



2018-2019 California Wattsmart Business Program Evaluation

FINAL REPORT

February 2, 2021

Prepared for:
Pacific Power
825 NE Multnomah
Portland, OR 97232



Prepared by:

The Cadmus Group LLC

Danielle Kolp

Ryan Hughes

Bonnie Powell

Laura James

Alex Oipari

Andrew Carollo

Steve Cofer

VuPoint Research

Table of Contents

Glossary of Terms iv

Acronyms vi

Executive Summary..... 1

 Key Findings 2

 Recommendations..... 5

Introduction 7

 Evaluation Objectives 8

 Data Collection and Evaluation Activities..... 9

Impact Evaluation 13

 Project Review 14

 Engineering Analysis..... 14

 Overall Evaluated Savings Results 15

 Evaluated Gross Savings Results by Stratum..... 15

 Evaluated Net Savings 21

Process Evaluation 22

 Methodology 22

 Program Implementation Changes 25

 Trade Ally Experience 27

 Participant Experience and Satisfaction 28

 Nonparticipants 33

Cost-Effectiveness..... 36

Conclusions and Recommendations..... 40

Appendix A. PacifiCorp Wattsmart Business Program (2018-2019) Wattsmart Business Participant Survey A-1

Appendix B. PacifiCorp Wattsmart Business Program (2018-2019) Nonparticipant/Partial Participant Survey B-1

Appendix C. Measure Category Cost-Effectiveness C-1

Tables

Table 1. 2018 and 2019 Wattsmart Business Gross Program Savings.....	2
Table 2. 2018 Wattsmart Business Program Savings.....	3
Table 3. 2019 Wattsmart Business Program Savings.....	3
Table 4. 2018-2019 Wattsmart Business Program Net Savings.....	3
Table 5. 2018-2019 Evaluated Wattsmart Business Program Net Cost-Effectiveness Summary.....	5
Table 6. Evaluation Objectives and Activities	9
Table 7. California 2018-2019 Wattsmart Business Program Impact Sampling	10
Table 8. California 2018-2019 Wattsmart Business Program Impact Sampling Summary.....	11
Table 9. Interviews Conducted for the 2018-2019 Process Evaluation	11
Table 10. California 2018-2019 Wattsmart Business Program Survey Sampling	12
Table 11. Impact Steps to Determine Evaluated Savings	13
Table 12. Reported and Evaluated Savings by Program Year	15
Table 13. Reported and Evaluated Wattsmart Business Program Savings by Stratum (2018-2019)*	15
Table 14. Other Sample Detailed Findings.....	21
Table 15. 2018-2019 Wattsmart Business Program Net Savings.....	21
Table 16. Research Areas and Questions.....	22
Table 17. Trade Ally Interviews for the 2018-2019 Process Evaluation	23
Table 18. Customer Participation in Pacific Power Offerings in 2018-2019	26
Table 19. Benefits and Costs Included in Various Cost-Effectiveness Tests	37
Table 20. Selected Cost Analysis Inputs.....	37
Table 21. Wattsmart Business Program Cost-Effectiveness Summary of 2018 and 2019 Evaluated Net Savings	38
Table 22. Wattsmart Business Program Cost-Effectiveness Summary of 2018 Evaluated Net Savings	39
Table 23. Wattsmart Business Program Cost-Effectiveness Summary of 2019 Evaluated Net Savings	39
Table C-1. California Wattsmart Business End-Use Category Cost-Effectiveness Inputs	C-1
Table C-2. California Building Shell 2018 Net.....	C-2
Table C-3. California Building Shell 2019 Net.....	C-3
Table C-4. California Compressed Air 2019 Net.....	C-3
Table C-5. California Energy Management 2018 Net	C-3

Table C-6. California Energy Management 2019 Net	C-4
Table C-7. California Farm & Dairy 2019 Net	C-4
Table C-8. California Food Service Equipment 2018 Net	C-4
Table C-9. California HVAC 2018 Net	C-5
Table C-10. California HVAC 2019 Net	C-5
Table C-11. California Irrigation 2018 Net	C-5
Table C-12. California Irrigation 2019 Net	C-6
Table C-13. California Lighting 2018 Net	C-6
Table C-14. California Lighting 2019 Net	C-6
Table C-15. California Motors 2019 Net	C-7
Table C-16. California Refrigeration 2019 Net	C-7

Figures

Figure 1. Wattsmart Business Program Delivery Roles.....	8
Figure 2. Distribution of 2018-2019 Strata Savings	10
Figure 3. Lighting—Sample Results.....	16
Figure 4. Agricultural Sample Results	18
Figure 5. Energy Management Sample Results	19
Figure 6. Other Sample Results.....	20
Figure 7. Respondents by Business Sector.....	29
Figure 8. Typical Upgrades and Custom Analysis Participants Information Sources.....	30
Figure 9. Participant Satisfaction Levels	32
Figure 10. Benefits of Equipment Installed.....	33
Figure 11. How Nonparticipants Learned About the Wattsmart Business Program	34
Figure 12. Nonparticipants’ Attitudes About Energy Efficiency Improvements.....	35

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.

Database for Energy Efficient Resources (DEER)

The Database for Energy Efficient Resources (DEER), developed by the California Public Utilities Commission (CPUC), provides estimates of the energy-saving potential for typical energy efficiency technologies and 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 utilized stipulated DEER values.

Realization Rate

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

Reported Savings

Energy savings for program participation that are recorded in program tracking databases and Pacific Power annual reporting.

In-Service Rate

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

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).

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.

Acronyms

CEE	Consortium for Energy Efficiency
CPUC	California Public Utilities Commission
DEER	Database for Energy Efficient Resources
DSM	Demand-side management
DSMC	Demand side management central
HVAC	Heating, ventilation, and air conditioning
kWh	Kilowatts per hour
LED	Light-emitting diode
MW	Megawatt
PCT	Participant cost test
PTRC	Pacific Power total resource cost
RIM	Ratepayer impact measure
RTF	Regional Technical Forum
TRC	Total resource cost
UCT	Utility cost test
VFD	Variable frequency drive

Executive Summary

Through its Wattsmart Business program, Pacific Power offers services and incentives to help commercial, industrial, and agricultural 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 2018 and 2019 program years, the Wattsmart Business program reported electricity savings of 10,283,125 kWh.

Pacific Power offers program measures and services through four delivery channels—Trade Ally, Small Business Enhanced Incentive, Midstream/Lighting Instant Incentive, and Project Manager.

Pacific Power contracts with Cascade Energy and Nexant to manage the day-to-day operations of the Trade Ally, Small Business Enhanced Incentive, and Midstream/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 and program implementors, deliver technical energy analysis services and custom incentives to large managed account customers (typically larger than 1 MW) engaged in more complex projects not covered under one of the other offerings.

Pacific Power contracted with the Cadmus team (comprising Cadmus and VuPoint Research) to conduct impact and process evaluations of the California Wattsmart Business program for the 2018 and 2019 program years. For the impact evaluation, the team assessed energy impacts, verified the application of DEER 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. VuPoint Research performed the process evaluation telephone surveys.

At Pacific Power's request, the Cadmus team evaluated program participants and reported the 2018-2019 evaluation findings under the following categories:

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

lighting controls upgrades.¹ A network of program-approved contractors perform the assessments and installed lighting upgrades for this offer.

- **Midstream/Lighting Instant Incentive.** Pacific Power offers 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 nonparticipating suppliers can apply for incentives after making the purchase.

Key Findings

Key Impact Evaluation Findings

For the impact evaluation, the Cadmus team analyzed 35 projects across four strata that contributed 53% of the 2018-2019 program savings. Table 1 provides a summary of the evaluation findings, including the number of unique projects, evaluated savings, and achieved precision.

Table 1. 2018 and 2019 Wattsmart Business Gross Program Savings

Strata	Unique Projects	Reported Savings (kWh)	Evaluated Savings (kWh)	Realization Rate	Precision*
Lighting	191	8,133,689	8,282,851	102.1%	3.0%
Agricultural	45	1,166,052	1,301,851	111.6%	18.1%
Energy Management	4	610,742	612,094	100.2%	0.0%
Other	11	372,642	421,353	113.1%	18.0%
Total**	251	10,283,125	10,618,148	103.3%	4.0%

*Precision was calculated at 80% confidence per stratum and 90% confidence for the program overall.

**Totals may not sum due to rounding.

Overall, the realization rate was 103.3% for the two program years, though variability occurred between measure categories. The impact evaluation achieved $\pm 4.0\%$ precision with 90% confidence overall. This report's *Evaluated Gross Savings Results by Stratum* section describes specific details and findings per stratum.

These are the key findings of the impact evaluation:

- Lighting accounts for 79% of all reported energy savings. Cadmus evaluated 18 projects accounting for 53% of reported energy savings in the lighting stratum and resulting in a realization rate of 102%. Cadmus found that annual energy savings were calculated appropriately, and minimal variability was found between the reported documentation and investigation findings.
- No variability was found within the Energy Management stratum.

¹ Prior to May 2017, Pacific Power incentivized T5 and T8 fluorescent fixture retrofits and T12 conversions through the Small Business Enhanced Incentive offer.

- The Agricultural and Other strata account for 15% of all reported savings and, though evaluated savings deviated from reported savings for various projects, no systemic discrepancies were found that result in recommended changes to the program.

Table 2 and Table 3 show impact evaluation findings by program year, for 2018 and 2019, respectively. Cadmus combined the 2018 and 2019 program years to perform the sampling and analysis and applied the overall realization rates to the reported savings for each year.

Table 2. 2018 Wattsmart Business Program Savings

Strata	Unique Projects	Reported Savings (kWh)	Evaluated Savings (kWh)	Realization Rate
Lighting	99	2,822,725	2,874,490	102%
Agricultural	21	577,697	644,976	112%
Energy Management	1	204,404	204,856	100%
Other	4	283,344	320,382	113%
Total*	125	3,888,170	4,044,704	104%

*Totals may not sum due to rounding.

Table 3. 2019 Wattsmart Business Program Savings

Strata	Unique Projects	Reported Savings (kWh)	Evaluated Savings (kWh)	Realization Rate
Lighting	92	5,310,964	5,408,361	102%
Agricultural	24	588,355	656,875	112%
Energy Management	3	406,338	407,238	100%
Other	7	89,298	100,971	113%
Total*	126	6,394,955	6,573,444	103%

*Totals may not sum due to rounding.

Table 4 shows the net energy savings by program strata for 2018 and 2019 combined. The Cadmus team used the required Database for Energy Efficient Resources (DEER) NTG values for each project type and appropriate year and aggregated the results below. The overall program NTG was 77%, and the program achieved over 8 million kWh over the two-year period.

Table 4. 2018-2019 Wattsmart Business Program Net Savings

Strata	Evaluated Gross Savings (kWh)	NTG	Evaluated Net Savings (kWh)
Lighting	8,282,851	79%	6,543,452
Agricultural	1,301,851	66%	859,221
Energy Management	612,094	67%	410,103
Other	421,353	75%	316,015
Total*	10,618,148	77%	8,128,792

*Totals may not sum due to rounding.

Key Process Evaluation Findings

This report's *Process Evaluation* section provides more detailed discussion of these key findings. Because sample sizes for the 2018-2019 evaluation were small, all results should be considered qualitative. Differences among subgroups are not statistically significant.

Trade Allies

- All four trade allies interviewed said the Pacific Power incentive offerings fit well into their business models. The Wattsmart program provided several benefits, including increasing business overall and allowing more projects to provide a return on investment to trade ally customers.
- Two of three trade allies participating in the Small Business Enhanced incentive lead generation initiative reported it was very successful. One said it doubled business, and the other reported customers were so impressed by the available incentives some doubted the legitimacy of the program.
- Trade allies had few suggestions for improvement but when pressed, they felt incentives for T-LED lamps were low.

Typical Upgrade and Custom Analysis Participant Experience

- Participants receiving Typical Upgrade or Custom Analysis incentives reported that the incentives covered 25% or less of the project cost, on average. Seven of 12 respondents said they worked with an independent contractor to install their project (as opposed to installing it themselves or working with a trade ally or someone else).
- The great majority of Typical Upgrade and Custom Analysis incentives participants reported satisfaction with various components of the offering and with the offering overall. Participants were least likely to be satisfied with the ease of paperwork, but 82% of respondents reported the application was very easy or somewhat easy to complete.
- The majority of respondents, 79% (n=14),² reported utility bill savings as a benefit of completing their project. However, 79% also reported some other benefit resulting from the project, including higher productivity, better or brighter lighting, and improved equipment function.

Nonparticipants

- Sixty-eight percent (n=197) of nonparticipants are unaware of the Wattsmart Business program. Those aware of the program learned about it from a Pacific Power mailing or bill insert (38%) or through contact with a Wattsmart Business or Pacific Power representative (18%, n=56)
- The majority of nonparticipants said their primary motivation to consider energy efficiency improvements was the opportunity to save money on energy bills. Correspondingly,

² 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.

nonparticipants indicated they would be more motivated to make energy improvements if equipment costs were lower (52%, n=161) or incentives higher (21%).

- Most nonparticipants disagreed with the statement that they do not have authority to execute energy improvement projects (72%, n=116), and most also disagreed with the statement that they did not want to invest in energy efficiency because they lease their facility (68%, n=120).

Cost-Effectiveness Results

As shown in Table 5, the program passed all cost-effectiveness tests in the 2018 and 2019 evaluation years except for the ratepayer impact (RIM) test, as calculated by Guidehouse (Pacific Power’s cost-effectiveness consultant) using the approved California cost-effectiveness calculator. The program achieved benefit/cost ratios of 2.11 from the Total resource cost (TRC) test perspective and 4.96 from the participant cost test (PCT) perspective.

Table 5. 2018-2019 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)	\$0.0505	\$4,058,613	\$9,420,484	\$5,361,871	2.32
Total Resource Cost Test (TRC) No Adder	\$0.0505	\$4,058,613	\$8,564,076	\$4,505,463	2.11
Utility Cost Test (UCT)	\$0.0326	\$2,624,566	\$8,564,076	\$5,939,510	3.26
Ratepayer Impact Measure (RIM) Test		\$15,052,292	\$8,564,076	(\$6,488,216)	0.57
Participant Cost Test (PCT)		\$3,510,937	\$17,397,222	\$13,886,286	4.96
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000470378
Discounted Participant Payback (years)					1.91

Recommendations

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

- Continue to monitor the program administrative systems for potential improvements, such as the ongoing effort to develop an online application portal for participants. Online applications are a best practice for nonresidential incentive programs and reduce the perceived paperwork burden for participants by auto-populating some fields by keeping all project documents in a single location and allowing customers to reference the status of their application as it is being processed.
- Continue to expand the number of trade allies promoting the Wattsmart offerings, especially the Small Business Enhanced incentives. Pacific Power has already made progress addressing the trade ally constraint, since the number of participating trade allies in California has increased from 18 in 2019 to 27 at the time of writing. In addition to increasing the number of registered trade allies, Nexant, who administers the Small Business Enhanced incentive program, should consider new approaches to increase the proportion of these participating trade allies that are

actively completing projects. One way to do this could be expanding the trade allies participating in the lead generation initiative that Nexant began in 2019. In addition, Nexant should consider developing promotional materials for trade allies, informing them of the positive experiences that active trade allies are having. These materials could include the number and total value of rebated projects, and testimonials about growth in total business, or access to new markets that trade allies have experienced through the program.

Introduction

Pacific Power offered several Wattsmart Business technical assistance and incentive options in the 2018-2019 cycle:

- Typical Upgrades incentive
- Custom Analysis incentive
- Small Business Enhanced incentive
- Lighting Instant incentive
- Energy Management

Typical Upgrades incentive. Through this offering, Pacific Power provides prescriptive incentives primarily for small and midsize customers, although large customers may also receive these incentives. These incentives are available to customers who submit an application directly or work with a Pacific Power trade ally.

Custom Analysis incentive. For large energy users or customers with projects that require custom analysis, Pacific Power targets incentives that generally offer multiple opportunities for energy efficiency upgrades. Midsize and smaller customers may also participate in Custom Analysis incentives.

Pacific Power's implementers work with account managers, with trade allies, and directly with interested customers to help identify energy efficiency opportunities and provide analysis and verification of custom savings. The incentive is based on the expected project savings with caps applied for project costs and one year payback.

Small Business Enhanced incentive. This offering is delivered through the trade ally network to provide enhanced lighting incentives for small business customers.

Lighting Instant incentive. Through this offering, Pacific Power targets the lighting maintenance market by offering customers instant point-of-purchase incentives on qualified LEDs, occupancy sensors, 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 after the purchase.

