



2014–2015 Wyoming *wattsmart* Business Program Evaluation

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Glossary of Terms

Custom Energy Savings Calculation Methodology

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

Deemed Energy Savings Calculation Methodology

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

Demand Side Management Central

Demand Side Management Central (DSMC) is Rocky Mountain 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 Gross Savings

Evaluated gross savings represent the total program savings, based on the validated savings and installations, before adjusting for behavioral effects such as freeridership or spillover. They are most often calculated for a given measure 'i' as:

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

Evaluated Net Savings

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

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

Freeridership

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

Gross Realization Rate

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



In-Service Rate

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

Net-to-Gross

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

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

Prescriptive Energy Savings Calculation Methodology

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

Spillover

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

T-Test

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

Technical Resource Library

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

Trade Ally

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

Verification Engineer

Verification engineers are third parties hired to verify project savings.

Executive Summary

Through its **wattsmart**® Business Program, Rocky Mountain Power (RMP) offers incentives to commercial, industrial, and agricultural customers to facilitate their purchases of energy-efficient products and services through midstream (distributors/suppliers) and downstream (customer) incentive mechanisms. During the 2014 and 2015 program years, the **wattsmart** Business Program reported gross electricity savings of 30,493,215 kWh in Wyoming.

RMP contracted with the Cadmus team (composed of The Cadmus Group, ADM Associates, and VuPoint Research) to conduct impact and process evaluations of the Wyoming **wattsmart** Business Program for program years 2014 and 2015. Cadmus subcontracted a portion of the impact evaluation to ADM Associates, and VuPoint Research performed the telephone surveys. For the impact evaluation, the team assessed gross and net energy impacts and program cost-effectiveness. For the process evaluation, the team assessed program delivery and efficacy, bottlenecks, barriers, and opportunities for improvements. Further, the team evaluated downstream delivery channels, encompassing energy efficiency measures and services in three delivery channels:

- **Small Business Lighting (SBL):** RMP provided a free facility assessment and incentives for small business customers that made upgrades (e.g., T5 and T8 fluorescent lamps and ballasts, lighting controls and LED exit signs, or existing interior lighting systems). A network of program-approved trade allies delivered SBL. RMP transitioned SBL to a new administrative model in 2016, reintroducing it on November 1, 2016, as the Small Business Direct Install channel, which RMP offered to small business customers on specific rate schedules and in geo-targeted locations.
- **Typical Upgrades (also known as Prescriptive Measures):** RMP provided customers with prescriptive incentives for lighting, HVAC, compressed air, motors and variable frequency drives (VFDs), green motor rewinds, building envelopes, food service, appliances, office, farm and dairy, wastewater, and other refrigeration, and irrigation equipment and measures as well as refrigerator and freezer recycling.
- **Custom Analysis:** RMP provided customer incentives for first-year energy savings resulting from specialized, preapproved, capital equipment upgrades not covered by the Typical Upgrades incentives.

Key Findings

Key Impact Evaluation Findings

For the impact evaluation, the Cadmus team analyzed 77 projects that contributed 50% of the 2014 and 2015 program savings. Table 1 summarizes the evaluation findings (e.g., the number of unique projects, gross savings, net savings, and precision). Overall, the two years exhibited a gross realization rate of 109%, though variability occurred between measure categories. The team calculated the net-to-gross (NTG) as 70%, yielding evaluated net savings of 23,267,714 kWh. Overall, the impact evaluation



achieved $\pm 14.5\%$ precision with 90% confidence. This report’s Evaluated Gross Savings Results by Strata provides specific details and findings per strata. Two strata—lighting and motor systems—accounted for 90% of energy savings in Wyoming. The following bullet points describe the key findings for those strata:

- Motor systems accounted for 58% of all reported energy savings in Wyoming. The Cadmus team evaluated 26 projects, resulting in a 111% realization rate within the motor systems strata. The team found significant variations in the realization rates for motor projects: 20 evaluated projects showed realization rates above 120% or below 80%. Evaluation site visits did not find any installed green motor rewind projects, and the deemed value used for HVAC VFD projects was lower than the evaluation value. Process motor projects also experienced great variation due to changes in load and operating hours.
- Lighting projects make up the second highest strata, producing 32% of all reported energy savings. The Cadmus team evaluated 19 lighting projects, accounting for 11% of reported energy savings within the lighting strata, and resulting in a 106% realization rate. Differences in savings resulted from discrepancies in fixture quantities or claimed hours of use (HOU).

Table 1. 2014 and 2015 wattsmart Business Program Savings*

Strata	Unique Projects	Reported Gross Savings (kWh)	Evaluated Gross Savings (kWh)	Gross Realization Rate	Precision**	NTG	Evaluated Net Savings (kWh)
Lighting	518	9,830,527	10,406,604	106%	15.1%	70%	7,284,623
HVAC	17	1,050,184	951,655	91%	2.5%		666,159
Refrigeration	10	198,976	241,770	122%	4.0%		169,239
Motor Systems	155	17,626,840	19,501,759	111%	21.1%		13,651,231
Compressed Air	3	671,228	726,909	108%	N/A		508,836
Agricultural	19	204,015	501,636	246%	27.6%		351,145
Other	26	911,445	909,259	100%	13.4%		636,481
Total	748	30,493,215	33,239,591	109.0%	14.5%		70%

*Totals may not sum due to rounding.

**Measure category precision is based on 80% confidence. Portfolio precision is based on 90% confidence.

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

Table 2. 2014 wattsmart Business Program Savings*

Strata	Unique Projects	Reported Gross Savings (kWh)	Evaluated Gross Savings (kWh)	Gross Realization Rate	NTG	Evaluated Net Savings (kWh)
Lighting	225	4,275,092	4,525,616	106%	70%	3,167,931
HVAC	7	258,207	233,982	91%		163,787
Refrigeration	3	3,912	4,753	122%		3,327
Motor Systems	66	4,108,306	4,545,295	111%		3,181,707
Compressed Air	2	360,719	390,642	108%		273,449
Agricultural	10	62,888	154,630	246%		108,241
Other	7	282,650	281,972	100%		197,380
Total	320	9,351,774	10,136,891	108.4%	70%	7,095,824

*Totals may not sum due to rounding.

Table 3. 2015 wattsmart Business Program Savings*

Strata	Unique Projects	Reported Gross Savings (kWh)	Evaluated Gross Savings (kWh)	Gross Realization Rate	NTG	Evaluated Net Savings (kWh)
Lighting	293	5,555,435	5,880,988	106%	70%	4,116,692
HVAC	10	791,977	717,673	91%		502,371
Refrigeration	7	195,064	237,016	122%		165,911
Motor Systems	89	13,518,534	14,956,464	111%		10,469,525
Compressed Air	1	310,509	336,267	108%		235,387
Agricultural	9	141,127	347,005	246%		242,904
Other	19	628,795	627,287	100%		439,101
Total	428	21,141,441	23,102,701	109.3%	70%	16,171,890

*Totals may not sum due to rounding.

Key Process Evaluation Findings

The key process evaluation findings follow below (more nuanced descriptions of these key findings can be found in this report’s Process Evaluation section of this report):

- A high percentage of participants (from 82% up to 100%) in the three program delivery channels (SBL, Typical Upgrades, and Custom Analysis) reported being very satisfied with the work provided by their contractors, vendors, energy engineers, or contacts with RMP staff. With regards to equipment satisfaction, participants in the Typical Upgrades channel (93%, n=27) and the SBL channel (100%, n=6) also reported being very satisfied with the equipment they installed. The Cadmus team did not ask Custom Analysis participants to rate their satisfaction with equipment installed. Regarding satisfaction with the incentive levels, all six SBL participants were very satisfied, but participants in the Typical Upgrades and Custom Analysis channels were somewhat less satisfied (75%, n=28; and 67%, n=12, respectively). The Satisfaction sections of each program delivery channel provide details for each rating.



- Seventy-two percent (n=46) of participants in the SBL, Typical Updates, and Custom Analysis delivery channels said they received one or more benefits from the program. Each group reported better lighting quality as their first or second most frequently reported benefit. Participants in both SBL and Typical Upgrades reported lower bills as their second most frequent benefit, and Custom Analysis participants reported increased productivity as their second most common benefit.
- While 57% of Typical Upgrades customers and 40% of SBL customer preferred to receive program updates from **wattsmart** Business Program representatives, these customer-stated preferences do not align with the most cost-effective program design for these channels: interaction with contractors/vendors. The large majority, however, of all customers in the **wattsmart** Business Program reported learning about available incentives through their contractors/vendors.
- Of the three delivery channels, participants in the Custom Analysis delivery channel appeared least familiar with the **wattsmart** Business Program name.
- Participants in each program delivery channel reported some challenges with program processes and tools. SBL participants reported the fewest, but participant challenges increased with the Typical Upgrades channel, and increased further with the Custom Analysis channel. One SBL participant described the difficulty of paying upfront project costs while waiting for the incentives to arrive. Participants in Typical Upgrades and Custom Analysis cited challenges in working with their contractors and with the application and verification processes (e.g., documenting energy use before and after the equipment installation; receiving less of an incentive than expected; understanding what paperwork participants were required to provide; understanding how to use program tools). The Benefits and Challenges section of each program delivery channel presents more detailed information.
- Typical Upgrades delivery channel participants reported very high satisfaction levels with the timeframe in which they received their incentive checks, provided their incentive arrived within six weeks or less (65% received checks within this timeframe [n=20]).
- Custom Analysis channel participants reported very high satisfaction levels with timeframes when their incentive checks arrived within three weeks or less. Custom Analysis participant satisfaction declined as timeframes extended beyond three weeks, although 50% of participants receiving incentive checks in seven to eight weeks still reported satisfaction. Eighty-nine percent received their checks in eight weeks or less (n=9).
- Nonparticipants and partial participants reported low awareness of the **wattsmart** Business Program's name (30%, n=87). These customers most frequently learned of the program through a RMP mailing/bill insert, the website, or word of mouth. Additionally, nonparticipants' attitudes about making energy efficiency improvements indicated opportunities for RMP to engage a portion of these customers in making energy efficiency upgrades. In assessing nonparticipants' reasons for not using the **wattsmart** Business Program, the Cadmus team found these

customers primarily did not use the program as they did not know enough about it or its benefits.

- The two program implementers maintained separate databases, from which they reviewed and uploaded projects to RMPs project database, Demand Side Management Central (DSMC), and they processed applications on a weekly basis. For DSMC’s acceptance, inputs of measure names, project savings, and incentive amounts had to be error free. RMP and program implementers reported that their data exchange requires further streamlining as it is not yet error free.

Cost-Effectiveness Results

As shown in Table 4, the program proved cost-effective in the 2014 and 2015 evaluation years from all test perspectives, except for the Ratepayer Impact Measure (RIM) test. The program was cost-effective from the Total Resource Cost (TRC) Test perspective, with a benefit/cost ratio of 1.56.

Table 4. 2014–2015 Evaluated Net wattsmart Business Program Cost-Effectiveness Summary

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PacifiCorp Total Resource Cost Test (PTRC) (TRC + 10% Conservation Adder)	\$0.044	\$10,193,966	\$17,450,979	\$7,257,013	1.71
Total Resource Cost Test (TRC) No Adder	\$0.044	\$10,193,966	\$15,864,527	\$5,670,561	1.56
Utility Cost Test (UCT)	\$0.032	\$7,439,879	\$15,864,527	\$8,424,647	2.13
Ratepayer Impact Measure (RIM) Test		\$25,014,552	\$15,864,527	(\$9,150,025)	0.63
Participant Cost Test (PCT)		\$9,466,867	\$28,979,396	\$19,512,529	3.06
Lifecycle Revenue Impacts (\$/kWh)				\$0.000073498	
Discounted Participant Payback (years)					3.36

As the RIM test measures program impacts on customer rates, most energy efficiency programs do not pass the RIM test because, although energy efficiency programs reduce energy delivery costs, they also reduce energy sales. As a result, the average energy rate per unit may increase. A RIM benefit/cost ratio greater than 1 indicates that rates as well as costs will fall due to the program. Typically, this only happens for demand-response programs or programs that target the highest marginal cost hours (when marginal costs are greater than rates).

Recommendations

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



Savings Considerations

Recommendation: The Cadmus team recommends reviewing the measure descriptions and deemed savings factors for irrigation hardware measures to ensure consistency, and will likely result in an overall savings increase.

Recommendation: Consider adding an HVAC interactive effect factor to indoor lighting savings, based on a weighted average of the heating and cooling systems within RMP's commercial and industrial customers in Wyoming. Many national technical reference manuals (TRMs) include HVAC interactive effect factors, ranging from approximately 0.85 to 1.15, accounting for energy saving interactions that occur when installing energy-efficient lighting. The Northwest Power and Conservation Council's 7th Power Plan, adopted in May 2016, defines HVAC interactive effects by heating types and building types. The Cadmus team recommends using an average HVAC interactive effect factor of 0.9. Alternatively, an interactive effect could be applied by facility heating type: Electric heating = 0.72, Natural Gas heating = 1.07, Heat Pump heating = 0.91.¹

Recommendation: Increase the deemed savings amount for prescriptive HVAC VFD fan and pump motor projects. To determine savings for the nine prescriptive VFD motor systems projects in the evaluation sample, the implementers used RMP's deemed savings value of 1,160 kWh per horsepower, regardless of the motor end use. To evaluate energy savings for the HVAC fan motor projects, the Cadmus team used the deemed savings values from Cadmus' 2014 *Variable Speed Drive Loadshape Project* report, created for the Northeast Energy Efficiency Partnership² (NEEP; shown in Table 33 of the Savings Considerations section). This resulted in realization rates greater than 100% for all deemed VFD fan motor projects. The team recommends using these deemed values for HVAC fan motor projects. For these nine projects, the team derived an overall realization rate of 166%.

For prescriptive VFD projects installed on central HVAC equipment (including hot water pumps, chilled water pumps, condenser water pumps, and cooling tower fans), the Cadmus team recommends using an average deemed energy savings value, calculated from the 2016 Pennsylvania Technical Reference Manual (PA TRM). The team calculated a deemed savings factor of 1,191 kWh per year, per horsepower, for central plant equipment from the 2016 PA TRM. The evaluation sample included only two prescriptive VFD projects for central plant equipment. More projects incorporating VFDs serving central plant equipment will be required before conclusions can be made regarding the deemed savings values.

Recommendation: The Cadmus team recommends RMP consider providing additional training to participating motor service centers, regarding the need for more accurate estimates for when the motor

¹ Interactive effects referenced in "InteractionsBldgType2015-7p.xlsx":
<https://nwcouncil.app.box.com/v/7thplanconservationdatafiles/1/6722938165>

² These deemed savings values were based on the Cadmus 2014 Variable Speed Drive Loadshape Project report, created for NEEP. This report is available online: <http://www.neep.org/variable-speed-drive-loadshape-study-final-report>

will be installed (rather than always entering six months from time of service. After delivery of training or new instructions, the team recommends the program begin reviewing applications and tracking estimated reinstall dates to make certain the motor service centers provide a more reliable estimate and to better understand when the savings may be realized. If motor replacements are estimated to occur beyond a year, the team recommends RMP considers prorating energy savings by project or based on an average historical average of applications submitted. Green motor rewinds represent a small percentage of total program savings (i.e., 0.11% of total claimed savings in the evaluation sample), but first-year savings are not being realized because the equipment has not been installed.

Overall Program Management

Recommendation: The Cadmus team recommends that the implementers reinforce, through contacts with the trade allies, contractors, and vendors, the need to provide detailed and accurate cost, savings, and benefit information to participants, along with clear explanations of expectations from participants (i.e., paperwork, timeframes), and how final incentives may vary from incentive offers. With each of these groups, the implementers can review the steps necessary to accurately calculate costs, projected energy savings, and incentives, thereby decreasing customer confusion and better setting expectations.

Recommendation: Consider adding a search function to the website, allowing customers to enter the equipment they wish seek to install and directing them to delivery channels, qualified measures, and incentive application documents. Include information on whether or not specific measures require prequalification. Also consider adding chat or instant messaging feature on the website to more seamlessly assist customers who prefer to ask questions using this method rather than through phone calls or e-mail.

Recommendation: Continue enhancing the existing customer-facing vendor search tool. This could include a rating system of the participating contractors, for various measure categories, based on the quality of work performed, and including ratings from program participants (similar to Yelp). The Cadmus team recommends RMP visit the Energy Trust of Oregon website (<http://www.energytrust.org/find-a-contractor/commercial/>) for its example of contractor selection tips.

Program Data Interface

Recommendation: Assess the size of exchange inconsistencies between RMP's data and the implementers' data (along with associated impacts), and identify the most appropriate solution for resolving these. Resolutions could include the following:

- Continue the same process
- Revise the implementers' databases to use drop-down menus that include precise measure names and formulas, or provide look-up tables of saving/incentive amounts and update these as needed
- Have RMP revise the DSMC batch process to allow room for variations in DSMC uploads



- Have RMP provide implementers with a direct interface to the DSMC, rather than using their own databases
- Have RMP provide trade allies with direct access to the DSMC

Small Business Lighting and Typical Upgrades

Recommendation: While taking an account management approach would not be appropriate for smaller customers, RMP could consider methods for increasing direct customer contact. These could include expanding the “Targeted Town” luncheon event format (used in Washington state) to Wyoming, or adding chat or instant messaging features to the website (thus more seamlessly assisting customers who prefer this method for asking questions over phone calls or e-mails).

Nonparticipants

Recommendation: If RMP chooses to engage nonparticipating customers, seeking to stimulate additional program growth or to achieve other utility goals, consider performing a comprehensive marketing effectiveness assessment to evaluate the impact of existing marketing and outreach activities, and to investigate methods for better reaching and motivating these customers.

Recommendation

Utilizing nonparticipant attitudes about energy efficient improvements (reported in [Figure 31](#)), develop messaging specifically addressing those attitudes by highlighting program benefits which can alleviate barriers inherent in those attitudes. For example, one attitude is “We don’t replace working equipment”. Develop messaging demonstrating when early replacement is cost effective.

Introduction

Program Description

For program years 2014 and 2015, Rocky Mountain Power's (RMP) **wattsmart** Business Program offered incentives for measures and services through three delivery channels: Small Business Lighting (SBL); Typical Upgrades (also known as Prescriptive Measures); and Custom Analysis.

RMP program managers, who oversee nonresidential energy efficiency programs in Wyoming, undertake the following: contract and manage the program administrators, manage in-house delivery and cost-effectiveness, achieve and monitor program performance and compliance, conduct program marketing, and recommend changes to program terms and conditions. RMP provides the program through multiple delivery channels, differentiated on customer need.

The SBL delivery channel is an enhanced incentive offering for small business customers. Nexant managed SBL program-approved trade allies and SBL projects for all participants. This delivery channel was transitioned to a new administrative model in 2016 and reintroduced on November 1, 2016, as the Small Business Direct Install channel, which RMP offered to SBL customers on specific rate schedules and in targeted locations. This report addresses the SBL delivery channel as it existed throughout 2015.

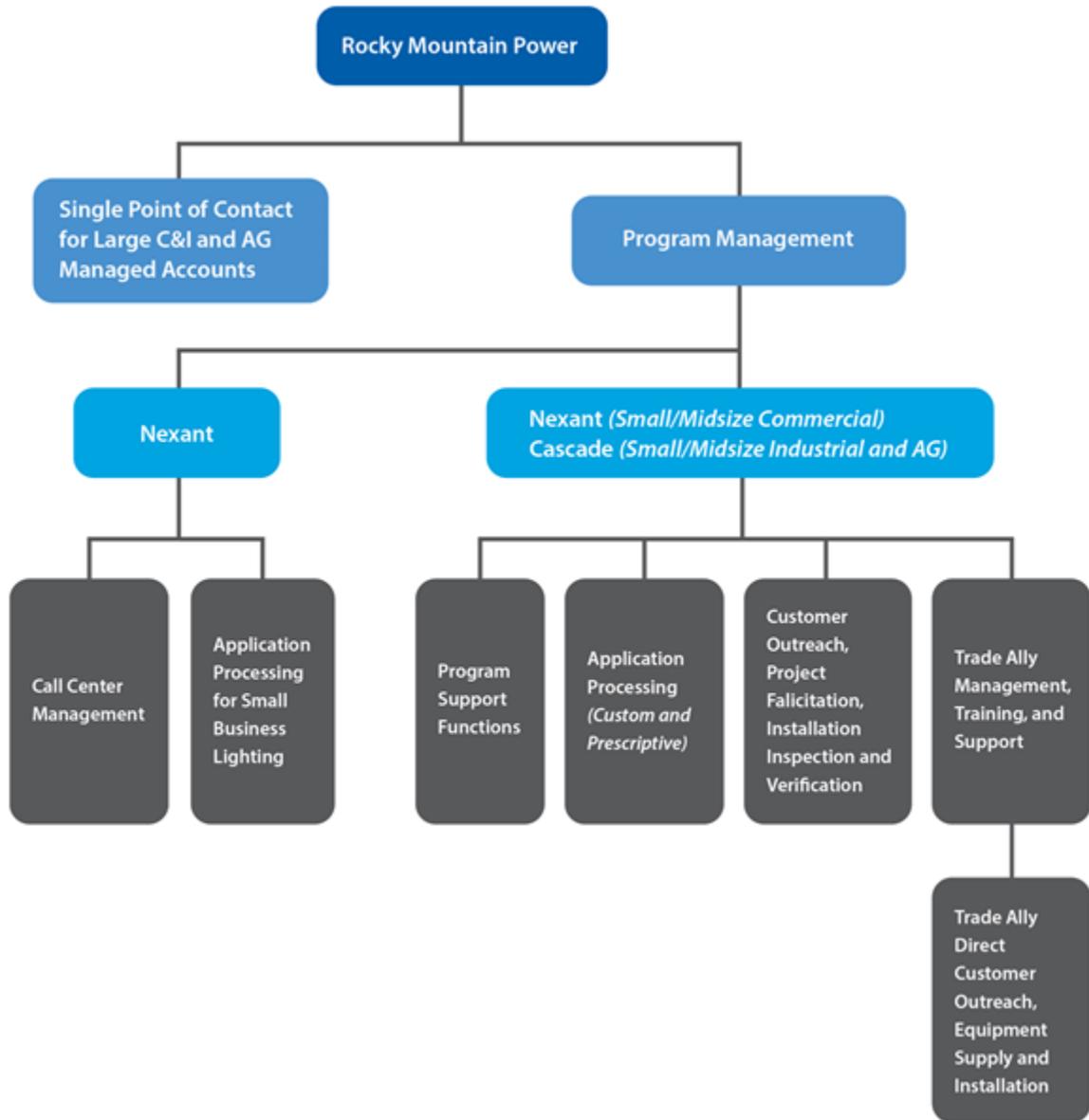
RMP offers the second delivery channel, Typical Upgrades, through trade allies and targets it for prescriptive opportunities (primarily for small and midsize customers); large customers, however, may also receive these incentives. RMP contracted with Nexant, Inc., and Cascade Energy to coordinate the trade allies delivering these upgrades and to administer the Typical Upgrades delivery channel. These companies managed trade ally coordination, provided training and support, and conducted application processing services for commercial and industrial/agricultural measures. Both administrators also implemented custom projects for non-managed accounts and conducted direct customer outreach, project facilitation, and measurement and verification.

RMP targets the Custom Analysis delivery channel to large energy users, which generally offer multiple opportunities for energy efficiency upgrades and have projects that require custom analysis. RMP internal project managers manage the largest of these customers in-house (with large accounts typically ≥ 100 kW). The program provides energy efficiency analysis and savings verification through a pre-contracted group of engineering firms.

Figure 1 provides an overview of the program management responsibilities.



Figure 1. *wattsmart* Business Program Delivery Roles



Evaluation Objectives

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

Table 5. Evaluation Objectives and Activities

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

Data Collection and Evaluation Activities

The Cadmus team performed on-site visits and engineering analysis for 77 projects, seeking to achieve 90% confidence and $\pm 10\%$ precision at the portfolio level. The team’s process evaluation included a thorough review of data tracking and of program operation and marketing materials. The team interviewed program managers and implementers to thoroughly understand and document the program’s history, objectives, and operations. In addition, the team surveyed program participants, partial participants, and nonparticipants regarding program delivery channels and operations.³

Impact Sampling and Extrapolation Methodology

Through the Wyoming **watt**smart Business Program, RMP provides incentives for the 24 measure types shown in Table 6. The Cadmus team stratified these 24 measure types into the seven strata shown in the table. The team designed the sampling plan for 2014 and 2015 combined participation to achieve approximately $\pm 20\%$ precision at 80% confidence per strata and to meet $\pm 10\%$ precision at 90% confidence at the nonresidential portfolio level. To account for the wide range of project sizes, the team

³ Participants are customers that completed a project through the program during the 2014 to 2015 evaluation period. Partial participants are customers that initiated a project through the program in 2014 or 2015, but did not complete the project. Nonparticipants are customers that have never initiated or completed a project through the program or who had not done in 2014 and 2015.



created a plan that divided each end-use strata into a selected group, from which the team hand-selected a few very large sites, combining these with random samples from the remaining projects.

