally in reaching out to the customer, preparing the necessary calculations to show the customer's potential savings, and advised the trade ally on how to achieve higher savings from a project.

Marketing Strategy

The program's 2017 marketing strategy reflected a strong contracted DSM delivery channel focus, utilizing a network of trade allies, contractors, and vendors, and broadening the program's reach through program and non-program contractors, with whom customers could have existing relationships. Pacific Power provided oversight into marketing conducted by program administrators or administrators' subcontractors.

As each administrator was responsible for meeting their program goals, each used a separate marketing effort, providing some control over attaining the program goals. Pacific Power noted that keeping all teams on the same page and maintaining the same brand presentation proved a bit challenging, due to

some turnover in the teams. Pacific Power’s marketing staff acknowledged that understanding the administrators’ desire to control their own marketing, while bringing it all in-house to Pacific Power, would simplify quality control and reduce the need to retrain administrator staff as they changed position, doing so would also require adding in-house staff. Such a change, marketing staff said, was not urgent, but perhaps something to consider in the future.

In 2016, Pacific Power’s in-house project manager executed an enhanced, direct, customer outreach effort. This included project managers providing more recognition for customers conducting large projects, such as offering a plaque or a check presentation ceremony.

In reviewing Pacific Power’s annual reports, Cadmus saw *wattsmart* Business communication impressions from newspaper and emails declined between 2016 and 2017, while radio and digital searches increased significantly. Pacific Power explained that it shifted more money into digital and social media, while the overall budget did not change; this money came out of print media funds. Pacific Power made the change based on research showing that more people were online and subsequently, had a click-through rate comparable to national averages, on Google Search or similar sites. Pacific Power tried Linked-In in 2016 without much effect, shifting its focus to Facebook in 2017. Furthermore, Pacific Power noted few responses to email blasts, unless the recipient list was huge or targeted with a great offer, adding that people did not tend to open or respond to unsolicited emails, regarding them as junk mail.

Pacific Power also utilized a direct-mail campaign twice per year, targeting irrigation customers. This included a customer letter and one-page application form to raise awareness of program incentives. Pacific Power reports these campaigns effectively drove customers to sign up for the program.

During 2016, in response to customer feedback that the Small Business lighting incentives were perhaps “too good to be true,” Nexant mailed a letter on Pacific Power letterhead to small business customers to add credibility to the program and to allay customers’ concern. The letter included the name and contact information for a local program trade ally, enhancing the trade ally’s credibility and making it easier for the customer to engage with the program. In 2017, Nexant followed up with Small Business customers, sending email blasts to raise awareness about how to participate in the Small Business Enhanced Incentives offering.

Marketing Messaging

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 the information provided within each measure category useful in achieving a high-level understanding of the steps necessary to initiate a project, as well as supporting brochures, case studies, detailed incentive lists, policy papers, and other documents explaining requirements of the program.

Wattsmart Advertising and Outreach Calendar

Following interviews with Pacific Power and the program administrators' staff, Cadmus' reviewed the 2017 California **wattsmart** advertising and outreach calendar, along with the campaign materials linked in that document. The calendar was comprehensive, providing detailed outreach campaign scheduling and links to related messaging, collateral materials, radio spots, case studies, and other materials utilized. Specific findings identified during the review of these elements are provided below.

Key Messages

Pacific Power's stated goal—to incorporate secondary messaging around how energy efficiency is good for the environment—was not present in any messaging included in the calendar spreadsheet, which mainly discusses cost.

Calendar

- Program changes: Changes that impact the customer incentive or experience, should be communicated close to when the changes take effect. This could be done via email.
- Town events: Some direct outreach occurs with town chambers of commerce, but Pacific Power could increase their presence at town events if budget allows.
- Email: Email is currently scheduled to coincide with marketing events but not at other times of the year.

Marketing materials

- General: Many materials provided a generic link (bewattsmart.com), leading to the main energy efficiency page, however no California business-specific vanity URLs were used in these documents.
- Eblasts (Electronic communications): Electronic communications did not include any California-specific language.
- Case studies: Case studies are provided for lighting and irrigation only. Other measure categories were not represented.

Database Interface and Data Management

During the 2014–2015 program evaluation, Pacific Power consolidated its nonresidential DSM programs under the **wattsmart** Business program umbrella and transitioned data management to its new DSMC software. A transition now complete and operating, program administrators—Nexant and Cascade Energy—complete weekly bulk uploads of project data into DSMC. Within the past 18 months, Nexant began using the DSMC software and can now enter Small Business Enhanced Incentive project data directly into its system, then upload these to Pacific Power, streamlining this process somewhat.

One administrator staff said, overall, the program operated efficiently with one exception: program staff would benefit from a greater understanding of the process by which measures become designed and entered into the program databases. “The measures as designed have so much information in them, it can be difficult to deal with them, and many measures have different versions and different effective dates, [making it] difficult to manage because of the complexity.” The staff member continued, “Errors

get caught because of the level of detail, and this reduces risk, but at a really big cost, higher than it needs to be.”

Data Quality Assurance

Pacific Power evaluates data quality assurance on an ongoing basis. Pacific Power data management staff said errors identified in projects uploaded from program administrators decreased overall since 2014–2015. A brief uptick observed early in 2018 was attributed to a transition in staff managing the data input at one administrator. Pacific Power said this uptick has again declined.

Evaluation of the Program Database

Cadmus found some issues in the different program databases provided by Pacific Power and the administrators, that made the program evaluation somewhat challenging:

- Missing contact information for Lighting Instant Incentive participants (these data had to be pulled from individual project files rather than appearing in participant data provided by Pacific Power)¹⁴
- Esoteric addresses for irrigation customers: this may be unavoidable due to the nature of rural locations (e.g., farm fields, barns), where equipment is installed:
 - Addresses included information that was not part of the actual address (#pumps, #Gym, #market, etc.).
- Abbreviations were used in customer names making cleaning and interpreting difficult (e.g., HS for high school, dist. for district, dept. for department).
- Descriptions of partial participant project dispositions, varied between Pacific Power and each administrator, meaning project designations included in the survey sample could vary year over year depending on evaluator interpretation.

Program Challenges and Successes

Pacific Power program management staff and the program administrators reported that, for the most part, they had the resources needed to deliver the program in 2016 and 2017. Staff from Pacific Power and the administrators cited the following program strengths:

- Now completed, consolidation of C&I incentives under the **watt**smart Business program umbrella did not impact overall program performance in 2016–2017.
- Although cost-effectiveness has been an issue, the program made inroads with irrigation customers, and opportunity still exists with water management.
- Pacific Power staff delivering the **watt**smart Business program have worked together as a team for more than 20 years and have found a good path for engaging customers in the program.

¹⁴ The 2016-2017 evaluation included four projects for which contact information could be pulled from the project files. As participation grows, contact information should be included in the participant database.

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

- Program goals will be very difficult to attain and remain cost-effective.
- This area of Northern California does not face a robust economic situation, and customers do not have the capital to do projects.¹⁵
- The remote nature of Pacific Power’s territory in California makes it difficult to recruit distributors and adequate and skilled trade allies.
- Multiple entry points into the program can confuse customers, particularly if they are implementing measures from more than one offering. Customers may have to talk to multiple people to access the necessary expertise. As described by one of the program administrator staff, “Even the administrator needs a sheet that describes who deals with what [offering], so they can pass customers smoothly [to the correct person without making the customer feel they are] getting the run around or punted.”

Customer Response—Participants

The Cadmus team conducted telephone surveys with 34 **wattsmart** Business program participants—31 receiving Typical Upgrades or Custom Analysis incentives, two receiving incentives through the Small Business Enhanced Incentive Offer, and one receiving Lighting Instant Incentives. Small participant populations for the Small Business Enhanced Incentive Offer and Lighting Instant Incentives resulted in an insufficient sample size for conclusive analysis. Therefore, this section focuses primarily on Typical Upgrades and Custom Analysis participants. While conclusions will not be drawn from Small Business or Lighting Instant Incentives participant responses, Cadmus reports those responses throughout this section.

wattsmart Business Typical Upgrades and Custom Analysis

The Cadmus team surveyed participants in one of four measure categories:

- Lighting (18)
- Irrigation (10)
- Refrigeration (1)
- Other (2)

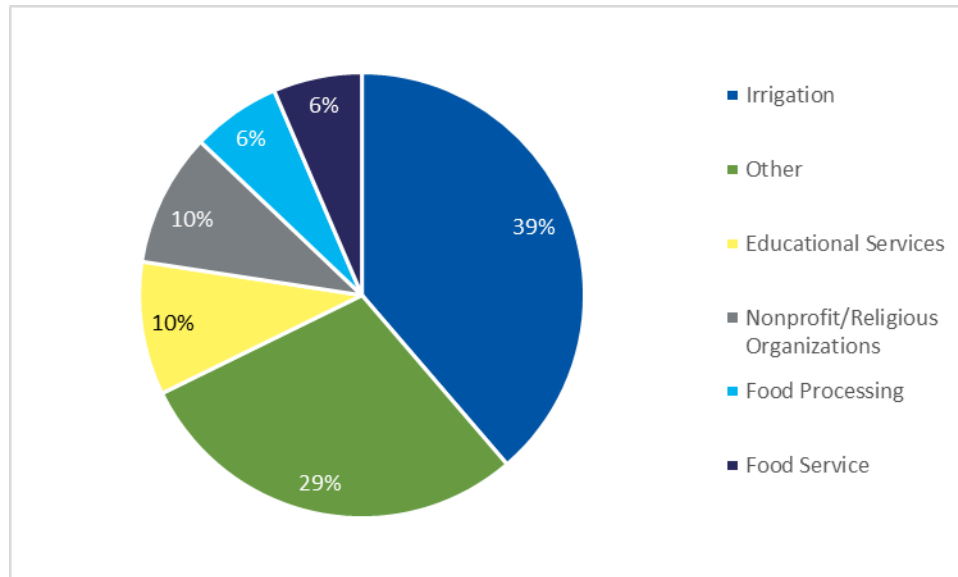
A majority of respondents fell into three business sectors: Dairy/Agriculture, Educational Services, or Nonprofit/Religious Organizations. As shown in Figure 7, however, a large percentage of respondents were scattered across a wide variety of other business sectors.¹⁶ Of these 31 participants, 88% operated

¹⁵ In 2017, Pacific Power teamed with HBC Energy Capital, who helps match customers to lending partners that can provide financing options for their energy efficiency projects.

¹⁶ The Other category consisted of respondents in Oil and Gas, Real Estate/Property Management, Transportation, Accommodations, Retail, Manufacturing, a carwash, and an outdoor advertising company.

in three or fewer locations in California, with the majority (52%) operating only in one location, and 68% owned vs. leased their facilities. Most businesses were small, with one to 10 employees. The next most-represented category included businesses employing 26 to 50 people (48% and 24% respectively, n=29). These business characteristics remained true when viewing the subset of custom participants separately.

Figure 7. Respondents by Business Sector



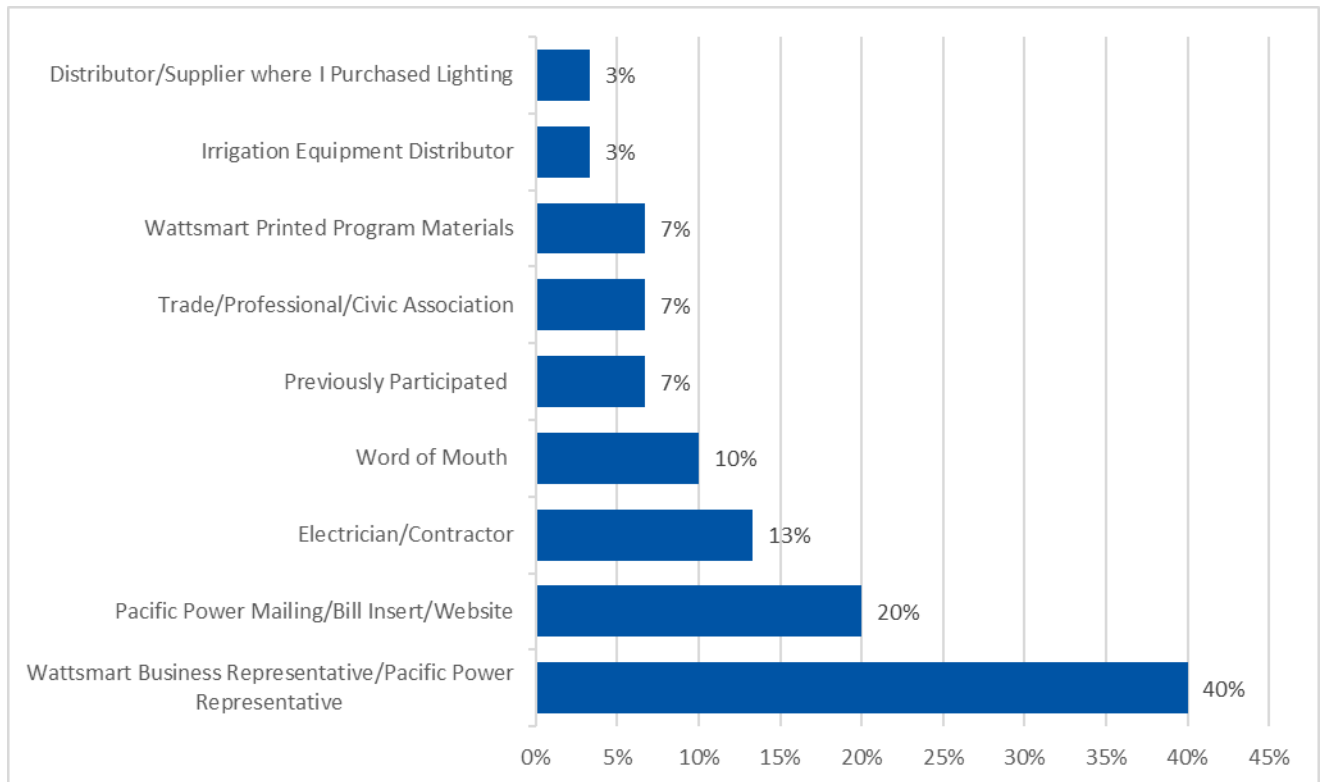
Source: Pacific Power **wattsmart** Business Program 2016–2017
wattsmart Business Participant Survey QF1. (n=31)

Awareness and Communication

Participants receiving **wattsmart** Business Typical Upgrade or Custom Analysis incentives most frequently learned about available incentives through program representatives or their Pacific Power representatives, followed by Pacific Power mailings, bill inserts, or the website (40% and 20%, respectively, n=30).¹⁷ As intended by the program design, equipment distributors (i.e., irrigation equipment and lighting) and contractors provided another sizeable information source for customers. As illustrated in Figure 8, these three groups combined, represented 19% of respondents’ answers.

¹⁷ This “n” represents the number of respondents providing a relevant response to the question, not the total number of relevant responses. Relevant responses excluded responses such as “don’t know” or “refused.” In all cases, Cadmus determined the percentage by dividing relevant responses by the number of relevant respondents.

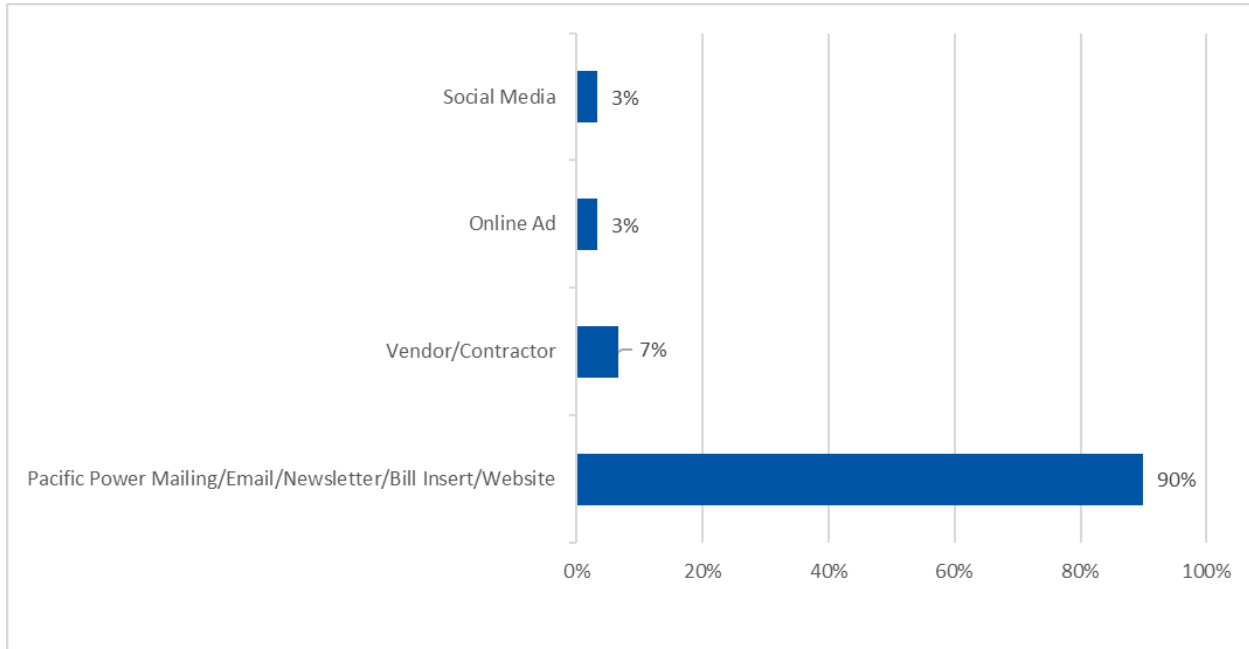
Figure 8. Typical Upgrades and Custom Analysis Participants Information Sources



Source: Pacific Power **wattsmart** Business Program 2016–2017 **wattsmart** Business Participant Survey QB3. Don't know and refused responses removed. Multiple responses allowed. (n=30)

Although participants most frequently learned about program incentives from a **wattsmart** Business program representative or a Pacific Power representative, the majority of customers receiving Typical Upgrades, or Custom Analysis incentives preferred to be kept informed about upcoming opportunities through a Pacific Power mailing, email, newsletter, bill insert, or the website. Figure 9 shows all preferences reported by participants.