Energy Management. Through this offering (e.g., recommissioning, industrial recommissioning, persistent commissioning), participating customers may receive expertise and custom incentives for verified savings achieved through improved operations, maintenance, and management practices.³

Pacific Power contracted with Cascade Energy and Nexant to administer these offerings. The administrators manage components of marketing and outreach; trade ally recruitment, training, and support; technical services for customers; and application processing services. Nexant manages offerings

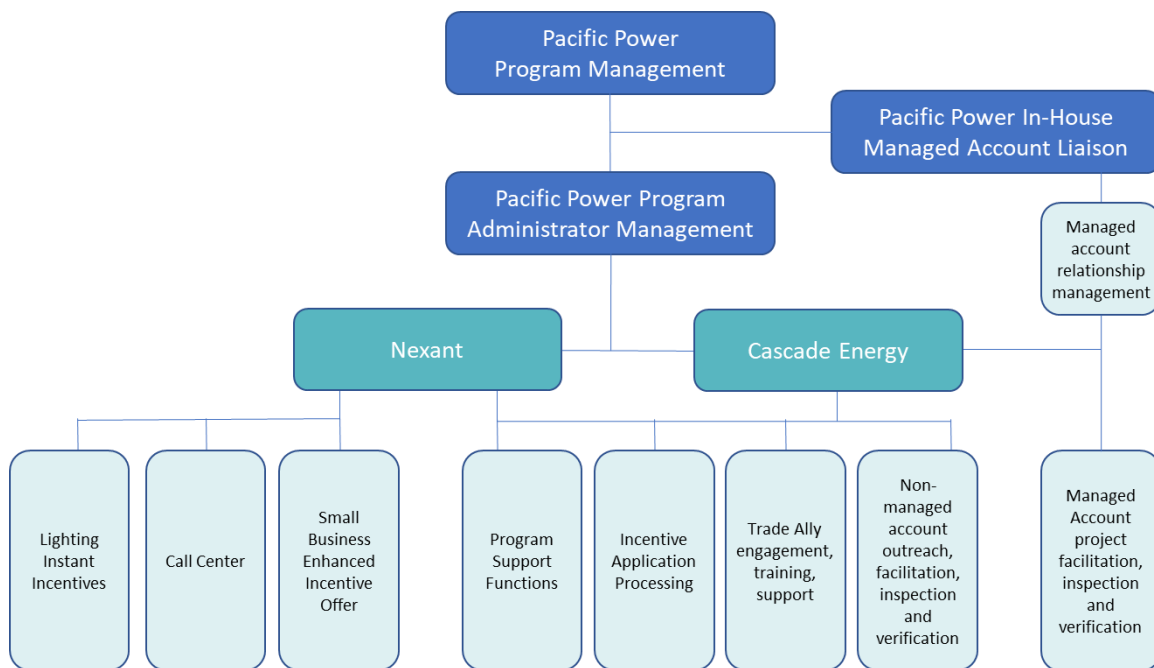
³ Cadmus evaluated four industrial recommissioning projects (typically categorized as Energy Management) under the Wattsmart Business category for the 2016–2017 evaluation period.

for most commercial measures. Cascade Energy manages offerings for agricultural and industrial measures.

Across all sectors, outreach to managed accounts (customers with average demand around 1 MW or higher) are initiated and coordinated through the Pacific Power in-house managed account project manager. Once the managed account customer has indicated interest, Cascade Energy manages the project through to completion.

Figure 1 provides an overview of the program management responsibilities.

Figure 1. Wattsmart Business Program Delivery Roles



Evaluation Objectives

The Cadmus team, comprising Cadmus and VuPoint Research,⁴ evaluated the Wattsmart Business program to determine savings achievements, assess cost-effectiveness, and, where applicable, identify areas for improving program delivery and customer involvement and satisfaction.

Table 6 lists evaluation goals, along with the corresponding evaluation activities employed to achieve those goals.

⁴ 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 6. Evaluation Objectives and Activities

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

Data Collection and Evaluation Activities

The Cadmus team performed engineering analysis for 35 projects to evaluate energy savings with at least 90% confidence and ±10% precision at the portfolio level. The process evaluation focused on assessing changes to program design since 2016-2017 and on monitoring trade ally and participant response to program design and delivery. Primary data collection included interviews with program managers, administrators, and trade allies and surveys with participant and nonparticipant customers.⁵

Impact Sampling and Extrapolation Methodology

Through the California Wattsmart Business program, Pacific Power provides incentives for 10 measure types. The Cadmus team stratified these measure types into four strata—lighting, agricultural, energy management, and other—to account for the largest savings and quantity of projects per stratum and approved by the PacifiCorp evaluation team. The team designed the sampling plan for 2018 and 2019 by combining participation to achieve approximately ±20% precision at 80% confidence per stratum and to exceed ±10% precision at 90% confidence at the nonresidential portfolio level.

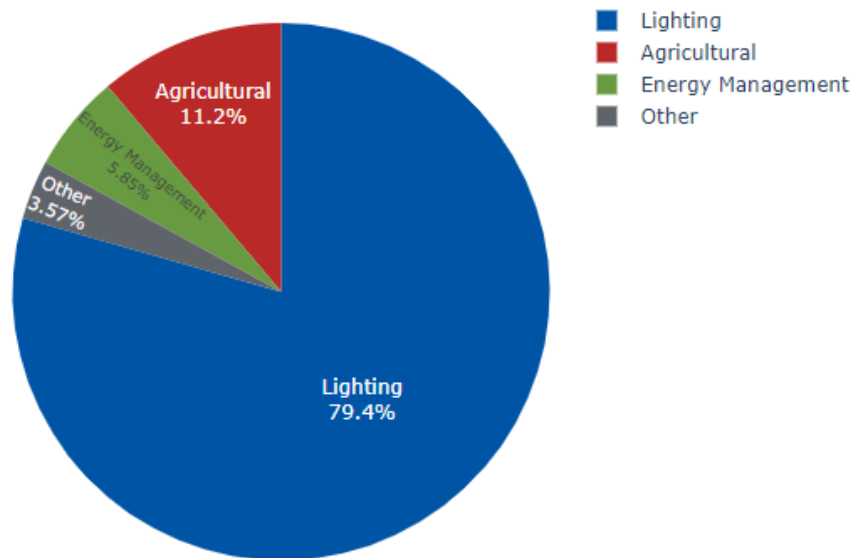
Table 7 shows total project counts in the tracking database, total reported energy savings, and sampled projects. Figure 2 shows the distribution of 2018-2019 savings by stratum.

⁵ Participants are customers completing a project through the program during the 2018 and/or 2019 evaluation period. Partial participants are customers initiating a project through the program in 2018 or 2019, but not completing that project. Nonparticipants are customers who have never initiated or completed a project through the program (or at least not in 2018 or 2019).

Table 7. California 2018-2019 Wattsmart Business Program Impact Sampling

Strata	Measure Type	Incentivized Unique Projects	Reported Energy Savings (kWh)	Sampled Unique Projects
Lighting	Lighting	192	8,133,689	18
Agricultural	Farm & Dairy	1	24,470	8
	Irrigation	44	1,141,582	
Energy Management	Energy Management	4	610,742	2
Other	Building Shell	2	96	7
	Compressed Air	1	10,803	
	Food Service Equipment	1	1,475	
	HVAC	3	286,435	
	Motors	2	4,222	
	Refrigeration	2	69,611	
Total		251	10,283,125	35

Figure 2. Distribution of 2018-2019 Strata Savings



The Cadmus team divided the 35 sampled projects into selected or random categories. For projects chosen randomly, the evaluated results were extrapolated to the rest of the population in the stratum. Selected projects were hand-picked from projects that accounted for 10% or more of total stratum savings per program year. The team evaluated these projects individually and included results in each stratum. However, associated realization rates were not extrapolated to the population because selected projects are not representative of the population due to the magnitude of reported energy savings.

Table 8 shows the distribution of sampled projects, associated reported energy savings, and percentage this sample represented of the population.

Table 8. California 2018-2019 Wattsmart Business Program Impact Sampling Summary

Strata	Sample Type	Sampled Unique Projects	Reported Energy Savings (kWh)		Percentage kWh Sampled
			Sampled Projects	Full Sample	
Lighting	Selected	3	4,112,299	4,279,063	53%
	Random	15	166,764		
Agricultural	Selected	2	139,697	291,355	25%
	Random	6	151,658		
Energy Management	Selected	2	548,259	548,259	90%
	Random	0	0		
Other	Selected	3	80,414	369,938	99%
	Random	4	289,524		
Total		35	5,488,615	5,488,615	53%

Process Survey Sample Design

Primary data collection in 2018-2019 included interviews with stakeholders and trade allies and surveys with 2018-2019 participants, partial participants, and nonparticipants. The team conducted three stakeholder interviews—one with Pacific Power program staff and one with each implementer. The team also interviewed four participating trade allies serving Pacific Power’s California territory. Table 9 presents sampling details for interviews.

Table 9. Interviews Conducted for the 2018-2019 Process Evaluation

Interview Group	Target Completes	Total Completes
Pacific Power Staff	1	1
Program Implementers	2	2
Trade Allies	4	4

The team developed survey samples for participants, partial participants, and nonparticipants using simple random sampling. After removing measures with duplicate or missing contact information, the team stratified the participant sample based on the program offering and further stratified the Typical Upgrades and Custom Analysis participants by the measures they installed. Partial participants and nonparticipants were defined by their actions during the 2018-2019 period, regardless of whether they had completed an incented project before 2018 or in 2020.

Table 10 shows the final sample disposition for survey activities. Participant surveys were delivered online, and the partial and nonparticipant surveys were delivered by phone. The *Surveys* section of the *Process Evaluation* chapter provides a detailed methodology for each surveyed population.

Table 10. California 2018-2019 Wattsmart Business Program Survey Sampling

Data Collection Activity	Project Population	Sampling Frame*	Target Completes	Achieved Completes
Typical Upgrades and Custom Analysis Participants				
Agricultural	52	21	38	7
Energy Management	3	3		1
Lighting (other than Small Business Enhanced Incentive or Lighting Instant Incentives)	201	31		5
Other**	8	4		1
Small Business Enhanced Participants	25	7	Census	0
Lighting Instant Incentives Participants	12	8	Census	0
Participant Subtotal	301	74	53	14
Partial Participants	24	4	Census	0
Nonparticipants	2,704	2,704	200	200
Total	3,029	2,782	253	214

* Sampling frame based on unique customers with contact information after removing duplicates.

**Other includes HVAC, motors, building shell, compressed air, and refrigeration.

Impact Evaluation

This section provides the findings of the Wattsmart Business program impact evaluation that resulted from the Cadmus team’s data analysis. The team incorporated the following activities:

- Participant surveys
- Nonparticipant surveys
- Site-level billing analysis
- Customer interviews
- Engineering analyses

Reported savings are electricity savings (kWh) that Pacific Power reported in its 2018 and 2019 annual reports on conservation acquisition.⁶ To determine evaluated savings, the Cadmus team applied step 1 through step 5, shown in Table 11 and explained in more detail below.

Table 11. Impact Steps to Determine Evaluated Savings

Savings Estimate	Step	Action
Evaluate 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, if applicable.
Net Savings	5	Net-to-gross: Use DEER to assign deemed NTG values.

Step 1: In the first step of verifying the accuracy of data, 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 program tracking database, stratifying the distribution of measures among sampled sites, primarily by end-use type: lighting, agricultural, refrigeration, and other measures. The team evaluated 35 sampled projects as part of the 2018 and 2019 program evaluation using phone interviews and customer-provided photos and site documentation to verify measure installations.

Step 3: The team reviewed all project documentation; developed an evaluation, measurement, and verification plan; and in a few instances performed virtual site visits to verify the installation,

⁶ These reports are available online:
 Pacific Power. March 15, 2019. *2018 California Annual Review of Energy Efficiency Programs*.
https://www.pacificorp.com/content/dam/pcorp/documents/en/pacificorp/environment/dsm/california/2018_CA_DSM_Annual_Report_Final.pdf
 Pacific Power. March 13, 2020. *2019 California Annual Review of Energy Efficiency Programs*.
https://www.pacificorp.com/content/dam/pcorp/documents/en/pacificorp/environment/dsm/california/2019_CA_DSM_Annual_Report_Final.pdf

specifications, and operations of incented measures. The team also collected trend data for nine projects to document historical performance.

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 in the International Performance Measurement and Verification Protocol.⁷ The team used interviews and other operational 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, Cadmus used the DEER database to assign NTG values to each project.

Project Review

Cadmus 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 performed the following tasks for each site:

- 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, interviewed facility personnel with a phone interview, gathering information such as equipment types replaced, and hours of operation.

Engineering Analysis

In general, Cadmus referenced current measure workbooks and saving estimation methodologies from the 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. This market baseline is more efficient than federal or state minimum code requirements, providing a snapshot in time and representing values such as the average efficiency. In many instances, reported savings were based on as-found conditions.

⁷ Efficiency Valuation Organization. January 2012. *International Performance Measurement and Verification Protocol, Concepts and Options for Determining Energy and Water Savings, Volume 1*. Page 25. (EVO 10000 – 1:2012) <http://www.evo-world.org/>

Cadmus reviewed both the market and as-found baselines—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 2018 and 2019 program years, with a 103% overall realization rate.

Table 12. Reported and Evaluated Savings by Program Year

Program Year	Program Savings (kWh)		Program Realization Rate
	Reported	Evaluated	
2018	3,888,170	4,044,704	104%
2019	6,394,955	6,573,444	103%
Total	10,283,125	10,618,148	103%

*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 Stratum (2018-2019)*

Strata	Measures	Reported Savings (kWh)	Evaluated Savings (kWh)	Realization Rate	Precision**
Lighting	517	8,133,689	8,282,851	101.8%	3.0%
Agricultural	99	1,166,052	1,301,851	111.6%	18.1%
Energy Management	4	610,742	612,094	100.2%	0.0%
Other	15	372,642	421,353	113.1%	18.0%
Total	635	10,283,125	10,618,148	103.3%	4.0%

*Totals may not sum due to rounding

**Precision was calculated at 80% confidence per stratum and 90% confidence for the program overall.

Evaluated Gross Savings Results by Stratum

Lighting

Pacific Power provides incentives for six types of lighting projects: controls, exterior lighting, general illuminance, interior lighting, 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 517 lighting measures in 192 unique projects and reported 8,133,689 kWh in energy savings for the 2018-2019 period. The incented lighting projects accounted for 79% of all reported lighting energy savings by Pacific Power in California’s Wattsmart program.

Methodology

The Cadmus team evaluated 18 lighting projects, accounting for 53% of all reported energy savings in the lighting stratum. 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:

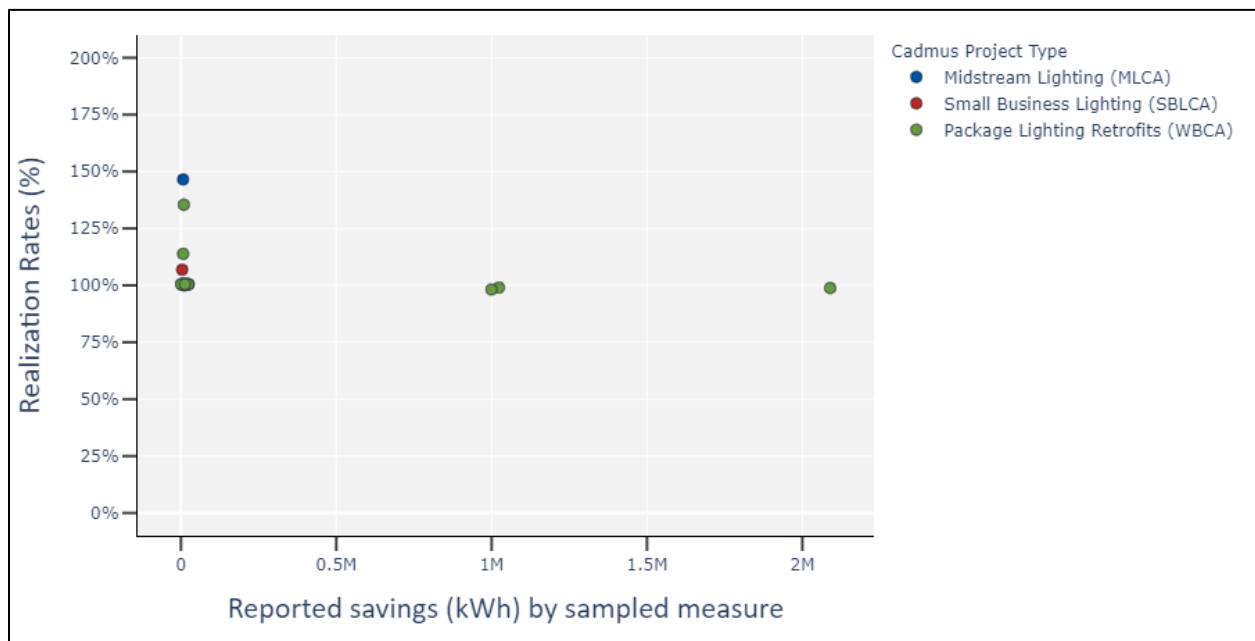
- Lighting operation schedules
- Space names, types, and area
- Baseline lighting fixture locations, types, quantities, controls, and wattages
- Proposed lighting fixture locations, types, quantities, controls, and wattages

The Cadmus team reviewed the calculator methodology and assumptions to determine their applicability for each sampled project.