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

Table 6. Wyoming 2014-2015 wattsmart Business Program Impact Sampling

Strata	Measure Type	Number of Incentivized Projects	Energy Savings (kWh)	Unique Sampled Projects
Agricultural	Water Distribution Equipment	53	204,015	9
	Irrigation Pumps	1		
	Irrigation	2		
Compressed Air	Compressed Air	5	671,228	2
HVAC	HVAC	13	1,050,184	8
	Controls and Thermostats	1		
	Heat Pump	1		
	Cooling	8		
Lighting	Lighting	590	9,830,527	19
	General Illuminance	1,859		
	Non-General Illuminance	168		
	Exterior Lighting	19		
	Controls	265		
Motor Systems	Motors	102	17,626,840	26
	Green Motor Rewinds	104		
	Electronically Commutated Motor	4		
Other	Insulation	12	911,445	8
	Building Shell	8		
	Windows	2		
	Roof	7		
	Additional Measures	9		
Refrigeration	Refrigeration	9	198,976	5
	Refrigerators	2		
	Freezers	3		
Total		3,247	30,493,215	77

The team divided sampled projects into two categories: selected and random. Per the name, random projects were chosen randomly, with the evaluated results extrapolated to the rest of the population within the strata. Selected projects were hand-picked from projects with the highest claimed energy savings per strata. These projects were evaluated individually, and the results were included within each strata, but the team did not extrapolate the associated realization rates to the population. Figure 2

extrapolates how the team applied realization rates for the selected and random sites within the HVAC strata to the population. This methodology was applied to each strata.

Figure 2. Realization Rate Extrapolation

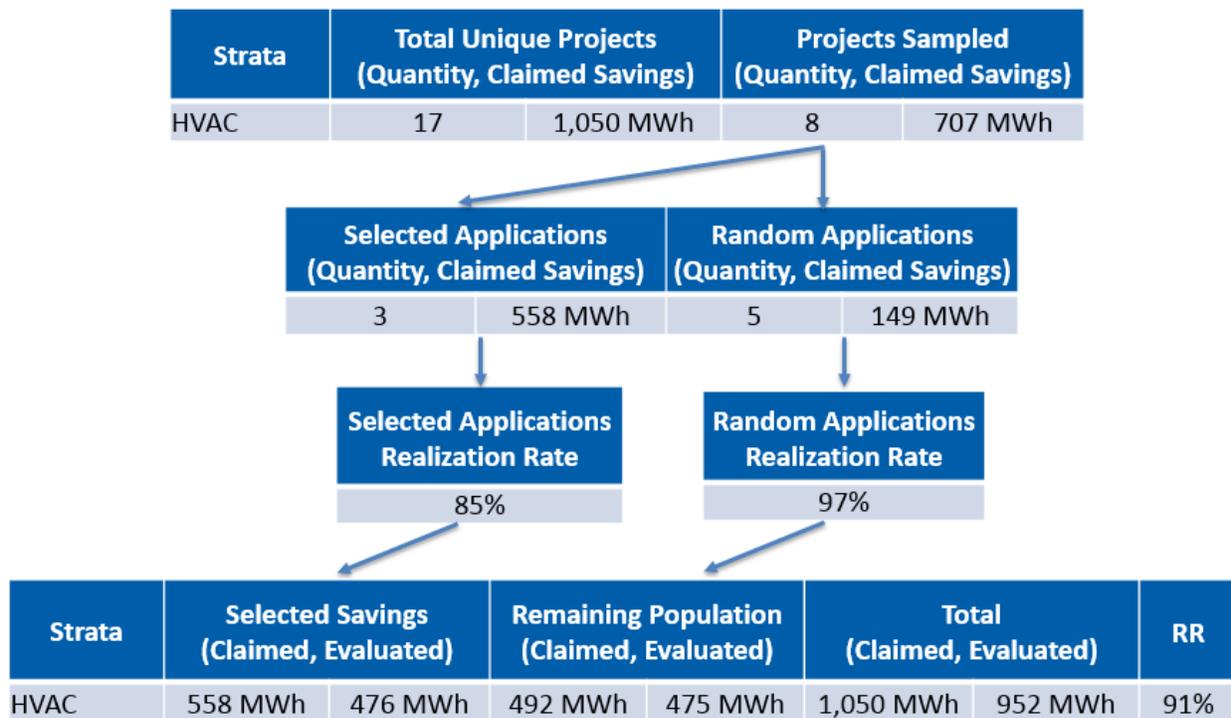


Table 7 shows the total quantity of projects sampled, the associated reported energy savings, and the percentage that these samples represented from the population.

Table 7. Wyoming 2014-2015 wattsmart Business Program Impact Sampling Summary

Strata	Sample Type	Unique Projects Sampled	Reported Energy Savings (kWh)		Percentage kWh Sampled
			Sampled Projects	All Projects	
Lighting	Selected	5	966,267	9,830,527	11.3%
	Random	14	148,083		
HVAC	Selected	3	558,232	1,050,184	67.3%
	Random	5	148,617		
Refrigeration	Selected	1	130,734	198,976	82.3%
	Random	4	33,029		
Motor Systems	Selected	9	10,849,446	17,626,840	69.0%
	Random	17	1,317,843		
Compressed Air	Selected	1	272,014	671,228	86.8%
	Random	1	310,509		



Strata	Sample Type	Unique Projects Sampled	Reported Energy Savings (kWh)		Percentage kWh Sampled
			Sampled Projects	All Projects	
Agricultural	Random	9	104,623	204,015	51.3%
Other	Random	8	311,350	911,445	34.2%
Total		77	15,150,747	30,493,215	49.7%

Process Sample Design and Data Collection Methods

The Cadmus team conducted the process evaluation by assessing each program delivery channel, with the three program delivery channels corresponding to each incentive type: SBL, Typical Upgrades, and Custom Analysis.

The team developed samples for three customer populations—participants, partial participants, and nonparticipants—using simple random sampling within each **wattsmart** Business Program delivery channel. This defined participants as customers completing an SBL, Typical Upgrades, or Custom Analysis project through the program during the evaluation period (i.e., program years 2014 and 2015). The team defined partial participants as customers that initiated a Typical Upgrades or Custom Analysis project through the program in 2014 or 2015, but did not complete that project. The team did not stratify these customers, given the small population and not all data provided for these customers clearly identifying the delivery channel. Rather, the team selected projects for review using simple random sampling.

Finally, the Cadmus team defined nonparticipants as customers that never initiated or completed a project through the program or that had not done so in 2014 and 2015. The team sorted nonparticipants into managed and non-managed accounts. Managed accounts represented customers with an assigned RMP account manager.

Table 8 shows the final sample disposition for each data collection activity.⁴ The Cadmus team exceeded the precision/confidence targets shown in the table for nonparticipants, achieving $\pm 8.9\%$ precision at 90% confidence. The team achieved $\pm 11.6\%$ precision at 90% confidence for participants in the SBL, Typical Upgrades, and Custom Analysis delivery channels. Further, the team achieved $\pm 46.1\%$ precision at 90% confidence for partial participants after dialing each person in the sample five times.

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

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 8. Wyoming 2014-2015 wattsmart Business Program Data Collection and Sampling

Data Collection Activity	Precision and Confidence Target*	Precision and Confidence Achieved	Population**	Sampling Frame**	Target Completes	Achieved Completes
RMP Program Staff Interviews	N/A	N/A	N/A	N/A	N/A	2
Program Administrator Interviews	N/A	N/A	N/A	N/A	N/A	6
Participant Surveys (SBL)	±10% at 90% (combined)	±11.6% at 90% (combined)	473	32	17	6
Participant Surveys (Typical Upgrades)				255	28	28
Participant Surveys (Custom Analysis)				48	20	12
Partial Participant Surveys	±15% at 90%	±46.1% at 90%	32	30	18	3
Nonparticipant Surveys (Managed)	±10% at 90% (combined)	±8.9% at 90% (combined)	6,408	102	20	5
Nonparticipant Surveys (Non-Managed)				5,406	50	80
Total Interviews and Surveys			6,913	5,873	153	142

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

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



Impact Evaluation

This section provides the **wattsmart** Business Program’s impact evaluation findings, resulting from the Cadmus team’s data analysis. This incorporated the following activities:

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

This section addresses two evaluated saving values: gross savings and net savings. Reported gross savings are electricity savings (kWh) that RMP reported in the 2014 and 2015 *Rocky Mountain Power Energy Efficiency and Peak Reduction Annual Reports* (annual reports).⁵ Net savings are the program savings, net of what would have occurred in the program’s absence. These savings provide observed impacts attributable to the program.

To determine gross savings, the Cadmus team applied Steps 1 through 4, as shown in Table 9. The team applied the fifth step to determine evaluated net savings.

Table 9. Impact Steps to Determine Evaluated Gross and Net Savings

Savings Estimate	Step	Action
Evaluated Gross Savings	1	Tracking Database Review: Validate the accuracy of data in the participant database and verify that savings match annual reports
	2	Verification: Adjust gross 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 population
Evaluated Net Savings	5	Attribution: Apply NTG adjustments

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

Step 2: The team selected a sample of sites from the RMP program database, followed by stratifying the distribution of measures among sampled sites, primarily by end-use type: lighting, HVAC, refrigeration, motor systems, compressed air, agricultural, and other measures. The team completed 77 site visits and

⁵ These reports are available online:
http://www.pacificorp.com/content/dam/pacificorp/doc/Energy_Sources/Demand_Side_Management/2015/WY_2014AnnualReport_FINAL_061515.pdf; and
http://www.pacificorp.com/content/dam/pacificorp/doc/Energy_Sources/Demand_Side_Management/2016/2015-DSM-WY-Annual-Report-081616.pdf

desk reviews as part of the 2014 and 2015 program evaluation. Site visits were performed to verify measure installation.

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

Step 4: The team reviewed 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 option within the International Performance Measurement and Verification Protocol. For sites with light loggers or power meters installed, the team used logger data to determine the hours of use (HOU) or power consumption for the metered equipment types. In some instances, the customer provided trend data from their building management system (BMS), which the team used to determine equipment load profiles, HOU, and performance characteristics.

Step 5: The team used participant surveys to calculate freeridership using an industry-standard self-report methodology. In addition, the team surveyed partial participants and nonparticipants to determine if nonparticipant spillover could be credited to the program, which otherwise was not incented. The team did not, however, apply this value to the overall NTG used to calculate net savings, but rather provided the information for future planning consideration.

Site Visits and Engineering Measurements

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

At each site visit, the team used a data collection form and performed the following tasks:

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

Overall Evaluated Gross Savings Results

Table 10 presents reported and evaluated gross savings for the 2014 and 2015 program years, indicating an overall realization rate of 109%.



Table 10. Reported and Evaluated Gross Savings by Program Year

Program Year	Program Savings (kWh)		Gross Program Realization Rate
	Reported	Evaluated Gross	
2014	9,351,774	10,136,891	108.4%
2015	21,141,441	23,102,701	109.3%
Total	30,493,215	33,239,591	109.0%

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

Table 11. Reported and Evaluated Gross wattsmart Business Program Savings by Measure Category (2014–2015)

Strata	Program Savings (kWh)		Realization Rate	Precision
	Reported	Evaluated Gross		
Lighting	9,830,527	10,406,604	106%	15.1%
HVAC	1,050,184	951,655	91%	2.5%
Refrigeration	198,976	241,770	122%	4.0%
Motor Systems	17,626,840	19,501,759	111%	21.1%
Compressed Air	671,228	726,909	108%	N/A
Agricultural	204,015	501,636	246%	27.6%
Other	911,445	909,259	100%	13.4%
Total	30,493,215	33,239,591	109.0%	14.5%

Evaluated Gross Savings Results by Strata

Lighting

RMP provides incentives for five types of lighting projects: exterior lighting, general illuminance, lighting, non-general illuminance, and controls. These projects apply to renovations or new construction, and involve high-efficient lighting technologies (e.g., CFLs, LEDs, induction fixtures, occupancy sensors).

For the 2014 and 2015 years, RMP incented 2,901 lighting measures within 518 unique projects, and reported 9,830,527 kWh in energy savings. The incented lighting projects accounted for 32% of all reported energy savings in Wyoming. The evaluated energy savings for the lighting strata were 10,406,604 kWh and the realization rate was 106%.

Methodology

The Cadmus team evaluated 19 lighting projects, accounting for 11% of all reported energy savings within the lighting strata. RMP used prescriptive calculations for all evaluated projects, and used the FinAnswer Express prescriptive lighting calculator to determine incentive amounts for all lighting

projects in Wyoming.⁶ The FinAnswer Express calculator documents customer information, project locations, light fixture specifications, energy saving calculations, and financial information. Critical inputs used to calculate energy savings include the following:

- Lighting operation schedule
- Space name, type, area, and condition
- Baseline lighting fixture location, type, quantity, controls, and wattage
- Proposed lighting fixture location, type, quantity, controls, and wattage

The Cadmus team reviewed the FinAnswer Express calculator methodology and assumptions to determine the applicability for each sampled project. The team also performed site visits at each sampled project to inspect and document installed lighting equipment. For eight of the 19 projects visited, the team installed light loggers to document HOU where incentivized lighting fixtures were installed. The team installed two to eight light loggers per facility in representative spaces, determining these spaces as areas with fixtures where the highest energy savings were claimed. The team left the loggers in place for a minimum of three weeks, then retrieved and analyzed the data. The team extrapolated measured HOU to annual HOU, and updated the prescriptive Express calculators with the revised values.

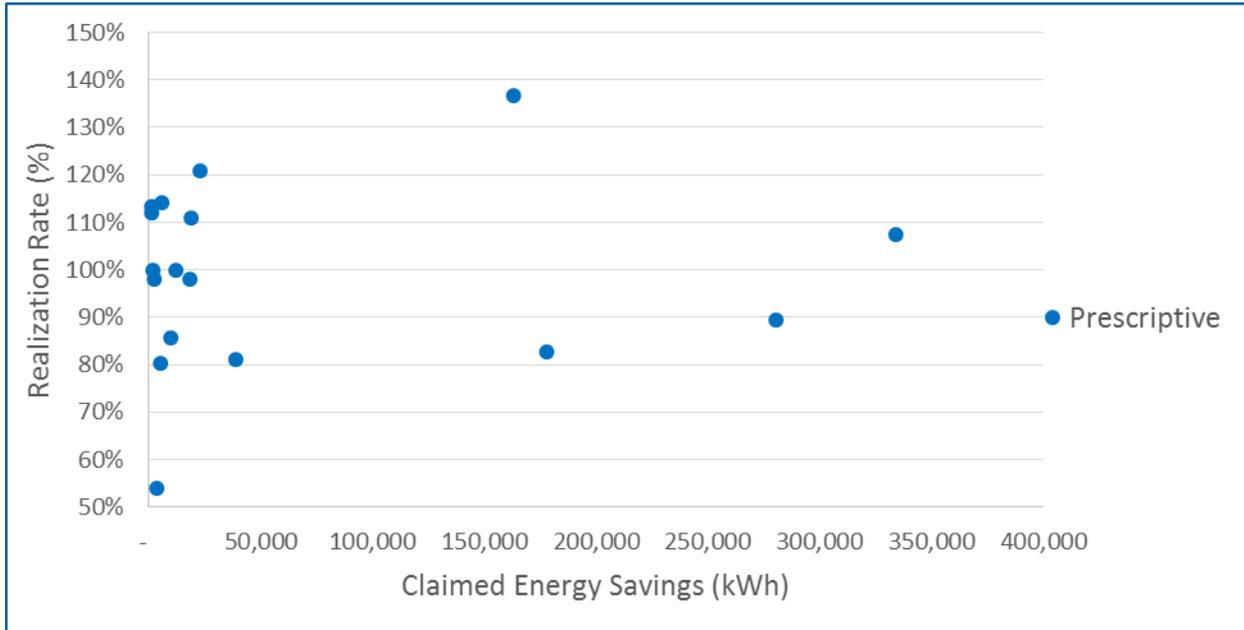
Findings

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

⁶ Between 2013 and 2015, RMP combined a number of programs under the **wattsmart** Business Program umbrella: the Energy FinAnswer program rolled into the Custom Analysis delivery channel, and the FinAnswer Express Program rolled into the Typical Upgrades delivery channel within the **wattsmart** Business Program.



Figure 3. Lighting Sample Results*



*One project not shown: Claimed 11,340 kWh and 221% Realization Rate

Two sites exhibited less than 80% realization rates and three sites exhibited greater than 120% realization rates. For the remaining sites, the Cadmus team found no (or nominal) differences between calculated savings and reported savings. For sites with evaluated energy savings less than 80% or greater than 120%, the savings differences resulted from discrepancies in the claimed HOU. Table 12 provides specific details.

Table 12. Lighting Sample Detailed Findings

Project	Project Measures	Reported kWh	Evaluated kWh	Site Realization Rate	Notes
WYFX1_000841	LED fixture retrofit	2,369	211	9%	Lights operate at reduced hours of operation, per staff interview
WYFX1_000183	Occupancy sensors	3,700	1,995	54%	Lights operate at higher hours of operation, per light logger data
WYFX1_000775	T8 fixture retrofit	23,267	28,148	121%	Lights operate at higher hours of operation, per staff interview
WYFX1_000389	T8 and LED fixture retrofit	163,462	223,294	137%	Lights operate at higher hours of operation, per light logger data
WYFX1_000779	LEDs in refrigerator cases	11,340	25,096	221%	Lights operate at higher hours of operation, per staff interview

Further explanation follows for two of the larger measure-level realization discrepancies:

- One project (WYFX1_000841) involved the installation of LED lights in hallways and classrooms for a church. The Cadmus team visited this facility and verified all fixtures were installed and matched the rebate documentation. Based on interviews with church staff, however, the lighting HOU were reduced to match actual church operation hours, resulting in a 9% realization rate.
- One project (WYFX1_000183) involved the installation of occupancy sensors to control lighting. Claimed savings for lighting controls projects are calculated by multiplying the lighting consumption by a fixed percentage, based on the control type. The team installed light loggers for this facility, and the resulting data indicated higher HOU than anticipated, resulting in lower energy savings.

HVAC

RMP incented 23 HVAC measures within 17 unique projects. These projects consisted of unitary air conditioners, heat pumps, packaged terminal heat pump controls, chillers, evaporative cooling systems, indirect/direct evaporative cooling (IDEC) systems, and economizers. RMP reported 1,050,184 kWh in energy savings, accounting for 3% of all reported energy savings during the 2014 and 2015 program years. The evaluated energy savings for the HVAC strata were 951,655 kWh and the realization rate was 91%.

Methodology

The Cadmus team evaluated eight HVAC projects, accounting for 67% of all reported energy savings within the HVAC strata. Of the evaluated projects, RMP used deemed savings for two projects, prescriptive calculations for five projects, and custom calculations for one project. Deemed values were used for an evaporative cooling measure and an occupancy-based packaged terminal heat pump controller measure.

RMP used one of three prescriptive calculators to determine energy savings and incentive amounts for the five prescriptive HVAC projects:

- RMP HVAC Calculator
- RMP FinAnswer Express Chiller Calculator
- RMP IDEC Calculator

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



Table 13. Critical Inputs to Calculating Energy Savings

RMP HVAC Calculator	RMP FinAnswer Express Chiller Calculator	RMP IDEC Calculator
Manufacturer make/model	Manufacturer make/model	Design air flow
Quantity	Quantity	Supply air temperature
Cooling capacity	Chiller service type	Supply fan size (hp)
EER, SEER, and/or HSPF	Heat rejection specifications	Static pressure
Business type	AHRI capacity	Evaporative stage types
Interior/exterior space type	AHRI integrated part load value and full-load efficiency	Chilled water stage type
	Facility type	Building square footage

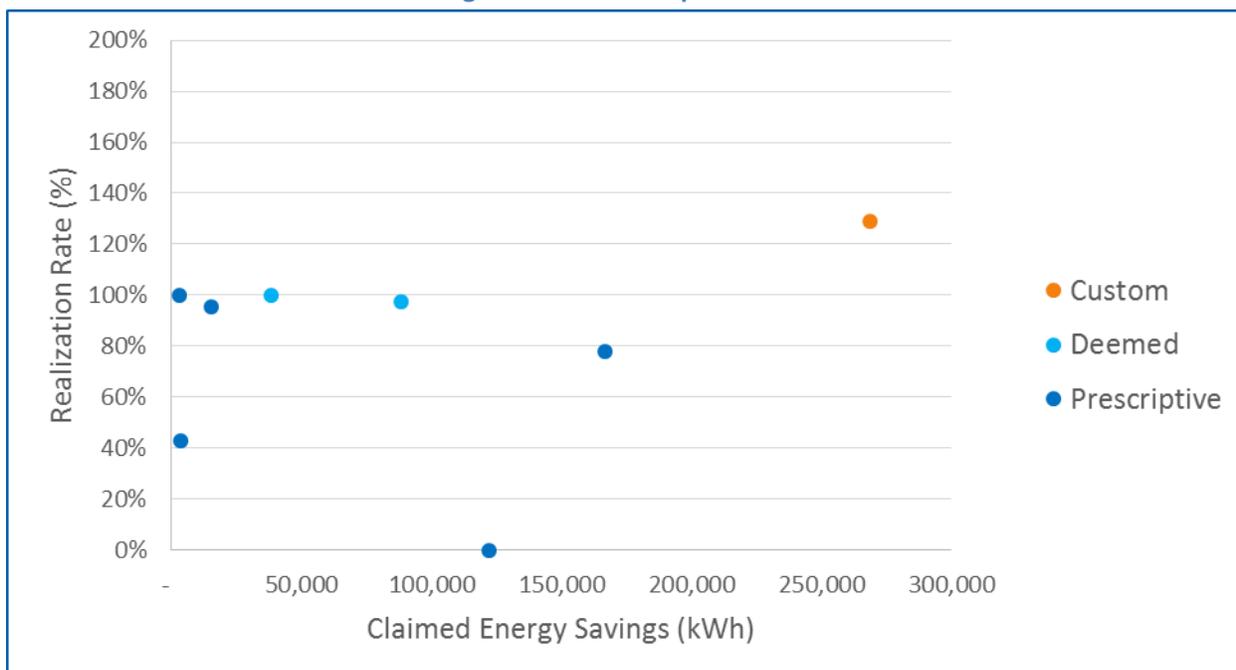
The Cadmus team reviewed the methodology and assumptions for each prescriptive calculator to determine the applicability for each project sampled. For each sampled project, the team performed site visits to inspect and document installed equipment, interview facility staff or farmers, and review the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

For the project where the implementer used custom calculations, the team reviewed the contractor’s energy analysis report and savings verification report for the energy savings methodology, inputs, assumptions, and accuracy. Where site findings (including analysis of building management trend data) deviated from claimed equipment quantities, performance specifications, or operation characteristics, the team recreated the custom calculations using the updated information.

Findings

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

Figure 4. HVAC Sample Results



Three sites exhibited a less than 80% realization rate and one site exhibited a greater than 120% realization rate. For the remaining sites, the Cadmus team found no (or nominal) differences between calculated savings and the savings. Table 14 provides specific details of sites achieving greater than 120% or less than 80% realization rates.

Table 14. HVAC Sample Detailed Findings

Project	Project Measures	Reported kWh	Evaluated kWh	Site Realization Rate	Notes
WBWY_25131	IDEC system	122,386	0	0%	IDEC system disabled due to controls issues
WYFX1_000447	Heat pump	3,417	1,469	43%	Incorrect performance value used in prescriptive tool
WBWY_17204	Chiller	166,985	129,962	78%	Incorrect facility type used in prescriptive tool
WBWY_9102	Flat plate heat exchanger	268,861	346,507	129%	7 months of trend data indicated higher hours in economizer operation

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

- One project (WBWY_25131) involved installation of an IDEC system. While on site, Cadmus observed the system no longer remained in place, and the facility staff indicated a new humidity control system was being installed. Facility staff indicated that operational problems constantly



plagued the IDEC system’s performance, including lack of humidity controls, leaking ductwork, and poor performance. Rebate documentation also indicated the system was not observed operational during the project’s verification portion due to the time of year observed.

- For two projects (WYFX1_000447, WBWY_17204), site verification identified that the implementer used incorrect inputs in the HVAC and chiller prescriptive calculators. An incorrect heat pump cooling performance value was used in WYFX1_000447 (i.e., the IEER performance value was added to the tool as a SEER value), and an incorrect facility type was used in WBWY_17204 (i.e., the implementer used “other” but should have selected “health-care/hospital”).

Refrigeration

RMP incented 14 refrigeration measures within 10 unique projects, consisting of food service refrigeration equipment, case lighting, and optimized refrigeration controls. RMP reported energy savings of 198,976 kWh, accounting for 0.7% of all reported energy savings for the 2014 and 2015 program years. The evaluated energy savings for the refrigeration strata were 241,770 kWh and the realization rate was 122%.

Methodology

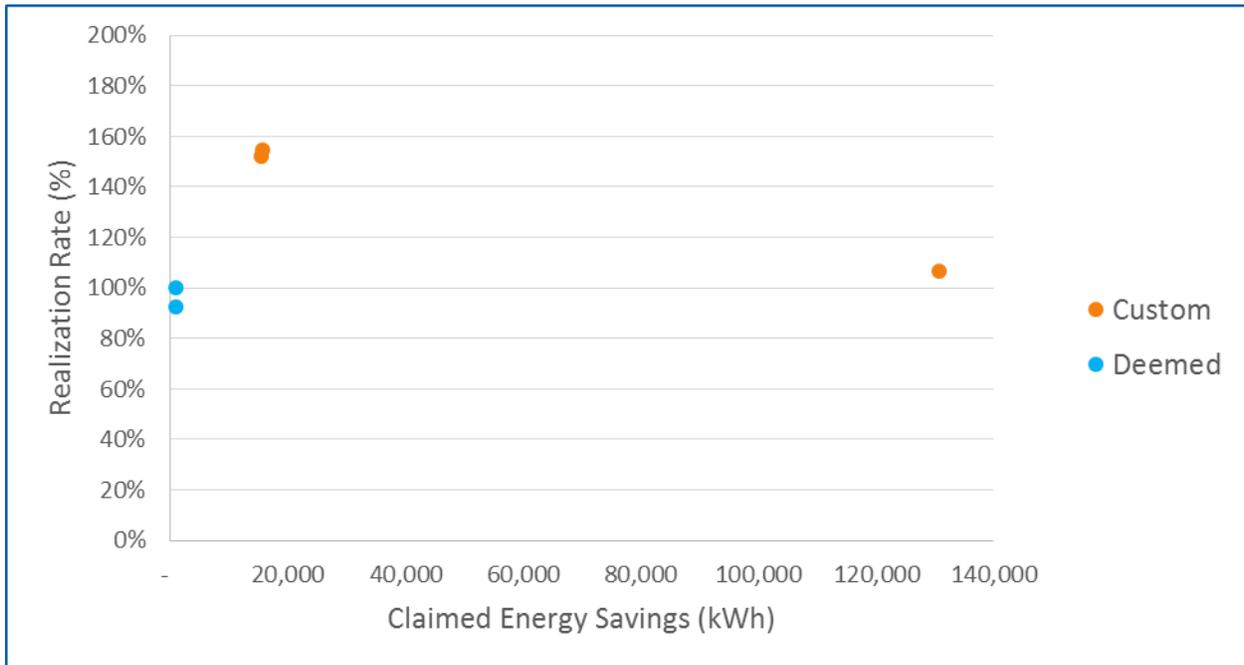
The Cadmus team evaluated five refrigeration projects, accounting for 82% of all reported energy savings within the refrigeration strata. Of the evaluated projects, RMP used deemed savings for two projects and custom calculations for three projects. RMP’s implementation contractor performed custom project calculations of energy efficiency savings. For deemed calculations, RMP used energy savings established by ENERGY STAR.