Figure 9. Typical Upgrades and Custom Analysis Participants Preferred Method of Communication to Stay Informed

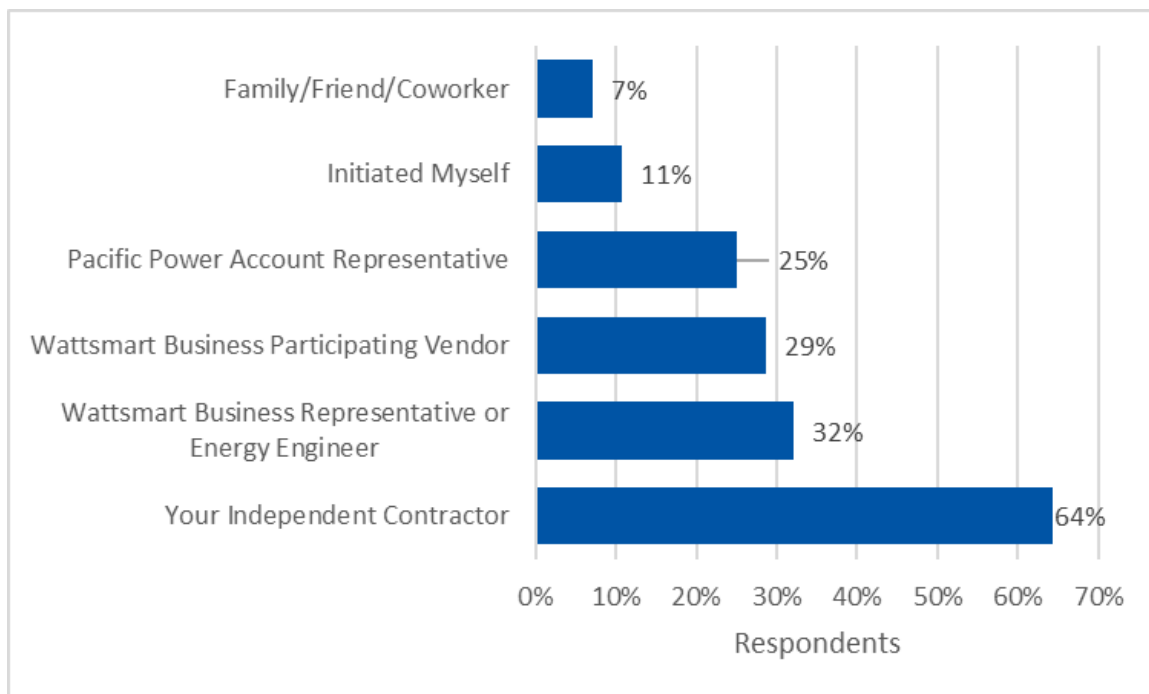


Source: Pacific Power **wattsmart** Business Program 2016–2017 **wattsmart** Business Participant Survey QG3. Don't know and refused responses removed. Multiple responses allowed.

Project Initiation and Installation

Participants cited independent contractors more frequently than other help sources in initiating their projects. Although, as shown in Figure 10, **wattsmart** Business program or Pacific Power representatives frequently aided participants, and only four participants (11%, n=28) representing irrigation projects said they initiated their projects without outside help.

Figure 10. Typical Upgrade Participants' Assistance Source



Source: Pacific Power **wattsmart** Business Program 2016–2017 **wattsmart** Business Participant Survey QC1. Don't know and refused responses removed. Multiple responses allowed. (n=28)

Ninety percent of participants found it easy to complete their project applications, reporting the process as very easy (61%) or somewhat easy (29%) (n=28). Eight people offered suggestions about making the process easier, focusing on simplifying the application form (saying it presented a great deal of paperwork to compile, particularly for large projects), and some found it confusing to determine what projects qualified. Others wanted help in completing the application. The Cadmus team found no correlation between participants reporting difficulties and a single measure category or source of project initiation help.

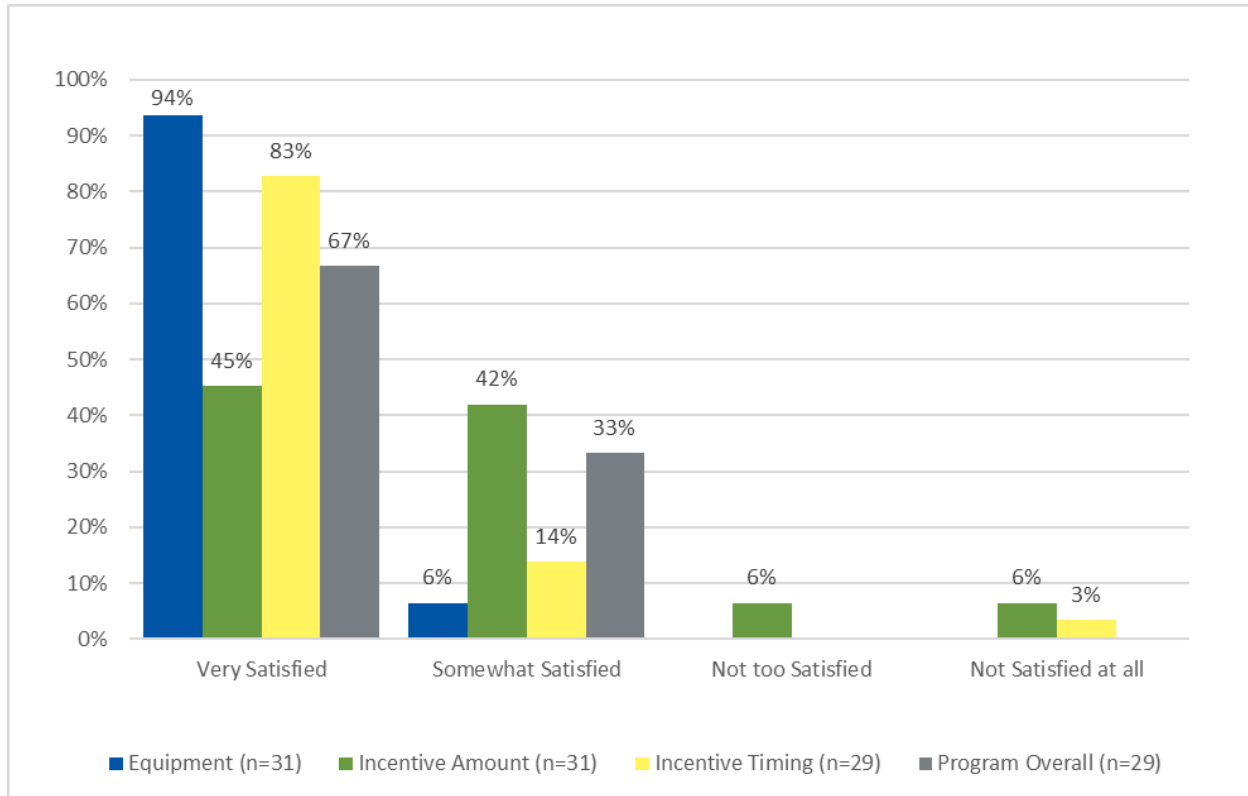
Satisfaction

As shown in Figure 11, participants reported high satisfaction levels with equipment they installed, and the time required to receive the incentive. Although fewer respondents reported they were very satisfied with the incentive amounts, 87% (n=31) reported they were very or somewhat satisfied with the incentives.¹⁸ Of four participants saying they used a **wattsmart** participating vendor, all reported they were very satisfied with their contractor's work. All participants reported they were very satisfied or somewhat satisfied with the **wattsmart** Business program overall (67% and 33%, respectively, n=29).

¹⁸ Of those reporting they were not too satisfied or not satisfied at all (6% each), two said they thought their incentive should have doubled for them to report being very satisfied, one thought Pacific Power should pay 100% of the cost, and one respondent did not recall receiving an incentive. Upon further review Pacific Power verified this respondent did receive and cashed the incentive check.

Four participants said they would like to install additional equipment that did not qualify for incentives through Typical Upgrades or Custom Analysis incentives, including electric heating, a well pump and motor, and a wind turbine.

Figure 11. Participant Satisfaction Levels



Source: Pacific Power *wattsmart* Business Program 2016–2017 *wattsmart* Business Participant Survey QC4, QC6, QC12, and QG1. Don't know and refused responses removed.

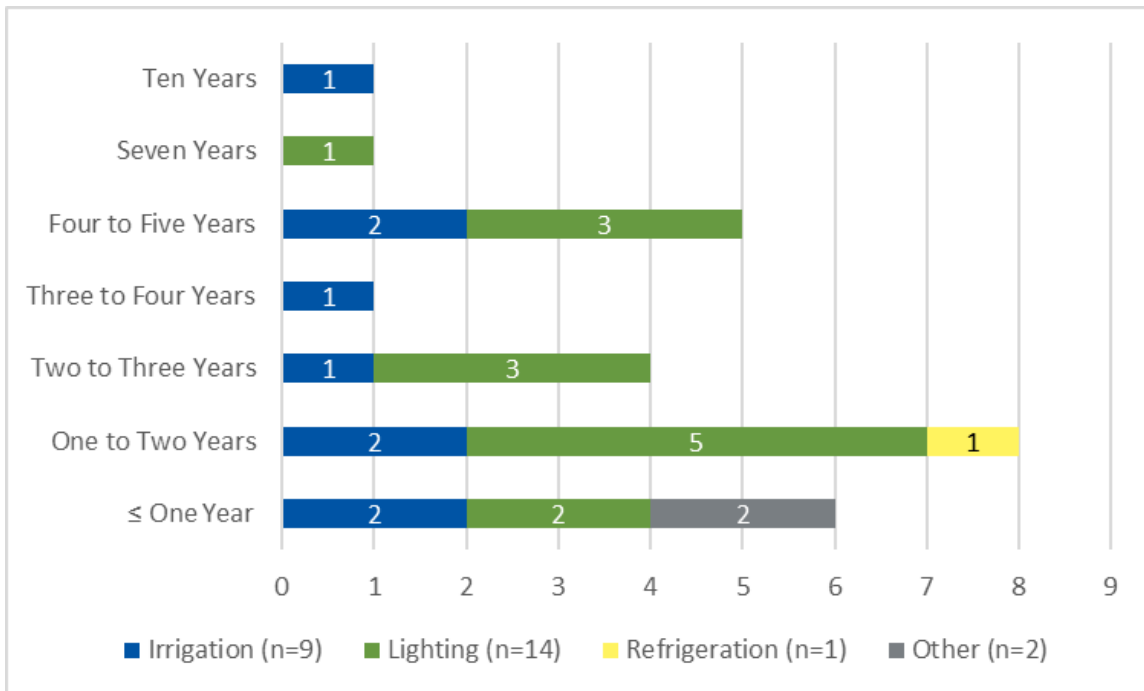
When asked what payback periods their companies looked for in projects, responses varied from less than one year up to 10 years. Of all participants reporting, 70% expected projects to payback in three years or less vs. more than three years. Figure 12 shows the breakout by measure category and payback period. Projects classified as Other included a VFD motor retrofit and a refrigeration case LED lighting retrofit.

The three projects receiving Custom Incentives produced payback expectations as follows:

- VFD motor retrofit—one year or less
- System redesign—four to five years
- Industrial recommissioning of a refrigeration system—within one to two years

Figure 12 includes these three projects under the Other, Irrigation, and Refrigeration categories, respectively.

Figure 12. Project Payback Period Expectations

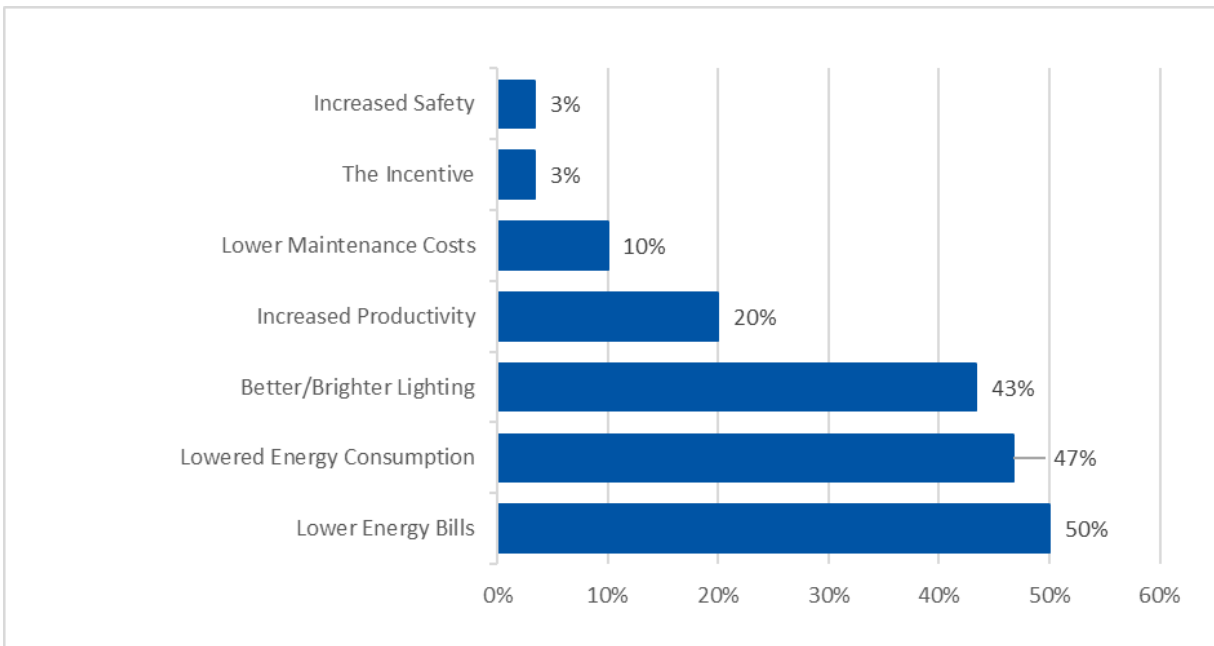


Source: Pacific Power *wattsmart* Business Program 2016–2017 *wattsmart* Business Participant Survey QC8.
 Don't know and refused responses removed. (n=26).

Benefits and Challenges

Thirty of 31 participants receiving Typical Upgrades or Custom Analysis incentives reported one or more benefits that their companies experienced due to equipment they installed. Most frequently, participants cited lower energy bills or reduced consumption. As shown in Figure 13, however, participants reported operational benefits such as better lighting, reduced maintenance costs, and greater safety in their facilities.

Figure 13. Benefits of Equipment Installed



Source: Pacific Power *wattsmart* Business Program 2016–2017 *wattsmart* Business Participant Survey QC18. Don't know and refused responses removed. Multiple responses allowed. (n=30)

Seventy-six percent of participants (23 of 30) did not report challenges in participating in the program. Of seven participants who reported challenges, five installed lighting projects and two installed irrigation projects. Participants in lighting and irrigation cited paperwork amounts required, with one lighting participant noting it was simply too much to do on their large project. Two other lighting participants cited challenges in getting the correct (qualifying) lighting products ordered and installed, and one reported challenges getting information about the program.

Overall, among 21 participants in the Typical Upgrades and Custom Analysis incentives who interacted with Pacific Power during their projects, all reported they were very satisfied or somewhat satisfied with their interactions. Two somewhat satisfied participants (one lighting and one irrigation) said they felt no sense of urgency or received no help; one additional irrigation participant said they did not receive the entire incentive they expected. Nine additional participants said they did not interact with Pacific Power during their projects (n=30).

Small Business Enhanced Incentive Offer

Cadmus surveyed two participants about their experiences with the Small Business Enhanced Incentive Offer. Each reported they were in the Retail business sector, and each business owning and operating at one Californian location. One participant employed 10 or fewer people, and the other participant employed 11 to 25 people.

Awareness and Communication

Both participants learned about the incentives through friends, family, or a business colleague, and one participant also heard about incentives through an electrician or contractor. One participant preferred

that Pacific Power informed them about new opportunities available in the **wattsmart** Business program via a Pacific Power mailing, email, newsletter, bill insert, or website. The other did not report a preference.