Findings

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

Figure 3. Lighting—Sample Results



Overall, the sampled lighting projects realized 102% of the reported energy savings. No sites exhibited realization rates less than 80%, and two sites exhibited greater than 120% realization rates. For the remaining sites, Cadmus found no (or a nominal) difference between the evaluated savings and the reported savings.

In previous evaluation cycles, the main differences between *ex ante* and adjusted energy savings were primarily due to differences in operating hours (based on light logger data) and installation rates. Cadmus was unable to perform site visits and install power metering equipment due to COVID-19. Instead, Cadmus determined that differences in fixture counts, fixture wattages, and the application of

building-specific coincidence factors accounted for the bulk of the discrepancies leading to variabilities in realization rates.

In general, Cadmus found that annual energy savings were calculated appropriately. Inputs presented in Pacific Power's prescriptive lighting calculator tool match the reported documentation. The calculator tool is updated regularly to match the local energy code and state requirements.

The main differences between the evaluated savings and reported savings were because Cadmus applied an HVAC interactive factor to savings to account for the reduction in HVAC cooling energy use required to offset electric space heating from high efficiency lighting.

Agricultural

Pacific Power provided incentives for four types of agricultural measures: water distribution equipment, irrigation pumps, custom measures, and agricultural fans. The company provided incentives for 99 measures in 45 unique projects, reporting 1,166,052 kWh in energy savings for the 2018 and 2019 program years. Incented agricultural projects accounted for 11% of all reported energy savings in Pacific Power's California territory.

Methodology

To determine savings for incented agricultural projects, Pacific Power used prescriptive or custom calculations or deemed savings. Cadmus evaluated eight agricultural projects, accounting for 25% of reported energy savings in the agricultural stratum. Of the evaluated projects, Pacific Power used deemed savings for four projects, prescriptive calculations for three projects, and custom calculations for three projects (some projects had multiple calculation types).

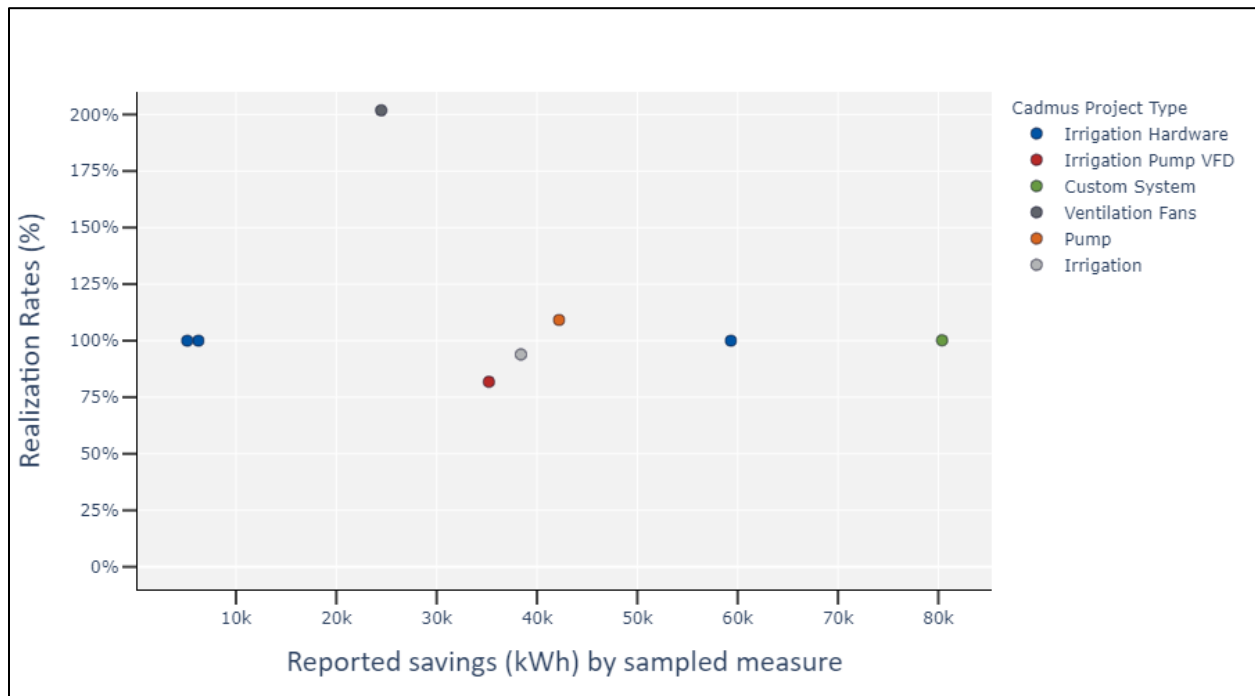
Five evaluated projects involved upgrading or replacing irrigation hardware equipment, including gaskets, sprinklers, nozzles, hoses, and regulators. These projects claimed savings by using deemed savings per unit. The team evaluated these projects by using the savings methodology provided in the RTF's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

For the three projects involving prescriptive calculations for installing variable frequency drives (VFDs) on irrigation pumps, the administrator determined claimed savings using the Irrigation Pump VFD Savings Estimator v1.4 calculator tool. Cadmus evaluated savings for these projects by reviewing the calculator tool for its methodology and assumptions and updating the calculations based on project-specific findings and inputs.

Findings

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

Figure 4. Agricultural Sample Results



Overall, the sampled agricultural projects realized 112% of the reported energy savings. All but one project was evaluated to have savings within 20% of the claimed value.

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. Cadmus used 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.

One project exhibited a 202% realization rate. This project involved the installation of high efficiency fans and VFDs serving a bird hatchery. Cadmus installed power meters and verified run times at a similar project for a separate utility and updated the hours of use and load profiles on the sampled project to match those findings, resulting in greater savings than reported.

Energy Management

Pacific Power provided incentives for four projects in the Energy Management category. All are defined as retro-commissioning projects and involve improving existing system efficiency by identifying and implementing optimized control strategies. The four unique projects reported 610,742 kWh in energy savings for the 2018 and 2019 program years and account for 6% of all reported energy savings by Pacific Power in the Wattsmart California program.

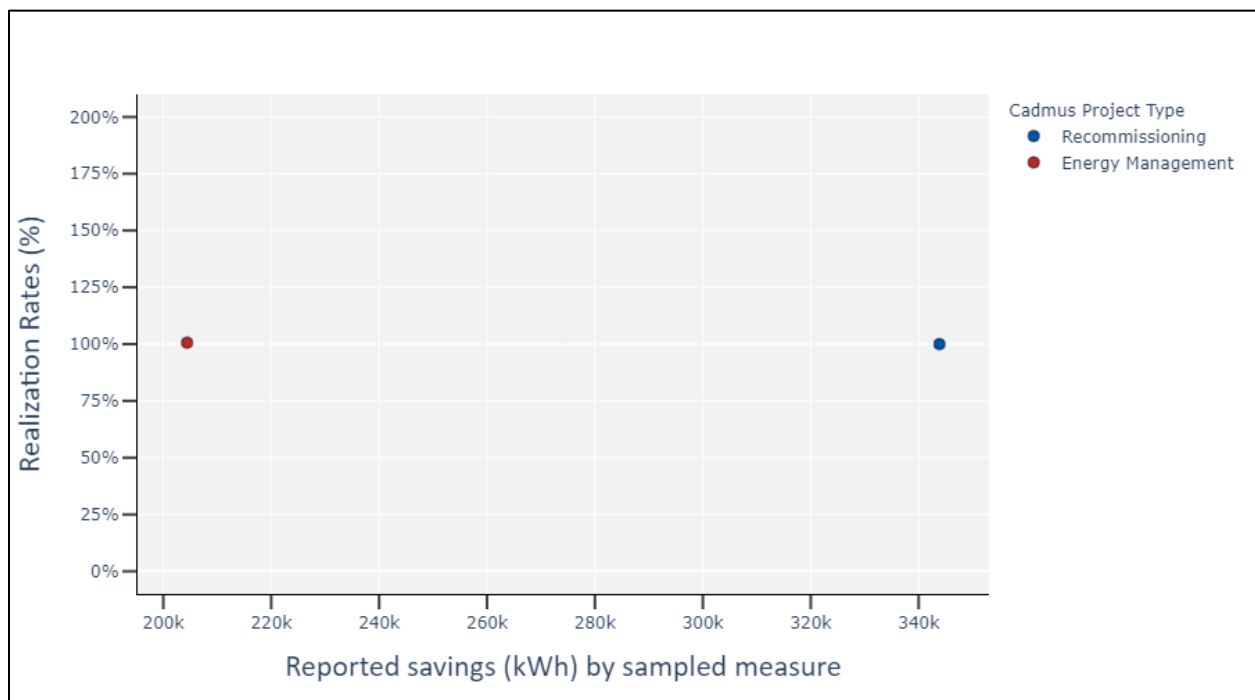
Methodology

The Energy Management projects represent unique, controls-related projects with custom calculation workbooks to report energy savings. These workbooks simulate equipment performance based on control strategies and setpoints observed during site visits and analyzed through trend data. Energy savings are predicted based on updated control strategies, setpoints, and proposed performance modifications. Often, the reported savings workbooks are based on trend data collected after the energy efficiency measures were implemented.

Findings

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

Figure 5. Energy Management Sample Results



The two sampled Energy Management projects realized 100% of the reported energy savings. One involved installation of soil sensors at a farm that implemented an optimized crop irrigation strategy to limit excess watering. This project strategy was based on a three-year pulsed drip irrigation study performed in California from 2015 to 2017. The implementers measured the electric energy use for the irrigation pumps before and after the project to report energy savings. Cadmus collected additional pump electric use utility data and actual weather data and found that savings closely aligned with the implementer’s calculations.

The other sampled project involved a change in operational strategy for pump control at an industrial facility. Cadmus studied the pumping requirements for the facility and found that an existing smaller pump can satisfy the pumping requirements instead of operating the existing large pump. Cadmus

confirmed the change in pump sequencing and collected documentation from the customer verifying the measure was successfully implemented. The reported calculations appear appropriate.

Other

Pacific Power provides incentives for six project types in the Other category: building shell, compressed air, food service equipment, HVAC, motors, and refrigeration. The company incented 15 measures in 11 unique projects and reported 372,642 kWh in energy savings for the 2018 and 2019 program years. Other incented projects accounted for 4% of all reported energy savings by Pacific Power in California.

Methodology

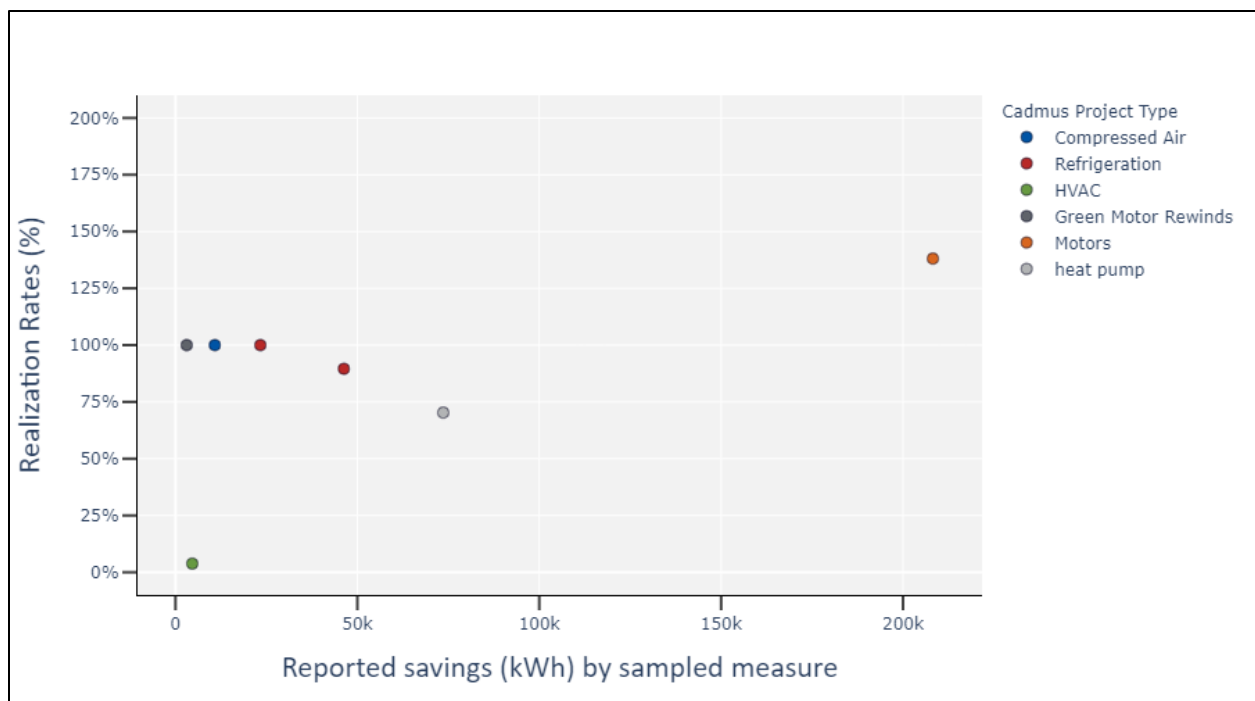
For incented projects in the Other category, Pacific Power used prescriptive or custom calculators and deemed savings to report energy savings. Cadmus evaluated seven projects, accounting for 99% of reported energy savings within the Other stratum.

From the evaluated projects, Pacific Power used deemed savings for three projects, prescriptive calculations for three projects, and custom calculations for one project.

Findings

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

Figure 6. Other Sample Results



Overall, the sampled other projects realized 113% of the reported energy savings. Two projects attained realization rates below 80%, and one project realized savings above 100%. Table 14 provides specific details related to these projects.

Table 14. Other Sample Detailed Findings

Project	Project Measures	Reported kWh	Evaluated kWh	Site Realization Rate	Notes
WBCA_248449	VFDs serving HVAC fans	208,2088	287,550	138%	Claimed Deemed savings lower than DEER for this specific application
WBCA_222080	¾ ton heat pumps	73,610	51,750	70%	Deemed savings higher than DEER
WBCA_282723	25 ton packaged Air Conditioner	4,617	176	4%	Deemed savings higher than DEER

Deemed savings was the driving factor for the difference between evaluated and reported energy savings. Cadmus used measures in the DEER to calculate evaluated savings. DEER provides deemed savings for energy efficiency measures using project-specific inputs such as equipment type, efficiency, size, location, building type, and climate zone. Pacific Power’s deemed values for energy efficiency measures often deviated from the DEER values due to the specificity of DEER.

Evaluated Net Savings

The Cadmus team determined evaluated net savings by reviewing Pacific Power’s annual report file that assigns a DEER NTG value to each project in the program tracking database. Cadmus evaluated whether the most applicable DEER NTG values for each project type and appropriate year were assigned in the annual report file. Cadmus determined that the required DEER NTG values were assigned for all records except for four occupancy sensor projects in 2019.

Table 15 shows the evaluated net energy savings by program strata for 2018 and 2019 combined. NTG estimates were weighted by their evaluated gross program energy savings to arrive at the overall 77% NTG estimate and over 8 million net kWh savings over the two-year period.

Table 15. 2018-2019 Wattsmart Business Program Net Savings

Strata	Evaluated Gross Savings (kWh)	NTG	Evaluated Net Savings (kWh)
Lighting	8,282,851	79%	6,545,023
Agricultural	1,301,851	66%	859,221
Energy Management	612,094	67%	410,103
Other	421,353	75%	316,015
Total*	10,618,148	77%	8,130,362

*Totals may not sum due to rounding.