For projects requiring custom calculations, the team reviewed the contractor’s energy analysis reports and savings verification reports for the energy savings methodology, inputs, assumptions, and accuracy. For projects where claimed savings were determined using deemed values, the team reviewed unit energy savings calculations provided by ENERGY STAR or the Regional Technical Forum (RTF), and adjusted savings inputs based on site findings and interviews.

Findings

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

Figure 5. Refrigeration Sample Results



Two sites exhibited a greater than 120% realization rate. For remaining sites, the Cadmus team found no (or nominal) differences between calculated savings and reported savings. Table 15 provides specific details for projects with high realization rates.

Table 15. Refrigeration Sample Detailed Findings

Project	Project Measures	Reported kWh	Evaluated kWh	Site Realization Rate	Notes
WYFX1_000777	Anti-sweat heater (ASH) controls and adding doors to walk-in coolers	15,415	23,407	152%	Equipment installed as expected. Evaluation used RTF calculator-deemed savings. Original study calculations not provided.
WYFX1_000778	ASH controls and adding doors to walk-in coolers	15,643	24,211	155%	Equipment installed as expected. Evaluation used RTF calculator-deemed savings. Original study calculations not provided.

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

- Both projects involving implementation of ASH controls utilized custom calculations to determine claimed energy savings. The rebate documentation for these projects did not include custom calculation workbooks. Cadmus evaluated these projects by utilizing the RTF’s ASH and



Door measure workbook and methodology. Though site findings matched rebate documentation, the difference in evaluated savings and claimed savings could not be determined due to the lack of documentation regarding claimed energy savings.

Motor Systems

RMP provides incentives for several types of motor systems projects—green motor rewinds, motor upgrades, and variable frequency drives (VFDs)—serving commercial HVAC and industrial processes. RMP incented 210 measures within 155 projects, and reported 17,626,840 kWh in energy savings for the 2014 and 2015 program years. Incentivized motor systems projects accounted for 58% of all reported energy savings in Wyoming. The evaluated energy savings for the motor systems strata were 19,501,759 kWh and the realization rate was 111%.

Methodology

The Cadmus team evaluated 26 motor systems projects, accounting for 69% of all reported energy savings within the motor systems strata. Of 26 evaluated projects, RMP determined claimed savings using deemed savings for nine projects, prescriptive calculations for six projects, and custom calculations for 11 projects.

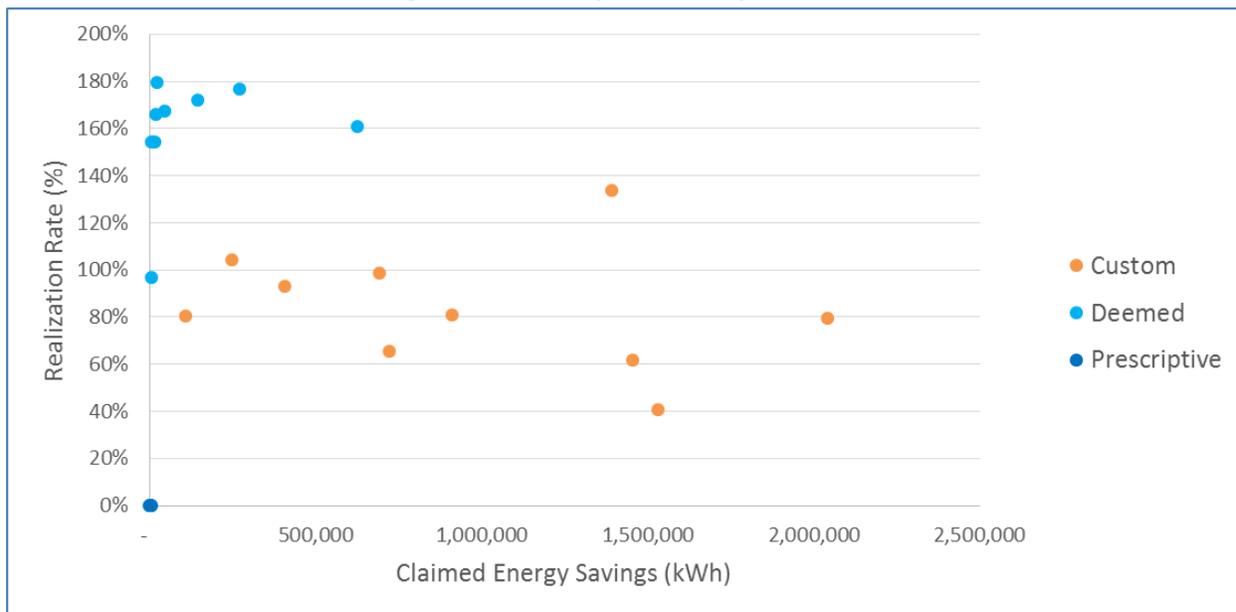
For deemed VFD projects installed on HVAC ventilation equipment (e.g., supply fans, return fans, exhaust fans), the team referenced deemed savings amounts identified within the VSD load-shape study.⁷ For prescriptive VFD projects installed on central plant equipment (e.g., chilled water pumps, condenser water pumps, hot water pumps, cooling tower fans), the team referenced the calculation methodology and energy savings factors identified within the PA TRM.

For projects where RMP’s implementation contractor used custom calculations to determine energy savings, the team reviewed energy analysis reports and savings verification reports for the energy savings methodology, inputs, assumptions, and accuracy. If site findings deviated from claimed equipment quantities, performance specifications, or HOU, the team recreated the custom calculations with the updated information. The team installed power metering equipment and collected coincident trend data for two of the custom projects and collected site trend data for five additional custom projects. The team analyzed the power metered data and trend data to develop load profiles and to determine equipment operating hours.

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

⁷ These deemed savings values were based on the Cadmus’ 2014 *Variable Speed Drive Loadshape Project Report* for NEEP. Available online: <http://www.neep.org/variable-speed-drive-loadshape-study-final-report>

Figure 6. Motor Systems Sample Results



Ten sites had realization rates below 80%, and 10 sites had realization rates above 120%. The Cadmus team found no (or nominal) differences in reported savings for the remaining sites. Table 16 provides specific details for sites with realization rates greater than 120% or less than 80%.

Table 16. Motor System Sample Results

Project	Project Measure	Reported kWh	Evaluated kWh	Site Realization Rate	Notes
WYFX1_000524	Green motor rewind	1,418	0	0%	Site could not confirm motor location
WYFX1_000903	Green motor rewind	2,005	0	0%	Site could not confirm motor location
WYFX1_000557	Green motor rewind	2,598	0	0%	Motor found in storage
WYFX1_000384	Green motor rewind	3,089	0	0%	Site could not confirm motor location
WYFX1_000706	Green motor rewind	3,089	0	0%	Site could not confirm motor location
WYFX1_000798	Green motor rewind	4,972	0	0%	Motor found in storage
WBWY_26548	Compressor rotor upgrade	1,531,018	626,858	41%	Trends indicated higher BHP and flow rate than expected; adjusted baseline rotor BHP
WBWY_15734	Process fan VFD, conveying system upgrade	1,455,639	902,190	62%	Measured system operating hours higher than expected



Project	Project Measure	Reported kWh	Evaluated kWh	Site Realization Rate	Notes
WBWY_21161	Process pump VFDs	723,413	474,294	66%	Measured power of one pump higher than expected; second pump had not run in ~2 years
WBWY_22259	Process pump VFD	2,043,000	1,625,476	80%	Trends indicated oil production reduced; baseline adjusted
WBWY_29384	Process pump VFD	1,392,000	1,864,096	134%	Trends indicated oil production increased; baseline adjusted
WYFX1_000568	HVAC fan VFDs	6,960	10,728	154%	Cadmus VFD study deemed savings higher than RMP deemed savings
WYFX1_001000	HVAC fan VFDs	17,400	26,820	154%	
WBWY_17479	HVAC fan and pump VFDs	625,150	1,005,820	161%	
WYFX1_000719	HVAC fan VFDs	20,300	33,740	166%	
WYFX1_000567	HVAC fan VFDs	46,400	77,645	167%	
WYFX1_000885	HVAC fan VFDs	145,000	249,225	172%	
WBWY_13833	HVAC fan VFDs	272,600	481,352	177%	
WYFX1_000566	HVAC fan VFDs	23,200	41,677	180%	
WBWY_12513	Oil Pump VFD	1,475,000	3,096,040	210%	

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

- All motors incentivized for green motor rewind projects were found in storage or could not be located during site visits. Energy savings from these projects are achieved by performing green motor rewinds, resulting in higher motor efficiencies than a normal rewind process. However, savings would be realized only upon placing the motor back in service. As no motors were found in service, no savings could be realized.
- For projects where VFDs are applied to HVAC fans, RMP uses deemed savings of 1,160 kWh/hp. The Cadmus team evaluated these projects by referencing the 2014 VSD study and applying the deemed savings specific to HVAC supply fans, return fans, and exhaust fans. The revised deemed savings amounts were higher than RMP's deemed savings value.
- Several projects involved VFD installations on process motors. For six projects exhibiting realization rates greater than 120% or lower than 80%, the Cadmus team installed power metering equipment or retrieved building management trends to determine system performance. In each case, the equipment's performance deviated from the rebate documentation. Critical inputs to modifying the calculations included HOU, load profile,

production output, flowrate, and pressure. If the production increased or decreased when compared to the rebate documentation, baseline energy consumption was adjusted to match the change.

Compressed Air

RMP provides incentives for several types of compressed air projects: VFDs serving air compressors; air dryers; compressed air system setpoint and sequence optimizations; air leak reduction; and zero-loss condensate drains. RMP incented five measures within three projects, and reported 671,228 kWh in energy savings for the 2014 and 2015 program years, accounting for 2% of all reported energy savings in Wyoming. The evaluated energy savings for the compressed air strata were 726,909 kWh and the realization rate was 108%.

Methodology

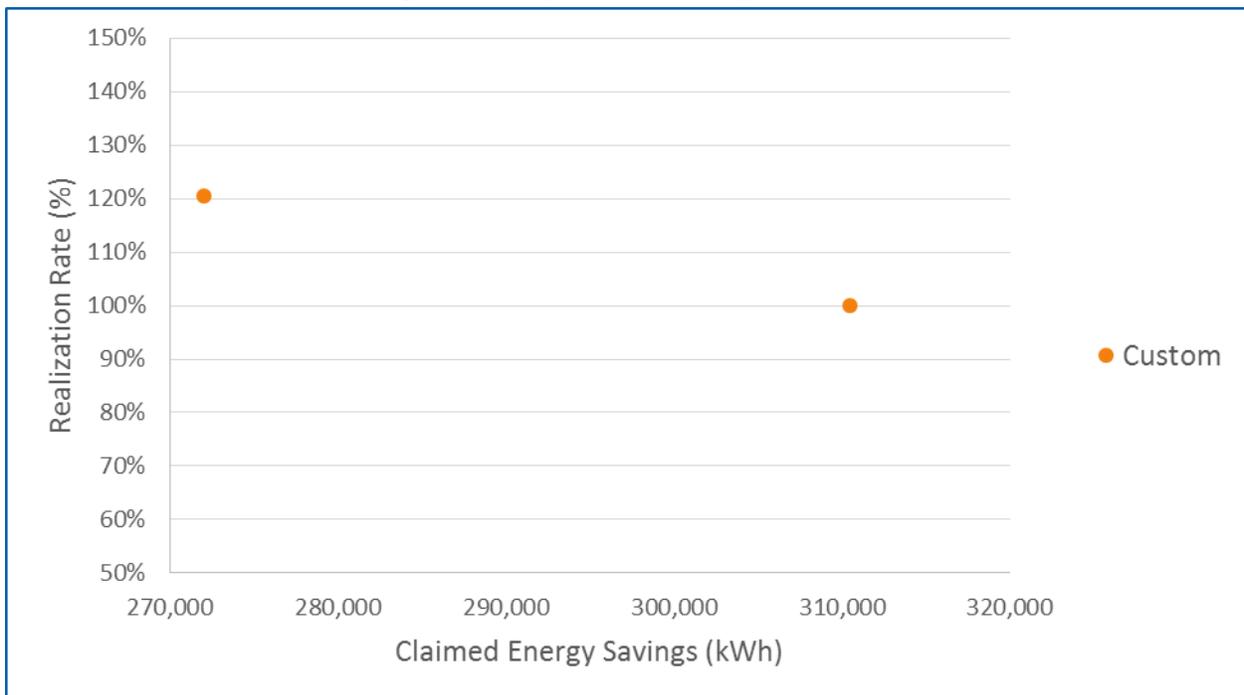
The Cadmus team evaluated two compressed air projects, accounting for 87% of all reported energy savings within the strata. RMP used custom calculations for both evaluated projects.

The team performed site visits to inspect and document the installed system specifications and operational setpoints. In evaluating the custom projects, the team reviewed energy analysis reports and savings verification reports for their methodology and accuracy, and used site findings to revise calculation inputs where variations occurred.

Findings

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

Figure 7. Compressed Air Sample Results





One site achieved a 120% realization rate. The Cadmus team found no (or nominal) differences in reported savings for the remaining site. Table 17 provides specific details for the site achieving a realization rate of 120%.

Table 17. Compressed Air System Sample Results

Project	Project Measure	Reported kWh	Evaluated kWh	Site Realization Rate	Notes
WYC00314	VFD air compressor	272,014	327,695	120%	Different load profile based on verification site visit

Further explanation follows for the more atypical measure-level realization:

- One custom project exhibited a 120% realization rate (WYC00314) due to higher compressed air system operating hours at high loads. The savings verification report projected annual operating hours above a 12% load at 3,250 hours. Based on the staff interview, annual operating hours above a 12% load were 3,754 hours. The team used the compressed air prescriptive calculator (i.e., NW Regional Compressed Air Tool v3.0) to recalculate the baseline and installed compressor energy consumption using the new load profile.

Agricultural

RMP provides incentives for several types of agricultural projects: pivots and linear irrigation systems; pump upgrades; system redesigns; VFDs; irrigation hardware upgrades; and wheel line/hand line equipment. RMP provided incentives for 56 measures in 19 unique projects, and reported 204,015 kWh in energy savings for the 2014 and 2015 program years. Incented agricultural projects accounted for 0.7% of all reported energy savings in Wyoming. The evaluated energy savings for the agricultural strata were 501,636 kWh and the realization rate was 246%.

Methodology

The Cadmus team evaluated nine agricultural projects, accounting for 51% of reported energy savings within the agricultural strata. From the evaluated projects, RMP used deemed savings for seven projects and custom calculations for two projects.

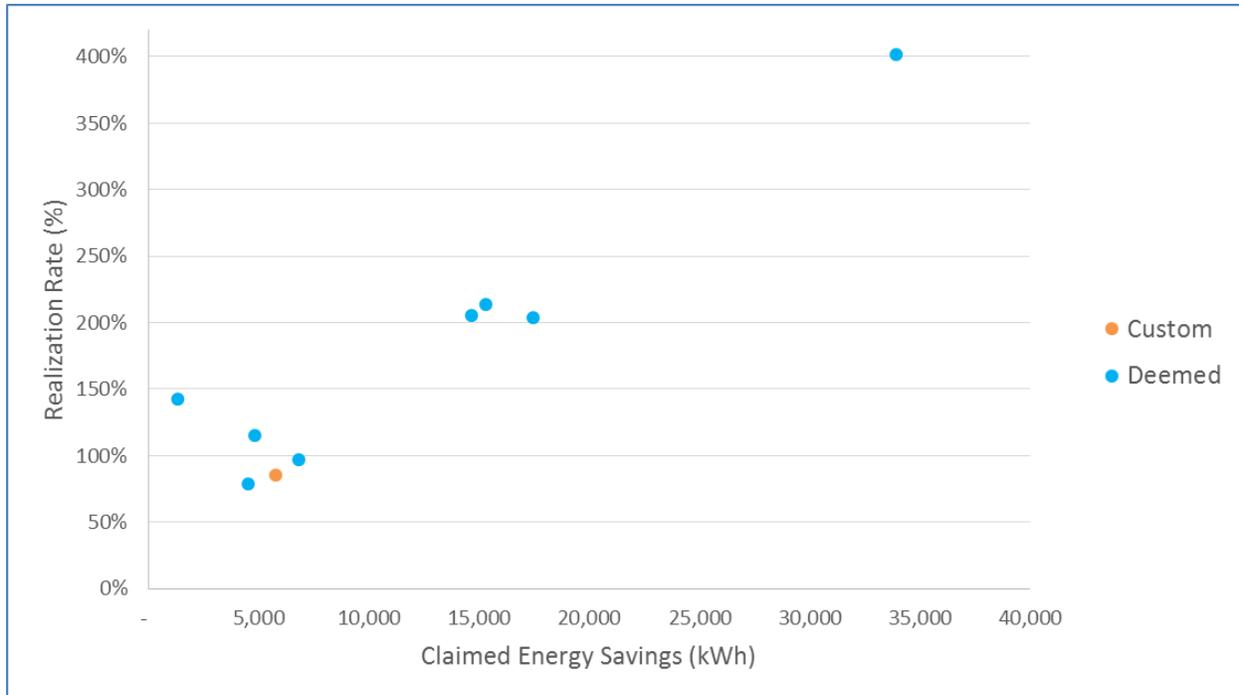
The majority of projects that the team evaluated involved upgrading or replacing irrigation hardware equipment (e.g., gaskets, sprinklers, nozzles, hoses, regulators). These projects claimed savings using a deemed savings value per unit. The team evaluated these projects by using the savings methodology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

The sampled custom project involved installing a VFD on an irrigation pump. The team evaluated savings by updating the prescriptive Irrigation Pump VFD Savings Estimator v1.4 calculator, based on site findings.

Findings

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

Figure 8. Agricultural Sample Results



Five sites exhibited realization rates greater than 120%, and one site exhibited a realization rate below 80%. Table 18 provides specific details related to these projects.

Table 18. Agricultural Sample Detailed Findings

Project	Project Measures	Reported kWh	Evaluated kWh	Site Realization Rate	Notes
WYC00879	Irrigation hardware	4,532	3,588	79%	RTF calculator used and adjusted for hours of operation and flowrate
WYC00938	Irrigation hardware	1,336	1,905	143%	RTF calculator used and adjusted for hours of operation and flowrate
WYC00773	Irrigation hardware	17,471	35,560	204%	RTF calculator used and adjusted for hours of operation and flowrate
WYC01179	Irrigation hardware	14,674	30,200	206%	RTF calculator used and adjusted for hours of operation and flowrate
WYC00636	Irrigation hardware	15,302	32,757	214%	RTF calculator used and adjusted for hours of operation and flowrate



Project	Project Measures	Reported kWh	Evaluated kWh	Site Realization Rate	Notes
WYC01185	Irrigation hardware, irrigation pump VFD	33,916	136,102	401%	RTF calculator used and adjusted for hours of operation and flowrate

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

- All projects involved replacing irrigation hardware (e.g., gaskets, sprinklers, nozzles, hoses, regulators). Claimed savings for these projects were based on a deemed savings value per hardware type. The deemed savings’ source drew upon RTF data with modifications specific to Wyoming’s local conditions. The Cadmus team evaluated these projects using the RTF irrigation hardware measure calculation methodology and associated calculation tools. The RTF calculator allows use of site-specific project data collected during site visits to update savings calculations. Site-specific information includes HOU, flow rate, and pump pressure. In general, the team determined higher energy savings for irrigation hardware projects due to increased HOU and flowrates.

Other

RMP provides incentives for projects within the “other” category (e.g., building shell measures, BMS controls, insulation, and additional measures that did not fit into typical categories). RMP incented 38 measures within 26 unique projects, and reported 911,445 kWh in energy savings for the 2014 and 2015 program years. Other incented projects accounted for 3% of all reported energy savings in Wyoming. The evaluated energy savings for the other strata were 909,259 kWh and the realization rate was 100%.

Methodology

The Cadmus team evaluated eight projects, accounting for 34% of the reported energy savings within the other strata. From the evaluated projects, RMP used deemed savings for five projects, custom calculations for two projects, and a combination of deemed and custom calculations for one project. Table 19 lists deemed savings sources and evaluation methodologies for projects within the other category.

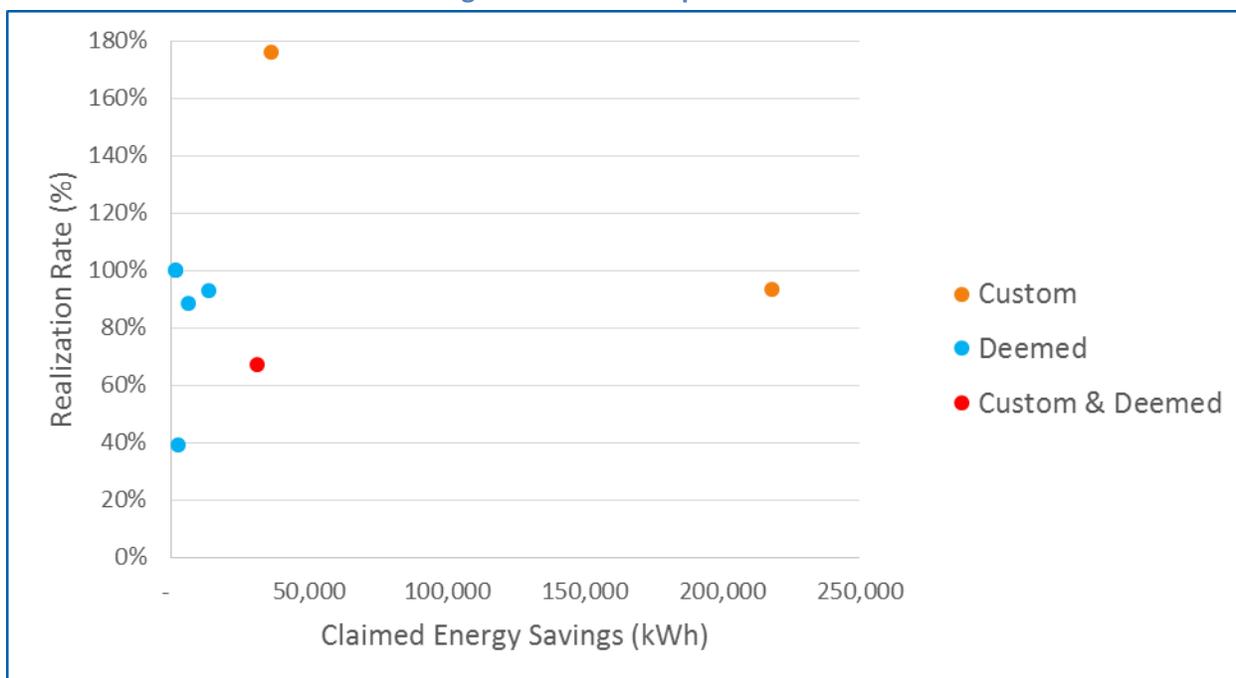
Table 19. Other Sample Energy Savings Methodology

Project Type	Reported Saving Methodology	Evaluation Methodology
Cool roofs	Deemed savings (0.144 kWh/yr/sq. ft.) based on California DEER	ORNL Commercial RSC
Roof/Attic Insulation	Deemed savings (0.022 kWh/yr/sq. ft.) based on California DEER	Used reported deemed savings and updated quantities based on site observations
Wall Insulation	Deemed savings (0.008 kWh/yr/sq. ft.)	Used reported deemed savings and updated quantities based on site observations
High-efficiency windows	Deemed savings vary between 0.96 kWh/yr/sq.ft. and 3.98 kWh/yr/sq.ft, depending on the window construction type	Used reported deemed savings and updated quantities based on site observations

Findings

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

Figure 9. Other Sample Results



Two projects exhibited realization rates below 80%, and one project exhibited a realization rate above 120%. Table 20 provides specific details related to those projects with low and high realization rates.