Motivation and Participation

Each participant said they opted for the Small Business Enhanced Incentive Offer to save money on their energy bills, and each found it very easy to schedule an approved contractor to conduct a free facility assessment.

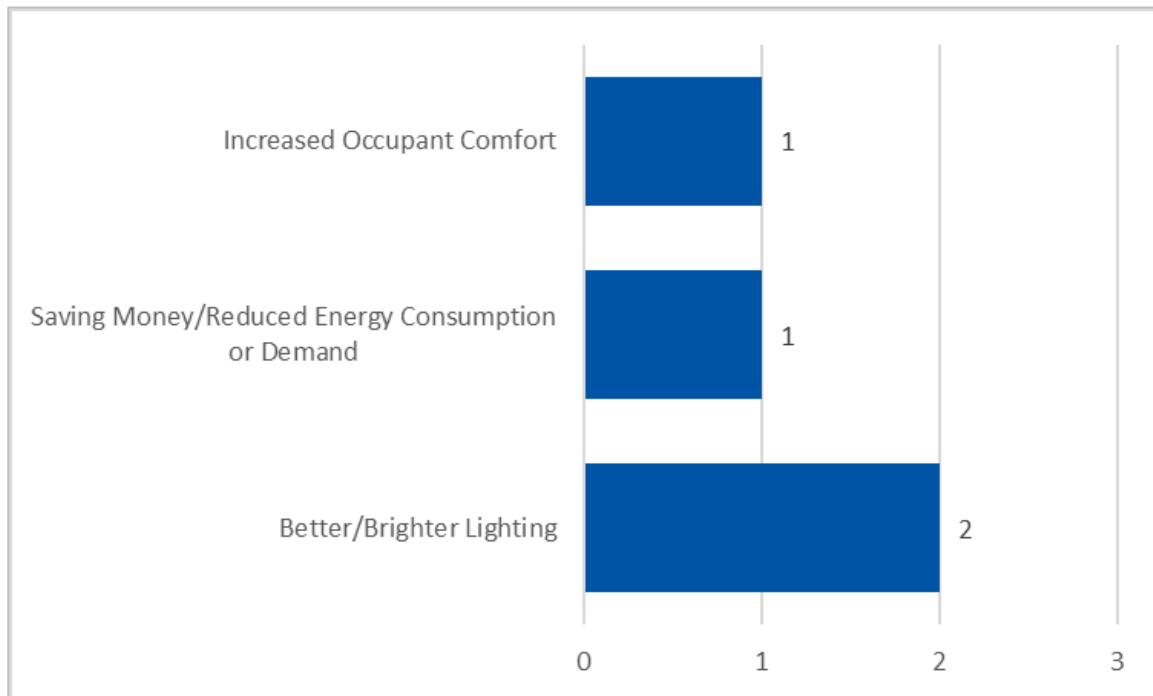
Satisfaction

The two participants reported different experiences and therefore satisfaction levels with the offer. While one was very satisfied with the equipment installed, the installing contractor's work, and the program overall, the other participant was somewhat satisfied with the installing contractor's work, but not satisfied at all with the equipment or the program. The dissatisfied participant reported receiving only fluorescent lighting rather than LEDs, and, therefore, said they achieved no savings. The project was a T12 to T8 fluorescent retrofit project, installed in 2016 before the program was changed to offer more LED options.

Benefits and Challenges

While participants reported mixed satisfaction levels, both identified benefits their companies received from the installed lighting equipment—most predominately, better and brighter light quality, as shown in Figure 14. Neither participant reported experiencing any challenges in participating in the Small Business Enhanced Incentives Offer.

Figure 14. Benefits of Equipment Installed Through the Small Business Enhanced Incentive Offer



Source: Pacific Power **watt**smart Business Program 2016–2017 Small Business Lighting/Small Business Direct Install Participant Survey QC16. Multiple responses allowed. (n=2)

Midstream/Lighting Instant Incentives

Cadmus surveyed one participant about their experience with the Lighting Instant Incentives offering. This participant owned and operated a facility in the Accommodation business sector, employing 10 or fewer staff.

Awareness and Communication

The participant learned about the incentives through friends, family, or a business colleague, and preferred to learn about new opportunities available in the **watt**smart Business program through a phone call or the mail.

Participation and Satisfaction

This customer found it very easy to find a distributor offering the lighting instant incentives and the eligible lighting equipment. The participant used the incentives for relamping an area of the company’s facility as part of ongoing maintenance, and reported that they were very satisfied with both the assistance provided by the distributor and the incentive amount received.

Nonparticipants

The Cadmus team surveyed 68 nonparticipants who either never completed a project through the program or had not completed a project through the program in 2016 or 2017. The largest single group

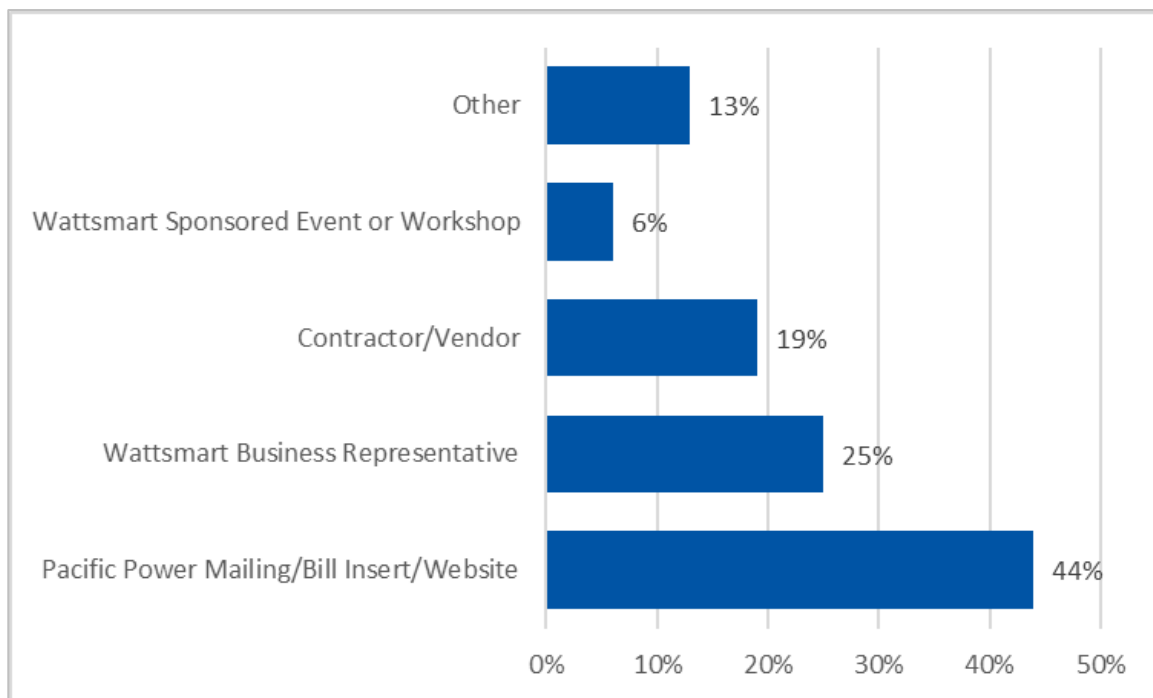
of surveyed nonparticipants (24%, n=62) operate in the Dairy/Agricultural business sector. Respondents represented 15 business sectors. The majority (63%, n=59), employ between one and 10 people.

The majority of nonparticipants (70%, n=63) operate a single facility in California, and 67% (n=63) own their facilities. Thirty-six percent of nonparticipants used electricity to heat their facilities while the remaining 64% used other fuels such as diesel, kerosene, wood, propane or did not heat their space (n=58). Participants relied more heavily on electricity for water heating (75%), with 25% using other fuels or not heating water (n=57).

Awareness and Communication

When asked if they had heard of the **wattsmart** Business program prior to the survey call, 24% of nonparticipants, (n=66) said they had, most frequently reporting they had learned about it through a Pacific Power mailing, bill insert, or the website (44%) or through contact with a **wattsmart** Business representative (25%, n=16), as shown in Figure 15. Although, 76% reported they had not heard of the program.

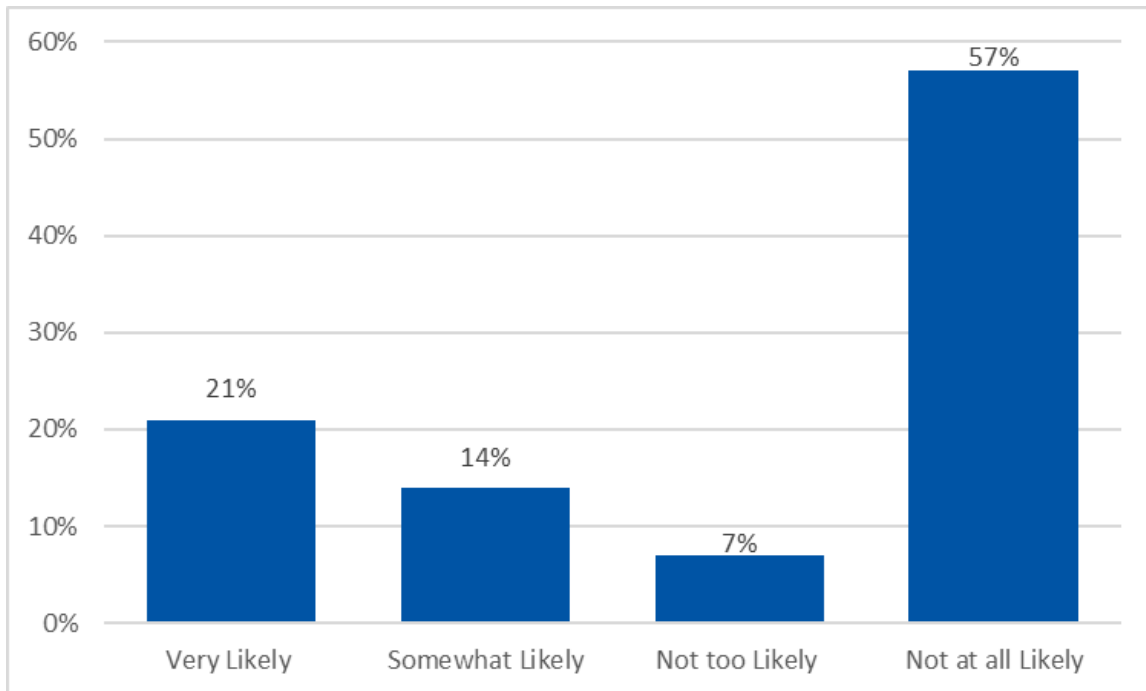
Figure 15. How Nonparticipants Learned About the *wattsmart* Business Program



Source: Pacific Power **wattsmart** Business Program 2016–2017 Partial Participant/Nonparticipant Survey: QC3. Don't know and refused responses removed. Total may not equal 100% due to rounding. (n=16)

The majority of nonparticipants said they wanted Pacific Power to inform them about incentives for energy efficiency improvements through a utility mailing/bill insert/website (82%), or through email (16%, n=67). Thirty-five percent said they were very likely or somewhat likely to request an incentive from the program in the next six months (n=14).

Figure 16. Likelihood of Requesting an Incentive in the Next Six Months

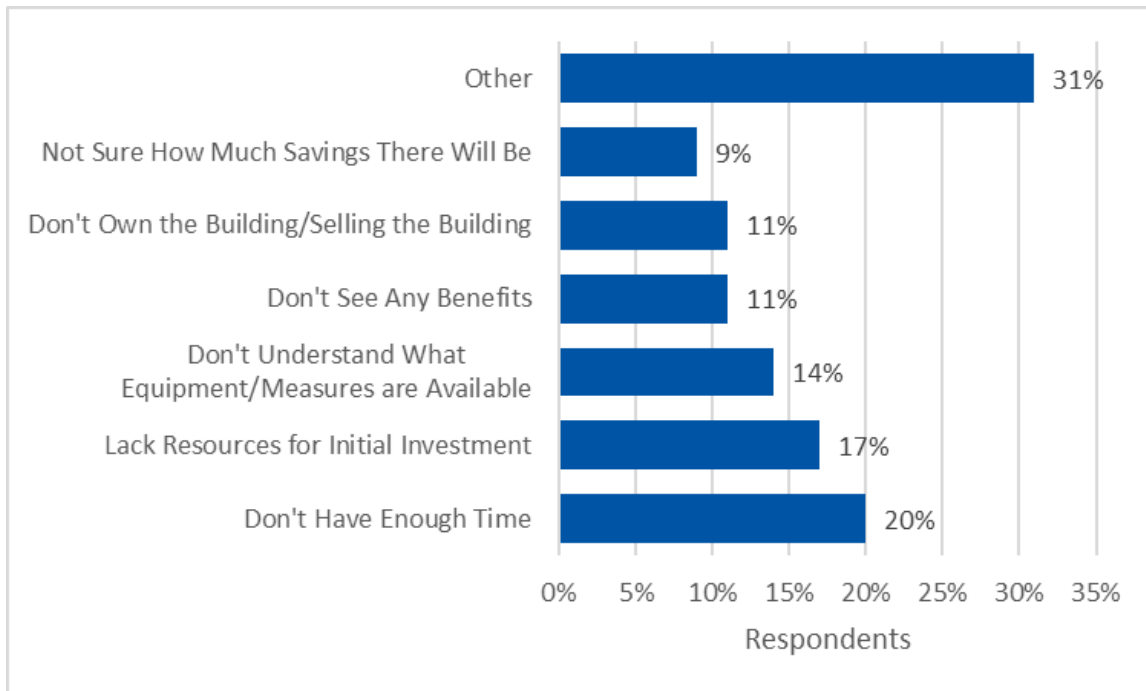


Source: Pacific Power **wattsmart** Business Program 2016–2017 Partial Participant/Nonparticipant Survey: QC5. Don't know and refused responses removed. Multiple responses allowed. (n=14)

In assessing nonparticipants' reasons for not yet using the **wattsmart** Business program, the Cadmus team found they did not do so primarily because they lacked time or financial resources, as shown in Figure 17. The Other category shown in the figure includes 10 customers for whom the program is not applicable, not cost-effective, or they simply had not done so.

When asked what Pacific Power could do to help their businesses participate, 62% asked for information about the program (including detailed information about their specific situations), and 21% asked for financial assistance through lower rates, higher incentives or interest-free financing. The remaining responses indicated the program did not apply to their situation or Pacific Power could do nothing more to encourage their participation (n=53).

Figure 17. Reasons for Not Yet Participating



Source: Pacific Power **watt**smart Business Program 2016–2017 Partial Participant/Nonparticipant Survey: QD13. Don't know and refused responses removed. Multiple responses allowed. (n=35)

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 (73%, n=59). While other responses described a variety of motivations (e.g., access to renewable energy resources such as solar and wind, replacing old equipment or improving productivity), no other group of responses represented more than 3% of all responses.

Participants said they would be more motivated to make energy-efficient purchases or upgrades if equipment costs were lower (56%), incentives were higher (23%), or if they had help putting together the business case for such investments (11%, n=57). Other responses included being offered incentives on different equipment, having more information about the program, and assorted responses such as access to three phase electricity, ownership of the property, and needing lower contractor costs.

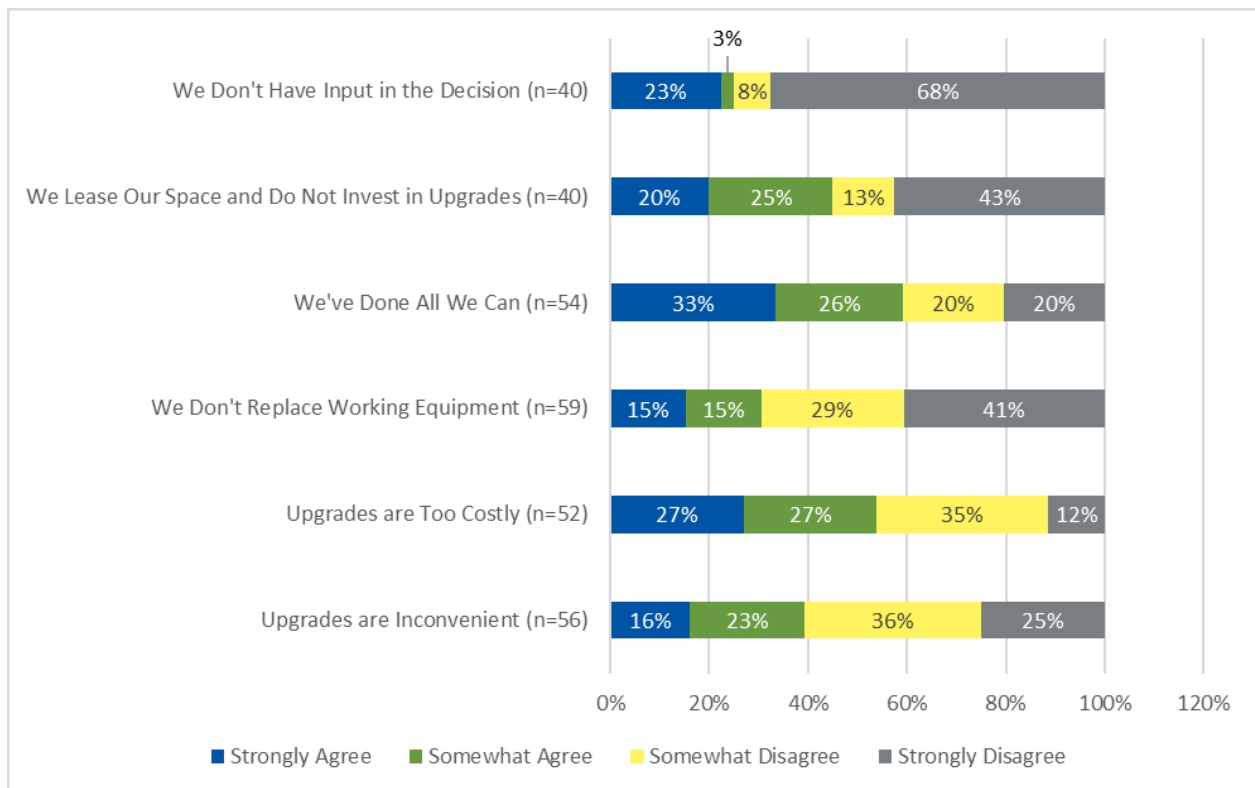
The Cadmus team further explored nonparticipants' attitudes about making energy efficiency upgrades at their facilities. The team asked these customers to what extent they agreed with the barrier statements shown in Figure 18 (note: not all statements applied to every customer, and the team removed responses of "don't know" and "not applicable").