The 2018-2019 Wattsmart Business program NTG estimate of 77%, which is based on prescribed DEER NTG values, is just slightly higher than the 75% NTG estimate from the 2016-2017 Wattsmart Business program that was based on self-report participant survey data.

Process Evaluation

Cadmus conducted an intensive process evaluation for the 2016-2017 cycle that included detailed documentation of administrative structures, marketing, data storage, and reporting. For the 2018-2019 cycle, Cadmus conducted a more limited process evaluation that focused on recent changes to program design or implementation and the response to those changes from trade allies and participants. Findings are based on an analysis of data collected through interviews with program and implementer staff and trade allies and surveys of participants, partial participants, and nonparticipants. Through these research tasks, the team assessed the following:

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

Table 16 lists the questions asked in the primary research areas. Although data collection occurred during the COVID-19 pandemic, survey and interview instruments tried to focus respondents on their experiences with the program in 2019 and did not address the events or situations occurring in 2020.

Table 16. Research Areas and Questions

Research Areas	Researchable Questions and Topics
Program Status	How did the program perform in 2018 and 2019, 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’ decision to participate in the program? What are the key factors in any customer’s 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?
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 the Cadmus team used for process evaluation research for the 2018-2019 period.

Materials and Database Review

The Cadmus team conducted a review of several program documents and files to inform development of data collection instruments, survey samples, and data analysis:

- California Annual Review of Energy Efficiency Programs (for January 1, 2018, to December 31, 2018, and for January 1, 2019, to December 31, 2019)
- Wattsmart Business program website
- Participant and partial participant databases
- Pacific Power’s nonresidential customer database

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 three interviews, one each with program staff at Pacific Power, Nexant, and Cascade Energy, focusing on changes during 2018 and 2019 and covering these topics:

- 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

Trade Ally Interviews

Cadmus interviewed four participating Pacific Power Wattsmart Business trade allies from California to understand their participation experience and gather insights about improving the experience for customers and vendors. Interviews sought to answer specific research questions regarding program function and how changes have impacted trade ally use and to collect feedback about the overall experience.

The Cadmus team targeted a census of active participating contractors and installers (defined as participating trade allies who had completed jobs in 2018-2019). At the time the team performed the interviews, seven of the 18 California trade allies listed on the Pacific Power website had completed a project in 2018 or 2019. The team used contact information provided by Nexant and sent a first round of email invitations and supplemented with follow-up calls where necessary. The team also used a consistent interview guide with subsections for programs unique to a specific state or trade. Table 17 shows the total available contacts for trade allies in California, targets, and completes.

Table 17. Trade Ally Interviews for the 2018-2019 Process Evaluation

	Total Active Participating TAs	Target Completes	Actual Completes
California	7	4	4

Surveys

The Cadmus team surveyed two customer populations—participants and nonparticipants—and attempted to survey partial participants. This section describes the process to design and field surveys. (For final survey disposition, see Table 10 above.)

Participant Surveys

The team designed survey instruments for each participant group (Typical Upgrades and Custom Analysis incentives, Small Business Enhanced incentives, and Lighting Instant incentives) to collect 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
- Customer firmographic information

Cadmus included only 2019 participants in the sample frame, considering that participants would no longer accurately remember the circumstances of projects completed in 2018 by the time of the survey. To prepare the sample frame, the team first removed records with no email address. Next, the team selected an individual record for each email contact in the participant tracking data. Where a group of records had the same contact information, the team first identified the measure category in the group that had the lowest representation in the sample frame then randomly selected one record from that measure category.

The sample frame included these measure categories, from highest priority (smallest population) to lowest priority (largest population):

- Refrigeration
- Lighting (Small Business Enhanced incentive)
- Lighting (Lighting Instant incentive)
- Other
- Irrigation
- Lighting (Typical Upgrades incentive)

Survey invitations were sent to the entire sample to collect as many responses as possible. The initial online survey did not achieve the target of 38 completes for Typical Upgrades and Custom Analysis incentives and achieved no completes for Small Business Enhanced and Lighting Instant incentives.

Cadmus initiated a telephone survey of Typical Upgrades and Custom Analysis participants who had not yet responded to supplement the total. The team prioritized Typical Upgrades and Custom Analysis projects because they are more variable and encompass a broader range of customer experiences. The team received 14 survey completes for Typical Upgrades and Custom Analysis, which represented a response rate of 24%.

Nonparticipant Telephone Surveys

VuPoint conducted telephone surveys with 200 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 firmographic information

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

Partial Participant Surveys

Pacific Power, Nexant, and Cascade Energy provided the Cadmus team with lists of 2018 and 2019 partial participants from their respective areas of program responsibility. The team removed any customers who, within this period, appeared in the participant tracking data. For the remaining partial participants who began but did not complete multiple projects during the evaluation period, the team selected the project with the greatest estimated kWh savings in the sample. The team also removed partial participants with no contact information.

VuPoint attempted to survey partial participants; however, this group was nonresponsive after five attempts and therefore no survey results or findings are reported.

Program Implementation Changes

Drawing on stakeholder interviews, this section describes changes in the Wattsmart Business program's implementation and delivery during the 2018-2019 evaluation period.

Administrator Roles

The most significant change in program administration in 2018-2019 was the shift in administrator roles to include direct project facilitation, inspection, and verification for managed accounts.⁸ Pacific Power rebid the nonresidential program administration contracts in 2018 and included in the scope services for

⁸ Managed accounts are typically accounts larger than 1 MW.

managed accounts that had previously been provided by an in-house project manager. Because its in-house project manager has valuable relationships and trust has built up with managed account contacts, Pacific Power continues to provide outreach and coordination of managed account energy efficiency projects directly.

The managed account project manager conducts initial outreach to customers and schedules one or more meetings to discuss potential energy efficiency opportunities. Once the customer has expressed interest in a specific opportunity, Cascade Energy or its subcontractors provide engineering services to define the project, estimate energy savings, and determine the incentive offer. The managed account project manager continues to serve as the point of contact and presents the customer with the defined project scope and incentive offer. Once the customer agrees to the proposal, Cascade Energy provides continuing technical support and inspection, verification once the project is complete. Pacific Power project manager reviews and approves project for processing of the incentive payments. Cascade Energy reports that the new arrangement has worked well, reducing the administrative burden on Pacific Power staff and streamlining the process to identify projects.

The new administrator contracts introduced other small improvements that also streamlined oversight for Pacific Power. The new contract combined targets for midstream and Typical Upgrades and Custom Analysis lighting savings, which gave the administrators greater flexibility to promote each offering where and how appropriate rather than having to force the market toward one over another just to hit a target. In addition, Pacific Power has fewer metrics to track, and all incentives are provided in a single invoice rather than two.

Typical Upgrades and Custom Analysis incentives continued to attract greater participation than the Midstream/Lighting Instant Incentive, which staff report is in line with the program design. Under this structure, midstream participation grew from four unique customers in 2018 to 10 in 2019, while Typical Upgrades and Custom Analysis lighting participation decreased slightly, from 72 unique customers to 59. Despite this drop, lighting savings nearly doubled due to a few very large projects (see the discussion of project savings in the *Evaluated Gross Savings Results by Stratum* section).

Table 18 shows the number of unique customers (identified as unique billing accounts) participating in each of the offerings in 2018 and 2019, by measure category.

Table 18. Customer Participation in Pacific Power Offerings in 2018-2019

Offering	Measure Category	Unique Customers	
		2018	2019
Midstream/Lighting Instant Incentives	Lighting	4	10
Small Business Enhanced Incentives	Lighting	12	14
Typical Upgrades and Custom Analysis Incentives	Agricultural	21	23
Typical Upgrades and Custom Analysis Incentives	Energy Management	1	3
Typical Upgrades and Custom Analysis Incentives	Lighting	72	59
Typical Upgrades and Custom Analysis Incentives	Other	4	5
Total		111	106

Updates to Program Offerings

Pacific Power launched the Small Business Enhanced Incentive offer in 2015 to better penetrate the small business community. To overcome the barrier of greater upfront cost faced by many cash-strapped small businesses, the offer provided enhanced incentives for lighting upgrades to eligible customers. This initiative requires that small businesses work with a program trade ally, which ensures they are able to identify opportunities for lighting savings and select qualifying equipment.

In 2019, Pacific Power and Nexant, the administrator of the commercial trade ally network, implemented lead generation support to encourage trade allies to promote the Small Business Enhanced incentive. Nexant targeted 15 eligible customers for each participating trade ally and mailed the 15 companies to explain that the trade ally would be calling to offer enhanced incentives.

Trade allies commit to call each customer within a defined period of time. Once the customers were contacted, the trade ally could request another round of postcard mailings. Pacific Power also gave these trade allies a co-branded polo shirt to reinforce their connection to Pacific Power and the program during their sales call. Staff said the initiative has been well-received by trade allies and has improved close rates when pitching lighting upgrades. In interviews with Cadmus, trade allies confirmed that the program has been helpful to them (see additional discussion in the *Trade Ally Experience* section.)

Trade Ally Experience

This section summarizes the key findings from interviews with four of seven trade allies active in Pacific Power's California territory. Three trade allies participated in the Small Business Enhanced offering, and one offered non-lighting Typical Upgrades incentives. Their responses were based on these targeted research questions:

- What do companies expect from participation?
- What aspects of the program work well?
- How have recent program changes impacted trade ally use of programs?
- Are there opportunities for improvement? Where do trade allies need more support?
- What feedback can trade allies offer on customer response to program changes?
- Do trade allies have ideas for new products?

Program Participation

The interviewed trade allies said they joined the Wattsmart program for two main reasons. The first was that the incentives were beneficial to their customers and the program brought them more business. The second was that the Wattsmart representatives were helpful and friendly. Two trade allies mentioned the project representatives.

Cadmus asked trade allies how the Wattsmart program fit with their business model, and all said it fit well or was an integral part of their system. One trade ally said he works with "six to seven other utility programs and they aren't as good." He added that the incentives are high enough to pitch a return on investment to their customers.

The postcard campaign was generally well received among California trade allies. All three small business trade allies had heard of the postcard campaign effort, but one “doesn’t really utilize it” due to the relatively small size of his county. Two trade allies were very enthusiastic about the effort. One said, “the t-shirts added credibility” and “doubled my business.” The other said the only issue with the program and the postcard campaign was that the “incentives were so good that people didn’t think it was real” and that they “would have to personally guarantee incentive beforehand.”

Of the four trade allies, two had heard of the quarterly scorecards but also said they did not use them. One of these said he received updates and advice from his project representative and found this information helpful.

Areas for Improvement

Cadmus asked the trade allies what barriers they have experienced and if they would add any products to the Wattsmart program. All said they were satisfied with the program. Cadmus made further inquiries to prompt more information. Two trade allies said the T-LED incentives were too low, making them less attractive to their clients, and one said there were occasional issues with the online portal.

Participant Experience and Satisfaction

The Cadmus team conducted online surveys and received 14 responses from Wattsmart Business program participants—six received Typical Upgrades and eight received Custom Analysis incentives. No responses were received from the small participant populations for Lighting Instant incentives and Small Business Enhanced incentives. Therefore, this section discusses only the responses from Typical Upgrades and Custom Analysis participants. Due to the number of completes for the Typical Upgrades and Custom Analysis survey, findings should be viewed as qualitative information and may not represent the population of participants.

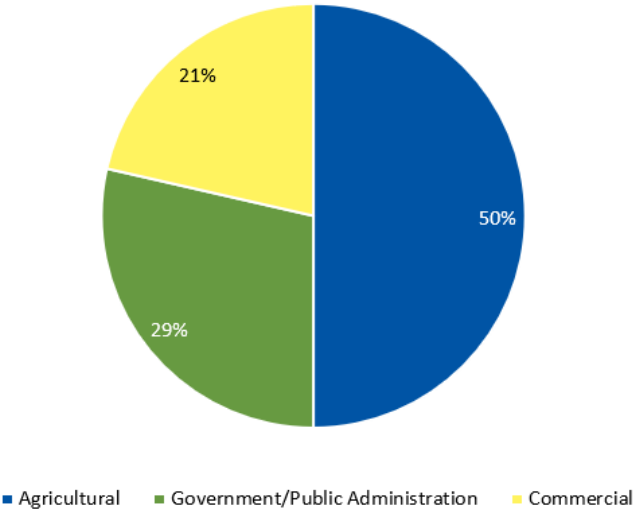
Wattsmart Business Typical Upgrades and Custom Analysis

The Cadmus team surveyed participants from four measure categories:

- Agricultural (7)
- Lighting (5)
- Energy Management (1)
- Other (1)

The 14 respondents fell into three business sectors: agricultural, government/public administration, or commercial, as shown in Figure 7. Most businesses were small, with zero to 10 employees (64%). The next most-represented category included businesses employing 101 to 200 people (14%).

Figure 7. Respondents by Business Sector

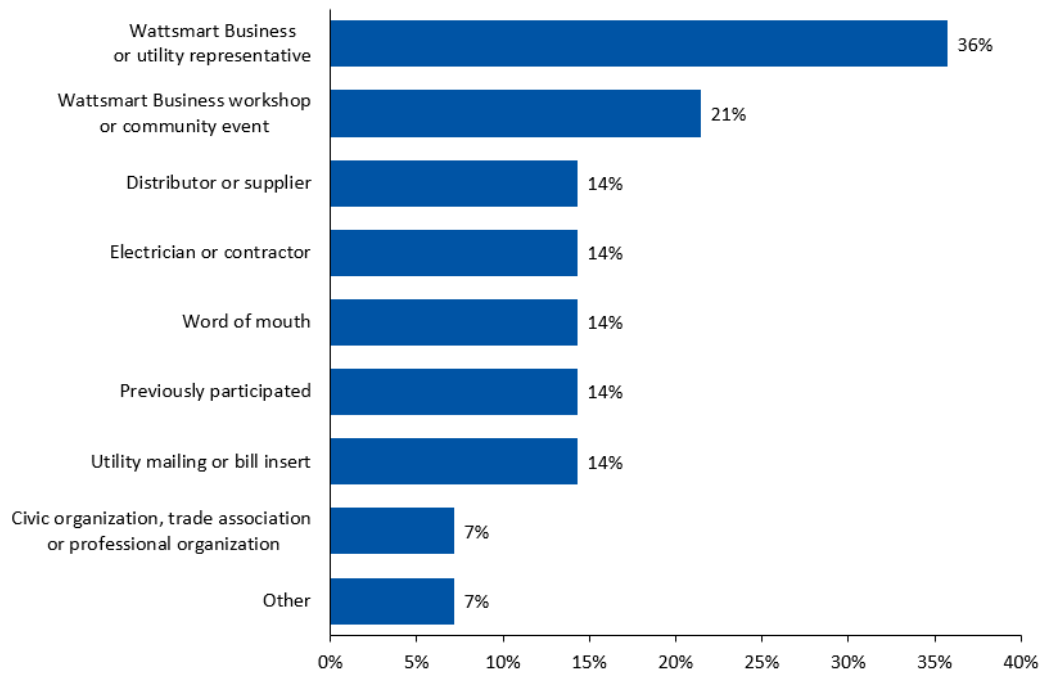


Source: Pacific Power Wattsmart Business Program 2018-2019
Wattsmart Business Participant Survey QE1. (n=14)

Awareness and Communication

Participants receiving Typical Upgrades or Custom Analysis incentives most frequently learned about the available incentives through Wattsmart Business program representatives or their Pacific Power representatives (36%, n=14), as shown in Figure 8. As intended by the program design, distributors of irrigation equipment and lighting and contractors were additional sources of information for customers, though channels such as word of mouth, previous participation, and utility mailings were mentioned equally frequently.

Figure 8. Typical Upgrades and Custom Analysis Participants Information Sources



Source: Pacific Power Wattsmart Business Program 2018-2019 Wattsmart Business Participant Survey QA4.
 Don't know and refused responses removed.
 Multiple responses allowed. (n=14)

Customer Experience

Cadmus identified three key metrics that provide a high-level picture of how participants are engaging with the Wattsmart Business programs and application processes: how much of the project cost is covered by incentives, who installed the measure, and who filled out the application. These metrics were not captured in previous surveys, but Cadmus intends to continue to monitor them moving forward.