Table 20. Other Sample Detailed Findings

Project	Project Measures	Reported kWh	Evaluated kWh	Site Realization Rate	Notes
WYFX1_000667	Cool roof, roof insulation	2,478	966	39%	ORNL Commercial RSC results show no energy savings for cool roof on warehouse in Rock Springs, WY
WBWY_19726	Direct digital control (DDC) upgrade with advanced control strategies, HVAC pump VFDs	31,232	20,935	67%	Utility bill analysis (4 years, 2 pre, 2 post, normalized for weather) shows lower energy savings
WBWY_19725	DDC upgrade with advanced control strategies	36,346	64,046	176%	Utility bill analysis (4 years, 2 pre, 2 post, normalized for weather) shows higher energy savings

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

- One project (WYFX1_000667) involved installation of a cool roof and roof insulation for a warehouse in Rock Springs, Wyoming. The Cadmus team could not inspect the roof insulation, but visually confirmed the cool roof material and measured the roof square footage. The team used the ORNL Commercial RSC to evaluate the energy savings for the cool roof. According to the ORNL, no electric energy savings result from a cool roof installed on a warehouse in Rock Springs.
- Two projects (WBWY_19725 and WBWY_19726) involved implementation of DDC system upgrades with advanced control strategies for primary schools. For both projects, RMP provided utility data for two years before and two years after the retrofit. The team performed a utility data analysis for the projects, normalizing for actual weather data from a local station. The WBWY_19725 results show higher energy savings than expected; the WBWY_19726 results show lower savings.

Evaluated Net Savings

The Cadmus team evaluated net savings by conducting a freeridership and participant spillover analysis, using participant survey responses. The team used the same net savings methodology employed for the 2011–2013 Energy FinAnswer Program evaluations. Appendix A. Self-Report NTG Methodology provides detailed information about the net savings methodology. This net savings approach aligns with industry best practices, summarized in the Uniform Methods Project.⁸

⁸ The Uniform Methods Project chapter that covers estimation of net savings can be found online: <http://www.nrel.gov/docs/fy14osti/62678.pdf>

Table 21 provides the net savings evaluation results, shown as evaluated gross savings and NTG, by program delivery channel. The team weighted program delivery channel NTG estimates by evaluated program energy savings, arriving at an overall 70% NTG estimate for the program. For informational purposes, the table shows delivery channel NTG values.

Table 21. *wattsmart* Business Program NTG Results for 2014–2015

Program Delivery Channel	n	Program Gross Savings (kWh)	NTG
Typical Upgrades	36	29,305,366	66%
Custom Analysis	12	3,594,767	99%
SBL	8	339,458	100%
Overall	56	33,239,591	70%*

*Weighted by evaluated program savings.

The following sections describe the NTG methodology used and the results for the 2014–2015 *wattsmart* Business Program.

Methodology

This presents a brief overview of the Cadmus team’s NTG methodology (Appendix A. Self-Report NTG Methodology provides a more detailed explanation). To determine net savings, the team used a self-report approach and analyzed collected data to estimate freeridership and participant spillover. Typically, this approach is the most cost-effective, transparent, and flexible method for estimating NTG. Consequently, it is the NTG methodology most frequently employed.

Freeridership and participant spillover constitute the NTG. The team used the following formula to determine the final NTG ratio for all three program channels (e.g., Typical Upgrades, Custom Analysis, SBL) for 2014 and 2015 participants:

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

The team then weighted each delivery channel’s NTG ratio by the delivery channel’s evaluated gross population energy savings to arrive at the program’s overall NTG estimate.

Freeridership Estimation

The Cadmus team determined freeridership for the SBL, Typical Upgrades, Custom Analysis, and LED Instant Incentive delivery channels, based on an approach previously developed for RMP (which ascertained freeridership using responses to a series of survey questions). Survey questions asked whether participants would have installed the same equipment in the program’s absence, at the same time, in the same amount, and at the same efficiency.

For the first step in freeridership scoring, the team reviewed participant survey responses to determine if the exact same project (in terms of scope and efficiency level) would have occurred at the same time without the program. If the same project would have occurred, the team scored the respondent as a complete freerider; otherwise, the team reviewed responses to determine whether the project would have occurred at all within the same 12-month period.



If the project would not have occurred, the team scored the respondent as a non-freerider. If the project would have occurred within the same 12-month period, but would have been altered regarding its size or efficiency level, the team scored the respondent as a partial freerider. By weighting the delivery channel-specific freeridership estimates by the evaluated energy savings achieved by respondents within the sample, the team calculated the weighted freeridership estimate for each delivery channel.

Estimation of Spillover

The Cadmus team estimated the program’s indirect influence on the broader market due to program activities. This program spillover represented energy savings attributable to the program’s intervention and influence, but not currently reported in program tracking data.

Spillover savings can result from participants and nonparticipants. Participant spillover occurs when the program influences program participants to install additional energy-efficient equipment beyond that incentivized by the program, while nonparticipant spillover savings occur when market allies influenced by the program install or influence nonparticipants to install energy-efficient equipment.

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

Freeridership Findings

After conducting 46 surveys covering 56 measures with Typical Upgrades, Custom Analysis, and SBL delivery channel participants, the Cadmus team converted the freeridership question responses into a freeridership estimate for each participant, using the approach described in Appendix A.

To determine the extent that the program affected installation decisions, the team asked respondents what would have differed about their installations had the program not been an option. The team asked about details for up to two measures for those installing more than one measure through the program. Participants stated they would have installed 23 project measures (41%) at the same efficiency and scope within the same year, while 20 project measures (36%) would not have been installed at all. Another 12 project measures (21%) would have occurred in the program’s absence, but the installations would have taken place more than 12 months later. For one project measure (1%), the participant would have installed the same quantity within one year of the original participation date, but replacements would have been with standard efficiency equipment. Table 22 summarizes participant measure responses, along with initial calculated freeridership estimates for each respondent group.

Table 22. Measure Installations in Absence of wattsmart Business Program

Respondent Category	n*	Percentage of Total**	Initial Freeridership Estimate
Would have been installed at the same efficiency and scope within the same year	23	41%	100%
Would not have been installed at all	20	36%	0%
Would have installed more than 12 months later	12	21%	0%
Would have installed the same quantity of the measure within one year of the original participation date, but would have installed standard efficiency equipment	1	2%	0%

*The team asked 46 respondents about 56 measures.

**Total may not sum to 100% due to rounding.

The Cadmus team compared participants’ statements about their actions in the program’s absence to their statements regarding factors influencing their projects. Several participants’ measure-specific responses (n=14) indicated that they found the program incentive or program assistance important in their decisions, but, without the program, they would have installed the same project at the same time. The team considered these responses inconsistent, and requested that participants use their own words to explain the program’s influence on their projects. Three respondents provided descriptions that warranted freeridership adjustments. The team adjusted respondents’ freeridership by a factor of 50% based on responses such as the following:

- “There were 22 new improvements that wouldn’t have been done without the program.”
- “It had a high impact, it gave us the incentive to do it.”

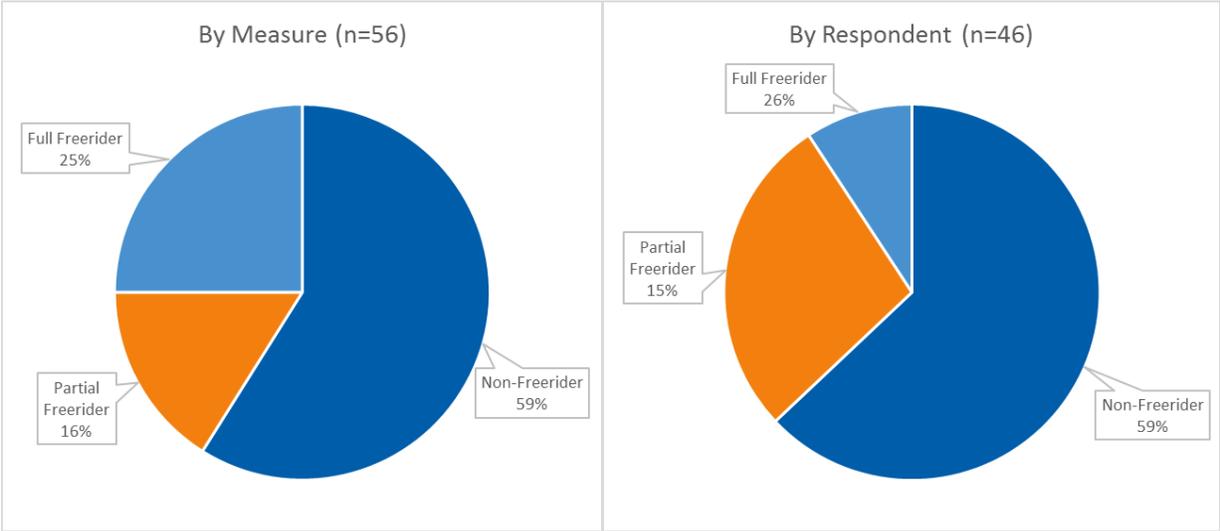
In addition, the team credited past participation’s influence (due to the portfolio nature of program delivery) by reducing freeridership if past program participation proved somewhat or very important in the participant’s decision to install efficient equipment. Given RMP’s efforts to cross-promote its entire portfolio of energy efficiency programs, a respondent’s prior participation in a RMP program could have influenced their decision to participate in the current program.

To calculate this credit, the team reviewed respondents’ ratings of the prior program’s influence on a scale of 1 to 5, where 1 indicated “not important at all” and 5 indicated “extremely important.” For those rating their previous participation as a 4 or 5, the team reduced their freeridership scores by 50% or 75%, respectively. This affected seven projects initially receiving a freeridership estimate of 100%, with the team reducing one project freeridership estimates by 75% and another six by 50%.

Based on participant responses and after adjusting for inconsistencies and prior program experience, the team determined freeridership by measure and by respondent, as shown in Figure 10.



Figure 10. Freeridership, by Measure and by Respondent



The team asked approximately 22% of respondents about two measures associated with their projects. Overall, responses remained consistent regarding the program’s influence on decisions; so overall representations were similar by measure and by respondent. Two participants, however, were influenced more by one measure than the other. Overall, the team determined that 26% of participants were full freeriders, 59% were non-freeriders, and 15% were partial freeriders.

Participant Spillover Findings

Some participants installed additional, energy-efficient measures after participating in the **wattsmart** Business Program. The Cadmus team attributed program spillover to additional purchases that **wattsmart** Business Program participation significantly influenced, but were not reported through the program. Respondents indicated the influence level on a 1 to 5 point scale, where 1 indicated “not important” and 5 indicated “extremely important” (in response to: “please rate how important your experience with the RMP program was in your decision to install this energy-efficient product”). For respondents rating a 5, the team considered the spillover measure attributable to the RMP program.

The team used evaluated savings values from the engineering gross savings analysis to estimate spillover measure savings. The team calculated the spillover percentage for each program delivery channel by dividing the sum of the additional spillover savings by the total gross program savings achieved for each program delivery channel. Table 23 shows the results.

Table 23. wattsmart Business Program Participant Spillover

Program Delivery Channel	Spillover Measures Installed	Spillover Measure Quantity	Spillover Energy Savings (kWh)	Surveyed Program Delivery Channel Savings (kWh)	Spillover Percentage
Typical Upgrade	LED's	550	32,583	1,518,081	4%
	T8 Fluorescent	250	6,193		
	CFL's	150	16,662		
Custom Analysis	None	N/A	0	694,032	0%
SBL	None	N/A	0	42,736	0%

Net-to-Gross Findings

The Cadmus team conducted 28 surveys, covering 36 project measures with Typical Upgrades delivery channel participants, 12 surveys covering 12 project measures with Custom Analysis delivery channel participants, and six surveys covering eight project measures with SBL delivery channel participants. The team used these participant responses to generate a 66% NTG for Typical Upgrades, 99% NTG for Custom Analysis, and a 100% NTG for SBL, as shown in Table 24.

The team calculated a program-weighted NTG of 70% by weighting each delivery channel NTG percentage from Table 24 by the evaluated gross population energy savings for each delivery channel.

Table 24. wattsmart Business Program NTG Results for 2014–2015

Program Delivery Channel	Measure Responses (n)	Freeridership Percentage	Spillover Percentage	NTG*	Evaluated Gross Population Savings (kWh)
Custom Analysis	36	38%*	4%	66%	29,305,366
Typical Upgrades	12	1%*	0%	99%	3,594,767
SBL	8	0%*	0%	100%	339,458
Overall	56	34%**	4%**	70%**	33,239,591

*NTG weighted by evaluated program savings.

**Overall results weighted by the evaluated gross program population savings.

Benchmarking NTG

The Cadmus team benchmarked RMP’s program against similar nonresidential programs. Table 25 shows freeridership, spillover, and NTG estimates reported for prior RMP program years as well as for other utilities with similar nonresidential programs and measure offerings.



Table 25. NTG Benchmarking Comparisons*

Utility/Region	Reported Year	Responses (n)	Freeridership	Spillover	NTG
Rocky Mountain Power Wyoming 2014–2015 <i>wattsmart</i> Business Program	2016	56	34%	4%	70%
Rocky Mountain Power Wyoming 2011–2013 Energy FinAnswer Evaluation	2015	3	37%	1%	64%
Rocky Mountain Power Wyoming 2011–2013 FinAnswer Express Evaluation	2015	189	24%	0%	76%
Northeast Utility—C&I Prescriptive	2016	77	23%	0%	77%
CY2015 Wisconsin Focus On Energy Nonresidential Evaluation Report—Wisconsin Statewide	2016	450	21%	0%	79%

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

The 34% 2014–2015 *wattsmart* Business Program freeridership estimate was slightly higher than other benchmarked programs, except for the 37% 2011–2013 Energy FinAnswer Evaluation freeridership estimate, based on only three respondents. The *wattsmart* Business Program freeridership estimate was than the 24% 2011–2013 FinAnswer Express Evaluation freeridership estimate.⁹ The 2011–2013 RMP program evaluations were completed using the same NTG methodology as that used this evaluation.

Methodologies used for the Northeast utility’s C&I Prescriptive and CY2015 Wisconsin Focus on Energy Nonresidential evaluations were comparable to that used for the 2014–2015 *wattsmart* Business Program, but differed in design.

Nonparticipant Spillover

The Cadmus team used a series of questions included in the nonparticipant surveys to estimate nonparticipant spillover. Nonparticipant spillover refers to savings generated by customers who were motivated by the RMP program’s reputation, past RMP program participation, and/or RMP program marketing to conduct energy efficiency installations for which they did not receive an incentive. The team did not apply nonparticipant spillover to program savings for this period, but calculated this for informational purposes (i.e., 2% of total *wattsmart* Business Program savings). Appendix B. Nonparticipant Spillover provides detailed nonparticipant spillover analysis methods and results.

⁹ Between 2013 and 2015, RMP combined a number of programs under the *wattsmart* Business Program umbrella, rolling the Energy FinAnswer program into the Custom Analysis delivery channel, and the FinAnswer Express program into the Typical Upgrades delivery channel.

Process Evaluation

This section presents detailed findings from the Cadmus team’s process evaluation of the SBL, Typical Upgrades, and Custom Analysis delivery channels for the Wyoming **wattsmart** Business Program. The team bases these findings on analysis of data collected through program staff interviews and through participant, partial participant, and nonparticipant surveys. In conducting the evaluation, the Cadmus team focused on assessing the following:

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

The team focused its research activities on key research topics identified during the evaluation kick-off meeting as well as on topics of interest identified by program stakeholders. Table 26 lists the primary research questions.

Table 26. Research Areas and Questions

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



Methodology

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

Materials and Database Review

The Cadmus team conducted a review of program materials that included the following: past evaluation reports for Wyoming’s Energy FinAnswer and FinAnswer Express programs (in program years 2011 through 2013); marketing materials; the **wattsmart** Business Program website; the contractor manual; participant and partial participant databases; and the RMP nonresidential customer database.

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

Utility and Administrator Staff Interviews

The Cadmus team developed stakeholder interview guides and collected information about key topics from program management staff. The team conducted one interview with the program staff at RMP and two interviews with program staff at Cascade and Nexant (the program administrators). These interviews covered the following topics:

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

Surveys

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

Participant Telephone Surveys

The team conducted telephone surveys with 46 participants who installed measures through three program delivery channels. The surveys included six participants in SBL, 28 in the Typical Upgrades channel, and 12 in the Custom Analysis delivery channel. Survey questions addressed the following process evaluation topics:

- **Customer perceptions and motivations**
 - Program awareness
 - Reasons and motivations for participation

- Perceived value of the program
- **Customer experience**
 - Effectiveness of the program delivery, including marketing materials and delivery channels
 - Customer interaction with trade allies and program staff
 - Customer satisfaction
- **Customer information:** firmographic information

Participant Sample Detail

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

After assigning all projects to a delivery channel, the team reviewed projects for participants who completed more than one project within a delivery channel, and retained the single project with the highest kWh savings. For projects with more than one installed measure type, the team retained the two non-identical measures with the highest energy savings. The team then randomly selected participants for surveys within each delivery channel. Table 27 shows each project’s program or measure designation, mapped to its respective delivery channel.

Table 27. Programs and Measures Reported by Delivery Channel

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



Nonparticipant and Partial Participant Telephone Surveys

The Cadmus team conducted telephone surveys with 85 nonparticipants (five with managed accounts and 80 with non-managed accounts) and with three partial participants regarding projects they started but did not complete. Surveys addressed the following process evaluation topics:

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

Nonparticipant Sample Detail

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

Partial Participant Sample Detail

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

Program Implementation and Delivery

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

Program Overview

RMP consolidated the previous energy efficiency programs under the **wattsmart** Business Program umbrella to offer an incentive portfolio to its customers through a reduced and simplified application process and an improved customer experience. Program staff reported that the consolidation has worked well and was the “right thing to do.”

In 2013, Nexant took over the **wattsmart** Business Program’s customer service call management from RMP. Previously, RMP maintained a single person to respond to calls on its business energy efficiency hotline. Nexant reported the person was not dedicated to the task, with most calls managed by voicemail. Nexant took these calls, answering them live or routing them to an appropriate person.

Currently, this position is staffed by a knowledgeable subject matter expert, who answers calls from customers and vendors as well as misdirected calls about residential programs and customers asking about their bills.

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

Design and Implementation

RMP reassigned utility staff who previously managed the individual DSM programs across the parent company's (i.e., PacifiCorp's) multistate territory to manage the **wattsmart** portfolio of programs, within the RMP division or the Pacific Power division. RMP program management staff said that program delivery worked well with in-house managed accounts, as did outreach to trade allies, but program delivery had not achieved this efficiency for smaller commercial and industrial customers with non-managed accounts.

Cascade staff noted that approximately 10% of customers installing irrigation equipment through the Typical Upgrades delivery channel anticipated higher incentives than they qualified for. RMP capped incentives at 70% of cost or as a one-year payback (whichever is less). This one-year cap meant incentives were unavailable to shorten a project's simple payback to less than one year.

Although the general application stated these incentive limits, staff reported that customers did not learn they exceeded the incentive limits until after submitting an application and the implementer completed the energy savings and incentive calculations. Though RMP recommends that customers prequalify for these incentives prior to purchasing equipment, prequalification is not mandatory.

Review of Contractor Manual

The Cadmus team reviewed the **wattsmart** *Business Program Guidelines for Contractors* manual and found it comprehensive in scope, well organized, and easy to search, and that it provided detailed information necessary to understand the following: program organization and offerings; the incentive calculator and analysis tools required by each delivery channel; contractor engagement and communication processes; program evaluation requirements; and savings verification and reporting frameworks.¹⁰

Marketing and Outreach

Program management staff said the outreach strategy did not change following the program's consolidation, primarily remaining a function of in-house RMP staff and customer-facing trade allies. RMP developed marketing collateral and managed co-branding to maintain quality control. RMP

¹⁰ Pacific Power and Rocky Mountain Power. **wattsmart** *Business Program Guidelines for Contractors*—Version 1.1. November 1, 2016.



extended the **wattsmart** Business Program logo to vendors (previously limited for use in advertising residential offerings across the portfolio).

Evaluation of the Program Website

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

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

Trade Allies

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

Cascade and Nexant managed this alliance, each in their respective markets. Trade allies joining RMP’s Energy Efficiency Alliance signed an agreement, then received incentive program training and calculation tools, introductions to local business prospects through organized meet-and-greet events, marketing support, and notifications about program updates. Program implementers posted business information for Energy Efficiency Alliance members on the program website’s searchable database.

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

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

Cascade, which works with agricultural and industrial customers, recruited trade allies but did not require them to join the Energy Efficiency Alliance. Cascade supported trade allies’ customer outreach in

Wyoming. Rather than a Cascade engineer taking the lead role with a customer when trade allies provided a program lead, Cascade provided engineering support to assist the trade ally in reaching out to the customer, prepared the necessary calculations to show customers potential savings, and advised the trade ally on ways to achieve higher savings from a project.

Database Interface and Data Management

RMP uses two software programs—Demand Side Management Central (DSMC) and the Technical Resource Library (TRL)—for project management, data warehousing, and reporting. As described in the **wattsmart** Business Program Guidelines for Contractors,¹¹ the TRL houses a program database of measure definitions, which the DSMC draws upon when RMP performs validation checks to ensure incentives and savings submitted by engineer and trade allies correspond with values and caps defined by tariff.

TRL measures are built into the Incentive Calculator Tool, which RMP provides to program energy engineers or trade allies to ensure consistency in incentive calculations. When preparing offers for customers or calculating savings and incentives, energy engineers and trade allies use the tool’s pulldown menus to select measures only included in **wattsmart** Business Program. Implementation staff who oversee the trade allies cited this as providing a major benefit in preventing trade allies from selecting ineligible equipment. When a new measure appears, RMP must update the TRL and the calculator. Though implementation staff said this worked fairly well, custom measure descriptions must be reviewed and revised, and some custom measures must be added.

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

Additionally, Nexant said the data reconciliation process could be streamlined by allowing trade allies to enter project data directly into RMP’s system. Though successfully tested during the SBL pilot, expanding this to all **wattsmart** Business Program delivery channels may require system modifications to limit the data trade allies could access. Budgets and RMP restrictions may limit such modifications.

Through the weekly batch, implementers submit invoices to RMP for payment of approved incentives, assuming RMP provides funding within 10 days. Currently, this requires a reported 10 to 15 days, challenging implementers to deliver checks within trade allies’ expectations.

¹¹ Pacific Power, and Rocky Mountain Power. Wattsmart Business Program Guidelines for Contractors. Version 1.1. November 1, 2016.



Data Quality Assurance

Though RMP’s DSMC serves as the database of record, both implementers (as noted) maintain their own databases. Nexant reported spending significant time transferring data between the two systems on a weekly basis, with very small variances found during weekly batch uploads (sometimes as little as \$0.15), and 99% matching exactly. Upon finding a variance, Nexant identifies and corrects it until the two systems match exactly. Nexant suggested that benefits from efforts should be evaluated relative to the potential savings amount.

RMP also performs quarterly and annual reconciliations between the DSMC and implementer databases—efforts that also prove time consuming and require significant effort. Given checks and balances occurring weekly between the two systems, Nexant suggested quarterly or annual reconciliations may not be necessary.

Before full launch of the SBL delivery channel (administered by Nexant), RMP and Nexant ran a pilot to build Nexant’s data into RMP’s system. This provided RMP with immediate and total visibility of all Nexant efforts; Nexant reported this worked well.

Project Quality Control

The program maintains its quality control function in an online database, accessible to Nexant’s implementation team. This function includes checklists of steps for reviewing and submitting projects for approval. The trade ally first submits information to Nexant’s processing group, which conducts final reviews, checking the project for program compliance, and then submits the project for payment to RMP (though RMP funds the incentives, Nexant writes the checks). Every project contains these checklists.

Evaluation of the Program Database

While evaluating the program, the Cadmus team identified the following inconsistencies in the participant databases:

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

The team expects inconsistencies in data reporting categories between 2014 and 2015 likely result from the ongoing consolidation of programs, and resolution of these inconsistencies will become apparent in data extracts from 2016 onward.

Program Challenges and Successes

RMP program management staff and program implementers reported, for the most part, that they had the resources needed to deliver the program in 2014 and 2015. RMP and implementer staff cited the following program strengths:

- A well-functioning, well-supported **wattsmart** Business Program network of trade allies, ingrained in local communities. Trade allies have their own contacts for questions, with relationships fostered over time. Nexant and Cascade provide proactive, locally outsourced delivery staff who remain available for site visits or trade ally visits.
- Strong relationships with large customers, which conduct projects delivering large savings.
- Project-level incentives for lighting retrofits and custom projects that encourage comprehensive projects and simplify delivery.
- Through third-party contractors, RMP provides robust energy engineering services for custom projects, providing customers with high-quality site evaluations or with savings and incentive reports prior to investments. These services facilitate informed decision making. Additionally, RMP hires a second engineer to develop the Savings Verification Report after project installation.
- Implementation staff provide personal attention to customers, contributing to year-over-year participation growth, despite boom and bust economic cycles.
- Targeting and recruiting customers has been continuously refined and improved.

Program management and implementation staff anticipated the following challenges will affect the program going forward:

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

Implementation staff said integration into the **wattsmart** Business Program addressed many prior issues with various express programs. For example, RMP wrote a new program manual (including **wattsmart**



Business Program guidelines), simplified the process and reporting templates, and provided measurement and verification guidance. Further, RMP scaled measurement and verification—labor and data intensive endeavors for all projects—to be commensurate with the project size. RMP also simplified customer projects and streamlined customer reports.