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: respondents clearly have input into decisions about energy efficiency upgrades; 68% of respondents strongly disagreed with the statement that they did not (n=40). Though 45% percent of participants were not opposed to investing in upgrades, even in leased spaces (n=40), approximately one half (54%) strongly agreed or somewhat agreed that upgrades were too costly (27% and 27%, respectively [n=52]). Figure 18 shows all nonparticipant responses.

Nonparticipants also split when asked if included savings gained from energy efficiency when calculating return on investments for capital upgrades (61% said yes and 39% said no (n=62)).

Figure 18. Nonparticipants' Attitudes About Energy Efficiency Improvements



Source: Pacific Power **watt**smart Business Program 2016–2017 Partial Participant/Nonparticipant Survey: QD7a-QD7e. Not applicable, don't know, and refused responses were removed.

Cost-Effectiveness

In assessing the **wattsmart** Business program's cost-effectiveness, the Cadmus team analyzed program benefits and costs from five different perspectives, using Cadmus' DSM Portfolio Pro model.¹⁹ The California Standard Practice Manual for assessing DSM program cost-effectiveness describes benefit/cost ratios for the following five tests:

- **Pacific Power 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.

¹⁹ 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 23 summarizes the five tests’ components.

Table 23. 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 24 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 2015 Integrated Resource Plan.

Table 24. Selected Cost Analysis Inputs

Input Description	2016	2017	Total
Evaluated Energy Savings (kWh/year)*	3,209,281	2,402,748	5,612,029
Discount Rate	6.66%	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	\$1,932,816	\$1,020,012	\$2,952,828

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

**Based on Pacific Power’s 2015 Integrated Resource Plan, Volume I; Chapter 7—Modeling and Portfolio Evaluation. Available online: https://www.rockymountainpower.net/content/dam/pacificorpPacificPower/doc/Energy_Sources/Integrated_Resource_Plan/2015IRP/PacificCorp_2015IRP-Vol1-MainDocument.pdf. The Cadmus team determined future retail rates using a 1.9% annual escalator.

The **wattsmart** 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.²⁰ For all analyses, the team used avoided costs associated with the Pacific Power 2015 IRP Westside Class 2 DSM Decrement Values.^{21, 22}

Table 25 presents the 2016 and 2017 program years’ gross 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 **wattsmart** Business program proved cost-effective from the UCT (1.57) and PCT (3.46) perspectives for the combined years’ gross 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 25. wattsmart Business Program Cost-Effectiveness Summary of 2016 and 2017 Evaluated Gross Savings

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC	\$0.081	\$3,936,883	\$3,628,443	(\$308,440)	0.92
TRC	\$0.081	\$3,936,883	\$3,298,585	(\$638,299)	0.84
UCT	\$0.043	\$2,094,809	\$3,298,585	\$1,203,775	1.57
RIM		\$10,100,752	\$3,298,585	(\$6,802,168)	0.33
PCT		\$2,510,732	\$8,674,601	\$6,163,869	3.46
Lifecycle Revenue Impacts (\$/kWh)					\$0.000729435
Discounted Participant Payback (years)					2.73

Table 26 presents the 2016 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 **wattsmart** Business program proved cost-effective from the UCT and PCT perspectives.

²⁰ See Appendix E for detailed cost-effectiveness inputs and results at the measure category level.

²¹ 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

²² PacifiCorp’s Class 2 DSM Decrement Study details IRP decrements. Dated April 20, 2017, this report is available online:
http://www.pacificorp.com/content/dam/pacificorp/doc/Energy_Sources/Demand_Side_Management/2017/2017_Class_2_DSM_Decrement_Study.pdf

Table 26. wattsmart Business Program Cost-Effectiveness Summary of 2016 Evaluated Gross Savings

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/ Cost Ratio
PTRC	\$0.085	\$2,421,418	\$2,091,457	(\$329,961)	0.86
TRC	\$0.085	\$2,421,418	\$1,901,324	(\$520,093)	0.79
UCT	\$0.041	\$1,165,475	\$1,901,324	\$735,849	1.63
RIM		\$5,885,958	\$1,901,324	(\$3,984,634)	0.32
PCT		\$1,679,883	\$5,144,423	\$3,464,540	3.06
Lifecycle Revenue Impacts (\$/kWh)				\$0.000461696	
Discounted Participant Payback (years)					2.69

Table 27 presents the 2017 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 **wattsmart** Business program proved cost-effective from the PTRC, UCT, and PCT perspectives.

Table 27. wattsmart Business Program Cost-Effectiveness Summary of 2017 Evaluated Gross Savings

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit / Cost Ratio
PTRC	\$0.076	\$1,616,395	\$1,639,350	\$22,954	1.01
TRC	\$0.076	\$1,616,395	\$1,490,318	(\$126,078)	0.92
UCT	\$0.046	\$991,228	\$1,490,318	\$499,090	1.50
RIM		\$4,495,499	\$1,490,318	(\$3,005,182)	0.33
PCT		\$886,184	\$3,765,288	\$2,879,104	4.25
Lifecycle Revenue Impacts (\$/kWh)				\$0.000322263	
Discounted Participant Payback (years)					1.78

Table 28, Table 29, and Table 30 show cost-effectiveness results with net evaluated savings for 2016-2017, 2016, and 2017, respectively. Across all years, net results proved cost-effective from the UCT, and PCT test perspectives.

**Table 28. wattsmart Business Program Cost-Effectiveness Summary of 2016 and 2017
Evaluated Net Savings**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit / Cost Ratio
PTRC	\$0.094	\$3,184,614	\$2,558,599	(\$626,015)	0.80
TRC	\$0.094	\$3,184,614	\$2,325,999	(\$858,615)	0.73
UCT	\$0.062	\$2,094,809	\$2,325,999	\$231,190	1.11
RIM		\$7,681,386	\$2,325,999	(\$5,355,387)	0.30
PCT		\$2,510,732	\$8,674,601	\$6,163,869	3.46
Lifecycle Revenue Impacts (\$/kWh)	\$0.000574288				
Discounted Participant Payback (years)	2.73				

Table 29. wattsmart Business Program Cost-Effectiveness Summary of 2016 Evaluated Net Savings

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit / Cost Ratio
PTRC	\$0.098	\$1,914,905	\$1,461,434	(\$453,470)	0.76
TRC	\$0.098	\$1,914,905	\$1,328,577	(\$586,328)	0.69
UCT	\$0.059	\$1,165,475	\$1,328,577	\$163,102	1.14
RIM		\$4,431,063	\$1,328,577	(\$3,102,487)	0.30
PCT		\$1,679,883	\$5,144,423	\$3,464,540	3.06
Lifecycle Revenue Impacts (\$/kWh)	\$0.000359482				
Discounted Participant Payback (years)	2.69				

Table 30. wattsmart Business Program Cost-Effectiveness Summary of 2017 Evaluated Net Savings

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit / Cost Ratio
PTRC	\$0.089	\$1,354,272	\$1,170,236	(\$184,036)	0.86
TRC	\$0.089	\$1,354,272	\$1,063,851	(\$290,422)	0.79
UCT	\$0.066	\$991,228	\$1,063,851	\$72,623	1.07
RIM		\$3,466,794	\$1,063,851	(\$2,402,943)	0.31
PCT		\$886,184	\$3,765,288	\$2,879,104	4.25
Lifecycle Revenue Impacts (\$/kWh)	\$0.000257681				
Discounted Participant Payback (years)	1.78				

Conclusions and Recommendations

Pacific Power's customers recognized and reported benefits from participation in the *wattsmart* Business program. Surveyed customers reported relatively high satisfaction levels with the program's elements and few participation challenges inherent in the design of the program other than collecting and providing the necessary paperwork required.

Pacific Power and program administrators have successfully transitioned to the new DSMC database and, for the most part, the data transfer is operating smoothly. Participation in the Lighting Instant Incentives offering was low, however, given that it launched mid-2017, participation will be better measured in the next evaluation period. The targeted business-to-business approach taken with industrial and agricultural customers appears to be effective among these customers and may represent the greatest opportunity for program savings growth.

The most significant challenge to the program overall, appears to be maintaining cost-effectiveness in the face of declining avoided costs. This challenge hinders Pacific Power's ability to increase incentives to drive installation of more costly measures such as HVAC equipment, which in turn reduces trade ally participation and, therefore, customer participation. Lack of funding for marketing and outreach also limits Pacific Power's marketing campaigns that might increase brand awareness across this geographically dispersed population of Northern California. The Cadmus team found that most nonparticipants did not participate primarily because they did not know of the program.

The 2016 and 2017 program evaluation yielded a 97.8% overall realization rate, with a precision of $\pm 6.0\%$ at 90% confidence. Within each of the four measure categories, varying degrees of realization rates and precision emerged. Evaluated savings that differed from reported was often due to deviations in installed equipment quantities or hours of use. We found custom calculation workbooks and measurement and verification methods used to be comprehensive and based on engineering best practices.

Overall, the program exhibited a NTG of 75%, including 30% freeridership, 0% participant spillover, and 5% nonparticipant spillover. The program achieved cost effective results for the two-year period for the UCT and PCT for both gross and net savings.

In summary, Cadmus found Pacific Power's overall accounting of energy savings adhered to well established principles, and findings were those expected. Cadmus identified areas where incremental changes could improve program offerings and implementation. Cadmus recognizes the challenges faced by Pacific Power in Northern California and has focused recommendations to those that may be achieved at low or no-cost.

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

Savings Considerations

Conclusion

Pacific Power’s deemed savings value for case lighting is much higher than the calculated values provided by DEER or the Regional Technical Forum. Evaluated savings for all LED case lights were lower than the claimed value resulting in reduced realization rates.

Recommendation

The Cadmus team recommends revising the deemed savings to match the DEER workpaper for low and medium temperature case lighting. Recommended deemed energy savings provided in Table 31.

Table 31. Deemed Energy Savings for LED Case Lighting Projects

Refrigerated Display Case Type	Deemed Energy Savings (kWh / 5 foot door)
Medium Temperature Display Case	102.9
Low Temperature Display Case	232.5

Marketing and Outreach

Conclusion

While Pacific Power’s marketing and outreach budget is limited, low- or no-cost opportunities exist to increase relevance of marketing materials to Pacific Power customers, improve their experience, and incorporate Pacific Power’s stated goals into the collateral materials.

Recommendation

Consider the opportunities listed below and incorporate those that can be done so cost-effectively:

- Include California-specific language in electronic communications directed exclusively to California customers.
- Increase the use of case studies.
- If budget allows, develop and incorporate messaging to support Pacific Power’s goal to appeal to customers based on energy efficiency as good for the environment and the state of California. Calendarize this message with specific campaign efforts throughout the year.
- Communicate program changes that impact the customers’ incentive or program experience, close to when the changes take effect. This could be done via email.
- Increase presence in town events through town chambers of commerce if the budget allows.
- If budget and resources allow, increase the frequency of email throughout the year, rather than only to coincide with marketing events.

Nonparticipants

Conclusion

With 76% of surveyed nonparticipants unaware of the program, increasing program awareness seems a clear opportunity for Pacific Power to acquire new participants, and potentially, energy savings. The majority of nonparticipants are small businesses operating one facility and employing 10 or fewer people, a group well suited to the Small Business Enhanced Incentives Offer, or the Lighting Instant Incentives offering, both of which had low participation in 2016 and/or 2017, which is particularly problematic because lighting is still a cost-effective measure for the program, which struggles with cost-effectiveness. While most nonparticipants said the cost of energy-efficient equipment was a barrier to making upgrades, some said they would like help forming a business case for making these investments.

Recommendation

Increase efforts to build awareness of the program and its benefits through regular email marketing and business-to-business outreach. Target nonparticipants with case studies highlighting actual energy cost savings achieved by other small businesses. Continue growing the program approved trade ally network and lighting distributor participation, to extend Pacific Power's outreach to customers, beyond its own marketing efforts.

Appendices

Appendix A. Self-Report NTG Methodology

Appendix B. Nonparticipant Spillover

Appendix C. Participant Survey Guides

Appendix D. Nonparticipant/Partial Participant Survey Guide

Appendix E. Measure Category Cost-Effectiveness

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 that has been used since the 2009-2011 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 2016-2017 **wattsmart** 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 its scope (i.e., 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 California's Energy FinAnswer Program (PY 2009-2011) – Appendix B: http://www.pacificorp.com/content/dam/pacificorp/doc/Energy_Sources/Demand_Side_Management/2013/CA_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:

$$\text{Initial Freeridership Ratio} = \text{Efficiency Score} \times \text{Quantity Score}$$

The initial 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.

After adjusting the initial freeridership ratio for past program participation, 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 (D9.2 = 5 – extremely important) but that they would have installed the exact same equipment at the same time without the program (D2 = Yes and D1= Yes), the interviewer asks them to describe in their own words what impact the program had on their decision (D8). 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.

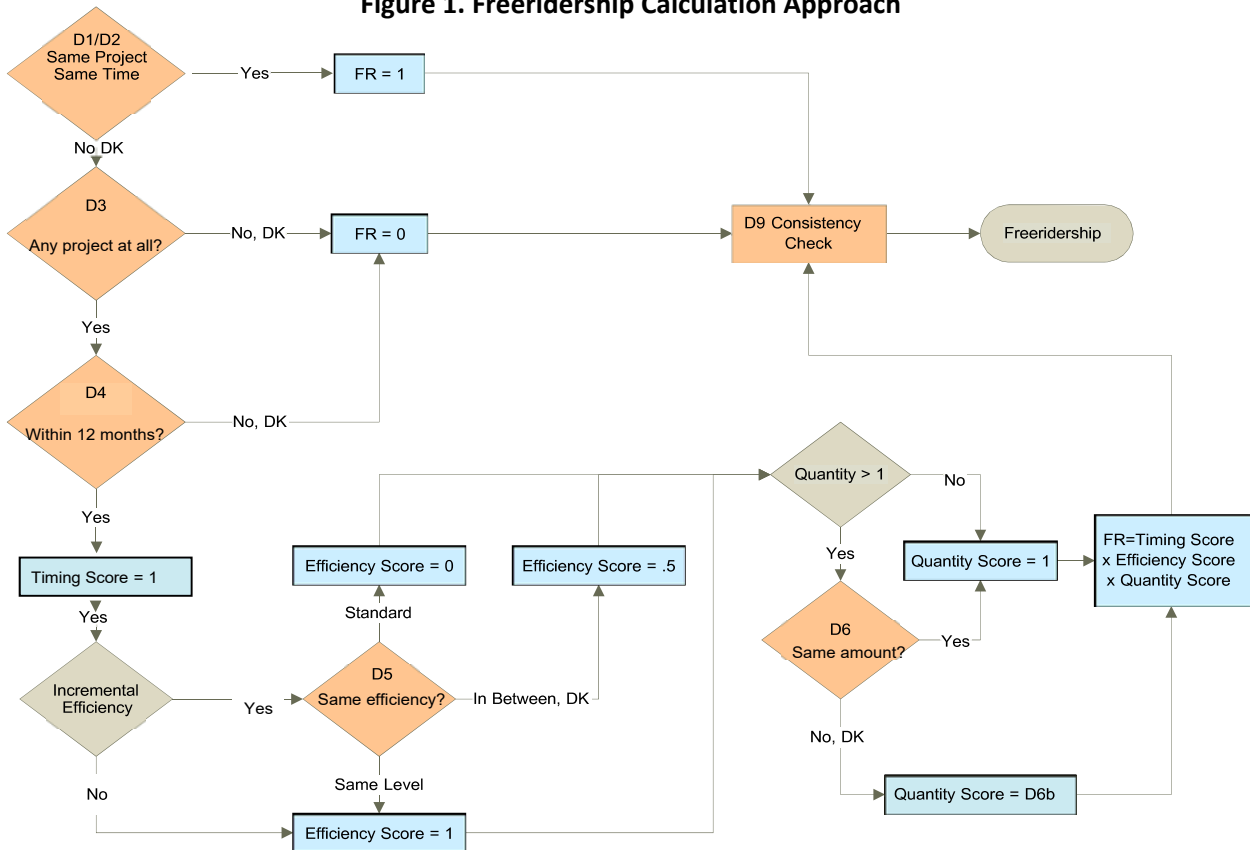
Table 1 provides detailed scoring and descriptions of each question.