Most respondents reported their incentive covered 25% or less of their project cost (75%, n=12). Of these respondents, three completed lighting projects and six completed non-lighting projects. Customers who reported being less than *very satisfied* with the dollar amount of their incentive were asked what amount would have been enough to make them very satisfied. One respondent who reported the incentive covered 8% of their project cost said they would have been very satisfied if the incentive covered 30%, similarly another respondent who said their incentive covered 16% said they would have been very satisfied if it covered 35%. Two other respondents said they would have been very satisfied if their incentives covered 50%, these respondents reported the incentive covered 15% and 25% of their project costs respectively.

Seven of 12 respondents said their projects were primarily installed by an independent contractor rather than by themselves (four respondents), someone else (one respondent), or a Wattsmart Business program participating trade ally (no respondents).

Six respondents said they or someone else at their company completed their applications, while three said a Wattsmart Business representative or Energy Engineer completed the application, two said a contractor or installer completed it, and one said their Pacific Power account representative completed it (n=12).

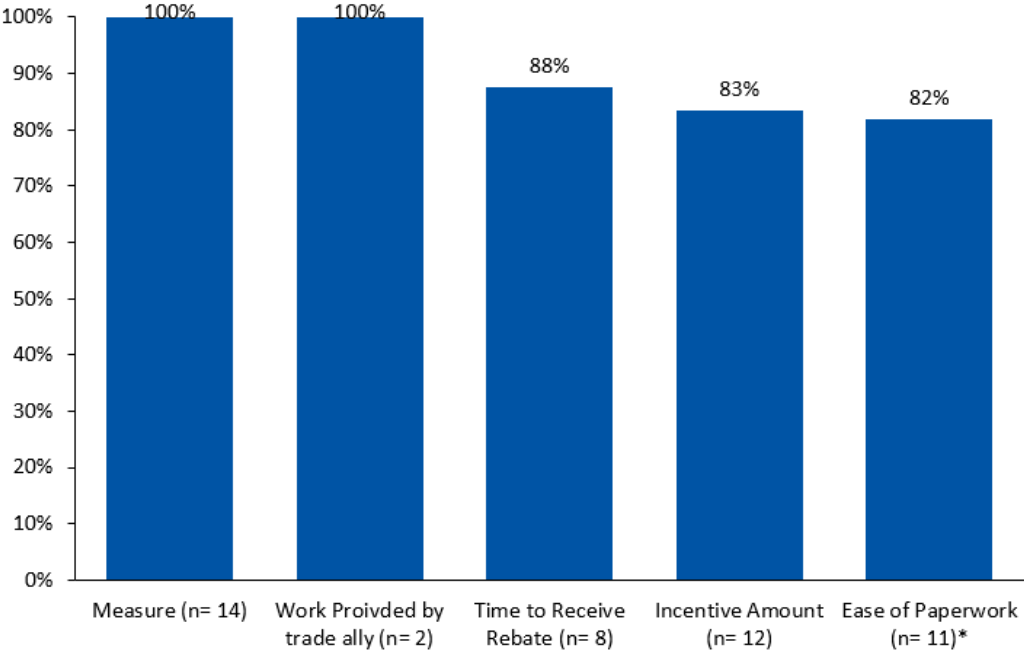
Satisfaction and Challenges

As shown in Figure 9, 100% of participants were satisfied with the measure they installed. Both of the respondents who worked with a Wattsmart trade ally to install their project were satisfied with the trade allies' work.⁹ Ninety-three percent reported they were *very satisfied* or *somewhat satisfied* with the Wattsmart Business program overall (n=14). The few respondents who were less than satisfied with the any component of the program were all agricultural customers completing non-lighting projects (as were half of the respondents in the sample).

Two respondents provided additional explanations for being less than satisfied. One respondent said the paperwork was "a lot of work for a small payout." Another respondent was *somewhat satisfied* with the measure installed because the respondent's company was not observing the level of savings expected from the equipment.

⁹ Satisfaction levels reported as *very satisfied* and *somewhat satisfied* combined.

Figure 9. Participant Satisfaction Levels

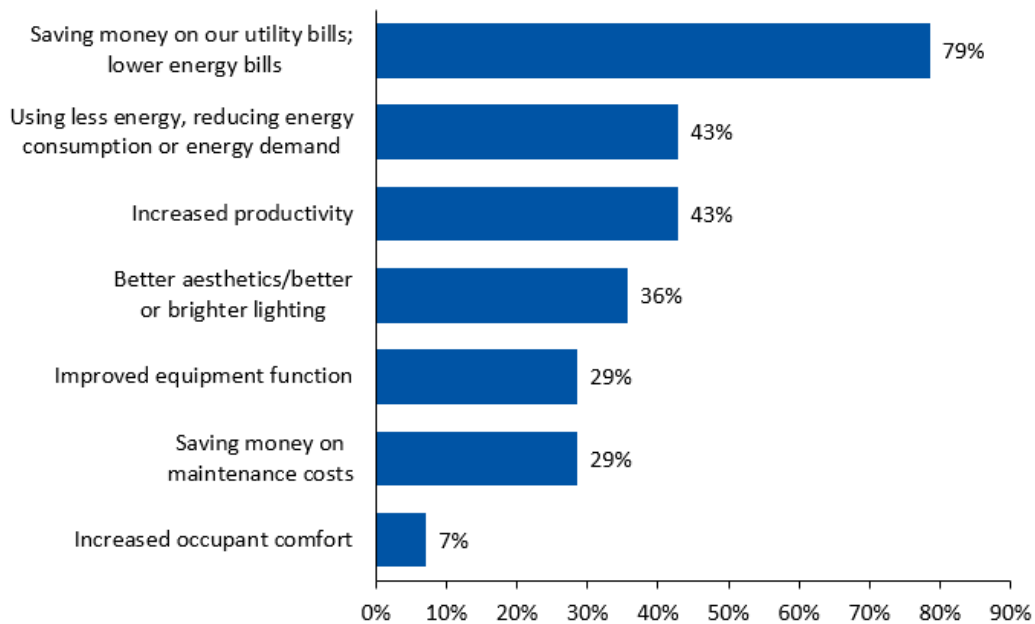


Source: Pacific Power Wattsmart Business Program 2018-2019 Wattsmart Business Participant Survey QB2, QCB4, QB7, B10, and QB12. Don't know and refused responses removed. *Rating scale measured "easy" rather than "satisfied"

Project Benefits

All 14 participants who received Typical Upgrades or Custom Analysis incentives reported one or more benefits that their companies experienced due to the equipment they installed. Most frequently, they cited lower energy bills or reduced consumption. As shown in Figure 10, participants also reported operational benefits such as higher productivity, better or brighter lighting, and improved equipment function. Eleven of 14 respondents, or 79% (n=14), reported some benefit from their project other than cost savings.

Figure 10. Benefits of Equipment Installed



Source: Pacific Power Wattsmart Business Program 2018-2019 Wattsmart Business Participant Survey QB14. Don't know and refused responses removed. Multiple responses allowed. (n=14)

Nonparticipants

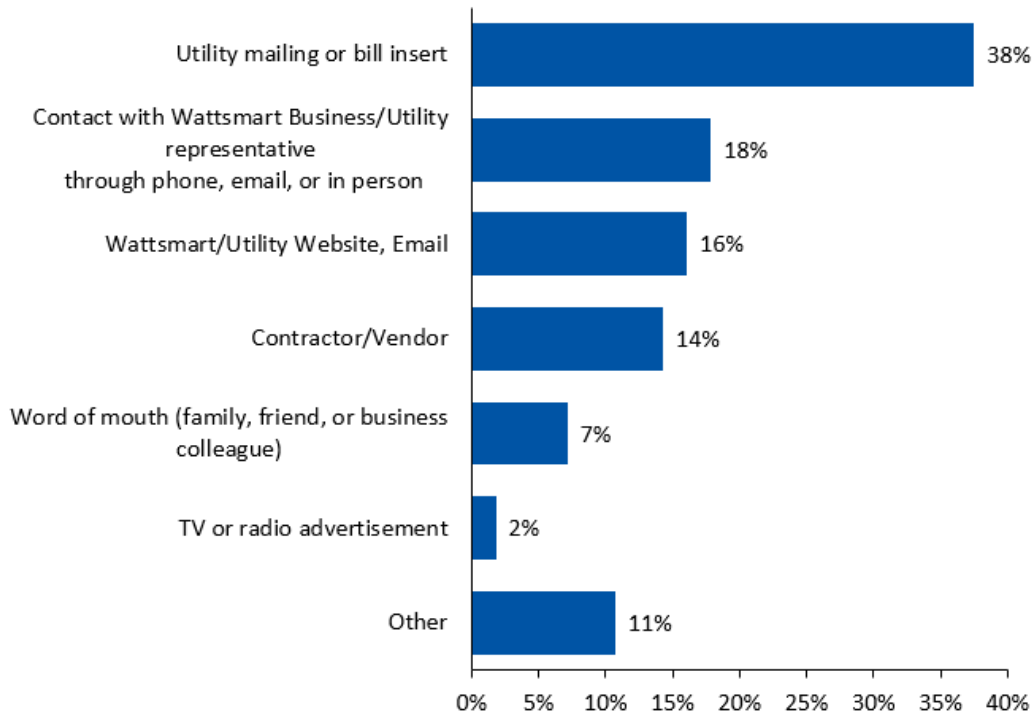
The Cadmus team surveyed 200 nonparticipants who either had never completed a project through the program or had not completed a project through the program in 2018 or 2019. The largest single group operates in the commercial business sector (64%, n=193). A majority employ between zero and 10 people (76%, n=190).

Forty-four percent of nonparticipants used electricity to heat their facilities, 22% used gas, and 34% used a mixture of both or other fuels (n=170). Participants relied more heavily on electricity for water heating (74%), with 15% using gas and 11% using a mixture of both or other fuels or not heating water (n=167).

Awareness and Communication

When asked if they had heard of the incentives and technical assistance available through Pacific Power prior to the survey call, 68% of nonparticipants (n=197) said they had not. (This is similar to the finding from the 2016-2017 evaluation, that 76% of nonparticipants were unaware of Wattsmart incentives and services). Of the 32% who had heard of the program, respondents most frequently reported learning about it through a Pacific Power mailing or bill insert (38%) or through contact with a Wattsmart Business or Pacific Power representative (18%, n=56). Figure 11 shows how nonparticipants heard about the program.

Figure 11. How Nonparticipants Learned About the Wattsmart Business Program



Source: Pacific Power Wattsmart Business Program 2018-2019 Partial Participant/Nonparticipant Survey: QC3. How did your organization learn about the Wattsmart Business Program? Multiple responses possible. Don't know and refused responses removed. (n=56)

Motivation

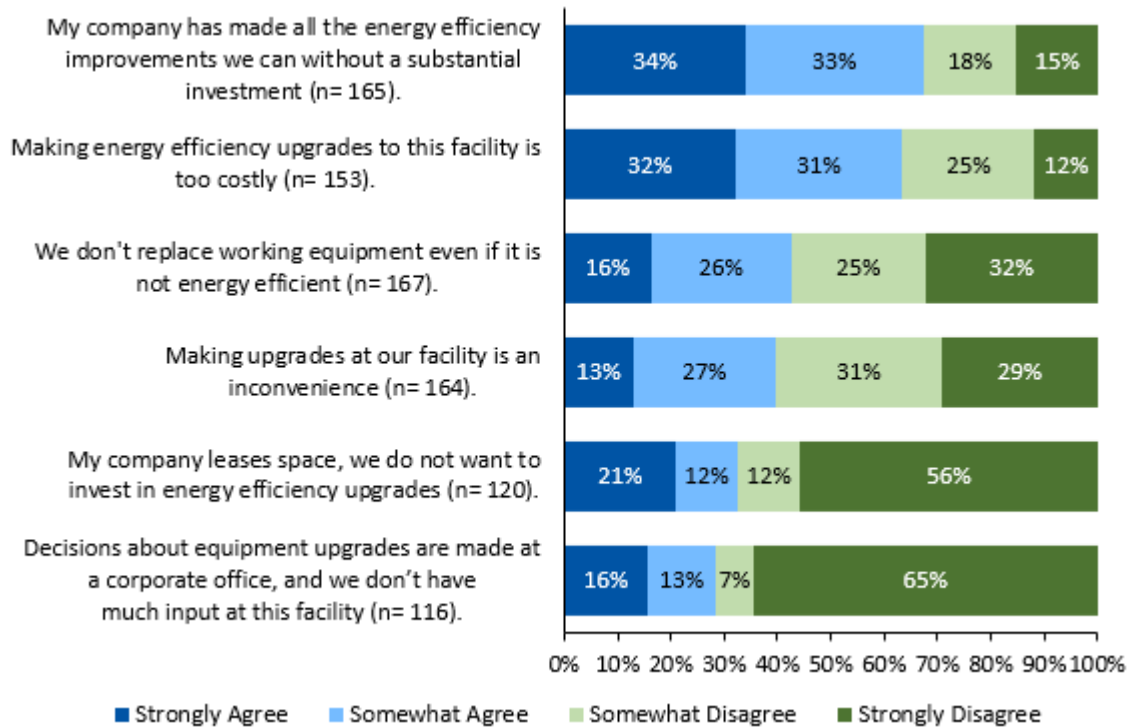
More than any other reason given, nonparticipants said, when considering energy efficiency upgrades, they were primarily motivated by the opportunity to save money on energy bills (78%, n=166). Other responses described a variety of motivations (e.g., access to renewable energy resources such as solar and wind, replacing old equipment, or improving productivity), but none represented more than 4% of all responses.

Participants said they would be more motivated to make energy-efficient purchases or upgrades if equipment costs were lower (52%), incentives were higher (21%), or if they had more information generally (9%, n=161). Other responses included being offered incentives on different equipment, help putting together the business case for such investments, higher annual savings, ownership of the property, and having more time to make such investments.

The Cadmus team also asked nonparticipants: “When calculating the return on investment for proposed capital upgrades, does your company include savings gained from energy efficiency?” Nonparticipants were split, with 55% saying yes and 45% saying no (n=158)).

To explore nonparticipants' attitudes about making energy efficiency upgrades at their facilities, the survey asked respondents to what extent they agreed with the barrier statements shown in Figure 12. Statements are shown in order by percentage of respondent agreement.

Figure 12. Nonparticipants' Attitudes About Energy Efficiency Improvements



Source: Pacific Power Wattsmart Business Program 2018-2019 Partial Participant/Nonparticipant Survey: QD7a-QD7f. Not applicable, don't know, and refused responses were removed.

Responses strongly indicate nonparticipants viewed energy efficiency as not worth the required upfront investment. Respondents generally have input into decisions about energy efficiency upgrades (72% *somewhat disagreed* or *strongly disagreed* with the statement that they did not, n=116), and most were not opposed to investing in upgrades even in leased spaces (68%, n=120). However, 67% *strongly agreed* or *somewhat agreed* that their company had made all the energy improvements they could without substantial investment (n=165), and 63% agreed that energy efficiency upgrades were too costly (n=153).

Cost-Effectiveness

In assessing the Wattsmart Business program's cost-effectiveness, the Guidehouse team (Pacific Power's cost-effectiveness consultant) analyzed program benefits and costs from five different perspectives using a cost-effectiveness model approved specifically for calculating the cost-effectiveness of the program in California.¹⁰ The California Standard Practice Manual for assessing demand-side management (DSM) program cost-effectiveness describes benefit/cost ratios for the following five tests:¹¹

- **Pacific Power Total Resource Cost (PTRC) Test:** This test examines program benefits and costs from Pacific Power and Pacific Power's customers' perspectives (combined). Benefits include avoided energy costs, capacity costs, and line losses, plus a 10% adder to reflect non-quantified benefits. Costs include 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). Benefits include avoided energy costs, capacity costs, and line losses. Costs include 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. 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. 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).

Table 19 summarizes the five tests' components.

¹⁰ Cadmus' 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.