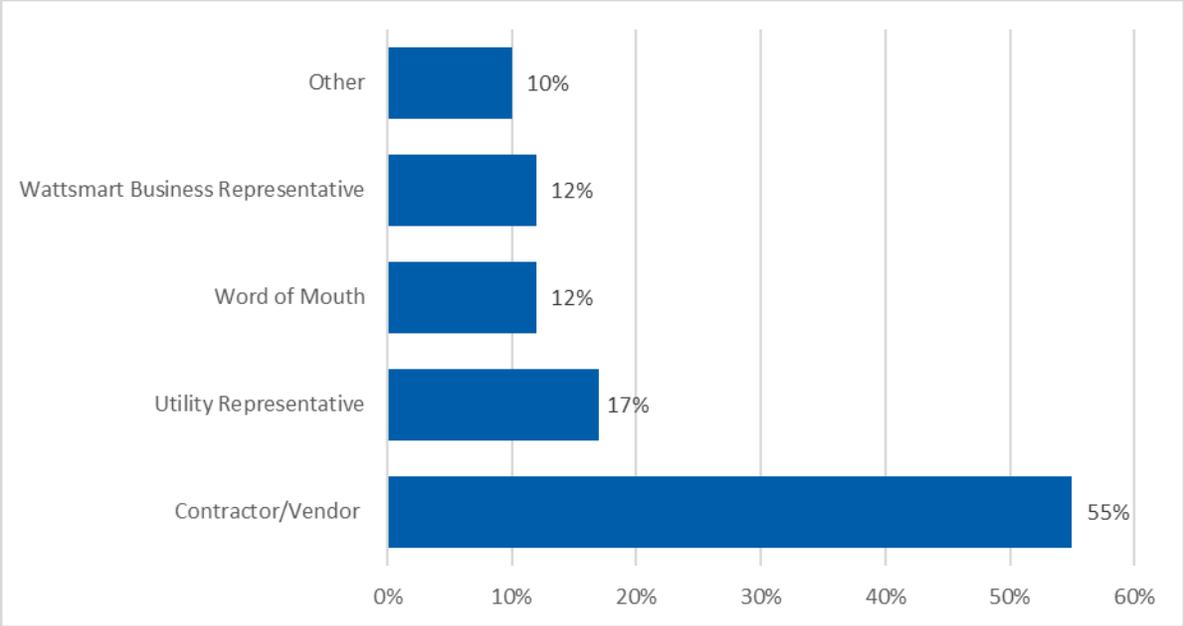
Customer Response

The Cadmus team surveyed 46 participants of the **wattsmart** Business Program. This section presents combined findings regarding awareness and communication, followed by separate findings for each program delivery channel. Occasionally (as with the following Awareness and Communication section), the report presents findings for the separate delivery channels and for the program overall.

Awareness and Communication

Participants in all delivery channels most frequently learned about available incentives through their contractors or vendors (mean combined 55%, n=42).¹² Figure 11 shows utilization of all information sources for all delivery channels combined.

Figure 11. Source of Information—All Delivery Channels Combined

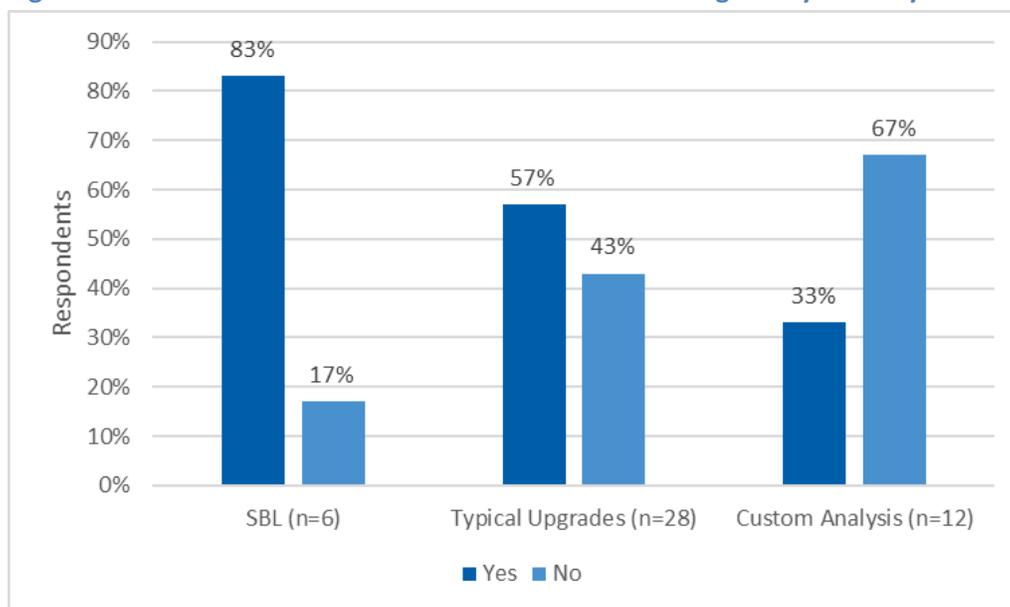


Source: RMP Wyoming **wattsmart** Business Program 2014–2015 Participant Survey QB3. Don’t know and refused responses removed. Multiple responses allowed (n=42).

¹² The “n” represents the number of respondents or responses to the question. For example, if the reference is 20% (n=100), this indicates 100 responses or respondents were included after removing any non-relevant answers (e.g., “don’t know” or “refused”).

As noted, program consolidation under **wattsmart** Business continued during the evaluation period, and customers continued to learn about the consolidation. During the participant surveys (September and October 2016), 54% of participant survey respondents (mean combined n=46) had heard of the **wattsmart** Business Program name before the survey call. As shown in Figure 12, SBL delivery channel participants displayed the highest program name awareness.¹³

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



Source: RMP Wyoming **wattsmart** Business Program 2014–2015 Participant Survey QB4.
Don't know and refused responses removed.

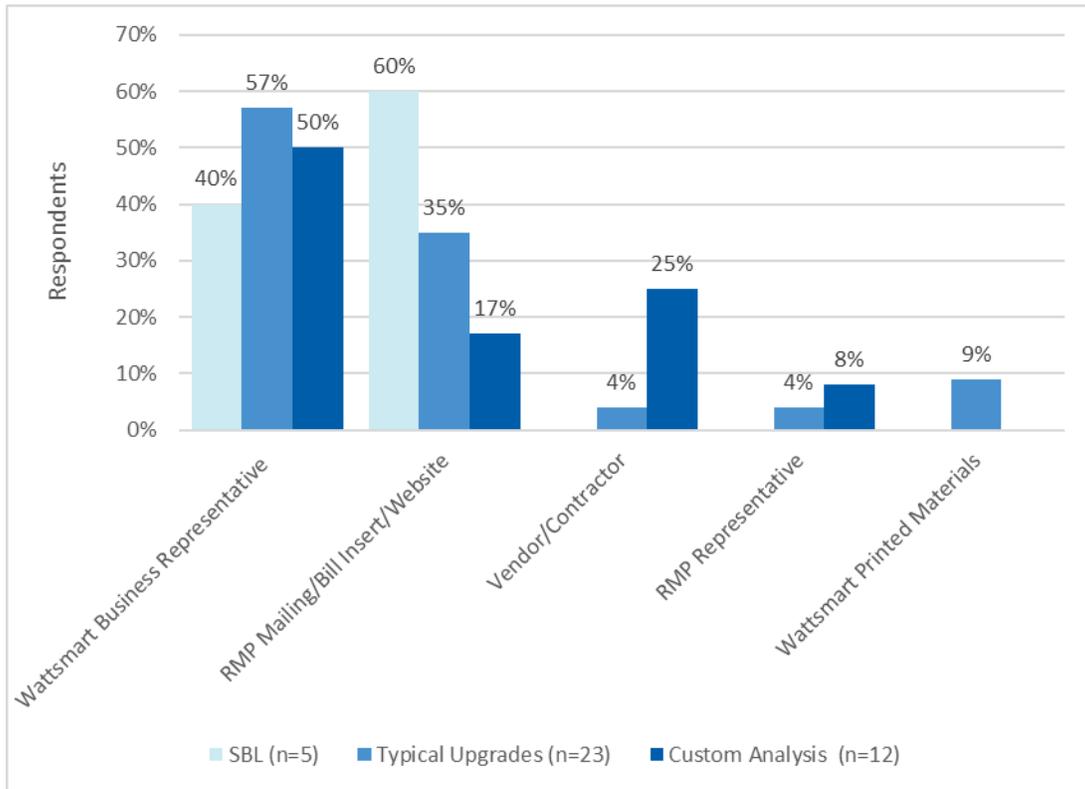
Although participants most frequently learned about program incentives from a contractor or vendor, the majority (60%, n=5) of SBL delivery channel customers preferred to be kept informed about the program through an RMP mailing, bill insert, or website. As shown in Figure 13, the other 40% of SBL participants preferred to be kept informed about the program through a **wattsmart** representative. Participants in the Typical Upgrades and Custom Analysis channels also preferred to receive information through the **wattsmart** representatives.

Though RMP can most cost-effectively market the SBL and Typical Upgrades delivery channels through participant interaction with a vendor or contractor, only 4% of Typical Upgrades participants and no SBL participants preferred this method.

¹³ Due to the small SBL sample (n=6), the Cadmus team did not calculate statistical significance between participants' program name awareness for the three delivery channels.



Figure 13. Preferred Method of Communication to Stay Informed



Source: RMP Wyoming **wattsmart** Business Program 2014–2015 Participant Survey QJ4. Don't know and refused responses removed.

Small Business Lighting Delivery Channel

Overall, the six surveyed SBL participants reported high satisfaction levels with the program elements, and only one reported a challenge—paying their project's upfront costs. Each participant employed 25 or fewer people.

Motivation

SBL participants reported saving money and reducing their energy consumption as their most important reasons for participating in the SBL offering (four of six). Two additional participants said they were motivated by incentives or helping another small business¹⁴ (one response each).

Satisfaction

Four of six SBL participants reported it very or somewhat easy to find an approved contractor to conduct their free site assessment, and five of six received a lighting proposal; these five were very satisfied with the proposal. Four respondents receiving a proposal said they were most influenced by projections for

¹⁴ The respondent who cited helping another business is a representative for a spa that leases the facility.

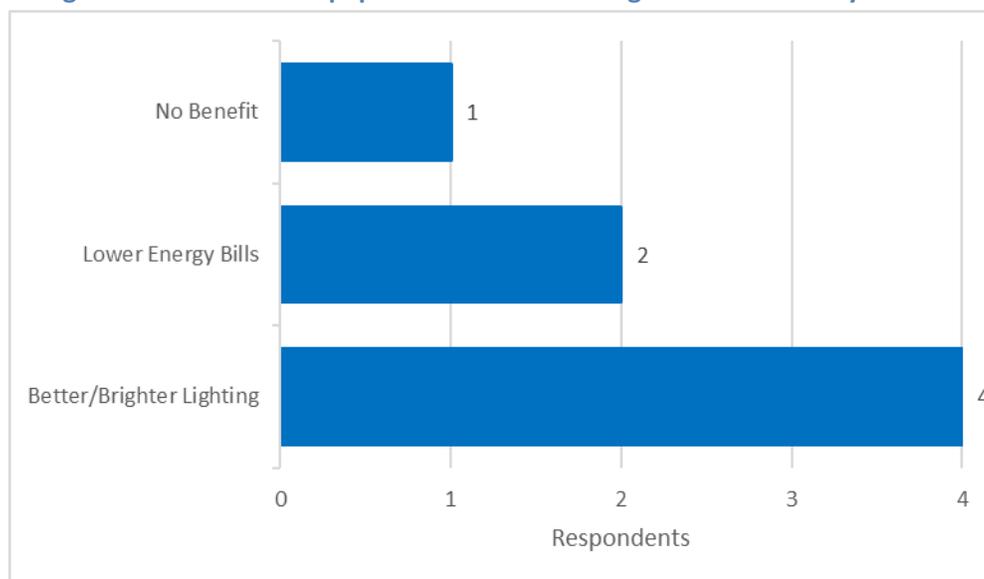
reduced costs when deciding whether to proceed with their projects; though the need for better lighting influenced one respondent.

With one exception, all SBL participants were also very satisfied with other channel elements, including work provided by the contractor, equipment installed—and the incentives. One participant responded “don’t know” when asked to rate their satisfaction with the incentive.

Benefits and Challenges

Overall, all but one SBL participant (five of six) said they received one or more benefits due to installing the lighting equipment. As shown in Figure 14, respondents most frequently cited better or brighter lighting quality, followed by lower energy bills. The one participant (a salon) saying they had not received any benefit, leased their space and was the same participant saying they were motivated to help another small business owner. This participant did not report challenges or dissatisfaction with the program.

Figure 14. Benefits of Equipment Installed Through the SBL Delivery Channel



Source: RMP Wyoming **watt**smart Business Program 2014–2015 Participant Survey QD16. Don’t know and refused responses removed. Multiple responses allowed. (n=6)

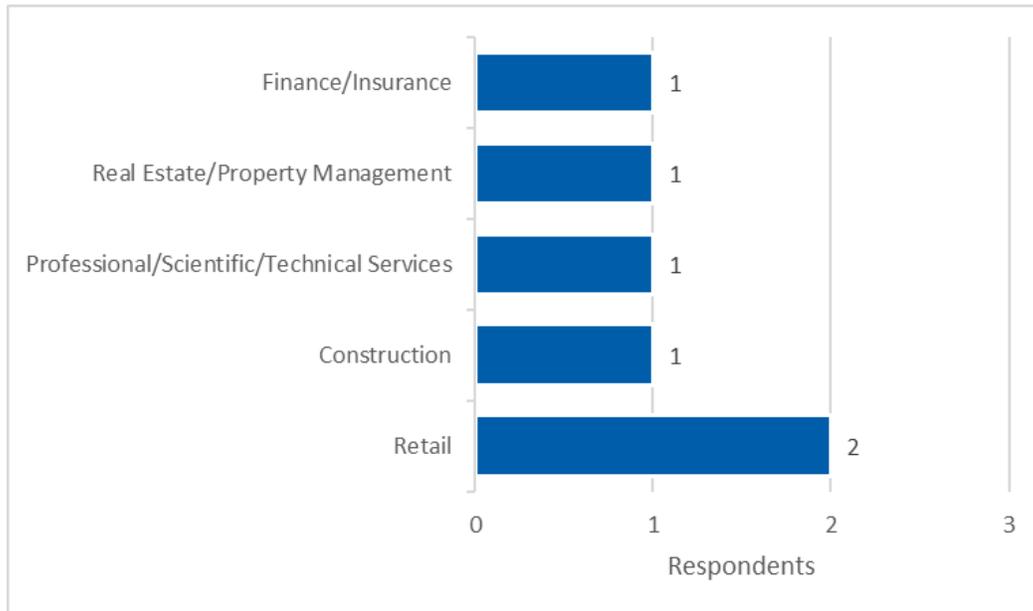
While five of six SBL delivery channel participants did not report challenges with their participation, one reported difficulties in paying the project’s upfront costs while waiting for the incentive, saying it would be easier if RMP provided the incentive directly to the contractor.

Finally, when asked if they had recommendations to improve the SBL delivery channel, one participant asked RMP to verify the energy and cost savings after the lighting installation. When asked if RMP could do anything to improve the respondents’ overall experience with the **watt**smart Business Program, all six participants responded “no.”

Firmographics

As shown in Figure 15, two of the six surveyed SBL delivery channel participants belonged to the Retail business sector; the remaining four business sectors represented one participant each.

Figure 15. SBL Delivery Channel Survey Participants by Business Sector



Source: RMP Wyoming **wattsmart** Business Program 2014–2015 Participant Survey Q1. Don't know and refused responses removed. May not total 100% due to rounding. (n=6)

Four of the six SBL participants owned between one to three facilities in Wyoming; three participants employed one to 10 people, and one employed 11 to 25 people. The remaining two participants leased one facility each; one employed 11 to 25 people, and the other did not know how many people were employed.

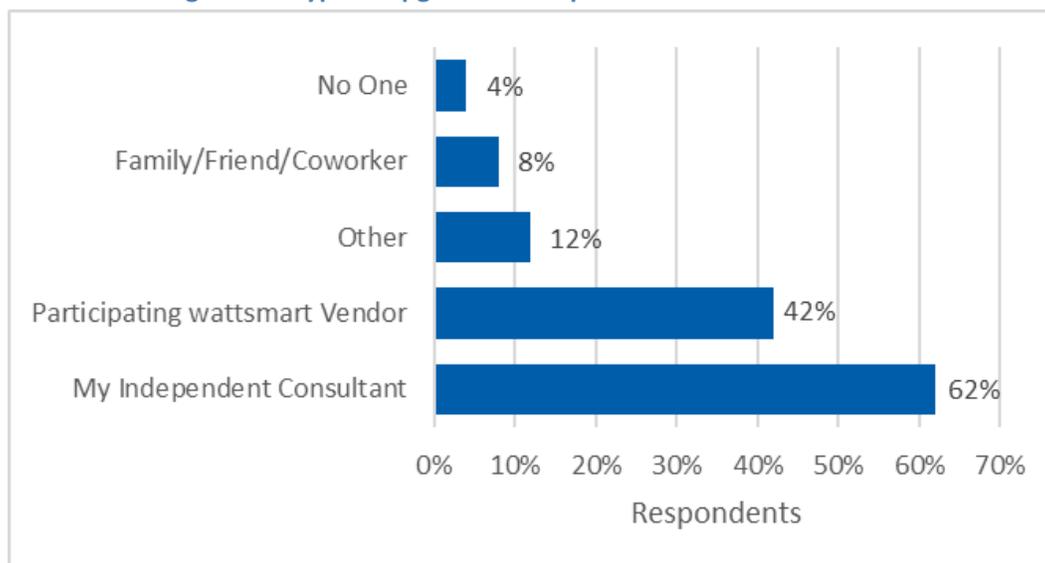
Typical Upgrades Delivery Channel

The Cadmus team surveyed 28 participants who received program incentives through the Typical Upgrades delivery channel. Overall, they represented a wide array of business sectors (with the highest percentage in Retail, followed by Health Care), ranging from less than 10 employees to more than 500, with 58% employing 25 or fewer people. Participants expressed high satisfaction rates with the work performed by their vendors and with the equipment installed, but less satisfaction with the incentives (as discussed in detail below).

Motivation

The team asked Typical Upgrades delivery channel participants about those who helped them initiate their projects. As shown in Figure 16, 25 of 28 participants said they were helped by one or more people, most frequently an independent consultant or a participating **wattsmart** vendor. One participant reported initiating the project themselves. Two participants did not know if they had received help.

Figure 16. Typical Upgrade Participants' Source of Assistance



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

Participation and Satisfaction

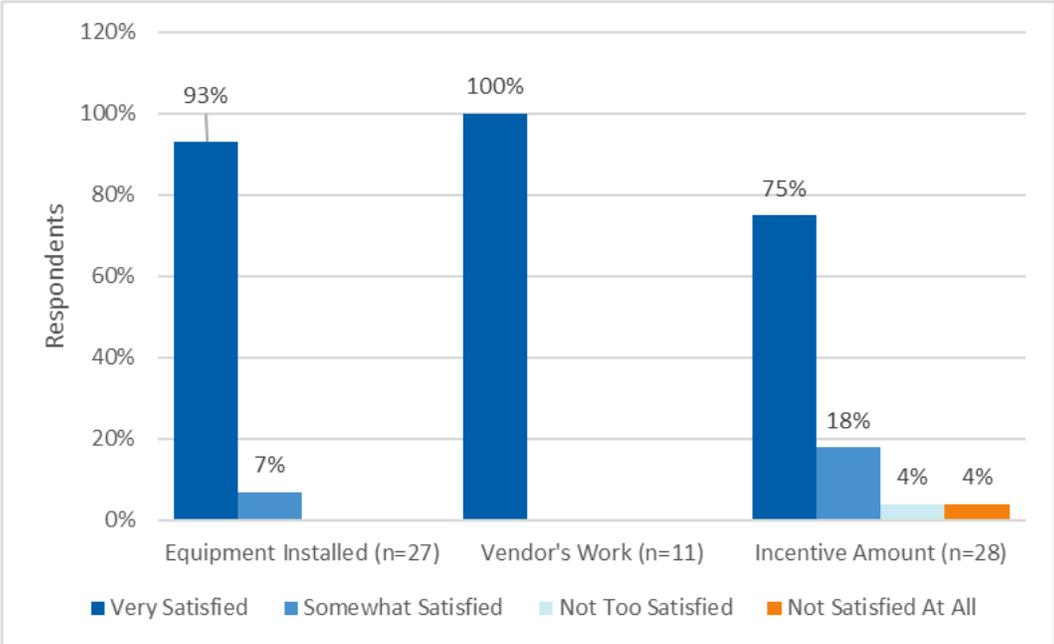
Most Typical Upgrades participants found it fairly easy to complete their project applications: 58% said it was very easy; 35% said it was somewhat easy; but 8% reported it was not at all easy (n=26). Two respondents suggested simplifying the application process and having RMP explain the program more clearly. Two others offered suggestions speaking more to simplifying the overall process (e.g., implementing the project incrementally, having the engineering firm on-site more often).

Figure 17 shows satisfaction levels with three elements of the Typical Upgrades delivery channel: equipment installed; participating vendor's work; and incentives. A large majority of participants (93%, n=27) were very satisfied with the equipment they installed, and all 11 participants using a participating **wattsmart** vendor reported being very satisfied with the vendor's work (compared to 65% [n=82] of 2011–2013 FinAnswer Express Program participants).

Participants expressed less satisfaction with the incentive amount they received for their projects, with 75% (n=28) responding they were very satisfied. The Cadmus team asked those less than very satisfied, what amount of incentive would have elicited a very satisfied response. One of seven respondents received incentives on a portion of the installed lighting and would have preferred incentives for all of the lighting. Five others did not cite an amount, and the seventh respondent found the incentive amount agreeable, but the time required to receive the incentive influenced their low satisfaction rating.



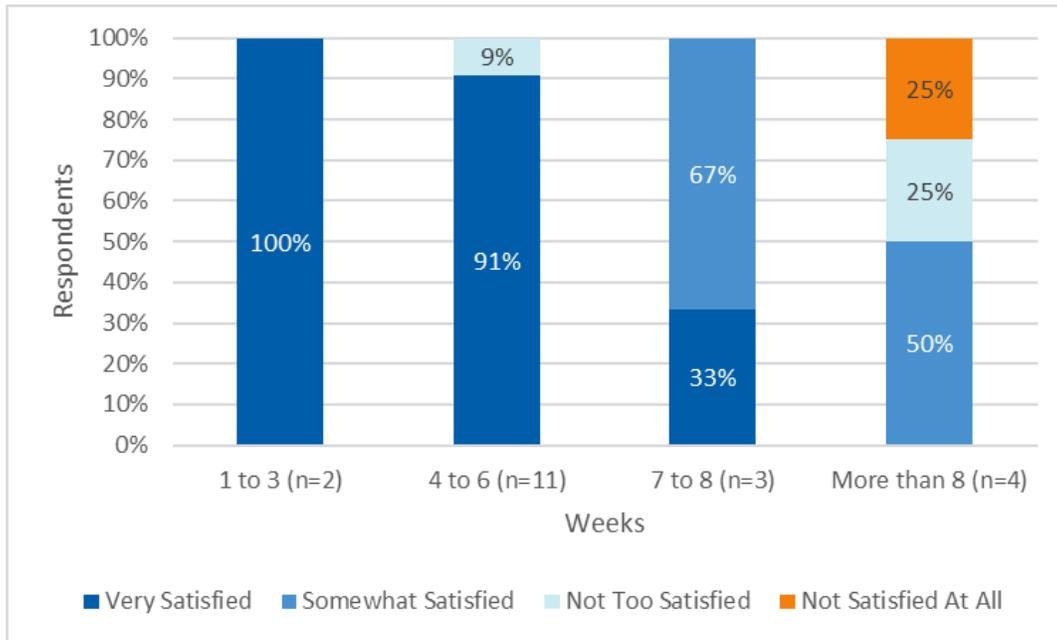
Figure 17. Participant Satisfaction Levels with Typical Upgrades Elements



Source: RMP Wyoming **wattsmart** Business Program 2014–2015 Participant Survey QE4, QE9, and QE11. Don't know and refused responses removed. May not total 100% due to rounding.

Participant satisfaction with the time required to receive incentives varied by how long it took for the incentive to arrive. The Cadmus team asked participants how long (in weeks) it took to receive their incentives. The team grouped the responses into four categories, from one week to more than eight weeks. All participants receiving incentives within three weeks said they were very satisfied, and a large percentage of participants receiving incentives within four to six weeks also reported being very satisfied. Figure 18 shows participants' satisfaction levels with the different times timeframes in which they received their incentives.