Table 1. Freeridership Calculation Approach

Question	Question Text	Scoring
D1	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
D2	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 D2=yes and D1=yes then freeridership = 1
D3	Without the program, would you have installed any [MEASURE] equipment?	If D4=no, freeridership = 0
D4	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
D5	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
D6	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
D9.6	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 D9.6 = 5, reduce adjusted free-ridership by 75% If D9.6 = 4, reduce adjusted free-ridership by 50%
D9.2	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
D9.4	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

D8	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 D9.2 or D9.4 Initial freeridership score is reduced by 50% if D8 response merits an adjustment free-ridership by 50%
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Figure 1. Freeridership Calculation Approach



Participant Spillover Calculation

For the **wattsmart** 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 **wattsmart** 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 **wattsmart** 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 **wattSmart** 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 2 provides detailed scoring and descriptions of each “like” spillover question.

Table 2. Participant Spillover Calculation Approach

Question	Question Text	Scoring
E9	Since participating in this program, have you purchased and installed any other energy efficiency improvements on your own without any assistance from a utility or other organization?	If no, potential spillover savings = 0
E10	What type of equipment did you install?	If no, potential spillover savings = 0
E10.# Series	Measure specific efficiency, capacity, fuel type questions	If responses indicated non-program qualifying unit, potential spillover savings = 0
E11	How many did you purchase and install?	E11 x program-evaluated per-unit savings = potential spillover savings
E12	Did you receive an incentive from Pacific Power or another organization for this equipment?	If yes, potential spillover savings = 0.
E15	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).	“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 68 nonparticipating customers from a sample of 2,443 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 2016-2017 **wattsmart** 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 2016 and 2017 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
C	Sample usage	Pacific Power Customer Database
D	Sample NPSO	$A \div C$
E	Total Population Usage kWh	Pacific Power Customer Database
F	NPSO kWh Savings Applied to Population	$D \times E$
G	Total Gross Program Evaluated kWh Savings	2016-2017 <i>wattsmart</i> Business Evaluation
H	NPSO as a Percentage of Total 2016-2017 <i>wattSmart</i> Business Evaluated kWh Savings	$F \div G$

Results

Of 68 Pacific Power nonparticipant customers surveyed, two nonparticipant respondents reported installing measures attributed to Pacific Power’s influence. Table 2 presents measures types and gross evaluated kWh savings the Cadmus team attributed to Pacific Power, generating total savings of 7,274 kWh.

Table 2. NPSO Response Summary

Reported Spillover Measure Type	Quantity	Unit Energy Savings (kWh) ¹	Total Savings (kWh)
LED Lighting	30	178 per unit	5,342
Window Air Conditioner	7	276 per unit	1,932
Total	37		7,274

¹ Unit energy savings (kWh) estimated for each measure were generated from the 2016-2017 *wattsmart* Business program evaluated gross savings analysis. Unit energy savings represents the average savings per unit for all attributable measures for a given measure type.

The NPSO represents energy savings from companies that did not participate in the 2016-2017 *wattsmart* Business program who reduced their energy consumption and attributed their action to information provided by Pacific Power or past participation in a Pacific Power energy efficiency program.

Cadmus found NPSO as a percentage of total 2016-2017 *wattsmart* Business Evaluated kWh Savings in California to be 5% (H). Table 3 below details the analysis steps. The first step is taking the total sample

spillover savings from the 68 respondents (7,274 kWh (A)) and dividing it by the total sample usage (2,576,157 kWh (C)). This results in the Sample NPSO (0.3% (D)).

The sample NPSO is then applied to the total population of consumption as calculated using average consumption by revenue class multiplied by the number of customers in each class (96,622,953 kWh (E)), as provided to Cadmus by Pacific Power¹.

The total population energy usage is then multiplied by the Sample NPSO to obtain the population NPSO savings (272,819 kWh (F)). This savings is then divided by the total gross program kWh savings (5,612,029 (G)) found in 2016-2017 **wattsmart** Business Evaluation to calculate the NPSO of 5%.

Table 3. California NPSO wattsmart Results

Variable	Metric	Value	Source
A	Total kWh Spillover Savings from Survey Respondents	7,274	Survey data / Engineering Analysis
B	Total Nonparticipant Customers Surveyed	68	Survey disposition
C	Sample usage	2,576,157	Pacific Power Customer Database
D	Sample NPSO	0.3%	$A \div C$
E	Total Population Usage kWh	96,622,953	Pacific Power Customer Database
F	NPSO kWh Savings Applied to Population	272,819	$D \times E$
G	Total Gross Program Evaluated kWh Savings	5,612,029	2016-2017 wattsmart Business Evaluation
H	NPSO as a Percentage of Total 2016-2017 wattSmart Business Evaluated kWh Savings	5%	$F \div G$

¹ NPSO savings were not extrapolated to industrial customers to provide a conservative estimate.

Appendix C. PacifiCorp *wattsmart* Business Program (2016–2017) *wattsmart* Business Participant Survey

Researchable Questions		
Key Research Topics	Areas of Investigation	Related Questions
Screening	Project initiation process	C1
Marketing and Outreach	Program Awareness	B3, C16-C17
	Future communication preferences	G3
Barriers	Obstacles to installing high-efficiency equipment	C2, C3, C14, C15, C19, C20
Satisfaction	Assess satisfaction with Program application process, various program components and reasons for dissatisfaction among participants	C4-C13, C18, C21, C22, G1,G2
Firmographics	Determine building and company characteristics of participants	Section F
Decision Making	Key factors influencing customers' decision to participate in program	C1, C18,
Freeridership and Spillover	Assess net savings	Sections D and E

Target Quota = See samples for each state

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

- **[UTILITY]**
- **[MEASURE.NAME.FINAL] MEASURE1**
- **[PROGRAM YEAR]**
- **[CONTACT NAME]**
- **[CUSTOMER NAME]**
- **[SITE ADDRESS 1]**
- **[SITE CITY]**
- **[PROJECT STATE]**
- **[CUSTOMER INCENTIVE]**
- **[BILL_CREDIT]**

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 [UTILITY] INCENTIVE FOR [CUSTOMER 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 [CUSTOMER 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 1], [SITE CITY] location? [IF SITE ADDRESS 1 IS BLANK, JUST READ THE CITY]

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 wattsmart 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 10-15 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. [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]**, at **[SITE ADDRESS 1]** in **[INSERT PROGRAM YEAR]**? Is this correct? **[MULTIPLE RESPONSE]**
1. (Yes)
 2. (No, wrong year) **[RECORD CORRECT YEAR IF POSSIBLE]**
 3. (No, wrong address) **[RECORD CORRECT ADDRESS]**
 4. (No, wrong measure) **[CORRECT BELOW]**
(MEASURE 1 IS INCORRECT **[Correct: _____]**) **[CALL THIS VARIABLE C_MEASURE]**
 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 this upgrade? The incentive may have been in the form of a check from the utility, a utility bill credit, 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 *wattsmart* Business representative or utility representative)
 2. (*wattsmart* printed program materials)
 3. (*wattsmart* sponsored workshop or community event)
 4. (Utility mailing, bill insert, or utility Website)
 5. (Through my electrician or contractor)
 6. (Previously participated in program/received an incentive)
 7. (Through a civic organization, trade association or professional organization) **[SPECIFY: _____]**
 8. (Through the distributor or supplier where I purchase lighting)
 9. (Word of mouth (family, friend, or business colleague))
 10. (Other **[SPECIFY: _____]**)
 98. (Don't know)
 99. (Refused)

C. Wattsmart Business

Thank you. I'd like to ask you about your project where you installed **[INSERT MEASURE1 OR C_MEASURE1]**.

C1. 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]**. **[READ LIST AND MARK ALL THAT APPLY 98 = DON'T KNOW TO ALL 99= REFUSED ALL] [RANDOMIZE LIST]**

1. A wattsmart Business program participating vendor
2. Your independent contractor
3. A wattsmart Business representative or Energy Engineer
4. Your **[UTILITY]** account representative
5. A family member, friend, or coworker?
6. Other **[SPECIFY: Who else was involved? _____]**
98. (Don't know)
99. (Refused)

C2. 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 C2=2, 3 OR 4]

C3. What would have made this paperwork easier to complete?

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

C4. 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 C4=2, 3 OR 4]

C5. What incentive amount would have been enough for you to say you were very satisfied?

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

C6. 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 C6=2, 3 OR 4]

C7. What amount of time would have been appropriate? **[RECORD VERBATIM: _____]**

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

C8. What payback period does your company typically look for on these kinds of projects? **[RECORD**

VERBATIM: _____]

98. (Don't know)

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

C9. I'm going to read you a short list. Please tell me who, if anyone, was involved in helping you install the **[INSERT MEASURE1 OR C_MEASURE1]**.

1. A wattsmart Business program participating vendor
2. Your independent contractor **[SKIP TO C12]**
3. Someone else **[SPECIFY: _____]** **[SKIP TO C12]**
98. (Don't know) **[SKIP TO C12]**
99. (Refused) **[SKIP TO C12]**

C10. How satisfied were you with the work provided by the participating vendor that installed the **[INSERT MEASURE1 OR C_MEASURE1]**? 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 C10=2, 3 OR 4]

C11. Why do you say that?

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

C12. How satisfied were you with the **[MEASRURE1 OR C MEASURE1]** 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 C12=2, 3 OR 4]

C13. Why do you say that?

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

C14. Was there other energy-efficient equipment you wanted to install, which did not qualify for *wattsmart* Business incentives?

1. (Yes)
2. (No) **[SKIP TO C18]**
98. (Don't know) **[SKIP TO C18]**
99. (Refused) **[SKIP TO C18]**

[IF C14=1]

C15. What equipment?

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

[IF C9=1]

C16. Did you ask the participating vendor installing your project about this other equipment?

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

[IF C16=1]

C17. Did the participating vendor direct you to the other *wattsmart* Business programs as a place where that equipment may be eligible for incentives?

1. (Yes)
2. (No)

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

C18. 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)

C19. What challenges, if any, did you encounter participating in the *wattsmart* Business program incentives?

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

[IF C19=1]

C20. 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 C20=5]

C20.5 You mentioned you would like more information. What type of information do you need?
[RECORD VERBATIM: _____]

C21. 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
5. I did not interact with [UTILITY] during this project
98. (Don't know)
99. (Refused)

[IF C21=2, 3, OR 4]

C22. Why do you say you were [INSERT ANSWER FROM C21] with [UTILITY]?

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

D. Freeridership

Thank you. Next, I'd like to ask you about your decision to purchase the [MEASURE1/C_MEASURE1].

D1. Without the program, meaning without either the technical assistance or the financial incentive, would you have still completed the exact same [MEASURE_1/C_MEASURE1] project?

1. (Yes)
2. (No) [SKIP TO D3]
98. (Don't know) [SKIP TO D3]
99. (Refused) [SKIP TO D3]

D2. Without the program, meaning without either the technical assistance or the financial incentive, would you have still installed the [MEASURE_1/C_MEASURE1] at the same time?

1. (Yes) [SKIP TO D7]
2. (No) [SKIP TO D4]
98. (Don't know) [SKIP TO D4]
99. (Refused) [SKIP TO D4]

D3. Without the program, would you have installed any [MEASURE_1/C_MEASURE1] equipment?

1. (Yes)
2. (No) [SKIP TO D8]
98. (Don't know) [SKIP TO D8]
99. (Refused) [SKIP TO D8]

- D4. Without the program, in terms of timing, when would you have installed the **[MEASURE_1/C_MEASURE1]**?
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 D8]**
 98. (Don't know)
 99. (Refused)
- D5. Relative to the energy efficiency of **[MEASURE_1/C_MEASURE1]** 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)
- D6. Would you have installed more, less, or the same amount of **[MEASURE_1/C_MEASURE1]** without the program?
1. (More)
 - D6a. Compared to the installed amount, how much more?
[RECORD PERCENTAGE: _____]
 2. (Less)
 - D6b. Compared to the installed amount, how much less?
[RECORD PERCENTAGE: _____]
 98. (Don't know)
 99. (Refused)
- D7. Prior to hearing about the program, was the cost of **[MEASURE_1/C_MEASURE1]** included in your organization's most recent capital budget?
1. (Yes)
 2. (No)
 98. (Don't know)
 99. (Refused)
- D8. In your own words, can you please describe what impact the program had on your decision to complete these energy efficiency improvements for **[MEASURE_1/C_MEASURE1]**?
- D9. With the *wattsmart* Business program, your company received financial incentives of **[CUSTOMER INCENTIVE OR BILL CREDIT]** for installing **[MEASURE_1/C_MEASURE1]**.

For the **[MEASURE_1/C_MEASURE1]** 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

E. Spillover

E1. 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 F]**
98. (Don't know) **[SKIP TO SECTION F]**
99. (Refused) **[SKIP TO SECTION F]**

E2. Did you purchase and install any energy efficient improvements that are the same as the **[MEASURE_1/C_MEASURE1]** you installed through the program?

1. (Yes)
2. (No) **[SKIP TO E9]**
98. (Don't know) **[SKIP TO E9]**
99. (Refused) **[SKIP TO E9]**

E3. How many did you purchase and install?

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

E4. 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)

- E5. 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 E5=1]

- E6. What program or sponsor provided the incentive?
1. **[ENTER PROGRAM OR UTILITIY]**
 98. (Don't know)
 99. (Refused)
- E7. 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]** wattsmart Business program was in your decision to install these energy efficient product(s).
1. RECORD RATING: _____]
 98. (Don't know)
 99. (Refused)

[ASK IF E5=2]

- E8. Why did you not apply for an incentive from **[UTILITY]** for this equipment?
1. [RECORD RESPONSE]
 98. (Don't know)
 99. (Refused)
- E9. 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 F]**
 98. (Don't know) **[SKIP TO SECTION F]**
 99. (Refused) **[SKIP TO SECTION F]**
- E10. 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, freezers)
 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 F]**
- 98. (Don't know) **[SKIP TO SECTION F]**
- 99. (Refused) **[SKIP TO SECTION F]**

[ASK E10.11-E10.14 AND E11-E15 if E10=1]

- E10.11** What type of lighting was purchased and installed? **[SPECIFY TYPE EXAMPLE: CFL, LED, FLUORESCENT]:** _____
- E10.12** What is the wattage of the lighting? **[SPECIFY]:** _____
- E10.13** In what location was it installed (Wall/Ceiling/Outdoors)? **[SPECIFY]:** _____
- E10.14** What type of equipment was removed or replaced? **[SPECIFY]:** _____

[ASK E10.21-E10.24 AND E11-E15 if E10=2]

- E10.21** What type of HVAC equipment was purchased and installed? **[SPECIFY TYPE]:** _____
- E10.22** What Fuel type is used? **[SPECIFY]:** _____
- E10.23** What is the efficiency rating of the equipment? **[SPECIFY]:** _____
- E10.24** What is the capacity of the equipment? **[SPECIFY]:** _____

[ASK E10.31-E10.34 AND E11-E15 if E10=3]

- E10.31** What type of water heating equipment was purchased and installed? **[SPECIFY TYPE]:** _____
- E10.32** What Fuel type is used? **[SPECIFY]:** _____
- E10.33** What is the efficiency rating of the equipment? **[SPECIFY]:** _____
- E10.34** (If water heater with storage) What is the capacity of the equipment? **[SPECIFY]:** _____

[ASK E10.41-E10.42 AND E11-E15 if E10=4]

- E10.41** What type of motor was it installed on? **[SPECIFY TYPE]:** _____
- E10.42** What is the horsepower of the motor? **[SPECIFY]:** _____

[ASK E10.51-E10.52 AND E11-E15 if E10=5]

- E10.51** What equipment was the motor installed on? **[SPECIFY TYPE]:** _____
- E10.52** What is the horsepower of the motor? **[SPECIFY]:** _____

[ASK E10.61 AND E11-E15 if E10=6]

- E10.61** What type of refrigeration or freezer equipment was purchased and installed? **[SPECIFY TYPE]:** _____

[ASK E10.71-E10.73 AND E11-E15 if E10=7]

E10.71 What building envelope measure was purchased and installed? [SPECIFY TYPE]:

E10.72 What is the efficiency (R-value) of the measure? [SPECIFY]: _____

E10.73 In what location was it installed (Wall/Roof/Floor)? [SPECIFY]: _____

[ASK E10.81-E10.82 AND E11-E15 if E10=8]

E10.81 FOR What type of application was the compressed air equipment purchased and installed? [SPECIFY APPLICATION]: _____

E10.82 What is the horsepower of the compressor motor? [SPECIFY]: _____

[ASK E10.91-E10.92 AND E11-E15 if E10=9]

E10.91 FOR What type of application was the chiller purchased and installed? [SPECIFY APPLICATION]: _____

E10.92 What size chiller did you install? [SPECIFY]: _____

[ASK E10.101-E10.103 AND E11-E15 if E10=10]

E10.101 FOR What type of application was the pump purchased and installed? [SPECIFY APPLICATION]: _____

E10.102 What is the horsepower of the motor for the pump? [SPECIFY] _____

E10.103 What is the efficiency rating of the pump? [SPECIFY]: _____

[ASK E10.111 AND E11-E15 if E10=11]

E10.111 WHAT IRRIGATION EQUIPMENT DID YOU purchase and install? [SPECIFY GASKETS, DRAINS, SPRINKLERS, ETC.]: _____

[ASK IF E10=1-12] [ASK ABOUT EACH ITEM MENTIONED IN E10]

E11. How many did you purchase and install? [ASK FOR EACH MEASURE MENTIONED IN E10] [IF E10 MEASURE = 'BUILDING ENVELOPE' THEN ASK HOW MANY 'SQUARE FEET']

1. [RECORD RESPONSE]

98. (Don't know)

99. (Refused)

[ASK IF E10=1-12] [ASK ABOUT EACH ITEM MENTIONED IN E10]

E12. Just to confirm, did you receive an incentive from [UTILITY] or another organization for this equipment? [ASK FOR EACH MEASURE MENTIONED IN E10]

1. (Yes)

2. (No)

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

[ASK FOR EACH YES IN E12]

- E13. What utility or organization provided the incentive? **[ASK FOR EACH MEASURE MENTIONED IN E10]**
- 1. **[RECORD UTILITY OR ORGANIZATION]**
 - 98. (Don't know)
 - 99. (Refused)

[ASK IF E10=1-12] [ASK ABOUT EACH ITEM MENTIONED IN E10]

- E14. What information did you rely upon to determine that the equipment installed was energy efficient? **[ASK FOR EACH MEASURE MENTIONED IN E10]**
- 1. **[RECORD RESPONSE]**
 - 98. (Don't know)
 - 99. (Refused)

[ASK IF E10=1-12] [ASK ABOUT EACH ITEM MENTIONED IN E10]

- E15. 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]** wattsmart Business program was in your decision to install [this/these] energy efficient product(s). **[ASK FOR EACH MEASURE MENTIONED IN E10]**
- 1. **[RECORD RATING: _____]**
 - 98. (Don't know)
 - 99. (Refused)

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

F3. Does your organization lease or own the facility 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
98. (Don't know)
99. (Refused)

G. Closing

G1. Overall, how satisfied would you say you are with the *wattsmart* 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)

G2. Is there anything that **[UTILITY]** could have done to improve your overall experience with the *wattsmart* 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)

G2.1 **[ASK IF G2 = 1]** You mentioned you would like better communication. Who would you like more communication from? **[RECORD RESPONSE_____]**

G2.2 **[ASK IF G2 = 2]** You mentioned a quicker response time. Who would you like a quicker response time from? **[RECORD RESPONSE_____]**

G2.3 **[ASK IF G2 = 3]** What other energy-efficient equipment should *wattsmart* business offer incentives for? **[RECORD RESPONSE_____]**

G2.5 **[ASK IF G2=5]** In what way would you like them to simply the application process? **[RECORD RESPONSE_____]**

G2.6 **[ASK IF G2 = 6]** In what way would you like them to simplify the website? **[RECORD RESPONSE_____]**

G3. 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 *wattsmart* Business representative or utility representative)
2. (*wattsmart* printed program materials)
3. (*wattsmart* sponsored workshop or event)
4. (Utility mailing, email, newsletter with bill, bill insert, or utility Website)

5. (Contact with a vendor/contractor)
6. (Through a trade association, trade publication or professional organization) [SPECIFY: _____])
7. (Newspaper ad)
8. (Radio ad)
9. (TV ad)
10. (Social Media (e.g., Facebook, Twitter, YouTube))
11. (Online ads)
12. (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.

PacifiCorp *wattsmart* Business Program (2016 - 2017) Small Business Lighting/ Small Business Direct Install Participant Survey

Researchable Questions		
Key Research Topics	Areas of Investigation	Related Questions
Screening	Project initiation process	C1, C4, C5
Marketing and Outreach	Program Awareness	B3, C14
	Future communication preferences	G3
Barriers	Obstacles to installing high-efficiency lighting	C17-C19
Satisfaction	Assess satisfaction with Program application process, various program components and reasons for dissatisfaction among participants	C1-C3, C6-C9, C15, C16
Firmographics	Determine building and company characteristics of participants	Section F
Decision Making	Key factors influencing customers' decision to participate in program	C1, C5
Freeridership and Spillover	Assess net savings	Sections D and E

Target Quota = See samples for individual states

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

- **[UTILITY]**
- **[PROGRAM NAME]**
- **[MEASURE.NAME.FINAL] MEASURE1**
- **[PROGRAM YEAR]**
- **[CONTACT NAME]**
- **[CUSTOMER NAME]**
- **[SITE ADDRESS 1]**
- **[SITE CITY]**
- **[PROJECT STATE]**
- **[CUSTOMER INCENTIVE]**

A. Introduction

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 facility manager, energy manager or someone who is familiar with your participation in the [UTILITY] [PROGRAM NAME] incentive program? [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 [UTILITY]. Are you 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)
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 1], [SITE CITY] 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 [PROGRAM NAME] 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 10 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. [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 **[FOR SBL READ: installed energy efficient lighting including [MEASURE1]] [FOR SBDI READ: participated in the [MEASURE1] program]**, at **[SITE ADDRESS 1]** in **[PROGRAM YEAR]**? Is this correct? **[MULTIPLE RESPONSE]**
1. (Yes)
 2. (No, wrong year) **[RECORD CORRECT YEAR IF POSSIBLE]**
 3. (No, wrong address) **[RECORD CORRECT ADDRESS]**
 4. (No, wrong measure) **[CORRECT BELOW]**
(MEASURE 1 IS INCORRECT **[Correct: _____]**) **[CALL THIS VARIABLE C_MEASURE]**
 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 this upgrade? The incentive may have been in the form of a check from the utility, 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 *wattsmart* Business representative or utility representative)
 2. (*wattsmart* printed program materials)
 3. (*wattsmart* sponsored workshop or community event)
 4. (Utility mailing, bill insert, or utility Website)
 5. (Through my electrician or contractor)
 6. (Previously participated in program/received an incentive)
 7. (Through a trade association or professional organization) **[SPECIFY: _____]**
 8. (Through the vendor, distributor or supplier where I purchase lighting)
 9. (Word of mouth (family, friend, or business colleague))
 10. (Other **[SPECIFY: _____]**)
 98. (Don't know)
 99. (Refused)

C. *Small Business Direct Install/Small Business Lighting/wattsmart Small Business Lighting Incentives*

Thank you. I'd like to ask you about your participation in the **[PROGRAM NAME]** incentives.

- C1. What factor was most important to your company's decision to participate in the **[PROGRAM NAME]** incentives? **[DO NOT READ LIST; RECORD ONE RESPONSE]**
1. (To save money on energy bills)
 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)

[IF PROGRAM NAME= SMALL BUSINESS LIGHTING OR WATTSMART SMALL BUSINESS LIGHTING ASK C2. IF PROGRAM NAME =SMALL BUSINESS DIRECT INTALL SKIP TO C4]

- C2. How easy was it to schedule a *wattsmart* Small Business Lighting 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 C2=2, 3 OR 4]

- C3. What would have made it easier to schedule a *wattsmart* Small Business approved contractor?
1. **[RECORD VERBATIM: _____]**
 98. (Don't know)
 99. (Refused)
- C4. After the free energy assessment, did you receive a project proposal with estimates of your incentive or discount and cost savings?
1. (Yes)
 2. (No) **[SKIP TO C6]**
 98. (Don't know) **[SKIP TO C6]**
 99. (Refused) **[SKIP TO C6]**

[IF C4=1]

C5. What information in the project proposal was most influential in your decision to proceed with your project....? **[PROBE FOR SPECIFICS OF WHAT WAS INFLUENTIAL]**

1. (Cost savings)
2. (Energy savings)
3. (Other) **[RECORD VERBATIM: _____]**
4. (Nothing)
98. (Don't know)
99. (Refused)

C6. 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 C6=2, 3 OR 4]

C7. Why do you say you were **[INSERT ANSWER FROM C6]** with the work provided by the contractor?

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

C8. 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 C8=2, 3 OR 4]

C9. Why do you say you were **[INSERT ANSWER FROM C8]** with the equipment provided by the contractor?

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

C10. Was there other lighting equipment you wanted to install, which was not offered in your **[PROGRAM NAME]** project proposal?

1. (Yes)
2. (No) **[SKIP TO C14]**
98. (Don't know) **[SKIP TO C14]**
99. (Refused) **[SKIP TO C14]**

[IF C10=1]

C11. What equipment?

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

C12. Did you ask the contractor installing your project, about this other equipment?

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

[IF C12=1]

C13. Did the contractor direct you to the other *wattsmart* Business programs as a place where that equipment may be eligible for incentives?

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

[IF PROGRAM NAME = SMALL BUSINESS DIRECT INSTALL ASK C14]

C14. **[UTILITY]** offered the Small Business Direct incentives in your community, during a specified window of time. Were you aware you had a limited time to enroll in the Small Business Direct incentives?

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

C15. **[IF C14=1]** Thinking about the timeframe of your project, how satisfied were you with the window of time in which you could enroll in the Small Business Direct incentives? 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)

C16. What would you say are the main benefits your company has experienced as a result of the lighting installed? **[DO NOT READ LIST; RECORD ALL THAT APPLY; PROBE FOR MULTIPLE RESPONSES]**

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

C17. What challenges, if any, did you encounter participating in the **[PROGRAM NAME]** incentives?

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

[ASK IF C17=1]

C18. 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 C18=5]

C18.5 You mentioned providing better information about the program. What type of information do you need? [SPECIFY: _____]

- C19. Do you have any suggestions for improving the [PROGRAM NAME] offering?
1. (Yes) [SPECIFY: _____]
 2. (No)
 98. (Don't know)
 99. (Refused)

D. Freeridership

Thank you. Next, I'd like to ask you about your decision to [FOR SBL READ: purchase] [FOR SBDI READ: install] the [MEASURE1/C_MEASURE1] equipment.

- D1. Without the program, meaning without either the technical assistance or the financial incentive, would you have still completed the exact same [MEASURE_1/C_MEASURE1] project?
1. (Yes)
 2. (No) [SKIP TO D3]
 98. (Don't know) [SKIP TO D3]
 99. (Refused) [SKIP TO D3]
- D2. Without the program, meaning without either the technical assistance or the financial incentive, would you have still installed the [MEASURE_1/C_MEASURE1] equipment at the same time?
1. (Yes) [SKIP TO D6]
 2. (No) [SKIP TO D4]
 98. (Don't know) [SKIP TO D4]
 99. (Refused) [SKIP TO D4]
- D3. Without the program, would you have installed any [MEASURE_1/C_MEASURE1] equipment?
1. (Yes)
 2. (No) [SKIP TO D7]
 98. (Don't know) [SKIP TO D7]
 99. (Refused) [SKIP TO D7]
- D4. Without the program, in terms of timing, when would you have installed the [MEASURE_1/C_MEASURE1] equipment?
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 D7]
 98. (Don't know)
 99. (Refused)

D5. Would you have installed more, less, or the same amount of **[MEASURE_1/C_MEASURE1]** equipment without the program?

1. (More)
 - D5a. Compared to the installed amount, how much more?
[RECORD PERCENTAGE: _____]
2. (Less)
 - D5b. Compared to the installed amount, how much less?
[RECORD PERCENTAGE: _____]
98. (Don't know)
99. (Refused)

D6. Prior to hearing about the program, was the cost of **[MEASURE_1/C_MEASURE1]** equipment included in your organization's most recent capital budget?

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

D7. In your own words, can you please describe what impact the program had on your decision to complete **[FOR SBL READ: these energy efficiency improvements for] [FOR SBDI READ: this installation of] [MEASURE_1/C_MEASURE1]** equipment?

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

D8. With the **[PROGRAM NAME]** program, your company received financial incentives of **[CUSTOMER INCENTIVE]** for installing **[MEASURE_1/C_MEASURE1]** equipment.

For the **[MEASURE_1/C_MEASURE1]** 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 type of lighting
6. Previous participation with a **[UTILITY]** program

E. Spillover

E1. Now I'd like to ask about energy efficient lighting improvements **other than those** you installed through the program. Since participating in this program, have you purchased and installed any additional energy-efficient lighting on your own without any assistance from a utility 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. Did you purchase and install any energy-efficient lighting that is the same as the **[MEASURE1/C_MEASURE1]** you installed through the program?

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

E3. How many did you purchase and install?

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

E4. Did you receive an incentive from **[UTILITY]** or another organization for this lighting?

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

[ASK IF E4=1]

E5. What program or sponsor provided the incentive?

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

E6. 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] [PROGRAM NAME]** program was in your decision to install this lighting.

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

[ASK IF E4=2 OTHERWISE SKIP TO SECTION F]

- E7. Why did you not apply for an incentive from **[UTILITY]** for this equipment?
1. **[RECORD RESPONSE] [SKIP TO SECTION F]**
 98. (Don't know) **[SKIP TO SECTION F]**
 99. (Refused) **[SKIP TO SECTION F]**
- E8. What type of efficient lighting did you purchase and install? **[SPECIFY TYPE EXAMPLE: CFL, LED, FLUORESCENT]:** _____
- E8.11 What is the wattage of the lighting? **[SPECIFY]:** _____
- E8.12 In what location was it installed (Wall/Ceiling/Outdoors)? **[SPECIFY]:** _____
- E8.13 What type of equipment was removed or replaced? **[SPECIFY]:** _____
- E9. How many did you purchase and install?
1. **[RECORD RESPONSE]**
 98. (Don't know)
 99. (Refused)
- E10. Just to confirm, did you receive an incentive from **[UTILITY]** or another organization for this energy-efficient lighting?
1. (Yes)
 2. (No)
 98. (Don't know)
 99. (Refused)
- [ASK IF E10=1]**
- E11. What utility or organization provided the incentive?
1. **[RECORD UTILITY OR ORGANIZATION]**
 98. (Don't know)
 99. (Refused)
- E12. What information did you rely upon to determine that the lighting installed was energy efficient?
1. **[RECORD RESPONSE]**
 98. (Don't know)
 99. (Refused)
- E13. 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]** LED Instant Incentive Program was in your decision to install this lighting.
1. **[RECORD RATING: _____]**
 98. (Don't know)
 99. (Refused)

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

F3. Does your organization lease or own the facility 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
98. (Don't know)
99. (Refused)

G. Closing

G1. Overall, how satisfied would you say you are with the **[PROGRAM NAME]** 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)

G2. Is there anything that **[UTILITY]** could have done to improve your overall experience with the **[PROGRAM NAME]** 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)

G2.1 **[ASK IF G2 = 1]** You mentioned you would like better communication. Who would you like more communication from? **[RECORD RESPONSE_____]**

G2.2 **[ASK IF G2 = 2]** You mentioned a quicker response time. Who would you like a quicker response time from? **[RECORD RESPONSE_____]**

G2.3 **[ASK IF G2 = 3]** What other energy-efficient equipment should wattsmart business offer incentives for? **[RECORD RESPONSE_____]**

G2.5 **[ASK IF G2=5]** In what way would you like them to simplify the application process? **[RECORD RESPONSE_____]**

G2.6 **[ASK IF G2 = 6]** In what way would you like them to simplify the website? **[RECORD RESPONSE_____]**

G3. 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 wattsmart Business representative or utility representative)
2. (wattsmart printed program materials)
3. (wattsmart sponsored workshop or event)
4. (Utility mailing, email, newsletter with bill, bill insert, or utility Website)
5. (Contact with a vendor/contractor)
6. (Through a trade association, trade publication or professional organization) **[SPECIFY: _____]**)
7. (Newspaper ad)
8. (Radio ad)
9. (TV ad)
10. (Social Media (e.g., Facebook, Twitter, YouTube))
11. (Online ads)
12. (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.