¹¹ California Measurement Advisory Council. *California Standard Practice Manual: Economic Analysis of Demand-Side Programs and Projects*. July 2002. http://www.calmac.org/events/SPM_9_20_02.pdf

Table 19. 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 20 provides selected cost analysis inputs for each year, including evaluated energy savings, discount rates, line losses, inflation rates, and total program costs. Guidehouse derived all inputs except for evaluated energy savings, provided in this report, from Pacific Power DSM Annual Reports.^{12,13}

Table 20. Selected Cost Analysis Inputs

Input Description	2018	2019	Total
Evaluated Energy Savings (kWh/year)*	3,074,071	5,054,720	8,128,792
Discount Rate	6.57%	6.57%	N/A
Commercial Line Loss	11.14%	11.14%	N/A
Industrial Line Loss	9.92%	9.92%	N/A
Irrigation Line Loss	11.43%	11.43%	N/A
Commercial Energy Rate (\$/kWh)	\$0.1487	\$0.1492	N/A
Industrial Energy Rate (\$/kWh)	\$0.1128	\$0.1123	N/A
Irrigation Energy Rate (\$/kWh)	\$0.1497	\$0.1526	N/A
Inflation Rate**	2.2%	2.2%	N/A
Total Program Costs	\$1,092,929	\$1,531,637	\$2,931,364

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

¹² Pacific Power. *2018 California Annual Review of Energy Efficiency Programs: January 1, 2018 – December 31, 2018*. March 15, 2019.
https://www.pacificorp.com/content/dam/pcorp/documents/en/pacificorp/environment/dsm/california/2018_CA_DSM_Annual_Report_Final.pdf

¹³ Pacific Power. *2019 California Annual Review of Energy Efficiency Programs: January 1, 2019– December 31, 2019*. March 13, 2020.
https://www.pacificorp.com/content/dam/pcorp/documents/en/pacificorp/environment/dsm/california/2019_CA_DSM_Annual_Report_Final.pdf

The Wattsmart Business program benefits included energy savings and their associated avoided costs. For the cost-effectiveness analysis, Guidehouse used avoided costs associated with the Pacific Power 2017 IRP Westside Class 2 DSM Decrement Values.¹⁴

Table 21 presents the net cost-effectiveness analysis results for the combined 2018 and 2019 program years, not accounting for non-energy benefits (except those represented by the 10% conservation adder in the PTRC test). For this scenario, the Wattsmart Business program proved cost-effective from all test perspectives except the RIM test for the combined years’ gross evaluated savings. The program achieved a TRC test ratio of 2.11, a PTRC of 2.32, a UCT ratio of 3.26, and a PCT ratio of 4.96.

The RIM test measures program impacts on customer rates. Most programs do not pass the RIM test because, though 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 happens only for demand response programs or programs targeting the highest marginal cost hours (when marginal costs are greater than rates).

Table 21. Wattsmart Business Program Cost-Effectiveness Summary of 2018 and 2019 Evaluated Net Savings

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC	\$0.0505	\$4,058,613	\$9,420,484	\$5,361,871	2.32
TRC	\$0.0505	\$4,058,613	\$8,564,076	\$4,505,463	2.11
UCT	\$0.0326	\$2,624,566	\$8,564,076	\$5,939,510	3.26
RIM		\$15,052,292	\$8,564,076	(\$6,488,216)	0.57
PCT		\$3,510,937	\$17,397,222	\$13,886,286	4.96
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000470378
Discounted Participant Payback (years)					1.91

Table 22 presents the 2018 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 all test perspectives except the RIM test, including benefit/cost ratios of 2.18 for the TRC perspective and 2.96 for the UCT perspective.

¹⁴ PacifiCorp’s *Class 2 DSM Decrement Study* details IRP decrements. April 20, 2017. https://www.pacificorp.com/content/dam/pcorp/documents/en/pacificorp/environment/dsm/2019-draft-study-docs/PacifiCorp_Class2_DSM_Decrement_Study.pdf

Table 22. Wattsmart Business Program Cost-Effectiveness Summary of 2018 Evaluated Net Savings

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/ Cost Ratio
PTRC	\$0.0482	\$1,480,848	\$3,559,024	\$2,078,176	2.40
TRC	\$0.0482	\$1,480,848	\$3,235,476	\$1,754,628	2.18
UCT	\$0.0355	\$1,092,929	\$3,235,476	\$2,142,548	2.96
RIM		\$5,651,379	\$3,235,476	(\$2,415,903)	0.57
PCT		\$1,129,606	\$6,438,248	\$5,308,642	5.70
Lifecycle Revenue Impacts (\$/kWh)	\$0.0000437128				
Discounted Participant Payback (years)	1.53				

Table 23 presents the 2019 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 all test perspectives except the RIM test, including benefit/cost ratios of 2.07 for the TRC perspective and 3.48 for the UCT perspective.

Table 23. Wattsmart Business Program Cost-Effectiveness Summary of 2019 Evaluated Net Savings

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/ Cost Ratio
PTRC	\$0.0519	\$2,577,765	\$5,861,460	\$3,283,695	2.27
TRC	\$0.0519	\$2,577,765	\$5,328,600	\$2,750,835	2.07
UCT	\$0.0308	\$1,531,637	\$5,328,600	\$3,796,963	3.48
RIM		\$9,400,912	\$5,328,600	(\$4,072,312)	0.57
PCT		\$2,381,330	\$10,958,974	\$8,577,644	4.60
Lifecycle Revenue Impacts (\$/kWh)	\$0.0000492607				
Discounted Participant Payback (years)	2.14				

Conclusions and Recommendations

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

Conclusion

Pacific Power's Wattsmart business program was found to accurately report and document energy savings in California for incentivized projects within each program stratum. Few discrepancies were found within the reported annual energy savings DEER calculation methodologies and reported documentation for all sampled projects were deemed appropriate.

Conclusion

Shifting delivery of technical assistance and application support to the program administrator, Cascade Energy, successfully reduced Pacific Power's administrative burden without disrupting customers' experience. According to interviews with Pacific Power and the program implementers, the transition has allowed Pacific Power staff to focus on initial outreach and relationship management and resulted in more streamlined technical assistance across customers. Participation, in terms of unique customers, remained steady, while savings increased from 2018 to 2019. Survey data, though qualitative, show no indication of any decrease in customer satisfaction.

Conclusion

Pacific Power's Typical Upgrades and Custom Analysis offers continue to provide a broadly satisfactory experience for customers in most aspects. Ease of paperwork was the program component with the lowest number of satisfied participants, at 82%, but this result nevertheless shows that the great majority of participants found the application paperwork to be easy.

Recommendation

Continue to monitor the program administrative systems for potential improvements, such as the ongoing effort to develop an online application portal for participants. Online applications are a best practice for nonresidential incentive programs, by reducing the perceived paperwork burden for participants by auto-populating some fields, keeping all project documents in a single location, and allowing customers to reference the status of their application as it is being processed.

Conclusion

Evidence from nonparticipant surveys indicates that existing delivery channels and marketing strategies may be insufficient to penetrate the majority of Pacific Power's nonresidential customer base. Sixty-eight percent of nonparticipant respondents were not familiar with Wattsmart business incentives (which is similar to the result from the 2016-17 survey, that 76% of respondents were not familiar with Wattsmart offerings.) The majority of these respondents were small commercial-sector businesses (63%) with 10 employees or fewer (76%), which implies that many of them would be eligible for the Small Business Enhanced Lighting incentives. However, the number of unique customers completing Small Business Enhanced projects over the evaluation period was 26, far less than the 131 customers completing lighting projects through the Typical Upgrades and Custom Incentives offerings, despite the higher amount of incentives available. This low penetration may be due in some part to limited

promotion by trade allies. Although interviewed trade allies were very satisfied with Pacific Power offerings and reported they had incorporated it into their regular business model, only seven of 18 registered trade allies were active over the evaluation period.

Recommendation

Continue to expand the number of trade allies promoting the Wattsmart offerings, especially the Small Business Enhanced incentives. Pacific Power has already made progress addressing the trade ally constraint, since the number of participating trade allies in California has increased from 18 in 2019 to 27 at the time of writing. In addition to increasing the number of registered trade allies, Nexant, who administers the Small Business Enhanced incentive program, should consider new approaches to increase the proportion of these participating trade allies that are actively completing projects. One way to do this could be expanding the trade allies participating in the lead generation initiative that Nexant began in 2019. In addition, Nexant should consider developing promotional materials for trade allies, informing them of the positive experiences that active trade allies are having. These materials could include the number and total value of rebated projects, and testimonials about growth in total business, or access to new markets that trade allies have experienced through the program.

Appendix A. PacifiCorp Wattsmart Business Program
(2018-2019) Wattsmart Business Participant Survey

PacifiCorp Wattsmart Business Program 2018 - 2019 Wattsmart Business Participant Survey

Researchable Questions		
Key Research Topics	Areas of Investigation	Related Questions
Screening	Project initiation process	B1
Marketing and Outreach	Program Awareness	A4, A5
Barriers	Obstacles to installing high-efficiency equipment	B2, B13, B17, B18
Satisfaction	Assess satisfaction with Program application process, various program components and reasons for dissatisfaction among participants	B4-B13, B15, B16
Firmographics	Determine building and company characteristics of participants	Section E
Decision Making	Key factors influencing customers' decision to participate in program	B1, B14
Freeridership and Spillover	Assess net savings	Sections C and D

Target Quota = TBD

General Instructions

- This survey is designed for visual presentation online
- Text in red indicates programming instructions that will not be seen by the respondent
- Question numbers will not be seen by the respondent

Variables to be pulled into Survey

- **[PROGRAM NAME]**
- **[UTILITY]**
- **[MEASURE1]**
- **[LTG FLAG]** (indicates a participant that purchased LEDs, but did not purchase controls)
- **[PROGRAM YEAR]**
- **[CONTACT NAME]**
- **[CUSTOMER NAME]**
- **[SITE ADDRESS 1]**
- **[SITE CITY]**
- **[SITE ZIP]**
- **[PROJECT STATE]**
- **[CUSTOMER INCENTIVE]**
- **[BILL_CREDIT]**

Email Invitation

To: [EMAIL]

From: **UTILITY** Feedback

Subject: We're checking in...give us an update on your efficient equipment purchase with a **[UTILITY] Wattsmart Business** rebate

Dear **[CONTACT NAME]**,

We invite you to tell us about your recent experience with **UTILITY's [PROGRAM NAME]** program. Your input is very important to us and will be kept confidential and only used for research purposes. The survey will take 7-10 minutes to complete. As our thanks for completing the survey, eligible respondents will be **entered into a drawing to win one of five \$50 Amazon gift cards**. Your vital feedback will be used to improve our programs for customers like you.

Click the link below to find out if you are eligible:

[auto-generated link]

Or you may copy and paste the URL below into your internet browser: [auto-generated URL]

If you have any questions about this research, or any difficulties taking the survey, please contact Alex Opipari at The Cadmus Group, the national research firm conducting this survey on **[UTILITY'S]** behalf. You can reach Alex at alex.opipari@cadmusgroup.com.

Thank you in advance for sharing your experiences and your time.

Alesha Pino
Sr. Business Specialist
PacifiCorp

Reminder Invitation

To: [EMAIL]

From: **UTILITY** Feedback

Subject: Don't forget to tell **UTILITY** about your **[PROGRAM NAME]** program experience!

Dear **[CONTACT NAME]**,

We recently invited you to tell us about your experience with **UTILITY's [PROGRAM NAME]** program. We would still like to hear from you. Your input is very important to us and will be kept confidential. **Please take 7-10 minutes today to complete the survey.** As our thanks for completing the survey, eligible respondents will be entered into a drawing to win one of five \$50 Amazon gift cards. Your vital feedback will be used to improve our programs for customers like you.

Click the link below to find out if you are eligible:

[auto-generated link]

Or you may copy and paste the URL below into your internet browser: [auto-generated URL]

If you have any questions about this research, or any difficulties taking the survey, please contact Alex Opipari at The Cadmus Group, the national research firm conducting this survey on **[UTILITY'S]** behalf. You can reach Alex at alex.opipari@cadmusgroup.com.

Thank you in advance for sharing your experiences and your time.

Alesha Pino
Sr. Business Specialist
PacifiCorp

Email Invitation – for suggested contacts

To: **[EMAIL]**

From: **UTILITY** Feedback

Subject: We're checking in...give us an update on your efficient equipment purchase with a **[UTILITY] Wattsmart Business** rebate

Dear **[CONTACT NAME]**,

We are reaching out to you based on a referral from **[NAME OF REFERRER]**. We invite you to tell us about your recent experience with **UTILITY's [PROGRAM NAME]** program. Your input is very important to us and will be kept confidential and only used for research purposes. The survey will take 7-10 minutes to complete. As our thanks for completing the survey, eligible respondents will be **entered into a drawing to win one of five \$50 Amazon gift cards**. Your vital feedback will be used to improve our programs for customers like you.

Click the link below to find out if you are eligible:

[auto-generated link]

Or you may copy and paste the URL below into your internet browser: [auto-generated URL]

If you have any questions about this research, or any difficulties taking the survey, please contact Alex Opipari at The Cadmus Group, the national research firm conducting this survey on **[UTILITY'S]** behalf. You can reach Alex at alex.opipari@cadmusgroup.com.

Thank you in advance for sharing your experiences and your time.

Alesha Pino
Sr. Business Specialist
PacifiCorp

Survey Introduction and Screener

[UTILITY-APPROVED LOGO TO APPEAR ON START SCREEN]

Welcome! Thank you for sharing your experience with the [PROGRAM NAME] program, offered by UTILITY.

[TERMINATION MESSAGE] Based on your responses, you are not eligible for this survey. Thank you for your interest in the WattsMart Business program.

[UTILITY] offers a variety of energy efficiency programs that could help you save energy and manage your monthly bills. For more information on other ways to save, please visit [UTILITY].net.

A. Screeners

A1. Before beginning, please verify our program information is correct and you are familiar with the project.

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

A1a. In what year did you install this project? [RECORD CORRECT YEAR : _____]

3. No, wrong address

A1b. What is the correct address? [RECORD CORRECT ADDRESS: fields for street, city, state, zip]

4. No, wrong measure

A1c. What type of equipment did you install or adjust? [CALL THIS VARIABLE C_MEASURE]

1. Lighting

2. New HVAC equipment

3. HVAC equipment scheduling or setpoint changes

4. Ventilation, Motor or Fan

5. Refrigeration

6. Compressed air

7. Irrigation

8. Other equipment

A1d. Can you describe this equipment? [OPEN_ENDED: _____]

5. No, I did not participate [THANK AND TERMINATE]

98. I don't know

A1e. Can you provide the name and email address of the right person to speak to about this project?

1. [First Name] [Last Name] [Email address]
[THANK AND TERMINATE]

A2. 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 or equipment invoice.

1. Yes, I received an incentive

2. No, I did not receive an incentive [THANK AND TERMINATE]

98. I don't know

A2f. Can you provide the name and email address of the right person to speak to about this project?

1. [First Name] [Last Name] [Email address]
[THANK AND TERMINATE]

A3. Great, you are eligible to take this short survey and be entered to win one of five \$50 Amazon gift cards!

This survey will take 7-10 minutes to complete. Your responses will remain confidential and will only be used for research purposes. Be sure to enter your name and address at the end of the survey to enter the drawing.

A4. How did your organization learn about the incentives or discounts available for this project? Please select all that apply and scroll down to see all options. [RANDOMIZE LIST]

1. Contact with Wattsmart Business representative or utility representative

2. Wattsmart Business printed program materials

3. [UTILITY] Website

4. Wattsmart Business sponsored workshop or community event

5. [UTILITY] mailing or bill insert

6. [UTILITY] email

7. Through my electrician or contractor

8. Previously participated and received a [UTILITY] incentive

9. Through a civic organization, trade association or professional organization [SPECIFY:

_____]

10. Through the distributor or supplier where I purchase equipment

11. Word of mouth, family, friend, or business colleague

12. TV or radio advertisement

- 13. Social media or other online advertisement
- 14. Other [SPECIFY: _____]
- 98. I don't know

- A5. **[IF A4≠8]** To your knowledge, had your company participated in a **[UTILITY]** incentive program prior to completing this project?
- 1. Yes
 - 2. No
 - 3. I don't know

B. **Wattsmart Business**

Thank you. This next section will ask you about the process to apply for and receive your incentive.

- B1. Who took the lead role in completing the application paperwork, including any supplemental applications? **[RANDOMIZE LIST; MAINTAIN "OTHER" AND "DON'T KNOW" AT END]**
- 1. Myself or someone else at my company
 - 2. My contractor or installer
 - 3. A Wattsmart Business representative or Energy Engineer
 - 4. My **[UTILITY]** account representative
 - 5. Someone else: [_____]
 - 6. I don't know
- B2. How easy would you say this paperwork was to complete?
- 1. Very easy
 - 2. Somewhat easy
 - 3. Not too easy
 - 4. Not at all easy
 - 98. I was not involved in the paperwork at all

[ASK IF B2=2, 3 OR 4]

- B3. What would have made this paperwork easier to complete?
- 1. [_____]
 - 98. I don't know
- B4. Thinking about the incentive you received for this project, how satisfied were you with the dollar amount of the incentive?
- 1. Very satisfied
 - 2. Somewhat satisfied
 - 3. Not too satisfied

4. Not satisfied at all

98. I don't know the amount of the incentive [SKIP TO B6]

B5. About what percent of the project cost would you estimate was covered by the incentive?