Figure 18. Customer Satisfaction with Time to Receive Incentive



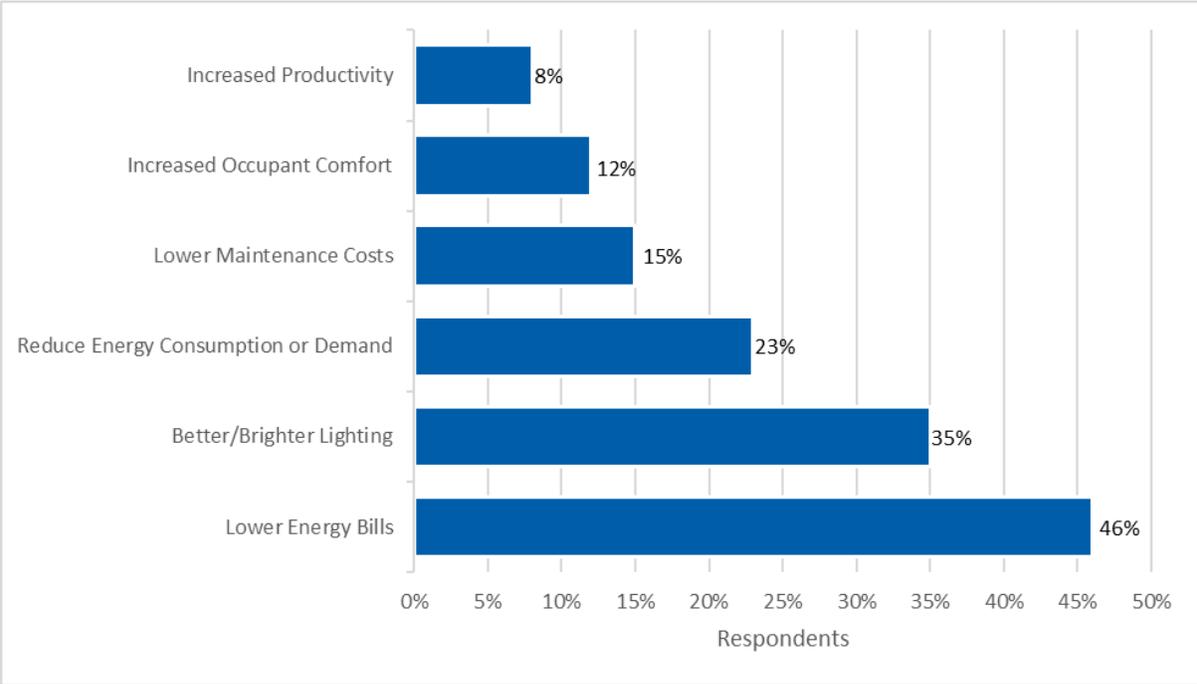
Source: RMP Wyoming **wattsmart** Business Program 2014–2015 Participant Survey QE6 and QE7. Don't know, has not arrived, and refused responses removed. (n=20)

Benefits and Challenges

As shown in Figure 19, 26 of 28 participants in the Typical Upgrades delivery channel said they received one or more benefits due to installing the program equipment. Participants' most frequent cited lower energy bills, followed by better or brighter lighting quality, and then by reduced energy consumption. Similar to results for the SBL and Custom Analysis delivery channels, Typical Upgrades participants listed better and brighter lighting among their top two benefits.



Figure 19. Benefits of Equipment Installed Through the Typical Upgrades Delivery Channel



Source: RMP Wyoming **wattsmart** Business Program 2014–2015 Participant Survey QE15. Don't know and refused responses removed. Multiple responses allowed. (n=26)

While 71% of participants (20 of 28) reported no challenges when installing equipment through the Typical Upgrades delivery channel, 29% (8 of 28) did experience, including the following:

- Selecting qualified fixtures
- Replacing faulty new equipment
- Replacing the project contractor and dealing with the engineering firm
- Dealing with the verification and payment processes (e.g., documenting energy use before and after equipment installations, receiving a lower incentive than expected due changes in equipment qualifications)
- Gaining buy-in from building owners

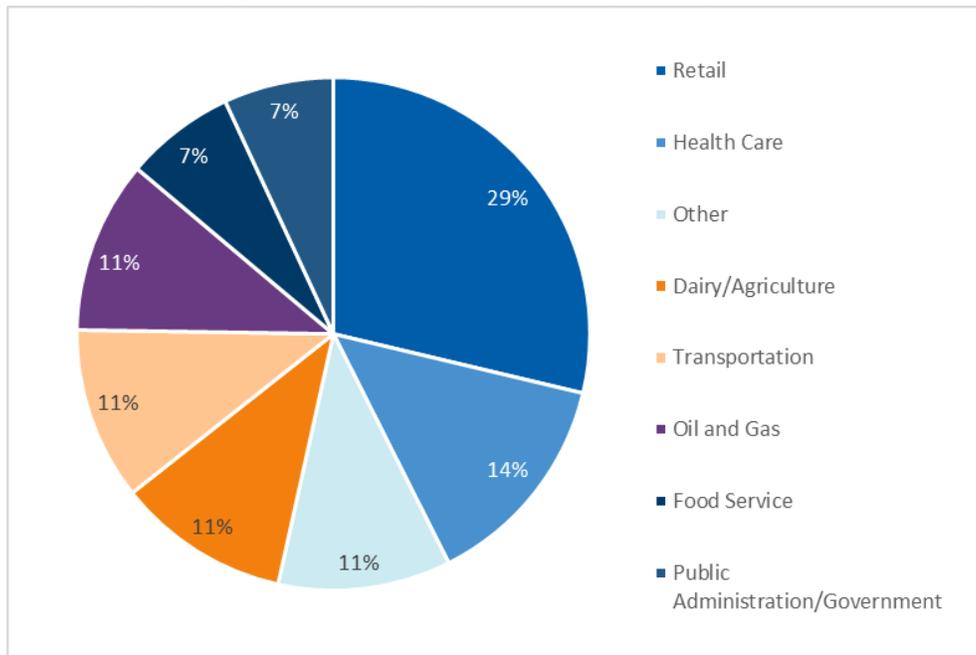
When asked if RMP could do anything to improve respondents' overall experiences with the **wattsmart** Business Program, or to reduce participants' challenges, 24 of 28 participants said nothing was needed. Three participants suggested RMP could improve the program by offering low-interest project financing; providing more clarity on lighting products qualifying for incentives; and providing clarity regarding how savings and incentive estimates provided in the incentive offer could be reduced by RMP during the installation verification process.

Firmographics

The 2014 and 2015 surveyed Typical Upgrades participants represented 10 different business sectors. While not all business sectors represented in the 2011 through 2013 FinAnswer Express program were included in the 2014 and 2015 Typical Upgrades delivery channel, participation was comparable in all business sectors addressed in both evaluations, except for Retail, Transportation, and Educational Services. At 90% confidence, both the Retail and Transportation sectors showed statistically higher participation in the Typical Upgrades channel (29% and 11% respectively, n=28) vs. the 2011 through 2013 FinAnswer Express Program (12% and 1%, n=192). The Educational Services sector showed statistically higher participation in the FinAnswer Express Program (12%) vs. the Typical Upgrades channel (3.6%).¹⁵ Figure 20 shows the distribution of 2014 and 2015 surveyed participants by business sector. “Other” reported business sectors shown represent single participants; combined, they represent 11% of the total surveyed population and include the following:

- Educational Services
- Manufacturing
- Mining

Figure 20. Typical Upgrades Delivery Channel Survey Participants by Business Sector



Source: RMP Wyoming **wattsmart** Business Program 2014–2015 Participant Survey: Q11. Don’t know and refused responses removed. Total may not equal 100% due to rounding. (n=28)

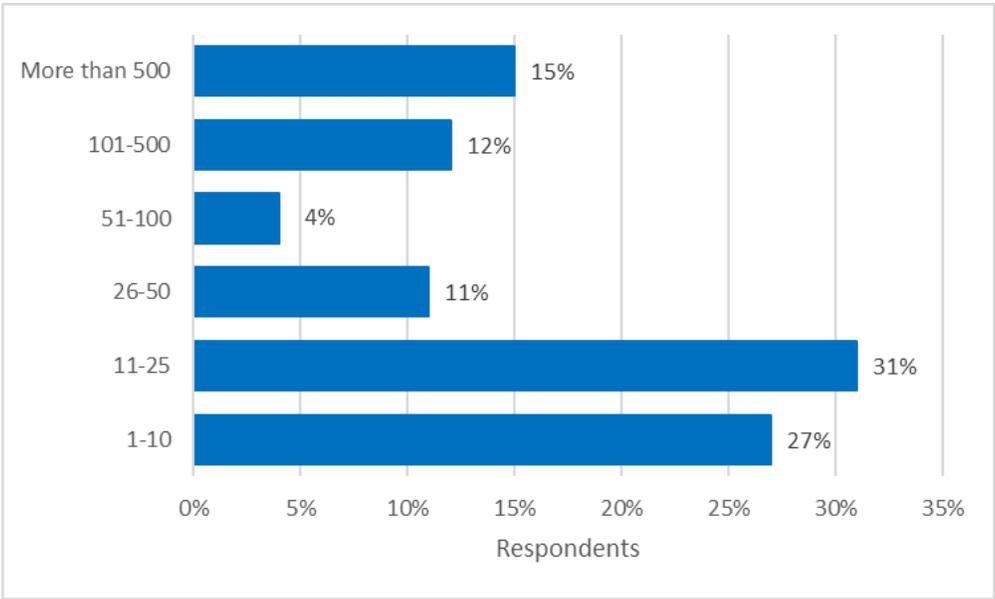
¹⁵ Navigant Consulting, Inc., in partnership with EMI Consulting. *Evaluation Report for Wyoming’s Energy FinAnswer Express Program (PY 2011 through 2013)*. March 19, 2015. Available online: http://www.pacificorp.com/content/dam/pacificorp/doc/Energy_Sources/Demand_Side_Management/2015/2011-2013_RMP-WY_FinAnswer-Express_Final-Report-and-Appendices-NEW.pdf



Sixty-four percent of the Typical Upgrades participants operated a single location in Wyoming; 25% operated two to five facilities, and the remaining 11% operated six to 15 facilities (n=28). Overall, 82% owned their building(s) (n=28).

The majority of surveyed Typical Upgrades participants employed 25 or fewer people: 27% employed one to 10, and 31% employed 11 to 25 (n=26). Four participants employed more than 500 people in their combined locations. These largest companies were not clustered in a single business sector; rather, they represented Educational Services, Health Care, Transportation, and Oil and Gas (i.e., equipment manufacturing). Figure 21 provides greater detail on the employee count distribution for surveyed Typical Upgrades delivery channel participants.

Figure 21. Typical Upgrades Delivery Channel Employee Count Distribution



Source: RMP Wyoming **wattsmart** Business Program 2014–2015 Participant Survey: Q14. Don't know and refused responses removed. (n=26)

Custom Analysis Delivery Channel

The Cadmus team surveyed 12 participants who received incentives through the **wattsmart** Business Program Custom Analysis delivery channel. The single largest sector—Oil and Gas—represented 25% of surveyed participants (n=12).¹⁶ A majority of participants represented small or midsize companies that employed 50 or fewer people.

¹⁶ Due to the small sample reported for RMP's 2011 to 2013 process evaluation of the Energy FinAnswer Program (n=4), the Cadmus team did not calculate statistical significance between participant responses for the program and for RMP's 2014 and 2015 Typical Upgrades delivery channel.

Overall, Custom Analysis participants reported moderately high satisfaction rates with the various delivery channel components, and they most often cited better lighting quality and increased productivity as benefits from completing their projects. Participants encountered challenges in understanding the program and in gathering the required paperwork.

Motivation

Five participants offered responses about aspects of their custom energy analysis reports that most influenced them to proceed with their projects: four participants reported reduced cost or energy savings; one participant said it availability of the program itself most influenced them. The remaining seven participants were not asked this question as they reported not receiving an energy analysis.

Participation and Satisfaction

Participants in the Custom Analysis delivery channel reported mixed experiences in completing the application paperwork for their projects: 58% said it was very easy, 33% found it somewhat easy, and 8% (one participant) said it was not at all easy (n=12). Participants described a process that required them to gather a great deal of information, such as requirements to prove ENERGY STAR® compliance. These participants said RMP could improve the application process by simplifying it and providing an easier Excel format.

Six respondents participated in a pre-inspection of their site, and five reported receiving a custom energy analysis report that identified efficiency measure opportunities, energy savings, costs, incentives, and payback. The sixth participant could not confirm receipt of the report. Four of the five participants receiving the report found the analysis very useful; one found it somewhat useful, citing limited opportunities for their company (in the Oil and Gas sector).

Participants rated their satisfaction with three program elements: their experience with the energy engineer provided through the **watt**smart Business Program; their interaction with RMP; and the incentive amount they received. Eighty-two percent (9 participants, n=11) were very satisfied with their experiences with the engineers. Of the remaining two participants, one was somewhat satisfied and one was not at all satisfied, citing engineers who were “pushy” and ordered them around but provided no follow-up, lamps that burned out, and an imbalance in the customer did vs. the work the energy engineer provided.

Most participants also were very satisfied with their RMP interactions (83%, n=12). The same two participants who were less than very satisfied with the energy engineer rated their interactions with RMP as somewhat satisfactory or not satisfactory at all. After reviewing the comments, the Cadmus team believes these two respondents did not distinguish between energy engineers provided by RMP and RMP or implementer staff.

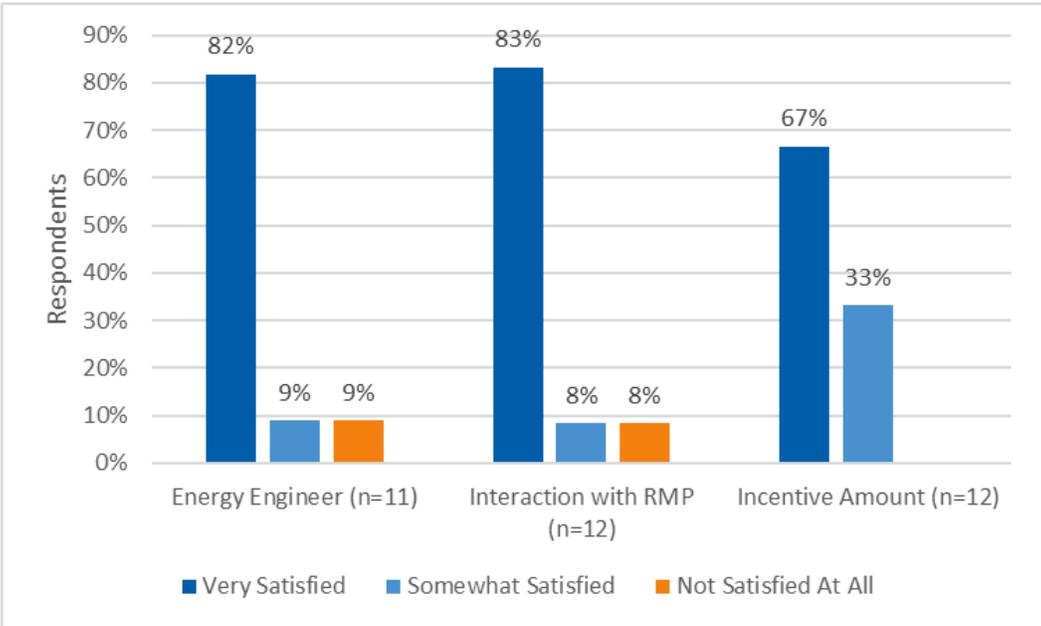
Fewer participants (67%) reported being very satisfied with the incentives received for their projects, with 33% reporting they were somewhat satisfied (n=12). Less than very satisfied participants said the incentive should be based on the project cost (rather than the equipment installed). Two of these



respondents also said that incentives would have received higher satisfaction ratings if they reimbursed 50% and 100% of their costs, respectively.

Figure 22 shows satisfaction levels with each program element.

Figure 22. Customer Satisfaction Levels with Custom Analysis Delivery Channel Elements

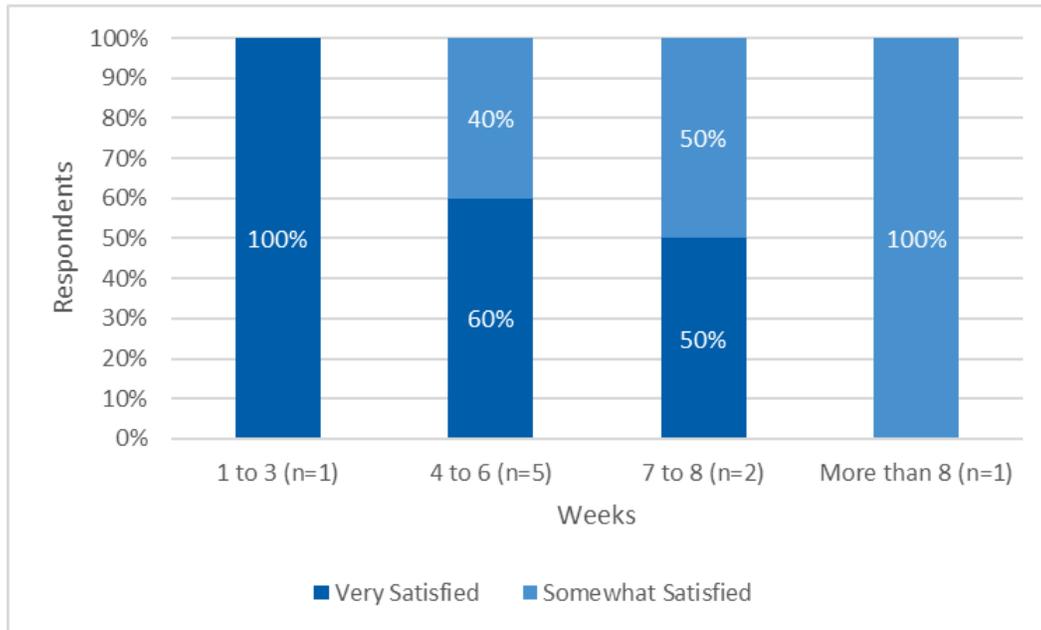


Source: RMP Wyoming *watt*smart Business Program 2014–2015 Participant Survey: QF2, QF3, and QF12. Don't know and refused responses removed.

Participants in the Custom Analysis delivery channel generally expressed satisfaction with the time required to receive their incentives; none rated their satisfaction levels as less than somewhat satisfied. Five rated themselves very satisfied, four somewhat satisfied, and three participants did not know how long it took for their incentives to be paid.

Participants that were somewhat satisfied with the time required to receive their incentives provided further information: two said two weeks would be acceptable, one said three weeks or less, and one said four to six weeks. Figure 23 shows reported times required to receive incentives in relation to participant satisfaction.

Figure 23. Customer Satisfaction with Time to Receive Incentive



Source: RMP Wyoming **watt**smart Business Program 2014–2015 Participant Survey: QF14 and F15. Don’t know and refused responses removed. (n=9)

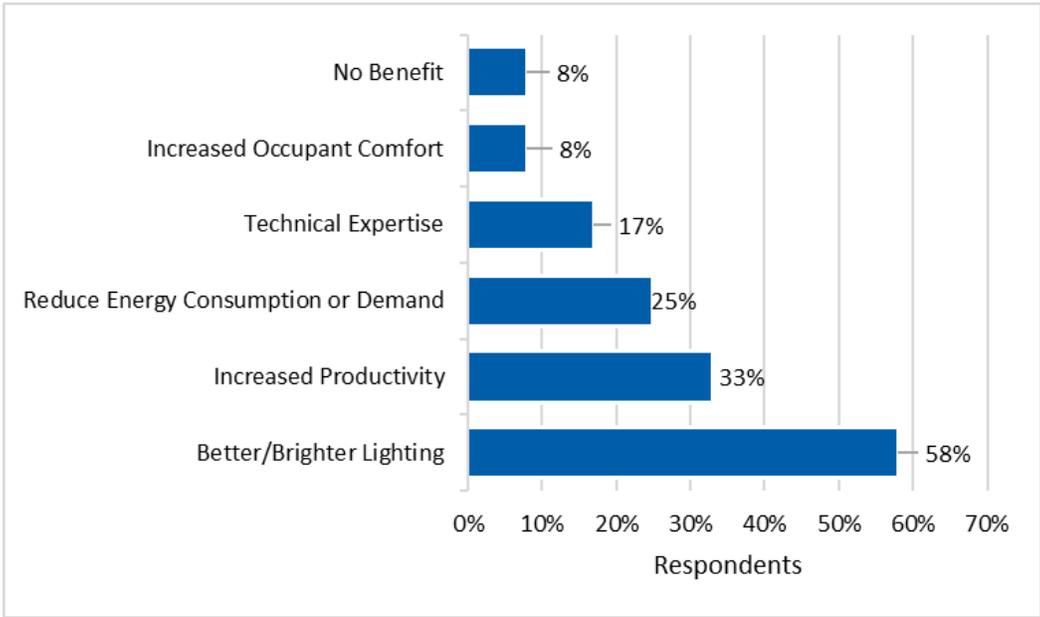
When asked, one participant reported wanting to install outdoor canopy lights that, at the time of the project, did not qualify for the **watt**smart Business Program. RMP added outdoor canopy lighting to the program on January 1, 2016.

Benefits and Challenges

Eleven of 12 participants said they received one or more benefits due to their energy efficiency upgrades. As shown in Figure 24, respondents most frequently cited better or brighter lighting. Unlike participants in the SBL or Typical Upgrades delivery channels, Custom Analysis participants also frequently cited increased productivity due to their upgrades. One participant—reporting an unsatisfactory experience with their energy engineer—said they did not receive benefits from program installation.



Figure 24. Benefits of Equipment Installed Through the Custom Analysis Delivery Channel



Source: RMP Wyoming **wattsmart** Business Program 2014–2015 Participant Survey: QF19. Don’t know and refused responses removed. Multiple responses allowed. (n=12)

While 42% of participants (5 of 12) did not report challenges while participating in the Custom Analysis delivery channel, the remaining 58% cited the following challenges:

- Understanding how the program worked, the application process, and paperwork required from participants (n=5)
- Understanding how to use the program lighting tool (n=1)
- Meeting the timeframe required to submit paperwork (n=1)
- Finding a contractor (n=2)

Two of the seven respondents who encountered challenges said RMP could help by simplifying paperwork and providing more “hands-on” assistance, rather than relying on the energy engineer or contractor to do so.

When asked if RMP could do anything to improve their overall **wattsmart** Business Program experience, one participant responded affirmatively, asking RMP for quicker response times.

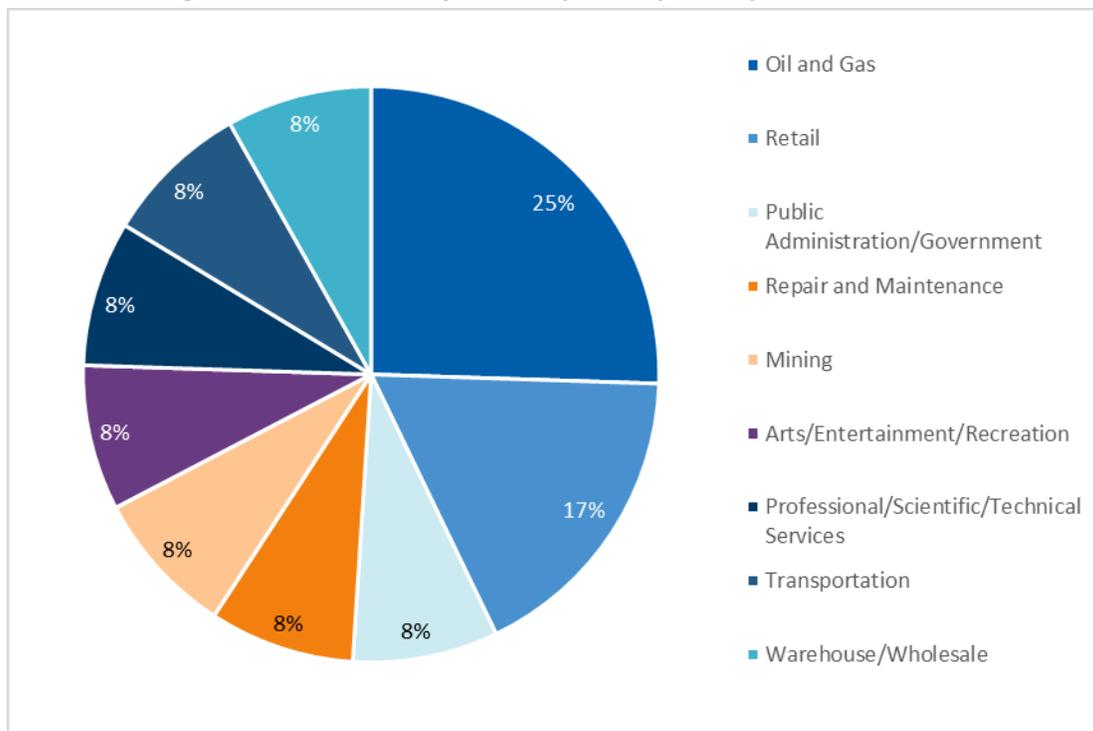
Firmographics

As shown in Figure 25, participants in the Custom Analysis delivery channel spread across nine business sectors: three participants belonged to the Oil and Gas business sector and two belonged to Retail. The remaining seven participants (one each) belonged to the following sectors:

- Arts/Entertainment/Recreation
- Mining

- Professional/Scientific/Technical Services
- Public Administration/Government
- Repair and Maintenance
- Transportation
- Warehouse/Wholesale

Figure 25. Custom Analysis Survey Participants by Business Sector



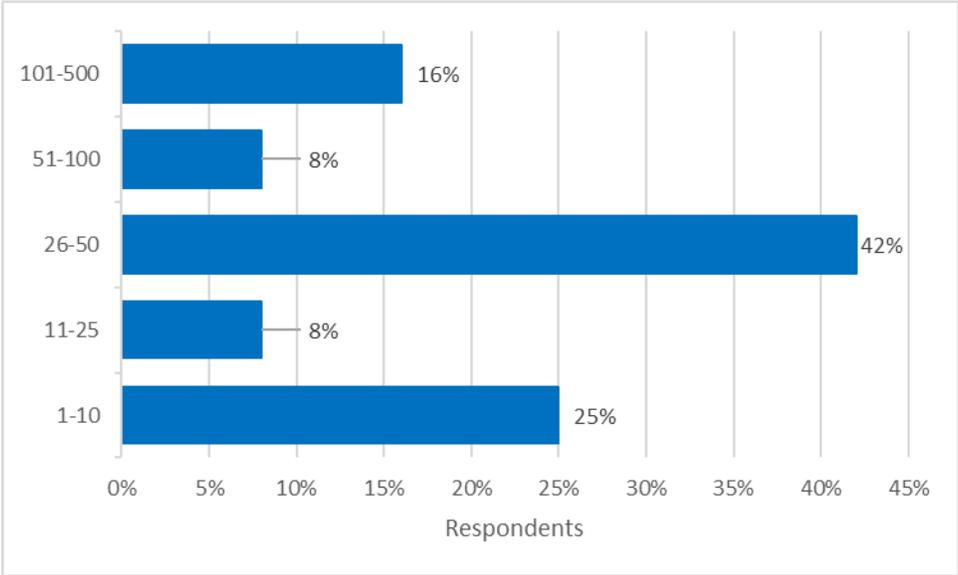
Source: RMP Wyoming **watt**smart Business Program 2014–2015 Participant Survey: Q11. Don't know and refused responses removed; may not total 100% due to rounding. (n=12)

Ten of the 12 surveyed Custom Analysis participants occupied four or fewer sites in Wyoming (six of these occupies a single facility); one occupied 250 sites; one respondent did not know how many sites the participant occupied. Eighty-three percent owned their facilities.