PacifiCorp *wattsmart* Business Program (2016 - 2017) Instant Incentives-Lighting (Midstream) Participant Survey

Researchable Questions		
Key Research Topics	Areas of Investigation	Related Questions
Screening	Project initiation process	C1, C8
Marketing and Outreach	Program awareness	B1-B3
	Future communication preferences	G3
Barriers	Obstacles to installing high-efficiency lighting	C2-C5
Satisfaction	Assess satisfaction with distributor/contractor and instant discount	C6-C7, C9-C10, G1, G2
Freeridership and Spillover	Assess net savings	Sections D and E
Firmographics	Determine building and company characteristics of participants	Section F

Target Quota = See samples for each state

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]**
- **[CUSTOMER.NAME]**
- **[SITE.ADDRESS 1]**
- **[SITE.CITY]**
- **[PROJECT. STATE]**
- **[UTILITY]**
- **[PROGRAM.YEAR]**
- **[MEASURE.NAME.FINAL] MEASURE1**
- **[CUSTOMER.INCENTIVE]**

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 or energy manager or the person who is familiar with your participation in the [INSERT UTILITY] Instant Incentive program? [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 VOICE MAIL]
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 CUSTOMER 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 1] [SITE CITY] 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 wattsmart Business Instant Incentive Lighting Program. [INSERT UTILITY] is actively seeking your opinions to help improve energy efficiency programs and to better understand how to assist customers in saving money and energy. This call may be monitored or recorded for quality assurance 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 5-7 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 its customers save money and energy."]
3. [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 lighting including **[MEASURE1]**, for **[INSERT SITE ADDRESS 1]** in **[INSERT PROGRAM YEAR]**? Is this correct? [Multiple Response]
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]**
 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 A1. 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 this new **[MEASURE1/C_MEASURE1]**? The incentive was in the form of check from the utility or an instant discount on your 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 available for this project? **[DO NOT READ LIST; MULTIPLE RESPONSES POSSIBLE]**
1. (Contact with *wattsmart* Business representative or utility representative)
 2. (*wattsmart* printed program materials)
 3. (*wattsmart* sponsored workshop or community event)
 4. (Utility mailing, bill insert, or utility website)
 5. (Through my electrician or contractor)
 6. (Previously participated in program/received an incentive)
 7. (Through a trade association or professional organization) **[SPECIFY: _____]**)
 8. (Through the vendor, distributor or supplier where I purchase lighting)
 9. (Word of mouth (family, friend, or business colleague)
 10. (Other **[SPECIFY: _____]**)
 98. (Don't know)
 99. (Refused)

C. Midstream (Instant Incentives)

Thank you. I'd like to ask you about the lamps you purchased through the Instant Incentive program.

C1. Did your company purchase your lamps direct from a distributor or through your contractor? **[DO NOT READ LIST; RECORD ONE ANSWER]?**

1. (Contractor)
2. (Distributor)
3. (Other) **[SPECIFY: _____]**
98. (Don't know)
99. (Refused)

[IF C1= 2]

C2. How easy was it to find a distributor offering the instant discount? 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=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 **[MEASURE1/C_MEASURE1]** 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=3 OR 4]

C5. What would have made it easier?

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

[ASK C6 IF C1=1 OR 2 [IF C1 = 3, 98, 99 SKIP TO C8]

- C6. Did the **[INSERT RESPONSE FROM C1]** provide assistance with the selection of the lamps you purchased?
1. (Yes)
 2. (No)
 98. (Don't Know)
 99. (Refused)

[IF C6 = 1]

- C7. How satisfied were you with their help? 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)
- C8. When you made this purchase of the **[MEASURE1/C_MEASURE1]**, were you...? **[RECORD ONE RESPONSE]**
1. Replacing burned out lamps
 2. Relamping an area of your facility as part of ongoing maintenance
 3. Purchasing lamps for a larger lighting retrofit project
 4. Or some other reason **[SPECIFY _____]**
- C9. Thinking about the incentive you received, how satisfied were you with the amount of the 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 C9=3 OR 4]

- C10. What incentive amount would have been enough for you to say you were very satisfied?
1. **[RECORD VERBATIM: _____]**
 98. (Don't know)
 99. (Refused)

D. Freeridership

Thank you. Next, I'd like to ask you about your decision to purchase the **MEASURE1/C_MEASURE1**.

- D1. Without the **[UTILITY]** incentive **[IF C6 = 1 OR 2 READ "AND ASSISTANCE FROM THE DISTRIBUTOR OR CONTRACTOR"]**, would you have still purchased **[MEASURE1/C_MEASURE1]**?
1. (Yes)
 2. (No) **[SKIP TO D3]**
 98. (Don't know) **[SKIP TO D3]**
 99. (Refused) **[SKIP TO D3]**
- D2. Without the **[UTILITY]** incentive **[IF C6 = 1 OR 2 READ "AND ASSISTANCE FROM THE DISTRIBUTOR OR CONTRACTOR"]**, would you have still purchased the **[MEASURE1/C_MEASURE1]** at the same time?
1. (Yes) **[SKIP TO D6]**
 2. (No) **[SKIP TO D4]**
 98. (Don't know) **[SKIP TO D4]**
 99. (Refused) **[SKIP TO D4]**
- D3. Without the **[UTILITY]** incentive **[IF C6 = 1 OR 2 READ "AND ASSISTANCE FROM THE DISTRIBUTOR OR CONTRACTOR"]**, would you have purchased any **[MEASURE1/C_MEASURE1]**?
1. (Yes)
 2. (No) **[SKIP TO D7]**
 98. (Don't know) **[SKIP TO D7]**
 99. (Refused) **[SKIP TO D7]**
- D4. Without the **[UTILITY]** incentive **[IF C6 = 1 OR 2 READ "AND ASSISTANCE FROM THE DISTRIBUTOR OR CONTRACTOR"]**, In terms of timing, when would you have purchased the **[MEASURE1/C_MEASURE1]**? **[READ LIST]**
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 D7]**
 98. (Don't know)
 99. (Refused)

- D5. Would you have purchased more, less, or the same amount of **[MEASURE1/C_MEASURE1]** without the incentive **[IF C6 = 1 OR 2 READ “AND ASSISTANCE FROM THE DISTRIBUTOR OR CONTRACTOR”]**?
1. (More)
D5. a. Compared to the installed amount, how much more? **[RECORD PERCENTAGE: _____]**
 2. (Less)
D5. b. Compared to the installed amount, how much less? **[RECORD PERCENTAGE: _____]**
 3. (Same)
 98. (Don't know)
 99. (Refused)
- D6. Prior to hearing about the program, was the cost of **[MEASURE1/C_MEASURE1]** included in your organization's most recent capital or maintenance budget?
1. (Yes)
 2. (No)
 98. (Don't know)
 99. (Refused)
- D7. In your own words, can you please describe what impact the **[UTILITY]** instant incentive offer **[IF C6 = 1 OR 2 READ “AND ASSISTANCE FROM THE DISTRIBUTOR OR CONTRACTOR”]** had on your decision to purchase **[MEASURE1/C_MEASURE1]**?
1. **[RECORD VERBATIM: _____]**
 98. (Don't know)
 99. (Refused)
- D8. With the instant incentive, your company received a discount of, **[CUSTOMER INCENTIVE]** for purchasing **[MEASURE_1/C_MEASURE1]**.

For this **[MEASURE_1/C_MEASURE1]** purchase, 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 lamps to purchase. 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 distributor or contractor
2. Information provided by **[UTILITY]** on energy saving opportunities
3. The **[UTILITY]** discount or incentive
4. Familiarity with this type of lighting
5. Previous participation with a **[UTILITY]** program

E. Spillover

E1. Now I'd like to ask about energy-efficient lighting improvements **other than those** you installed through the program. Since participating in this program, have you purchased and installed any additional energy-efficient lighting on your own **without** any assistance from a utility 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. Did you purchase and install any energy-efficient lighting that is the same as the **[MEASURE1/C_MEASURE1]** you installed through the program?

1. (Yes)
2. (No) **[SKIP TO E8]**
98. (Don't know) **[SKIP TO E8]**
99. (Refused) **[SKIP TO E8]**

E3. How many did you purchase and install?

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

E4. Did you receive an incentive from **[UTILITY]** or another organization for this lighting?

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

[ASK IF E4=1]

E5. What program or sponsor provided the incentive?

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

E6. 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]** Instant Incentive program was in your decision to install this lighting.

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

[ASK IF E4=2 OTHERWISE SKIP TO SECTION F]

- E7. Why did you not apply for an incentive from **[UTILITY]** for this equipment?
1. **[RECORD RESPONSE] [SKIP TO SECTION F]**
 98. (Don't know) **[SKIP TO SECTION F]**
 99. (Refused) **[SKIP TO SECTION F]**
- E8. What other type of efficient lighting did you purchase and install? **[SPECIFY TYPE EXAMPLE: CFL, LED, FLUORESCENT: _____]**
- E8.11 What is the wattage of the lighting? **[SPECIFY: _____]**
 - E8.12 In what location was it installed (Wall/Ceiling/Outdoors)? **[SPECIFY: _____]**
 - E8.13 What type of equipment was removed or replaced? **[SPECIFY: _____]**
- E9. How many did you purchase and install?
1. **[RECORD RESPONSE]**
 98. (Don't know)
 99. (Refused)
- E10. Just to confirm, did you receive an incentive from **[UTILITY]** or another organization for this energy-efficient lighting?
1. (Yes)
 2. (No)
 98. (Don't know)
 99. (Refused)

[ASK IF E10=1]

- E11. What utility or organization provided the incentive?
1. **[RECORD UTILITY OR ORGANIZATION]**
 98. (Don't know)
 99. (Refused)
- E12. What information did you rely upon to determine that the lighting installed was energy efficient?
1. **[RECORD RESPONSE]**
 98. (Don't know)
 99. (Refused)
- E13. 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]** LED Instant Incentive Program was in your decision to install this lighting.
1. **[RECORD RATING: _____]**
 98. (Don't know)
 99. (Refused)

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

F3. Does your organization lease or own the facility 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
98. (Don't know)
99. (Refused)

G. Closing

G1. Overall, how satisfied would you say you are with the Instant Incentive 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)

G2. Is there anything that **[UTILITY]** could have done to improve your overall experience with the Instant Incentive 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)

G2.1 **[ASK IF G2 = 1]** You mentioned you would like better communication. Who would you like more communication from? **[RECORD RESPONSE_____]**

G2.2 **[ASK IF G2 = 2]** You mentioned a quicker response time. Who would you like a quicker response time from? **[RECORD RESPONSE_____]**

G2.3 **[ASK IF G2 = 3]** What other energy-efficient equipment should *wattsmart* business offer incentives for? **[RECORD RESPONSE_____]**

G2.5 **[ASK IF G2=5]** In what way would you like them to simplify the application process? **[RECORD RESPONSE_____]**

G2.6 **[ASK IF G2 = 6]** In what way would you like them to simplify the website? **[RECORD RESPONSE_____]**

G3. 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 *wattsmart* Business representative or utility representative)
2. (*wattsmart* printed program materials)
3. (*wattsmart* sponsored workshop or community event)
4. (Utility mailing, emailing, newsletter w/bill, bill insert, or utility Website)
5. (Through my electrician or contractor)
6. (Through a trade association, trade publication or professional organization) **[SPECIFY: _____]**
7. (Through the vendor, distributor or supplier where I purchase lighting)
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.

Appendix D. PacifiCorp *wattsmart* Business Program (2016/2017) 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:

California=68

Washington=68

Utah=68

Idaho=68

Wyoming=68

Partial participants: See quota tab in Partial Participants 2016-2017 Sample for VuPoint

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]**
- **[CUSTOMER NAME]**
- **[SITE.ADDRESS 1]**
- **[SITE CITY]**
- **[SITE STATE]**
- **[UTILITY]**
- **[MEASURE.NAME.FINAL] MEASURE**
- **[YEAR] PROGRAM YEAR**

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 [SITE.ADDRESS 1] 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. [IF SITE STATE=CA AND IF PARTICIPANT=PARTIAL PARTICIPANT, READ: For completing this survey, we will enter your name into a drawing for the chance to win a \$100-dollar gift card.] 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. [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 **[SITE.ADDRESS 1]** with **[UTILITY]** in **[YEAR]**, but did not complete this project through the wattsmart Business Program. You may have first discussed this project with **[UTILITY]**, or submitted an application as early as 2013, but the project was officially created in **[YEAR]** **IS** this correct?
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 wattsmart Business Program for installing **[FOR PARTIAL PARTICIPANTS READ: this equipment?]** **[FOR NONPARTICIPANTS READ: energy efficient equipment in 2016 or 2017? 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.]**
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 THEN SKIP TO C4]

- 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 *wattsmart* Business representative or utility representative)
 2. (*wattsmart* printed program materials)
 3. (*wattsmart* sponsored workshop or community event)
 4. (Utility mailing, bill insert, or utility website)
 5. (Through my electrician or contractor)
 6. (Previously participated in program/received an incentive)
 7. (Through a trade association or professional organization) **[SPECIFY: _____]**)
 8. (Through a vendor, distributor or supplier where I purchase lighting)
 9. (Word of mouth (family, friend, or business colleague))
 10. (Other **[SPECIFY: _____]**)
 98. (Don't know)
 99. (Refused)

[ASK NONPARTICIPANTS C2]

- C2. Prior to this call today, were you aware that **[UTILITY]** offers technical expertise and cash incentives to help their commercial and industrial customers like you, improve your business' electric energy efficiency?
1. (Yes)
 2. (No) **[SKIP TO C5]**
 98. (Don't know) **[SKIP TO C5]**
 99. (Refused) **[SKIP TO C5]**

[ASK IF C2=1]

- C3. How did your organization learn about the *wattsmart* Business Program? **[DO NOT READ LIST; MULTIPLE RESPONSES POSSIBLE]**
1. (Contact with *wattsmart* Business representative through phone, email, or in person)
 2. (*wattsmart* printed program materials)
 3. (*wattsmart* 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 IF C1=1-12 OR 98 OR 99, OR IF C3=1-12 OR 98 OR 99]

C4. How likely is it that your business will request an incentive from the *wattsmart* 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. MULTIPLE RESPONSES POSSIBLE]**

- 1. (Contact with *wattsmart* Business representative, or utility representative)
- 2. (*wattsmart* printed program materials)
- 3. (*wattsmart* sponsored workshop or community event)
- 4. (Utility mailing, mail, newsletter with bill, bill insert, or utility website)
- 5. (Through my electrician or contractor)
- 6. (Through a trade association, trade publication or professional organization) **[SPECIFY: _____]**
- 7. (Through the vendor, distributor or supplier where I purchase lighting)
- 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 most important to motivate your company to make energy-efficient upgrades?

[DO NOT READ LIST; RECORD ONE RESPONSE]

1. (To save money on energy bills)
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 *wattsmart* 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 *wattsmart* Business incentive?

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 *wattsmart* Business representative, someone like your contractor, or a product manufacturer?
- 1. (*wattsmart* 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 *wattsmart* 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 *wattsmart* Business program?
- 1. **[RECORD ANSWER]**
 - 98. (Don't know)
 - 99. (Refused)

[ASK EVERYONE]

E. Spillover

- E1. In 2016 or 2017, 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]**
- E4. What program or sponsor provided the incentive(s)? **[RECORD FOR EACH MEASURE MENTIONED IN E2]**
 1. **[SPECIFY]**
 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 E5.1 = 1-5 AND MORE THAN 1 SELECTED IN E2]** Does this rating differ for any of the improvements you mentioned?

1. (Yes)
2. (No)
98. (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 E5.2 = 1-5 AND MORE THAN 1 SELECTED IN E2]** Does this rating differ for any of the other improvements you mentioned?

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

E5.2b **[ASK IF E5.2A = 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]**

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

E5.3 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 E5.3=1-5 AND MORE THAN 1 SELECTED IN E2]** Does this rating differ for any of the other improvements you mentioned?

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

E5.3b **[ASK IF E5.3A = 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]**

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

[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

[ASK PARTIAL PARTICIPANTS G1-G4] [NONPARTICIPANTS GO TO CLOSING STATEMENT]

G1. Overall, how satisfied would you say you are with the wattsmart 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 wattsmart 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)

G4. May I please get the spelling of your name, and your mailing address to enter you into the drawing for the \$100-dollar gift card? The winner will be notified within the next month.

1. **[RECORD NAME]**
2. **[RECORD MAILING ADDRESS]**

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 net results.

Table E1. California wattsmart Business End-Use Category Cost-Effectiveness Inputs

Input Description	2016	2017	Total
Average Measure Life*			
Agricultural	11.4	12.6	11.9
Lighting	13.1	13.0	13.1
Refrigeration	15.0	7.7	11.1
Other	7.4	14.5	12.0
Evaluated Net Energy Savings (kWh/year)**			
Agricultural	829,680	568,365	1,398,044
Lighting	1,214,012	870,396	2,084,408
Refrigeration	119,890	137,942	257,832
Other	72,069	132,087	204,155
Total Utility Cost (including incentives)***			
Agricultural	\$586,758.82	\$193,708.00	\$780,466.82
Lighting	\$1,218,247.81	\$739,465.00	\$1,957,712.81
Refrigeration	\$79,560.93	\$13,110.00	\$92,670.93
Other	\$48,608.44	\$44,945.00	\$93,553.44
Incentives			
Agricultural	\$108,259.66	\$64,094.02	\$172,353.68
Lighting	\$287,797.07	\$167,816.79	\$455,613.86
Refrigeration	\$20,213.25	\$10,190.20	\$30,403.45
Other	\$7,670.00	\$18,915.21	\$26,585.21
Commercial Retail Rate	0.151 \$/kWh	0.149 \$/kWh	N/A
Industrial Retail Rate	0.118 \$/kWh	0.113 \$/kWh	N/A
Irrigation Retail Rate	0.151 \$/kWh	0.150 \$/kWh	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.