1. [NUMERIC: 0% to 100%] % of the total project cost

98. I don't know

B6. [IF B4=2, 3 OR 4 OR 98] What incentive amount would have been enough for you to say you were very satisfied? Please respond as a percent of the total project cost.

1. [NUMERIC: 0% to 100%] % of the total project cost

98. I don't know

B7. How satisfied were you with the number of weeks from when you submitted a final application to when you received your incentive?

1. Very satisfied

2. Somewhat satisfied

3. Not too satisfied

4. Not satisfied at all

98. I don't know

B8. [IF B7=2, 3 OR 4] How many weeks would be acceptable from when you submit your application to when you receive your incentive?

1. [_Numeric 0-20_] weeks

98. I don't know

Screen Text: Thank you, the next questions will ask you about the implementation of your project.

B9. Who, if anyone, was involved in helping you install the [INSERT MEASURE1 OR C_MEASURE1].

1. A Wattsmart Business program participating vendor

2. My independent contractor [SKIP TO B12]

3. Someone else [SPECIFY: _____] [SKIP TO B12]

98. I don't know [SKIP TO B12]

B10. How satisfied were you with the work provided by the participating vendor that installed the [INSERT MEASURE1 OR C_MEASURE1]?

1. Very satisfied

2. Somewhat satisfied

3. Not too satisfied

4. Not satisfied at all

98. I don't know

B11. **[IF B10=2, 3 or 4]** Why do you say that?

1. **[TEXT: _____]**
98. I don't know

B12. How satisfied are you with the **[MEASURE1 OR C MEASURE1]** you installed?

1. Very satisfied
2. Somewhat satisfied
3. Not too satisfied
4. Not satisfied at all
98. I don't know

B13. **[IF B12=2, 3 or 4]** Why do you say that?

1. **[TEXT: _____]**
98. I don't know

B14. What would you say are the main benefits your company has experienced as a result of the energy-efficient equipment you installed? **Select all that apply. [RANDOMIZE]**

1. Using less energy, reducing energy consumption or energy demand
2. Saving money on our utility bills; lower energy bills
3. Increased occupant comfort
4. Better aesthetics/better or brighter lighting
5. Increased productivity
6. Saving money on maintenance costs
7. Improved equipment function
8. Another benefit: **[_____]**
9. NO BENEFITS **[LOCK OUT OTHER RESPONSES IF SELECTED]**

B15. Thinking about your project overall, how satisfied are you with the Wattsmart Business program?

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

[IF B15=2, 3, OR 4]

B16. Why do you say you were **[INSERT ANSWER FROM B15]** with the Wattsmart Business program?

1. **[SPECIFY: _____]**
98. I don't know

- B17. **[IF LTG FLAG=YES]** In the process of scoping your project, did you consider installing lighting controls?
1. Yes
 2. No
- B18. **[IF LTG FLAG=YES]** Why did you not purchase controls for your lighting equipment?
1. Our company has no need to automate lighting
 2. Controls are too expensive
 3. Didn't know enough about the technology or the options
 4. We already have controls installed
 5. We did purchase controls
 6. Another reason: _____
- B19. Do you have any recommendations to improve the Wattsmart Business program?
- 1.No
 - 2.Yes **[OPEN END TEXT ENTRY]**

C. *Freeridership*

[ASK SECTION C IF PROJECT STATE = WA, UT,WY OR ID; AND IF [PROGRAM YEAR] = 2019] [FORCE RESPONSE TO ALL QUESTIONS]

Thank you. For the next questions, think about the process to identify your project and finalize your decision to purchase the **MEASURE1/C_MEASURE1.**

- C1. 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 Error! Reference source not found.]**
 98. I don't know **[SKIP TO ERROR! REFERENCE SOURCE NOT FOUND.]**
- C2. 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 Error! Reference source not found.]**
 2. No **[SKIP TO Error! Reference source not found.]**
 98. I don't know **[SKIP TO Error! Reference source not found.]**
- C3. Without the program, would you have installed **any [MEASURE_1/C_MEASURE1]?**
1. Yes
 2. No **[SKIP TO Error! Reference source not found.]**
 98. I don't know **[SKIP TO Error! Reference source not found.]**

- C4. 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 Error! Reference source not found.]**
 98. I don't know
- C5. 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. I don't know
- C6. Would you have installed more, less, or the same amount of **[MEASURE_1/C_MEASURE1]** without the program?
1. More
 - C6a. Compared to the installed amount, how much more?
[RECORD PERCENTAGE: _____]
 2. Less
 - C6b. Compared to the installed amount, how much less?
[RECORD PERCENTAGE: _____]
 3. Same amount
 98. I don't know
- C7. 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. I don't know
- C8. 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]**?
- C9. With the Wattsmart Business program, your company received financial incentives of **[CUSTOMER INCENTIVE]** for installing **[MEASURE_1/C_MEASURE1]**.

For the **[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 equipment to install. If a factor is not applicable to you, please say so. **[NOTE: Respondent fills in numeric value (1 to 5) for each of the below six items. Respondents can also state that a particular factor is Not Applicable, please code N/A as 99]**

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

D. Spillover

[ASK SECTION D IF PROJECT STATE = WA, UT,WY OR ID]

The next questions will ask about energy efficiency improvements *other than those* you installed through the program.

- D1. Since participating in this program, have you purchased and installed any additional energy efficiency improvements on your own without any financial assistance from a utility?
1. Yes
 2. No [SKIP TO SECTION E]
 98. I don't know [SKIP TO SECTION E]
- D2. Did you purchase and install any energy efficient improvements that are the **same type** as the [MEASURE_1/C_MEASURE1] you installed through the program?
1. Yes
 2. No [SKIP TO D8]
 98. I don't know [SKIP TO D8]
- D3. How many did you purchase and install?
1. [RECORD RESPONSE]
 98. I don't know
- D4. 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. I don't know
- D5. Did you receive an incentive from [UTILITY] or another organization for this equipment?
1. Yes
 2. No
 98. I don't know

[ASK IF ERROR! REFERENCE SOURCE NOT FOUND.=1]

D6. 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 products.

1. [RECORD RATING: _____]
98. I don't know

[ASK IF ERROR! REFERENCE SOURCE NOT FOUND.=2]

D7. Why did you not apply for an incentive from [UTILITY] for this equipment?

1. [RECORD RESPONSE]
98. I don't know

[ASK ALL]

D8. Since participating in the [PROGRAM NAME] program, did you purchase and install any *other* energy efficiency improvements on your own without any financial or technical assistance from a utility, vendor or other organization?

1. Yes
2. No [SKIP TO SECTION E]
98. I don't know [SKIP TO SECTION E]

D9. What type of equipment did you install? [SELECT ALL THAT APPLY]

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

[ASK Error! Reference source not found..11-Error! Reference source not found..14 AND D10-D14 if D9=1]

ERROR! REFERENCE SOURCE NOT FOUND..11 What type of lighting was purchased and installed without assistance? [MULTIPLE RESPONSE]

1. Decorative LEDs
2. LED wall fixtures
3. General purpose LEDs
4. Pin-based LEDs
5. Reflector/flood LEDs
6. Tubular LEDs
7. Exterior LED wall packs or fixtures
8. Other type [_____]

ERROR! REFERENCE SOURCE NOT FOUND..12 What is the wattage of the lighting?
[SPECIFY]: _____

ERROR! REFERENCE SOURCE NOT FOUND..13 In what location was it installed?

1. Wall
2. Ceiling
3. Outdoors
4. Another location [SPECIFY]: _____
98. I don't know

ERROR! REFERENCE SOURCE NOT FOUND..14 What type of equipment was removed or replaced? [SPECIFY]: _____

[ASK Error! Reference source not found..21-Error! Reference source not found..24 AND D10-D14 if Error! Reference source not found.=2]

ERROR! REFERENCE SOURCE NOT FOUND..21 What type of HVAC equipment was purchased and installed without assistance? [SPECIFY TYPE]: _

ERROR! REFERENCE SOURCE NOT FOUND..22 What Fuel type is used? [SPECIFY]: _____

ERROR! REFERENCE SOURCE NOT FOUND..23 What is the efficiency rating of the equipment? This will be the HSPF or SEER or ER rating of the equipment. [SPECIFY]: _____

ERROR! REFERENCE SOURCE NOT FOUND..24 What is the capacity of the equipment in tons? [SPECIFY]: _____

[ASK Error! Reference source not found..31-Error! Reference source not found..34 AND D10-D14 if Error! Reference source not found.=3]

ERROR! REFERENCE SOURCE NOT FOUND..31 What type of water heating equipment was purchased and installed without assistance? (For example: storage tank, tankless, heat pump, point-of-use, etc.) **[SPECIFY TYPE]:** _____

ERROR! REFERENCE SOURCE NOT FOUND..32 What Fuel type is used? **[SPECIFY]:** _____

ERROR! REFERENCE SOURCE NOT FOUND..33 What is the efficiency rating of the equipment? (This should be an energy factor, such as .62 EF, or 2.6 EF) **[SPECIFY]:** _____

ERROR! REFERENCE SOURCE NOT FOUND..34 33 If a water heater with storage, what is the equipment capacity in gallons? **[SPECIFY]:** _____

[ASK Error! Reference source not found..41-Error! Reference source not found..42 AND D10-D14 if Error! Reference source not found.=4]

ERROR! REFERENCE SOURCE NOT FOUND..41 What type of motor was the VFD installed on? **[SPECIFY TYPE]:** _____

ERROR! REFERENCE SOURCE NOT FOUND..42 What is the horsepower of the motor? **[SPECIFY]:** _____

[ASK Error! Reference source not found..51-Error! Reference source not found..52 AND D10-D14 if Error! Reference source not found.=5]

ERROR! REFERENCE SOURCE NOT FOUND..51 What equipment was the motor installed on? **[SPECIFY TYPE]:** _____

ERROR! REFERENCE SOURCE NOT FOUND..52 What is the horsepower of the motor? **[SPECIFY]:** _____

[ASK Error! Reference source not found..61 AND D10-D14 if Error! Reference source not found.=6]

ERROR! REFERENCE SOURCE NOT FOUND..61 What type of refrigeration or freezer equipment did you install without assistance? **[SPECIFY TYPE]:** _____

[ASK Error! Reference source not found..71-Error! Reference source not found..72 AND D10-D14 if Error! Reference source not found.=7]

ERROR! REFERENCE SOURCE NOT FOUND..71 What is the efficiency R-value of the insulation measure? **[SPECIFY]:** _____

ERROR! REFERENCE SOURCE NOT FOUND..72 In what location was it installed Wall/Roof/Floor? **[SPECIFY]:** _____

[ASK Error! Reference source not found..81-Error! Reference source not found..82 AND D10-D14 if Error! Reference source not found.=8]

ERROR! REFERENCE SOURCE NOT FOUND..81 For what type of application was the compressed air equipment purchased and installed (production line, etc)? **[SPECIFY APPLICATION]:** _____

ERROR! REFERENCE SOURCE NOT FOUND..82 What is the horsepower of the compressor motor? **[SPECIFY]:** _____

[ASK Error! Reference source not found..91-Error! Reference source not found..92 AND D10-D14 if Error! Reference source not found.=9]

ERROR! REFERENCE SOURCE NOT FOUND..91 FOR What type of application was the chiller purchased and installed (commercial building, etc)? **[SPECIFY APPLICATION]:** _____

ERROR! REFERENCE SOURCE NOT FOUND..92 What size chiller did you install? **[SPECIFY]:** _____ (tons)

[ASK Error! Reference source not found..101-Error! Reference source not found..103 AND D10-D14 if Error! Reference source not found.=10]

ERROR! REFERENCE SOURCE NOT FOUND..101 FOR What type of application was the pump purchased and installed (HVAC, etc)? **[SPECIFY APPLICATION]:** _____

ERROR! REFERENCE SOURCE NOT FOUND..102 What is the horsepower of the motor for the pump? **[SPECIFY]** _____

ERROR! REFERENCE SOURCE NOT FOUND..103 What is the efficiency rating of the pump? **[SPECIFY]:** _____ (%)

[ASK Error! Reference source not found..111 AND D10-D14 if Error! Reference source not found.=11]

ERROR! REFERENCE SOURCE NOT FOUND..111 What irrigation equipment did you purchase and install without assistance? **[SPECIFY GASKETS, DRAINS, SPRINKLERS, ETC.]:** _____

[ASK IF D9=1-12] [ASK ABOUT EACH ITEM MENTIONED IN ERROR! REFERENCE SOURCE NOT FOUND.]

D10. In regard to the **[D9 TEXT]**, how many did you purchase and install? **[ASK FOR EACH MEASURE MENTIONED IN Error! Reference source not found.] [IF Error! Reference source not found. MEASURE = 'BUILDING ENVELOPE' THEN ASK HOW MANY 'SQUARE FEET']**

1. **[RECORD RESPONSE]**
98. I don't know

[ASK IF ERROR! REFERENCE SOURCE NOT FOUND.=1-12] [ASK ABOUT EACH ITEM MENTIONED IN ERROR! REFERENCE SOURCE NOT FOUND.]

D11. Just to confirm, did you receive an incentive from **[UTILITY]** or another organization for this equipment? **[ASK FOR EACH MEASURE MENTIONED IN Error! Reference source not found.]**

1. Yes
2. No
98. I don't know

[ASK FOR EACH YES IN D11]

D12. What utility or organization provided the incentive? **[ASK FOR EACH MEASURE MENTIONED IN Error! Reference source not found.]**

1. **[RECORD UTILITY OR ORGANIZATION]**
98. I don't know

[ASK IF ERROR! REFERENCE SOURCE NOT FOUND.=1-12] [ASK ABOUT EACH ITEM MENTIONED IN ERROR! REFERENCE SOURCE NOT FOUND.]

D13. What information did you rely upon to determine that the equipment installed was energy efficient? **[ASK FOR EACH MEASURE MENTIONED IN Error! Reference source not found.]**

1. **[RECORD RESPONSE]**
98. I don't know

[ASK IF ERROR! REFERENCE SOURCE NOT FOUND.=1-12] [ASK ABOUT EACH ITEM MENTIONED IN ERROR! REFERENCE SOURCE NOT FOUND.]

D14. 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 products. **[ASK FOR EACH MEASURE MENTIONED IN Error! Reference source not found.]**

1. **[RECORD RATING: _____]**
98. I don't know

[ASK SECTION E TO ALL SURVEY RESPONDENTS]

E. Firmographics

These final questions will help us understand your business.

- E1. What industry is your company in?
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. Something else [SPECIFY: _____]
 98. I prefer not to answer
- E2. How many people are employed by your company at all locations in [PROJECT STATE]?
1. None
 2. 1-10
 3. 11-25
 4. 26-50
 5. 51-75
 6. 76-100
 7. 101-200
 8. 201-500
 9. More than 500
 10. I don't know
 11. I prefer not to answer

- E3. What type of fuel is used for space heating at your facility?
1. Electric
 2. Gas
 3. Another fuel [SPECIFY: _____]
 4. I don't know

- E4. What type of fuel is used for water heating at your facility?
1. Electric
 2. Gas
 3. Another fuel [SPECIFY: _____]
 4. I don't know

F. Closing

- F1. Please provide the following information to be entered into a drawing to win one of five \$50 Amazon gift cards.
1. Name:
 2. Address:
 3. Address 2:
 4. City:
 5. State:
 6. Zip:
 7. Email:

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

Appendix B. PacifiCorp Wattsmart Business Program (2018-2019) Nonparticipant/Partial Participant Survey

PacifiCorp Wattsmart Business Program (2018-2019) Nonparticipant/Partial Participant Phone 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: up to 200 for each state

Partial Participants: up to 50 for each state

Partial participants: (See quota tab in Partial Participants 2018-2019 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 your company? [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 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. How are you doing today? I'm calling because we are conducting an important survey today about [UTILITY]'s Wattsmart Business Program. [UTILITY] is actively seeking your opinions to help improve their energy efficiency incentive programs and to better understand how to assist customers in saving money and energy. **THIS CALL WILL TAKE ABOUT FIVE MINUTES.** So you are aware, this call may be monitored or recorded for quality assurance purposes. Anything you share with us today will be kept confidential and anonymous. Is that alright?
1. [IF RESPONDENT ASKS HOW LONG, SAY "Approximately 5 minutes."]
 2. [IF NEEDED, STATE "This survey is for research purposes only and 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 [Alesha Pino, 801-220-2656]

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. 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 2018 or 2019? 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 Business printed program materials)
 3. **[(UTILITY) Website]**
 4. (Wattsmart Business sponsored workshop or community event)
 5. **[(UTILITY) mailing or bill insert]**
 6. **[(UTILITY) email]**
 7. (Through my electrician or contractor)
 8. (Previously participated in program/received an incentive)
 9. (Through a trade association or professional organization) **[SPECIFY: _____]**
 10. (Through a vendor, distributor or supplier where I purchase lighting)
 11. (Word of mouth (family, friend, or business colleague))
 12. (TV or radio advertisement)
 13. (Social media or other online advertisement)
 14. (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 or utility representative)
 2. (Wattsmart Business printed program materials)
 3. (**[UTILITY]** Website)
 4. (Wattsmart Business sponsored workshop or event)
 5. (**[UTILITY]** mailing or bill insert,)
 6. (**[UTILITY email]**)
 7. (I contacted my contractor/vendor to ask)
 8. (My contractor/vendor let me know about them)
 9. (Previously participated in program/received an incentive)
 10. (Through a trade association or professional organization) **[SPECIFY: _____]**)
 11. (Word of mouth (family, friend, or business colleague)
 12. (TV or radio advertisement)
 13. (Social media or other online advertisement)
 14. (Other **[SPECIFY: _____]**)
 98. (Don't know)
 99. (Refused)

[ASK IF C1=1-10 OR 98 OR 99, OR IF C3=1-11 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 or website)
 3. (Wattsmart sponsored workshop or community event)
 4. (Utility mailing, email, newsletter with bill, bill insert,)
 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, Instagram, 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 short 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 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 2018 or 2019, did you purchase and install any energy efficiency improvements on your own without any financial assistance from a utility?