Employee counts for Custom Analysis delivery channel participants, similar to Typical Upgrades channel participants, varied widely. As shown in Figure 26, most employed 50 or fewer people in all locations combined, with only three falling into the 51 to 500 range.



Figure 26. Custom Analysis Delivery Channel Employee Count Distribution

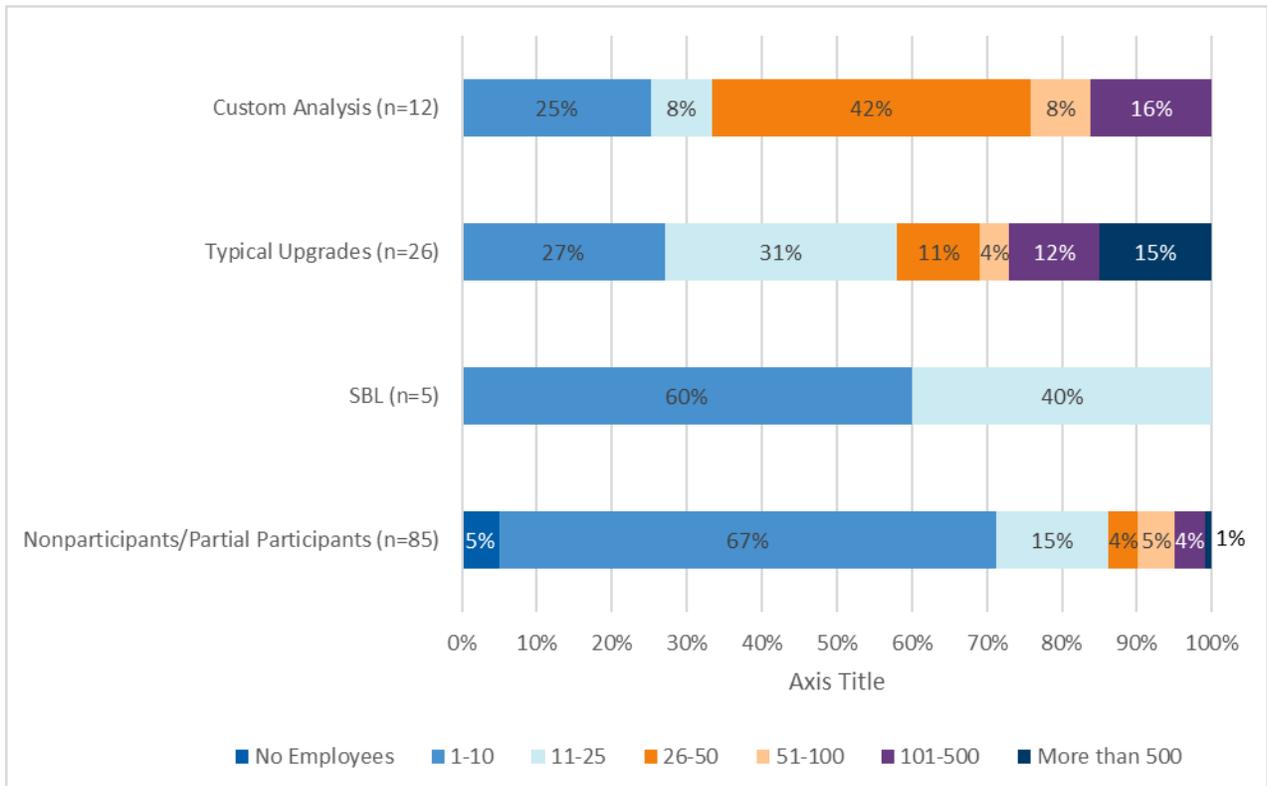


Source: RMP Wyoming *wattsmart* Business Program 2014–2015 Participant Survey: Q14. Don't know and refused responses removed. (n=12)

Comparison of Employee Count Distribution by Delivery Channel

Figure 27 compares the percentage of businesses employing a given number of people, segmented by the three program delivery channels (e.g., SBL, Typical Upgrades, Custom Analysis) and by nonparticipants. As shown, the number of employees varied (as expected) by delivery channel. Nonparticipants largely consisted of smaller businesses, with one to 10 employees. Four nonparticipants that did not report any employees did not include themselves or operated with volunteer staff.

Figure 27. Employee Count Distribution: SBL, Typical Upgrades, and Custom Analysis Program Delivery Channels; and Nonparticipants/Partial Participants



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

Nonparticipants and Partial Participants

The Cadmus team surveyed 85 nonparticipants who never completed a project through the program or did not complete a project through the program in 2014 or 2015. Five of 85 respondents were managed accounts—larger usage accounts managed in-house by RMP; four of these five managed accounts were in the Public Administration/Government business sector, and one was a Nonprofit/Religious Organization. Due to the small sample size of managed nonparticipants, the team reports managed and non-managed nonparticipants as a whole.

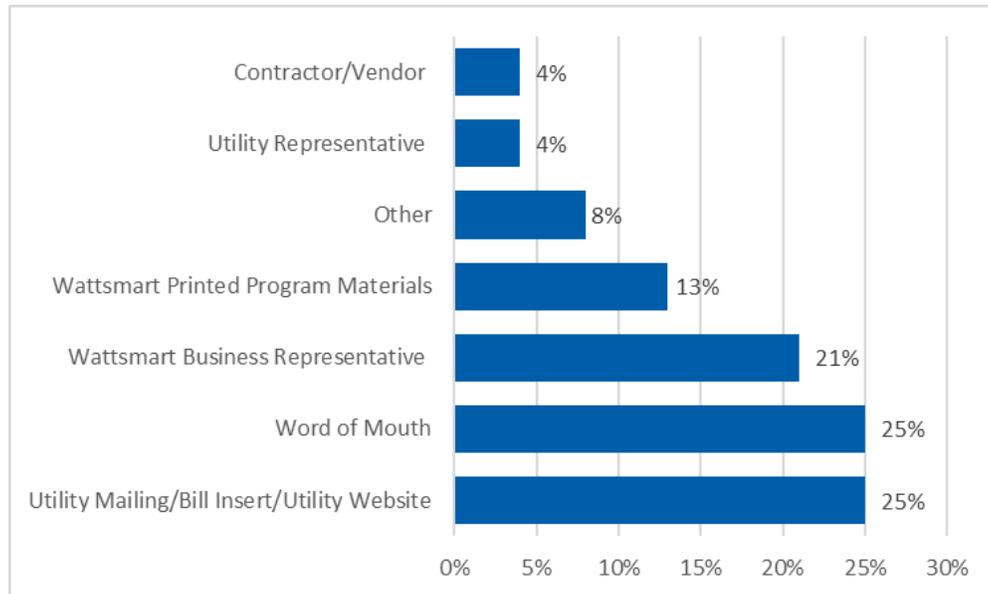
The team also surveyed three partial participants who initiated but did not complete a project through the program during the evaluation period. Partial participants represented three business sectors: Nonprofit and Religious Organizations; Real Estate/Property Management; and Automotive (car wash). The majority of these customers owned and operated single facilities in Wyoming.

Awareness and Communication

When asked if they had heard of the **wattsmart** Business Program name prior to the survey call, one partial participant had heard of the name, and two had not. Among nonparticipants, 30% (n=84) said they had heard of the program name.

Twenty-four nonparticipants said they most frequently learned about the program from an RMP mailing, bill insert, or website, or by word of mouth. As shown in Figure 28, however, they also frequently said they learned of it from a **wattsmart** Business representative. The one partial participant that knew of the program name also learned of the incentives from a **wattsmart** Business representative. Only 12% of these respondents (n=24) would very likely request an incentive from the **wattsmart** Business Program in the next six months.

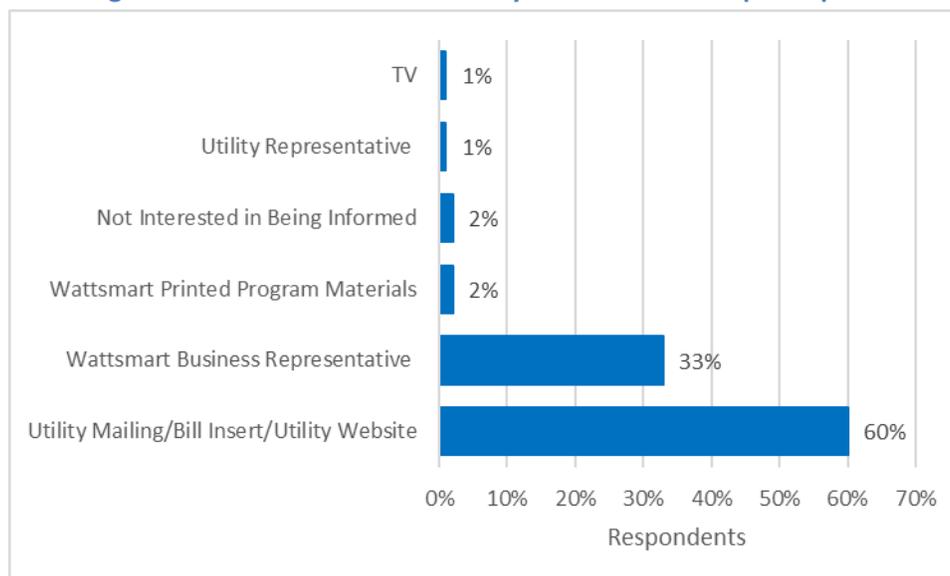
Figure 28. How Nonparticipants Learned About the *wattsmart* Business Program



Source: RMP Wyoming **wattsmart** Business Program 2014–2015 Partial Participant/Nonparticipant Survey: QC3. Don't know and refused responses removed. (n=24)

The majority of nonparticipants (60%, n=90) preferred that RMP inform them about incentives for energy efficiency improvements through an RMP mailing, bill insert, or website; but 33% preferred contact with a **wattsmart** Business representative. Figure 29 shows all preferences for nonparticipants.

Figure 29. Preferred Method to Stay Informed for Nonparticipants



Source: RMP Wyoming **wattsmart** Business Program 2014–2015 Partial Participant/Nonparticipant Survey: QC5. Don't know and refused responses removed. Total may not equal 100% due to rounding. (n=90)

Similar to nonparticipants, two partial participants (n=3) said they preferred that RMP informed them of incentives through an RMP mailing, bill insert, or website. The third partial participant did not report a preference.

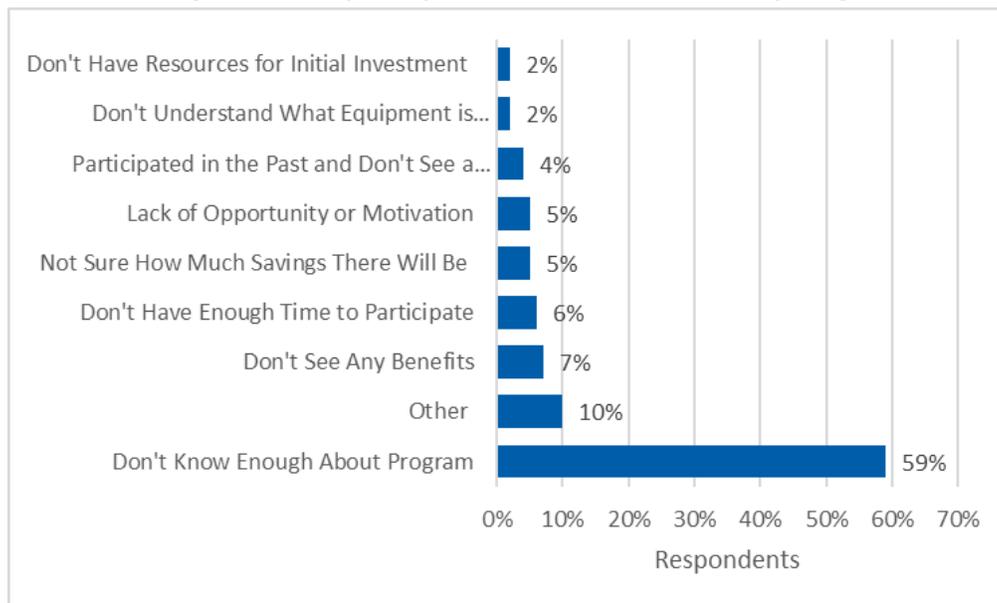
In assessing nonparticipants’ reasons for not using the **wattsmart** Business Program, the Cadmus team found nonparticipants primarily did not use the program as they did not know enough about it (59%, n=83), as shown in Figure 30. Seven respondents in the “other” category (n=8) reported they did not participate for the following reasons.

- They closed their business in 2014
- They did not own their building
- They were a new business just getting started
- None of their projects qualified for the program
- They handled their projects in-house
- They participated based on equipment cost
- Their electric service was unreliable

The eighth respondent indicated dissatisfaction with the program, but the reason offered proved too general for the team to draw a clear conclusion.



Figure 30. Nonparticipants Reasons for Not Participating



Source: RMP Wyoming **wattsmart** Business Program 2014–2015 Partial Participant/Nonparticipant Survey: QD13. Don't know and refused responses removed. (n=83)

Nonparticipants

Nonparticipants most frequently said lower equipment costs would motivate them to make more energy-efficient upgrades to their current equipment (52%), followed by higher incentives (17%, n=82). When asked what RMP could do to help their businesses participate in the **wattsmart** Business Program, nonparticipants asked for more information about the program (61%, n=56). Nonparticipants offered three other responses that individually represented 5% or more of the total responses: 5% cited increased incentives; 7% cited personal contact from RMP to discuss their options; 11% said there was nothing RMP could do.

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

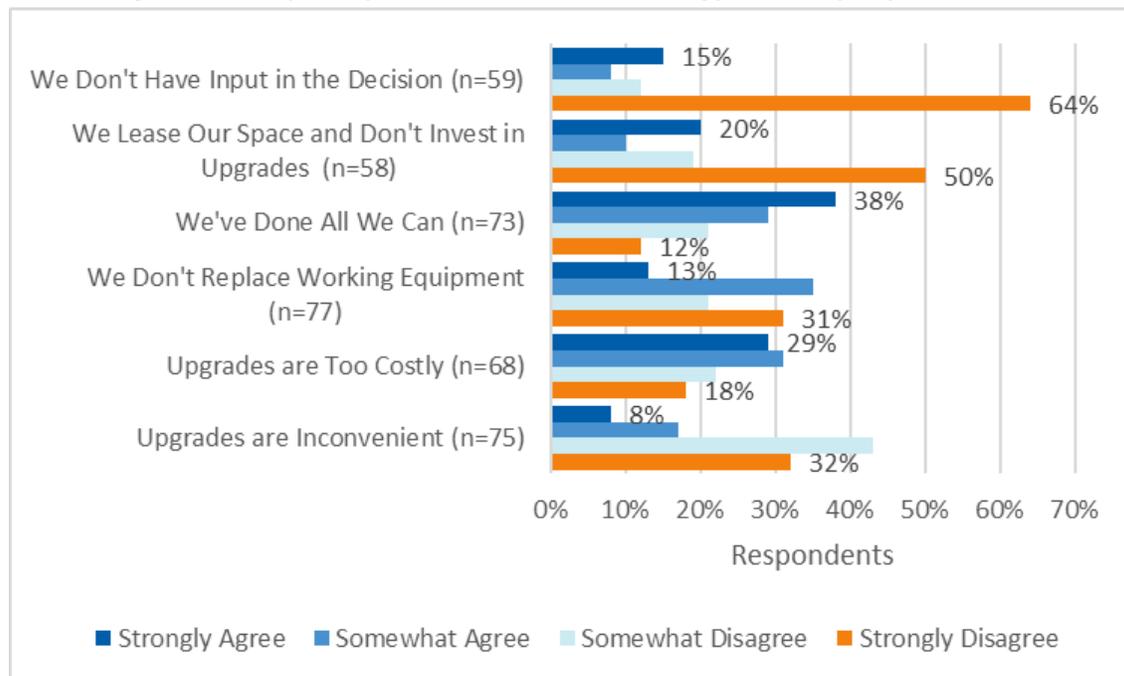
- "Making upgrades at our facility is an inconvenience."
- "Making energy efficiency upgrades to this facility is too costly."
- "We don't replace working equipment, even if it is not energy efficient."
- "My company has made all the energy efficiency improvements we can without a substantial investment."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

- “Decisions about equipment upgrades are made at a corporate office, and we don’t have much input at this facility.”

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

As shown in Figure 31, nonparticipants offered mixed responses. Respondents indicated they had input into decisions regarding energy efficiency upgrades; one-half owned their facilities; they did not consider upgrades too inconvenient; and only 38% strongly agreed that they accomplished all energy efficient upgrades possible at their facilities (indicating RMP has some opportunities to engage this group). A majority of these respondents included savings gained from energy efficiency when calculating a return on investment for capital upgrades (62%, n=79).

Figure 31. Nonparticipants’ Attitudes about Energy Efficiency Improvements



Source: RMP Wyoming wattsmart Business Program 2014–2015 Partial Participant/Nonparticipant Survey: QD7a-QD7e. Not applicable and don’t know responses were removed.

Partial Participants

Partial participants indicated that, when considering energy efficiency upgrades, primary motivations included the opportunity to save money on energy bills or to reduce energy consumption or energy demand.

Three surveyed partial participants initiated lighting retrofit projects through the program, but did not complete the projects. Two respondents reported not completing their projects as they lacked funds, or



completion did not prove economically worthwhile without the incentives. One respondent moved out of the building before completing their project.

Satisfaction

Two of three partial participants said they were somewhat satisfied with the **wattsmart** Business Program; one did not know. When asked if RMP could do anything to improve their experiences with the program, only one partial participant responded, asking for incentives to be delivered faster.

The partial participant aware of the **wattsmart** Business Program name before the survey call and who said the project was not economically worthwhile without the incentive, also said they were very likely to request another incentive from the program in the next six months.

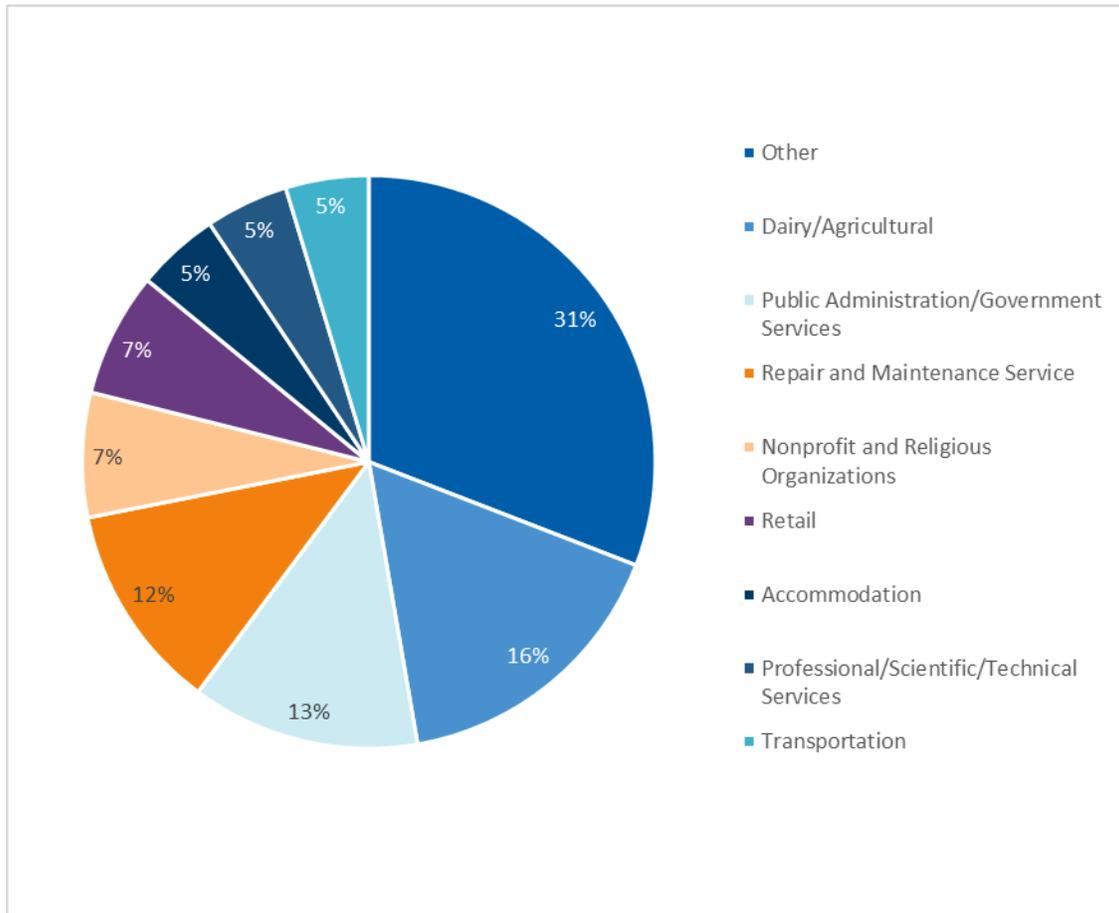
Firmographics

Nonparticipants belong to 20 business sectors, eight of which represented 5% or greater of the total population; and 12 sectors, grouped under the category “other,” each representing less than 5% of the total. As shown in Figure 32, 16% of nonparticipant respondents belonged to the Dairy/Agricultural sector—the largest individual business sector.

The “other” category represented 12 business sectors:

- Arts/Entertainment/Recreation
- Construction
- Educational Services
- Finance/Insurance
- Food Processing
- Food Service
- Forestry/Logging
- Health Care
- Manufacturing
- Oil and Gas
- Real Estate/Property Management
- Warehouses/Wholesaler

Figure 32. Survey Nonparticipants by Business Sector



Source: RMP Wyoming *wattsmart* Business Program 2014–2015 Partial Participant/Nonparticipant Survey: QF1. Don't know and refused responses removed. (n=85)

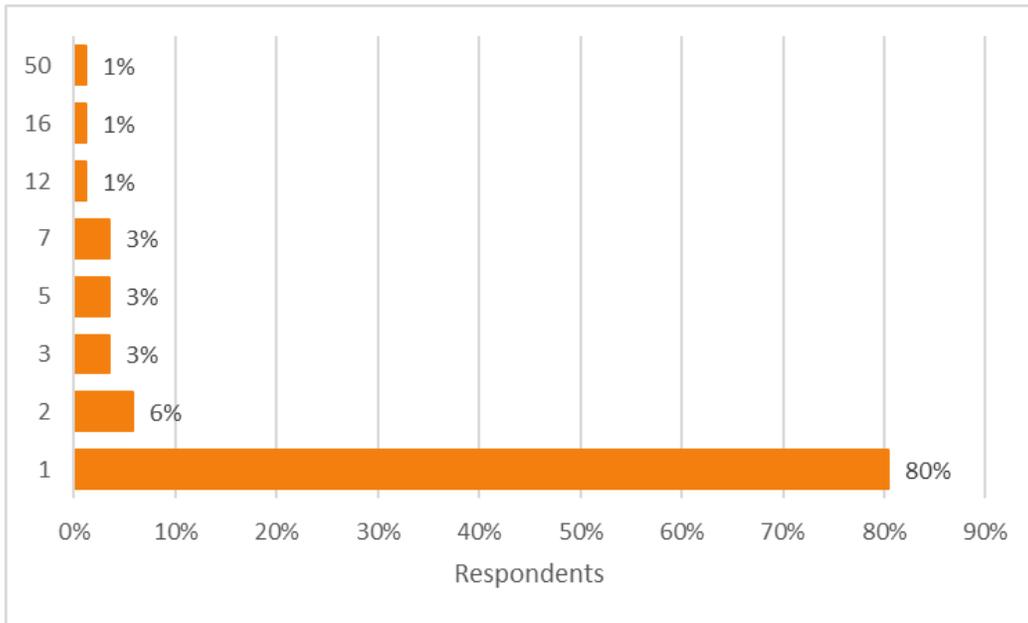
The three surveyed partial participants fell into three sectors: Nonprofit and Religious Organizations; Real Estate/Property Management; and Automotive.

Nonparticipants and partial participants operated a number of facilities, ranging from a single facility to one nonparticipant operating 50 facilities in the state of Wyoming; a majority, however, operated one facility (80%, n=87). Included in these 87 customers, the three partial participants operated single sites.

Figure 33 shows the number of facilities operated by all nonparticipants and partial participants combined.