***PacifiCorp provided program costs and incentives in annual report data, allocating program costs by weighted savings.

Agricultural

Table E2, Table E3, and Table E4 show the agriculture end-use category cost-effectiveness results for net evaluated savings. The agricultural end-use category proved cost-effective from the UCT and PCT perspectives (Table E2).

**Table E2. California Agricultural 2016-2017 Net
(2015 Decrement West Industrial 44%% – Load Shape Irrigation)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	\$0.091	\$1,057,697	\$821,599	(\$236,098)	0.78
TRC	\$0.091	\$1,057,697	\$746,909	(\$310,789)	0.71
UCT	\$0.046	\$535,315	\$746,909	\$211,594	1.40
RIM		\$2,463,942	\$746,909	(\$1,717,034)	0.30
PCT		\$874,347	\$2,609,652	\$1,735,305	2.98
Lifecycle Revenue Impacts (\$/kWh)					\$0.000200698
Discounted Participant Payback (years)					3.23

**Table E3. California Agricultural 2016 Net
(2015 Decrement West Industrial 44%% – Load Shape Irrigation)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	\$0.103	\$715,864	\$475,930	(\$239,934)	0.66
TRC	\$0.103	\$715,864	\$432,664	(\$283,200)	0.60
UCT	\$0.051	\$353,702	\$432,664	\$78,962	1.22
RIM		\$1,496,353	\$432,664	(\$1,063,68)	0.29
PCT		\$595,470	\$1,554,653	\$959,183	2.61
Lifecycle Revenue Impacts (\$/kWh)					\$0.000145791
Discounted Participant Payback (years)					3.23

**Table E4. California Agricultural 2017 Net
(2015 Decrement West Industrial 44% – Load Shape Irrigation)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	\$0.072	\$364,599	\$368,691	\$4,092	1.01
TRC	\$0.072	\$364,599	\$335,173	(\$29,426)	0.92
UCT	\$0.038	\$193,708	\$335,173	\$141,465	1.73
RIM		\$1,032,030	\$335,173	(\$696,857)	0.32
PCT		\$297,449	\$1,125,262	\$827,812	3.78
Lifecycle Revenue Impacts (\$/kWh)					\$0.000081453
Discounted Participant Payback (years)					2.22

Table E5, Table E6, and Table E7 show the agriculture end-use category cost-effectiveness results for net evaluated savings. The agricultural end-use category proved cost-effective from the UCT and PCT perspectives (Table E5).

**Table E5. California Agricultural 2016-2017 Gross
(2015 Decrement West Industrial 44%% – Load Shape Irrigation)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	\$0.084	\$1,241,310	\$1,039,999	(\$201,311)	0.84
TRC	\$0.084	\$1,241,310	\$945,454	(\$295,856)	0.76
UCT	\$0.036	\$535,315	\$945,454	\$410,139	1.77
RIM		\$2,976,615	\$945,454	(\$2,031,161)	0.32
PCT		\$874,347	\$2,609,652	\$1,735,305	2.98
Lifecycle Revenue Impacts (\$/kWh)					\$0.000237415
Discounted Participant Payback (years)					3.23

**Table E6. California Agricultural 2016 Gross
(2015 Decrement West Industrial 44%% – Load Shape Irrigation)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	\$0.096	\$840,913	\$602,444	(\$238,469)	0.72
TRC	\$0.096	\$840,913	\$547,676	(\$293,237)	0.65
UCT	\$0.040	\$353,702	\$547,676	\$193,974	1.55
RIM		\$1,800,096	\$547,676	(\$1,252,420)	0.30
PCT		\$595,470	\$1,554,653	\$959,183	2.61
Lifecycle Revenue Impacts (\$/kWh)					\$0.000171658
Discounted Participant Payback (years)					3.23



**Table E7. California Agricultural 2017 Gross
(2015 Decrement West Industrial 44% – Load Shape Irrigation)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	\$0.067	\$427,063	\$466,697	\$39,634	1.09
TRC	\$0.067	\$427,063	\$424,270	(\$2,793)	0.99
UCT	\$0.030	\$193,708	\$424,270	\$230,562	2.19
RIM		\$1,254,876	\$424,270	(\$830,606)	0.34
PCT		\$297,449	\$1,125,262	\$827,812	3.78
Lifecycle Revenue Impacts (\$/kWh)	\$0.000097087				
Discounted Participant Payback (years)	2.22				

Lighting

Table E8, Table E9, and Table E10 show the lighting end-use category cost-effectiveness results for net evaluated savings. The lighting end-use category did not prove cost-effective for all perspectives except for the PCT (Table E8).

**Table E8. California Lighting Large 2016-2017 Net
(2015 Decrement West Commercial Lighting 46% – Load Shape Commercial Lighting)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	\$0.103	\$1,901,205	\$1,356,833	(\$544,371)	0.71
TRC	\$0.103	\$1,901,205	\$1,233,485	(\$667,720)	0.65
UCT	\$0.077	\$1,427,660	\$1,233,485	(\$194,175)	0.86
RIM		\$4,499,977	\$1,233,485	(\$3,266,492)	0.27
PCT		\$1,481,742	\$5,400,485	\$3,918,744	3.64
Lifecycle Revenue Impacts (\$/kWh)	\$0.000364938				
Discounted Participant Payback (years)	2.57				

**Table E9. California Lighting 2016 Net
(2015 Decrement West Commercial Lighting 46% – Load Shape Commercial Lighting)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	\$0.096	\$1,060,869	\$800,469	(\$260,400)	0.75
TRC	\$0.096	\$1,060,869	\$727,699	(\$333,170)	0.69
UCT	\$0.066	\$734,368	\$727,699	(\$6,669)	0.99
RIM		\$2,586,198	\$727,699	(\$1,858,499)	0.28
PCT		\$990,803	\$3,274,619	\$2,283,816	3.31
Lifecycle Revenue Impacts (\$/kWh)	\$0.000226409				
Discounted Participant Payback (years)	2.46				

**Table E10. California Lighting 2017 Net
(2015 Decrement West Commercial Lighting 46% – Load Shape Commercial Lighting)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	\$0.113	\$896,302	\$593,418	(\$302,884)	0.66
TRC	\$0.113	\$896,302	\$539,471	(\$356,831)	0.60
UCT	\$0.093	\$739,465	\$539,471	(\$199,994)	0.73
RIM		\$2,041,237	\$539,471	(\$1,501,766)	0.26
PCT		\$523,635	\$2,267,449	\$1,743,814	4.33
Lifecycle Revenue Impacts (\$/kWh)					\$0.000167780
Discounted Participant Payback (years)					1.73

Table E11, Table E12, and Table E13 show the lighting end-use category cost-effectiveness results for gross evaluated savings. The lighting end-use category proved cost-effective from the PCT and UCT test perspectives (Table E11).

**Table E11. California Lighting 2016-2017 Gross
(2015 Decrement West Commercial Lighting 46% – Load Shape Commercial Lighting)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	\$0.083	\$2,464,266	\$2,188,441	(\$275,826)	0.89
TRC	\$0.083	\$2,464,266	\$1,989,492	(\$474,775)	0.81
UCT	\$0.048	\$1,427,660	\$1,989,492	\$561,832	1.39
RIM		\$6,383,010	\$1,989,492	(\$4,393,519)	0.31
PCT		\$1,481,742	\$5,400,485	\$3,918,744	3.64
Lifecycle Revenue Impacts (\$/kWh)					\$0.000490851
Discounted Participant Payback (years)					2.57

**Table E12. California Lighting 2016 Gross
(2015 Decrement West Commercial Lighting 46% – Load Shape Commercial Lighting)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	\$0.080	\$1,437,375	\$1,291,079	(\$146,296)	0.90
TRC	\$0.080	\$1,437,375	\$1,173,708	(\$263,666)	0.82
UCT	\$0.041	\$734,368	\$1,173,708	\$439,340	1.60
RIM		\$3,721,190	\$1,173,708	(\$2,547,482)	0.32
PCT		\$990,803	\$3,274,619	\$2,283,816	3.31
Lifecycle Revenue Impacts (\$/kWh)					\$0.000310344
Discounted Participant Payback (years)					2.46



**Table E13. California Lighting 2017 Gross
(2015 Decrement West Commercial Lighting 46% – Load Shape Commercial Lighting)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	\$0.086	\$1,095,283	\$957,126	(\$138,157)	0.87
TRC	\$0.086	\$1,095,283	\$870,115	(\$225,168)	0.79
UCT	\$0.058	\$739,465	\$870,115	\$130,650	1.18
RIM		\$2,839,097	\$870,115	(\$1,968,982)	0.31
PCT		\$523,635	\$2,267,449	\$1,743,814	4.33
Lifecycle Revenue Impacts (\$/kWh)					\$0.000219978
Discounted Participant Payback (years)					1.73

Refrigeration

Table E14, Table E15, and Table E16 show the refrigeration end-use category cost-effectiveness results for net evaluated savings. The refrigeration end-use category proved cost-effective from all perspectives except for the RIM (Table E14).

**Table E14. California Refrigeration 2016-2017 Net
(2015 Decrement West Commercial Cooling 13% – Load Shape Large Office Space Cooling)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	\$0.055	\$110,406	\$256,098	\$145,692	2.32
TRC	\$0.055	\$110,406	\$232,816	\$122,410	2.11
UCT	\$0.030	\$60,251	\$232,816	\$172,565	3.86
RIM		\$390,035	\$232,816	(\$157,218)	0.60
PCT		\$86,872	\$388,227	\$301,356	4.47
Lifecycle Revenue Impacts (\$/kWh)					\$0.000017565
Discounted Participant Payback (years)					1.95

**Table E15. California Refrigeration 2016 Net
(2015 Decrement West Commercial Cooling 13% – Load Shape Large Office Space Cooling)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	\$0.076	\$90,596	\$155,095	\$64,499	1.71
TRC	\$0.076	\$90,596	\$140,995	\$50,400	1.56
UCT	\$0.040	\$47,960	\$140,995	\$93,035	2.94
RIM		\$249,489	\$140,995	(\$108,494)	0.57
PCT		\$68,314	\$239,266	\$170,952	3.50
Lifecycle Revenue Impacts (\$/kWh)					\$0.000012571
Discounted Participant Payback (years)					2.53

**Table E16. California Refrigeration 2017 Net
(2015 Decrement West Commercial Cooling 13% – Load Shape Large Office Space Cooling)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	\$0.024	\$21,130	\$107,730	\$86,600	5.10
TRC	\$0.024	\$21,130	\$97,936	\$76,807	4.63
UCT	\$0.015	\$13,110	\$97,936	\$84,826	7.47
RIM		\$149,906	\$97,936	(\$51,970)	0.65
PCT		\$19,794	\$158,882	\$139,088	8.03
Lifecycle Revenue Impacts (\$/kWh)					\$0.000008342
Discounted Participant Payback (years)					0.61

Table E17, Table E18, and Table E19 show the refrigeration end-use category cost-effectiveness results for gross evaluated savings. The refrigeration end-use category proved cost-effective from all perspectives except for the RIM (Table E17).

**Table E17. California Refrigeration 2016-2017 Gross
(2015 Decrement West Commercial Cooling 13% – Load Shape Large Office Space Cooling)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	\$0.054	\$117,356	\$278,367	\$161,012	2.37
TRC	\$0.054	\$117,356	\$253,061	\$135,705	2.16
UCT	\$0.028	\$60,251	\$253,061	\$192,810	4.20
RIM		\$418,711	\$253,061	(\$165,650)	0.60
PCT		\$86,872	\$388,227	\$301,356	4.47
Lifecycle Revenue Impacts (\$/kWh)					\$0.000018507
Discounted Participant Payback (years)					1.95

**Table E18. California Refrigeration 2016 Gross
(2015 Decrement West Commercial Cooling 13% – Load Shape Large Office Space Cooling)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	\$0.074	\$96,061	\$168,581	\$72,521	1.75
TRC	\$0.074	\$96,061	\$153,256	\$57,195	1.60
UCT	\$0.037	\$47,960	\$153,256	\$105,296	3.20
RIM		\$267,013	\$153,256	(\$113,757)	0.57
PCT		\$68,314	\$239,266	\$170,952	3.50
Lifecycle Revenue Impacts (\$/kWh)					\$0.000013181
Discounted Participant Payback (years)					2.53



**Table E19. California Refrigeration 2017 Gross
(2015 Decrement West Commercial Cooling 13% – Load Shape Large Office Space Cooling)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	\$0.024	\$22,713	\$117,098	\$94,384	5.16
TRC	\$0.024	\$22,713	\$106,453	\$83,739	4.69
UCT	\$0.014	\$13,110	\$106,453	\$93,343	8.12
RIM		\$161,802	\$106,453	(\$55,349)	0.66
PCT		\$19,794	\$158,882	\$139,088	8.03
Lifecycle Revenue Impacts (\$/kWh)					\$0.000008884
Discounted Participant Payback (years)					0.61

Other

Table E20, Table E21, and Table E22 show the Other end-use category cost-effectiveness results for net evaluated savings. The Other end-use category proved cost-effective from all perspectives except for the TRC and RIM (Table E20). In 2016, the Other end-use category only proved cost-effective from the PCT (Table E22). In 2017, the Other end use category proved cost-effective from all perspectives except for the RIM.

**Table E20. California Other 2016-2017 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)	\$0.070	\$115,307	\$124,069	\$8,762	1.08
TRC	\$0.070	\$115,307	\$112,790	(\$2,517)	0.98
UCT	\$0.044	\$71,583	\$112,790	\$41,207	1.58
RIM		\$327,432	\$112,790	(\$214,643)	0.34
PCT		\$67,772	\$276,237	\$208,465	4.08
Lifecycle Revenue Impacts (\$/kWh)					\$0.000023017
Discounted Participant Payback (years)					2.28

**Table E21. California Other 2016 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)	\$0.109	\$47,576	\$29,940	(\$17,635)	0.63
TRC	\$0.109	\$47,576	\$27,218	(\$20,357)	0.57
UCT	\$0.068	\$29,444	\$27,218	(\$2,226)	0.92
RIM		\$99,023	\$27,218	(\$71,805)	0.27
PCT		\$25,295	\$75,885	\$50,589	3.00
Lifecycle Revenue Impacts (\$/kWh)					\$0.000008320
Discounted Participant Payback (years)					1.69

**Table E22. California Other 2017 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)	\$0.056	\$72,242	\$100,397	\$28,155	1.39
TRC	\$0.056	\$72,242	\$91,270	\$19,028	1.26
UCT	\$0.035	\$44,945	\$91,270	\$46,325	2.03
RIM		\$243,621	\$91,270	(\$152,351)	0.37
PCT		\$45,306	\$213,696	\$168,390	4.72
Lifecycle Revenue Impacts (\$/kWh)	\$0.000016337				
Discounted Participant Payback (years)	1.68				

Table E23, Table E24, and Table E25 show the Other end-use category cost-effectiveness results for gross evaluated savings. The Other end-use category proved cost-effective from all perspectives except for the TRC and RIM (Table E23). In 2016, the Other end-use category only proved cost-effective from the PCT (Table E24). In 2017, the Other end use category proved cost-effective from all perspectives except for the RIM.

**Table E23. California Other 2016-2017 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)	\$0.071	\$113,951	\$121,636	\$7,685	1.07
TRC	\$0.071	\$113,951	\$110,578	(\$3,373)	0.97
UCT	\$0.045	\$71,583	\$110,578	\$38,995	1.54
RIM		\$301,598	\$110,578	(\$191,020)	0.37
PCT		\$67,772	\$255,419	\$187,647	3.77
Lifecycle Revenue Impacts (\$/kWh)	\$0.000020484				
Discounted Participant Payback (years)	2.28				

**Table E24. California Other 2016 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)	\$0.110	\$47,070	\$29,353	(\$17,716)	0.62
TRC	\$0.110	\$47,070	\$26,685	(\$20,385)	0.57
UCT	\$0.069	\$29,444	\$26,685	(\$2,760)	0.91
RIM		\$97,215	\$26,685	(\$70,530)	0.27
PCT		\$25,295	\$75,440	\$50,145	2.98
Lifecycle Revenue Impacts (\$/kWh)	\$0.000008172				
Discounted Participant Payback (years)	1.69				



**Table E25. California Other 2017 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)	\$0.057	\$71,336	\$98,429	\$27,093	1.38
TRC	\$0.057	\$71,336	\$89,481	\$18,145	1.25
UCT	\$0.036	\$44,945	\$89,481	\$44,536	1.99
RIM		\$217,995	\$89,481	(\$128,515)	0.41
PCT		\$45,306	\$191,966	\$146,660	4.24
Lifecycle Revenue Impacts (\$/kWh)					\$0.000013781
Discounted Participant Payback (years)					1.68