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 without assistance?

1. (Lighting) **[SPECIFY TYPE EXAMPLE: LED,]:** _____
 - 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? This will be the HSPF or SEER or EER rating of the equipment. **[SPECIFY]:** _____
 - d. What is the equipment's rated capacity in tons **[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 Frequency Drives (VFDs))
 - 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. [Question Deleted]

[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 How important was general information about energy efficiency provided by **[UTILITY]** ____ on your decision to purchase these improvements?

[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 your rating for the importance of general energy efficiency information provided by **[UTILITY]** differ for any specific improvements you mentioned?

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

E5.1b **[ASK IF E5.1A=1]** For which of the following improvements would you rate the importance of general energy efficiency information differently, and what would be your rating? **[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 Thank you. Now, how important was product 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 specific improvements you mentioned?

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

E5.2b **[ASK IF E5.2A = 1]** For which of the following improvements would you rate the importance of information from **[UTILITY]** program staff or contractors differently, and what would be your rating? **[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 How important was your past experience with a **[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 specific improvements you mentioned?

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

E5.3b **[ASK IF E5.3A = 1]** For which of the following improvements would you rate the importance of your past experience with a **[UTILITY]** energy efficiency program differently? **[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, Lodging)
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. **[Question removed]**

- F3. How many people are employed by your company at all locations?
1. (None)
 2. (1-10)
 3. (11-25)
 4. (26-50)
 5. (51-75)
 6. (76-100)
 7. (101-200)
 8. (201-500)
 9. (More than 500)
 10. (Other) [RECORD VERBATIM: _____]
 98. (Don't know)
 99. (Refused)
- F4. 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)
- F5. 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-ERROR! REFERENCE SOURCE NOT FOUND.] [NONPARTICIPANTS GO TO ERROR! REFERENCE SOURCE NOT FOUND.]

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)

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 C. Measure Category Cost-Effectiveness

Completed at the measure-category level, cost-effectiveness was reported for evaluated net savings. Net results apply the evaluated NTG to evaluated gross savings. Table C-1 shows cost-effectiveness inputs for net results.

Guidehouse, Pacific Power’s cost-effectiveness consultant, organized its cost-effectiveness inputs at the measure category level. These measure categories informed the program strata that Cadmus created for this report. The leftmost column of the table indicates the measure category and its designated strata in parentheses.

Table C-1. California Wattsmart Business End-Use Category Cost-Effectiveness Inputs

Input Description	2018	2019	Total*
Average Measure Life			
Building Shell (Other)	15.0	15.0	15.0
Compressed Air (Other)	N/A	13.0	13.0
Energy Management (Energy Management)	3.0	3.0	3.0
Farm & Dairy (Agricultural)	N/A	11.0	11.0
Food Service Equipment (Other)	12.0	N/A	12.0
HVAC (Other)	15.0	15.0	15.0
Irrigation (Agricultural)	12.0	12.0	12.0
Lighting (Lighting)	14.0	14.0	14.0
Motors (Other)	N/A	8.0	8.0
Refrigeration (Other)	N/A	15.0	15.0
Evaluated Net Energy Savings (kWh/year)**			
Building Shell (Other)	43	38	81
Compressed Air (Other)	0	9,161	9,161
Energy Management (Energy Management)	137,254	272,849	410,103
Farm & Dairy (Agricultural)	0	18,031	18,031
Food Service Equipment (Other)	1,251	0	1,251
HVAC (Other)	238,992	3,915	242,908
Irrigation (Agricultural)	425,684	415,506	841,191
Lighting (Lighting)	2,270,847	4,272,605	6,543,452
Motors (Other)	0	3,580	3,580
Refrigeration (Other)	0	59,033	59,033
Total Utility Cost (including incentives)***			
Building Shell (Other)	\$91.11	\$78.00	\$169.12
Compressed Air (Other)	\$0.00	\$2,712.14	\$2,712.14
Energy Management (Energy Management)	\$11,098.96	\$54,212.51	\$65,311.47
Farm & Dairy (Agricultural)	\$0.00	\$1,367.74	\$1,367.74
Food Service Equipment (Other)	\$286.26	\$0.00	\$286.26
HVAC (Other)	\$53,346.12	\$1,665.94	\$55,012.06
Irrigation (Agricultural)	\$205,600.56	\$203,174.00	\$408,774.56

Input Description	2018	2019	Total*
Lighting (Lighting)	\$822,505.65	\$1,255,826.82	\$2,078,332.48
Motors (Other)	\$0.00	\$917.26	\$917.26
Refrigeration (Other)	\$0.00	\$11,682.61	\$11,682.61
Incentives			
Building Shell (Other)	\$83.98	\$73.95	\$157.93
Compressed Air (Other)	\$0.00	\$1,620.45	\$1,620.45
Energy Management (Energy Management)	\$4,088.08	\$8,126.76	\$12,214.84
Farm & Dairy (Agricultural)	\$0.00	\$1,030.00	\$1,030.00
Food Service Equipment (Other)	\$80.00	\$0.00	\$80.00
HVAC (Other)	\$13,937.50	\$1,250.00	\$15,187.50
Irrigation (Agricultural)	\$68,485.75	\$73,739.64	\$142,225.39
Lighting (Lighting)	\$383,265.17	\$705,424.70	\$1,088,689.87
Motors (Other)	\$0.00	\$360.00	\$360.00
Refrigeration (Other)	\$0.00	\$10,441.65	\$10,441.65
Commercial Retail Rate (\$/kWh)	\$0.1487	\$0.1492	N/A
Industrial Retail Rate (\$/kWh)	\$0.1128	\$0.1123	N/A
Irrigation Retail Rate (\$/kWh)	\$0.1497	\$0.1526	N/A

*Totals may not sum due to rounding.

**Evaluated savings reflect impacts at the customer meter.

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

Building Shell

Table C-2 and Table C-3 show the building shell measure category cost-effectiveness results for net evaluated savings. The building shell measure category was not cost-effective from any test perspective.

Table C-2. California Building Shell 2018 Net

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	\$0.561	\$57	\$263	(\$206)	0.22
TRC	\$0.561	\$52	\$263	(\$211)	0.20
UCT	\$0.194	\$52	\$91	(\$40)	0.57
RIM		\$52	\$166	(\$114)	0.31
PCT		\$184	\$341	(\$157)	0.54
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000000098
Discounted Participant Payback (years)					N/A

Table C-3. California Building Shell 2019 Net

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	\$0.554	\$50	\$229	(\$179)	0.22
TRC	\$0.554	\$46	\$229	(\$184)	0.20
UCT	\$0.189	\$46	\$78	(\$32)	0.59
RIM		\$46	\$144	(\$99)	0.32
PCT		\$162	\$300	(\$138)	0.54
Lifecycle Revenue Impacts (\$/kWh)	\$0.0000000084				
Discounted Participant Payback (years)	N/A				

Compressed Air

Table C-4 shows the compressed air measure category cost-effectiveness results for net evaluated savings. The compressed air measure category proved cost-effective from all perspectives except for the RIM.

Table C-4. California Compressed Air 2019 Net

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	\$0.058	\$10,670	\$5,172	\$5,498	2.06
TRC	\$0.058	\$9,700	\$5,172	\$4,528	1.88
UCT	\$0.030	\$9,700	\$2,712	\$6,988	3.58
RIM		\$9,700	\$13,475	(\$3,776)	0.72
PCT		\$15,972	\$5,440	\$10,532	2.94
Lifecycle Revenue Impacts (\$/kWh)	\$0.0000003726				
Discounted Participant Payback (years)	3.86				

Energy Management

Table C-5 and Table C-6 show the energy management measure category cost-effectiveness results for net evaluated savings. The energy management measure category proved cost-effective from all perspectives except for the RIM.

Table C-5. California Energy Management 2018 Net

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	\$0.028	\$39,827	\$10,517	\$29,310	3.79
TRC	\$0.028	\$36,206	\$10,517	\$25,689	3.44
UCT	\$0.029	\$36,206	\$11,099	\$25,107	3.26
RIM		\$36,206	\$71,548	(\$35,341)	0.51
PCT		\$94,310	\$5,233	\$89,077	18.02
Lifecycle Revenue Impacts (\$/kWh)	\$0.0000151510				
Discounted Participant Payback (years)	0.05				

Table C-6. California Energy Management 2019 Net

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	\$0.071	\$78,867	\$53,055	\$25,812	1.49
TRC	\$0.071	\$71,697	\$53,055	\$18,642	1.35
UCT	\$0.072	\$71,697	\$54,213	\$17,485	1.32
RIM		\$71,697	\$148,913	(\$77,215)	0.48
PCT		\$149,471	\$10,402	\$139,068	14.37
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000330854
Discounted Participant Payback (years)					0.07

Farm & Dairy

Table C-7 shows the farm & dairy measure category cost-effectiveness results for net evaluated savings. The farm & dairy measure category proved cost-effective from all perspectives except for the RIM.

Table C-7. California Farm & Dairy 2019 Net

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	\$0.034	\$18,673	\$5,226	\$13,447	3.57
TRC	\$0.034	\$16,975	\$5,226	\$11,750	3.25
UCT	\$0.009	\$16,975	\$1,368	\$15,608	12.41
RIM		\$16,975	\$26,114	(\$9,139)	0.65
PCT		\$38,525	\$7,406	\$31,119	5.20
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000010673
Discounted Participant Payback (years)					2.39

Food Service Equipment

Table C-8 shows the food service equipment measure category cost-effectiveness results for net evaluated savings. The food service equipment measure category proved cost-effective from all perspectives except for the RIM.

Table C-8. California Food Service Equipment 2018 Net

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	\$0.024	\$1,335	\$279	\$1,056	4.79
TRC	\$0.024	\$1,214	\$279	\$935	4.36
UCT	\$0.025	\$1,214	\$286	\$927	4.24
RIM		\$1,214	\$2,117	(\$904)	0.57
PCT		\$2,521	\$97	\$2,425	26.12
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000000969
Discounted Participant Payback (years)					0.09

HVAC

Table C-9 and Table C-10 show the HVAC measure category cost-effectiveness results for net evaluated savings. The HVAC measure category proved cost-effective from all perspectives except for the RIM.

Table C-9. California HVAC 2018 Net

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	\$0.031	\$309,119	\$79,490	\$229,628	3.89
TRC	\$0.031	\$281,017	\$79,490	\$201,526	3.54
UCT	\$0.021	\$281,017	\$53,346	\$227,671	5.27
RIM		\$281,017	\$466,424	(\$185,407)	0.60
PCT		\$564,708	\$53,443	\$511,265	10.57
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000158620
Discounted Participant Payback (years)					1.09

Table C-10. California HVAC 2019 Net

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	\$0.076	\$5,152	\$3,228	\$1,924	1.60
TRC	\$0.076	\$4,684	\$3,228	\$1,456	1.45
UCT	\$0.039	\$4,684	\$1,666	\$3,018	2.81
RIM		\$4,684	\$8,456	(\$3,772)	0.55
PCT		\$10,304	\$3,750	\$6,554	2.75
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000003220
Discounted Participant Payback (years)					4.51

Irrigation

Table C-11 and Table C-12 show the irrigation measure category cost-effectiveness results for net evaluated savings. The irrigation measure category proved cost-effective from all perspectives except for the RIM.

Table C-11. California Irrigation 2018 Net

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	\$0.076	\$476,493	\$298,287	\$178,207	1.60
TRC	\$0.076	\$433,176	\$298,287	\$134,889	1.45
UCT	\$0.053	\$433,176	\$205,601	\$227,575	2.11
RIM		\$433,176	\$832,873	(\$399,697)	0.52
PCT		\$1,018,898	\$244,200	\$774,698	4.17
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000428436
Discounted Participant Payback (years)					2.81

Table C-12. California Irrigation 2019 Net

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	\$0.071	\$497,924	\$277,871	\$220,053	1.79
TRC	\$0.071	\$452,658	\$277,871	\$174,787	1.63
UCT	\$0.052	\$452,658	\$203,174	\$249,484	2.23
RIM		\$452,658	\$844,357	(\$391,698)	0.54
PCT		\$1,045,228	\$224,905	\$820,324	4.65
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000419042
Discounted Participant Payback (years)					2.42

Lighting

Table C-13 and Table C-14 show the lighting measure category cost-effectiveness results for net evaluated savings. The lighting measure category proved cost-effective from all perspectives except for the RIM.

Table C-13. California Lighting 2018 Net

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	\$0.046	\$2,732,193	\$1,092,013	\$1,640,181	2.50
TRC	\$0.046	\$2,483,812	\$1,092,013	\$1,391,800	2.27
UCT	\$0.034	\$2,483,812	\$822,506	\$1,661,307	3.02
RIM		\$2,483,812	\$4,278,252	(\$1,794,440)	0.58
PCT		\$4,757,628	\$826,294	\$3,931,334	5.76
Lifecycle Revenue Impacts (\$/kWh)					\$0.0001646400
Discounted Participant Payback (years)					1.43

Table C-14. California Lighting 2019 Net

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	\$0.050	\$5,172,814	\$2,208,163	\$2,964,652	2.34
TRC	\$0.050	\$4,702,559	\$2,208,163	\$2,494,396	2.13
UCT	\$0.029	\$4,702,559	\$1,255,827	\$3,446,732	3.74
RIM		\$4,702,559	\$8,241,624	(\$3,539,066)	0.57
PCT		\$9,548,206	\$2,098,431	\$7,449,775	4.55
Lifecycle Revenue Impacts (\$/kWh)					\$0.0003239507
Discounted Participant Payback (years)					2.22

Motors

Table C-15 shows the motors measure category cost-effectiveness results for net evaluated savings. The motors measure category proved cost-effective from all perspectives except for the RIM.

Table C-15. California Motors 2019 Net

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	\$0.045	\$2,658	\$1,076	\$1,582	2.47
TRC	\$0.045	\$2,416	\$1,076	\$1,341	2.25
UCT	\$0.039	\$2,416	\$917	\$1,499	2.63
RIM		\$2,416	\$3,770	(\$1,353)	0.64
PCT		\$4,163	\$691	\$3,472	6.02
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000002176
Discounted Participant Payback (years)					0.81

Refrigeration

Table C-16 shows the refrigeration measure category cost-effectiveness results for net evaluated savings. The refrigeration measure category proved cost-effective from all perspectives except for the RIM.

Table C-16. California Refrigeration 2019 Net

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	\$0.037	\$74,651	\$23,745	\$50,907	3.14
TRC	\$0.037	\$67,865	\$23,745	\$44,120	2.86
UCT	\$0.018	\$67,865	\$11,683	\$56,182	5.81
RIM		\$67,865	\$114,059	(\$46,194)	0.59
PCT		\$146,943	\$30,005	\$116,938	4.90
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000039431
Discounted Participant Payback (years)					2.23