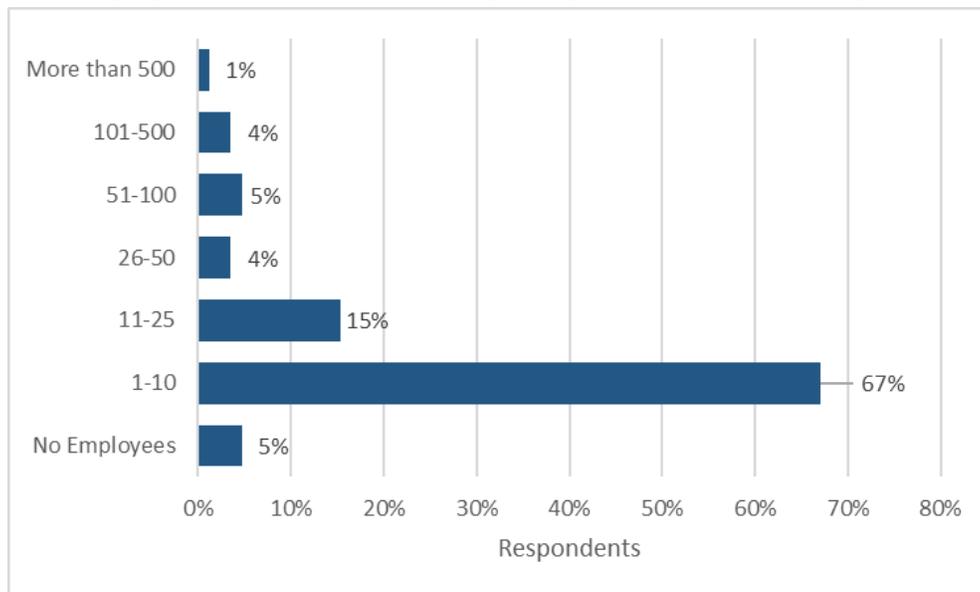
Figure 33. Number of Facilities in Wyoming: Nonparticipants and Partial Participants Combined



Source: RMP Wyoming **wattsmart** Business Program 2014–2015 Partial Participant/Nonparticipant Survey: QF2. Don't know and refused responses removed. (n=87)

A majority of all nonparticipants and partial participants (79%, n=88) owned all or a portion of their facilities. As shown in Figure 34, 67% (n=85) of nonparticipants and partial participants also worked at companies employing 10 or fewer people.

Figure 34. Employee Count Distribution: Nonparticipants and Partial Participants Combined



Source: RMP Wyoming **wattsmart** Business Program 2014–2015 Partial Participant/Nonparticipant Survey: QF4. Don't know and refused responses removed. (n=85)

Cost-Effectiveness

In assessing the **watt**smart Business Program's cost-effectiveness, the Cadmus team analyzed program benefits and costs from five different perspectives, using Cadmus' DSM Portfolio Pro model.¹⁷ The California Standard Practice Manual for assessing DSM program cost-effectiveness describes the benefit/cost ratios for the following five tests:

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

Table 28 summarizes the five tests' components.

¹⁷ DSM Portfolio Pro has been independently reviewed by various utilities, their consultants, and a number of regulatory bodies, including the Iowa Utility Board, the Public Service Commission of New York, the Colorado Public Utilities Commission, and the Nevada Public Utilities Commission.



Table 28. 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 29 provides selected cost analysis inputs for each year, including evaluated energy savings, discount rate, line loss, inflation rate, and total program costs. RMP provided all of these values, except for energy savings and the discount rate, which the Cadmus team derived from the RMP 2013 and 2015 Integrated Resource Plans.

Table 29. Selected Cost Analysis Inputs

Input Description	2014	2015	Total
Evaluated Gross Energy Savings (kWh/year)*	10,136,891	23,102,701	33,239,591
Discount Rate	6.88%	6.66%	N/A
Commercial Line Loss	8.90%	8.90%	N/A
Industrial Line Loss	5.61%	5.61%	N/A
Irrigation Line Loss	9.28%	9.28%	N/A
Inflation Rate**	1.9%	1.9%	N/A
Total Program Costs	\$2,627,544	\$5,132,837	\$7,760,381

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

**This inflation rate is based on PacifiCorp's 2015 Integrated Resource Plan, Volume I – Chapter 7 – Modeling and Portfolio Evaluation. Available online:

https://www.rockymountainpower.net/content/dam/pacificorp/doc/Energy_Sources/Integrated_Resource_Plan/2015IRP/PacifiCorp_2015IRP-Vol1-MainDocument.pdf. The Cadmus team determined future retail rates

using a 1.9% annual escalator.

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

measure lives from sources such as the RTF.¹⁸ For all analyses, the team used avoided costs associated with the RMP 2013 and 2015 IRP Eastside Class 2 DSM Decrement Values.^{19, 20}

The Cadmus team analyzed **wattsmart** Business Program cost-effectiveness for net savings by incorporating the evaluated freeridership and spillover.

Table 30 presents the 2014 and 2015 program years’ cost-effectiveness analysis results, including the evaluated NTG (but 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 perspectives, except the RIM test. The primary criterion for assessing cost-effectiveness in Wyoming is the TRC, which achieved a 1.56 benefit/cost ratio for the combined years’ net savings.

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

Table 30. wattsmart Business Program Cost-Effectiveness Summary of 2014 and 2015 Net Savings

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC	\$0.044	\$10,193,966	\$17,450,979	\$7,257,013	1.71
TRC	\$0.044	\$10,193,966	\$15,864,527	\$5,670,561	1.56
UCT	\$0.032	\$7,439,879	\$15,864,527	\$8,424,647	2.13
RIM		\$25,014,552	\$15,864,527	(\$9,150,025)	0.63
PCT		\$9,466,867	\$28,979,396	\$19,512,529	3.06
Lifecycle Revenue Impacts (\$/kWh)					\$0.000073498
Discounted Participant Payback (years)					3.36

Table 31 presents the 2014 program cost-effectiveness analysis results, including the evaluated NTG, but not accounting for non-energy benefits (except those represented by the 10% conservation adder

¹⁸ See Appendix C for detailed cost-effectiveness inputs and results at the measure category level.

¹⁹ Appendix N of PacifiCorp’s 2013 Integrated Resource Plan, Volume II—Appendices details the IRP decrements. This report is available online:
http://www.pacificorp.com/content/dam/pacificorp/doc/Energy_Sources/Integrated_Resource_Plan/2013IRP/PacifiCorp-2013IRP_Vol2-Appendices_4-30-13.pdf

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



included in the PTRC test). For this scenario, the **wattsmart** Business Program proved cost-effective from all perspectives except the RIM test.

Table 31. wattsmart Business Program Cost-Effectiveness Summary of 2014 Net Savings

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/ Cost Ratio
PTRC	\$0.054	\$3,963,565	\$6,060,316	\$2,096,751	1.53
TRC	\$0.054	\$3,963,565	\$5,509,379	\$1,545,813	1.39
UCT	\$0.036	\$2,627,544	\$5,509,379	\$2,881,835	2.10
RIM		\$8,326,294	\$5,509,379	(\$2,816,915)	0.66
PCT		\$3,506,522	\$9,259,615	\$5,753,093	2.64
Lifecycle Revenue Impacts (\$/kWh)				\$0.000022343	
Discounted Participant Payback (years)					3.32

Table 32 presents the 2015 program cost-effectiveness analysis results, including evaluated NTG, but not accounting for non-energy benefits (except those represented by the 10% conservation adder included in the PTRC test). Also for this scenario, the **wattsmart** Business Program proved cost-effective from all perspectives except the RIM test.

Table 32. wattsmart Business Program Cost-Effectiveness Summary of 2015 Net Savings

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/ Cost Ratio
PTRC	\$0.040	\$6,645,345	\$12,149,281	\$5,503,936	1.83
TRC	\$0.040	\$6,645,345	\$11,044,801	\$4,399,456	1.66
UCT	\$0.031	\$5,132,837	\$11,044,801	\$5,911,964	2.15
RIM		\$17,799,696	\$11,044,801	(\$6,754,896)	0.62
PCT		\$6,357,305	\$21,033,119	\$14,675,814	3.31
Lifecycle Revenue Impacts (\$/kWh)				\$0.000054259	
Discounted Participant Payback (years)					2.09

Conclusions and Recommendations

RMP, in collaboration with its implementers, Cascade Energy and Nexant, Inc., successfully delivers energy efficiency incentives and services to its customers in Wyoming, across a large number of business sectors, through the **wattsmart** Business Program. Customers recognize and report benefits from participation in the program. With some exceptions, customers cite satisfaction with measures offered, program staff, and vendors/contractors/engineers involved in their individual projects. Some customers, however, report that contractor selection and management pose challenges, as do program applications, qualifications, and savings verification processes. Participants in all three delivery channels reported some preferences for working directly with RMP staff rather than working through third-party contractors.

The Cadmus team found that most nonparticipants (i.e., the majority of which are small businesses) did not participate, primarily because they did not know enough about the program or did not understand participation benefits. Opportunities exist for RMP to grow segments of the **wattsmart** Business Program through enhanced marketing and outreach.

The 2014 and 2015 program evaluation yielded an overall gross realization rate of 109%, with a precision of $\pm 14.5\%$ at 90% confidence. Realization rates and precision varied to some degree within each of the seven measure categories. The team calculated 70% NTG for the program overall.

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

Savings Considerations

Conclusion—Irrigation Hardware

RMP utilizes deemed energy savings for irrigation hardware equipment in Wyoming. Deemed savings factors derived from RTF data, with modifications specific to Wyoming's local conditions. Of hardware projects included in the evaluation sample, all referenced deemed savings factors to calculate savings, but the deemed factors varied based on the reference source. Some of the measures referenced the 2011 deemed savings (effective 10/1/2011), some measures referenced the deemed values in the Wyoming Review and Update – Industrial/Agricultural Incentive Table Measures document (effective November 2013), some referenced the Wyoming TRL, and some of the deemed values did not match any of three named sources. Measure descriptions and deemed savings factors are not consistent in these three sources. The team found that measure-level deemed savings factor source variation also existed within projects.

The team used the RTF's Irrigation Hardware calculator for Montana to evaluate energy savings for all irrigation hardware projects, with updated values based on HOU, flow rate, and pressure. As a result, six of the nine projects produced realization rates greater than 100%.



Recommendation—Irrigation Hardware

The Cadmus team recommends reviewing the measure descriptions and deemed savings factors for irrigation hardware measures to ensure consistency.

Conclusion—HVAC Interactive Effects

Lighting calculations within the Wyoming territory currently do not use a HVAC interactive effect factor. Such factors account for heat reductions produced by high-efficiency lighting, which otherwise would contribute to space heating. For climates where cooling energy dominates energy consumption, an HVAC interactive effect greater than 1.0 would be applied, resulting in increased energy savings for high-efficiency lighting projects. HVAC interactive effects vary depending on the HVAC system, facility type, and climate.

Recommendation—HVAC Interactive Effects

Consider adding an HVAC interactive effect factor to indoor lighting savings, based on a weighted average of heating and cooling systems for RMP’s commercial and industrial customers in Wyoming. The Northwest Power and Conservation Council’s 7th Power plan, adopted in May 2016, defines HVAC interactive effects by heating type and building type. The Cadmus team recommends using an average HVAC interactive effect factor of 0.9 for Wyoming. Alternatively, an interactive effect could be applied by facility heating type: Electric heating = 0.72, Natural Gas heating = 1.07, Heat Pump heating = 0.91.

Conclusion—Prescriptive VFDs

RMP’s deemed savings value for prescriptive VFD projects does not account for motor end-use. All nine deemed VFD motor systems projects in the evaluation sample used RMP’s deemed value to determine savings. To evaluate energy savings for fan motor projects, the Cadmus team used deemed savings values from Cadmus’ 2014 Variable Speed Drive Loadshape Project report, created for the NEEP, which led to realization rates greater than 100% for all deemed fan VFD projects. Deemed savings from Cadmus’ study varied based on motor use (e.g., supply, return, or exhaust). To evaluate energy savings for the two deemed pump motor VFD projects, the team referenced the 2016 PA TRM.

Recommendation—Prescriptive VFDs

Based on evaluation findings, the Cadmus team recommends increasing deemed savings for prescriptive VFD projects to match the Cadmus 2014 Variable Speed Drive Loadshape Project report for HVAC fan projects (with savings shown in Table 33).

Table 33. Deemed Energy Savings for HVAC Fan Projects

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

*Deemed savings values based on the Cadmus 2014 Variable Speed Drive Loadshape Project report, created for NEEP. Available online: <http://www.neep.org/variable-speed-drive-loadshape-study-final-report>

For central equipment (e.g., hot/chilled water pumps, condenser water pumps, cooling tower fans), the team recommends using average savings from the 2016 PA TRM. Using average energy savings factors, operating hours, and the default load factor of 75% from the PA TRM, and assuming a motor full-load efficiency of 93% (i.e., the National Electrical Manufacturers Association's premium efficiency for a 20-horsepower motor), a deemed savings factor results: 1,191 kWh per year, per horsepower.

Conclusion—Green Motor Rewinds

Green motor rewinds are typically performed on motors that fail or require service. While being rewound, the motor typically is replaced by a spare. After rewinding, the motor can be reinstalled or kept as a spare to replace another failed motor. Reinstalling the rewound motor can take months or years. It appears servicing technicians or motor service centers complete green motor rewind applications, and every application reviewed by the Cadmus team indicated the motor would be installed exactly six months after servicing.

All six green motor rewind projects included in the evaluation sample resulted in a 0% realization rate: for two, this occurred because the rewind was performed on spare motors, still in storage during the team's inspection; for another four projects, this resulted from a failure to locate rewound motors on the site. Green motor rewinds represent a small percentage of total program savings (i.e., accounting for 0.11% of total claimed savings in the evaluation sample), with first-year savings not being realized.

Recommendation—Green Motor Rewinds

The Cadmus team recommends that RMP consider additional training to participating motor service centers regarding provision of more accurate estimates of motor installations, rather than always entering six months from time of service. After delivery of training or new instructions, the Cadmus team recommends that the program begins reviewing applications and tracking estimated reinstall dates to ensure motor service centers provide more reliable estimates and to better understand when savings may be realized. If motor replacements are estimated to occur beyond a year, the team recommends considering prorating energy savings, either by project or based on an average of applications submitted.

Overall Program Management

Conclusion

RMP may reduce customer participation challenges and increase customer satisfaction by improving communication to participants in all delivery channels. The most common challenges reported across all delivery channels related to participants' need to better understand the program processes (e.g., applications, savings verification and incentive calculations, and paperwork requirements).

Recommendation

The Cadmus team recommends that implementers, in communications with trade allies, contractors, and vendors, emphasize the need to provide participants with detailed and accurate costs, savings, and benefit information, along with a clear explanation of participant expectations (e.g., paperwork,



timeframes) and how final incentives may vary from incentive offers. With each of these groups, implementers can review the steps necessary to accurately calculate costs, projected energy savings, and incentives.

Conclusion

RMP may further improve customer experience via the website by providing customers a means to easily search for qualified equipment, identify applicable delivery channels, in addition to participation requirements and equipment incentives. Additionally, RMP can streamline the process by which a customer can ask questions without leaving the website.

Recommendation

Consider adding a search function to the website, where customers can enter the equipment they seek to install and be directed to delivery channels, qualified measures, and incentive documents. Include information on whether or not specific measures require prequalification. Also consider adding chat or instant messaging features on the website to more seamlessly assist customers who prefer asking questions through this method over phone calls or e-mails.

Conclusion

RMP currently provides **wattsmart** Business participants with a list of participating vendors. While useful, an opportunity exists for RMP to further help participants select the best contractors for their projects without recommending one contractor over another.

Recommendation

Continue enhancing the existing customer-facing vendor search tool. This could include a rating system of the participating contractors, for various measure categories, based on the quality of work performed, and including ratings from program participants (similar to Yelp). The Cadmus team recommends RMP visit the Energy Trust of Oregon website for an example of its contractor selection tips (<http://www.energytrust.org/find-a-contractor/commercial/>).

Program Data Interface

Conclusion

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

Recommendation

Assess the size of data exchange inconsistencies between RMP and implementers' data as well as associated impacts, and identify the most appropriate solutions. These could include the following:

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

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

Small Business Lighting and Typical Upgrades

Conclusion

RMP may increase customer engagement through additional direct contacts. Participants in both groups prefer to learn about the program from **wattsmart** Business Program representatives.

Recommendation

While an account management approach proves inappropriate for smaller customers, RMP could consider adopting methods for increasing direct customer contact. These could include expanding the “Targeted town” luncheon event format—used in Washington state—for Wyoming, or adding a chat or instant messaging feature to the website, thus more seamlessly assisting customers who prefer this method for asking questions over phone calls or e-mails.

Nonparticipants

Conclusion

Nonparticipants largely remain unaware of the **wattsmart** Business Program and its benefits. Although those knowing of the program learned about it through a RMP mailing/bill insert or the website as well as through word of mouth from friends or business associates, few have been motivated to participate.

Having RMP or implementer staff increase one-to-one contact with these customers does not prove cost-effective as nonparticipants (primarily non-managed accounts) are frequently smaller energy users, dispersed across a large number of business sectors, thus making it more difficult to reach them through industry-oriented events.

Recommendation

Identifying methods for engaging these customers to stimulate additional program growth or to achieve other utility goals could be accomplished by RMP performing a comprehensive marketing effectiveness assessment to evaluate the impacts of existing marketing and outreach activities, while investigating how to better reach and motivate these customers.

Conclusion

Nonparticipants’ attitudes about energy efficiency improvements indicates RMP has additional opportunities to assist a portion of these customers to make further improvements to their facilities if RMP can engage them to understand the **wattsmart** Business Program benefits.



Recommendation

Utilizing nonparticipant attitudes about energy efficient improvements (reported in [Figure 31](#)), develop messaging specifically addressing those attitudes by highlighting program benefits which can alleviate barriers inherent in those attitudes. For example, one attitude is “We don’t replace working equipment”. Develop messaging demonstrating when early replacement is cost effective.

Appendices

Appendix A. Self-Report NTG Methodology

Appendix B. Nonparticipant Spillover

Appendix C. Participant Survey Guide

Appendix D. Nonparticipant Survey Guide

Appendix E. Measure Category Cost-Effectiveness

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

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

Survey Design

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

¹ Final Evaluation Report For Utah's Energy FinAnswer Program (PY 2009-2011) – Appendix B: http://www.pacificorp.com/content/dam/pacificorp/doc/Energy_Sources/Demand_Side_Management/2013/Energy_FinAnswer_Program_Evaluation_2009-2011.pdf

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



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

Freeridership Calculation

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

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

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

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

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

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

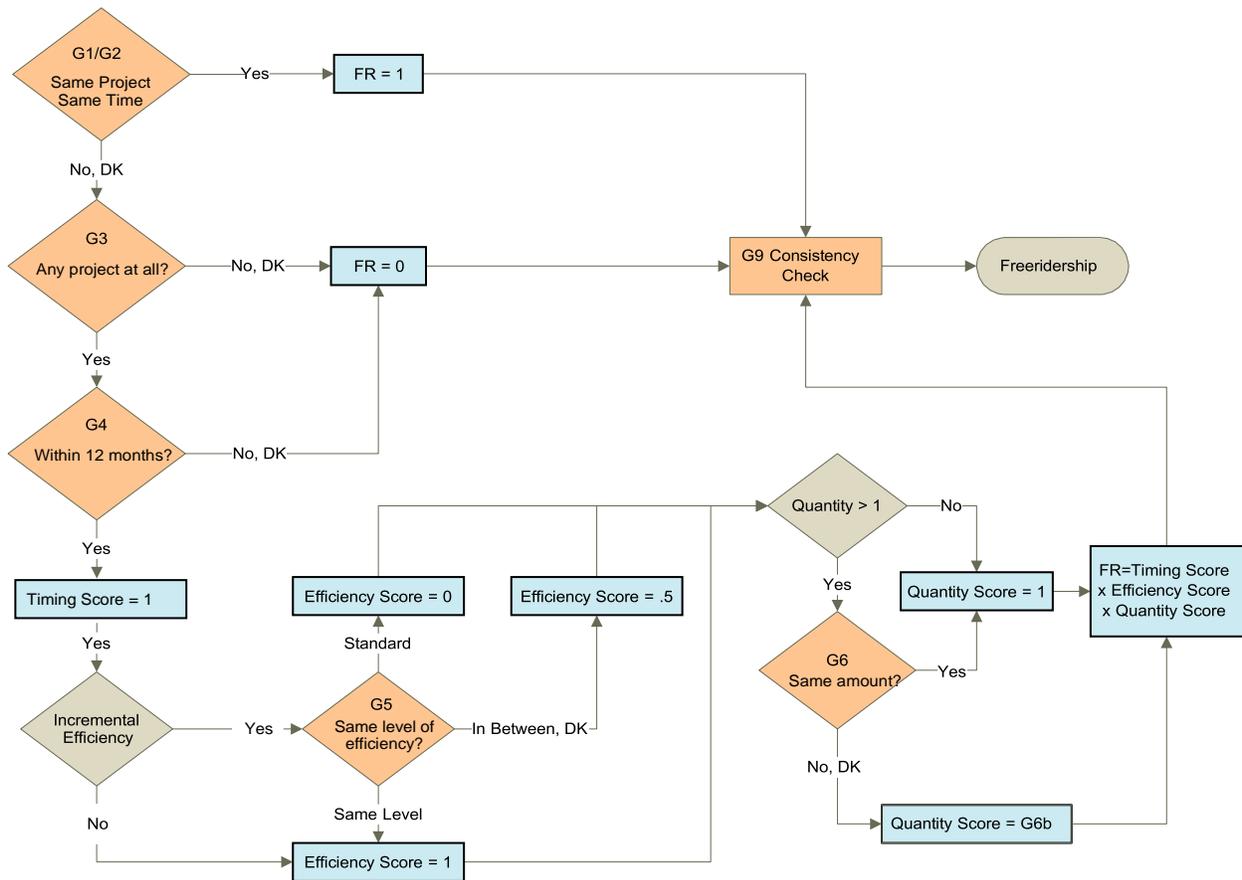
Table 1 provides detailed scoring and descriptions of each question.



Table 1. Freeridership Calculation Approach

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

Figure 1. Freeridership Calculation Approach



Participant Spillover Calculation

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

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



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

Table 2. Participant Spillover Calculation Approach

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

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

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

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

Appendix B. Nonparticipant Spillover

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

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

Methodology

The Cadmus team randomly selected and surveyed 80 nonparticipating customers from a sample of 5,406 randomly generated nonresidential nonparticipant accounts provided by RMP.

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

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

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

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

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

Table 1. NPSO Analysis Method

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



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

Results

Of 80 RMP nonparticipant customers surveyed, seven nonparticipant respondents reported installing three measure types attributed to RMP’s influence. Table 2 presents measures types and gross evaluated kWh savings the Cadmus team attributed to RMP, generating total savings of 8,896 kWh.

Table 2. NPSO Response Summary

Reported Spillover Measure Type	Quantity	Unit Energy Savings (kWh) ¹	Total Savings (kWh)
LED Lighting	14	83.0 per unit	500
T8 Fluorescent Lighting	110	70.3 per unit	7,734
Total	124		8,896

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

Table 3 presents variables used to estimate overall NPSO for the RMP nonresidential portfolio, a figure the Cadmus team estimated as 2% of total 2014-2015 **wattSmart Business** Program evaluated savings.

Table 3. NPSO Analysis Results

Variable	Metric	Value	Source
A	Total kWh Spillover Savings from Survey Respondents	8,896	Survey data / Engineering Analysis
B	Total Nonparticipant Customers Surveyed	80	Survey disposition
C	Average kWh Spillover Savings Per Nonparticipant Surveyed	111	A ÷ B
D	Total RMP Nonresidential Population - minus 2014-2015 wattSmart Business Participants	6,408	Rocky Mountain Power Customer Database
E	NPSO kWh Savings Applied to Population	712,572	C x D
F	Total Gross Program Evaluated kWh Savings	33,239,591	2014-2015 wattSmart Business Evaluation
G	NPSO as a Percentage of Total 2014-2015 wattSmart Business Evaluated kWh Savings	2%	E ÷ F

**Appendix C. Pacificorp wattsmart Business Program
(2014 - 2015) Participant Survey**

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

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

General Instructions

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

Variables to be pulled into Survey

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

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

A. Introduction

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

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

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

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

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

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

- A3. We are conducting an important survey today about **[INSERT UTILITY]'S WATTSMART BUSINESS PROGRAM**. **[INSERT UTILITY]** is actively seeking your opinions to help improve their business efficiency programs and to better understand how to assist customers in saving money and energy. This call may be monitored or recorded for quality assurances purposes. Anything you share with us today will be confidential and not attributed to any one individual or business.
1. **[IF RESPONDENT ASKS HOW LONG, SAY "Approximately 20 minutes."]**
 2. **[IF NEEDED, STATE "this survey is for research purposes only and this is not a marketing call. This is the primary way for customers to provide input into the incentive programs [UTILITY] offers. Your perspectives help [UTILITY] design energy-efficiency programs to help their customers save money and energy."]**
 3. **[IF CUSTOMER IS UNFAMILIAR WITH "WATTSMART" STATE "between 2013 and 2015 the programs energy Finanswer, Finanswer Express, Recommissioning, Self-Direction Credit, and Irrigation Energy Services, were combined under one umbrella, the Wattsmart Business Program."]**
 4. **[ONLY IF ASKED FOR A [UTILITY] CONTACT TO VERIFY THE SURVEY AUTHENTICITY, offer NIKKI KARPAVICH, 801-220-4439.**

B. Screeners

- B1. Our records show that you installed energy efficient equipment including **[MEASURE1]**, and **[MEASURE2]**, at **[INSERT SITE ADDRESS]** in **[INSERT PROGRAM YEAR]**? Is this correct? **[IF NEEDED: "General Illuminance includes interior or exterior lighting and controls." OR "NON-general illuminance includes exit signs, LED signs, LED case lighting, and refrigerator case occupancy sensors."]**
1. (Yes)
 2. (No, wrong year) **[RECORD CORRECT YEAR IF POSSIBLE]**
 3. (No, wrong address) **[RECORD CORRECT ADDRESS]**
 4. (No, wrong measure) **[CORRECT BELOW]**
 (MEASURE1 IS INCORRECT **[Correct: _____]**) **[CALL THIS VARIABLE C_MEASURE1]**
 (MEASURE2 IS INCORRECT **[Correct: _____]**) **[CALL THIS VARIABLE C_MEASURE2]**
 5. (No, I did not participate) **[THANK AND TERMINATE]**
 98. (Don't know) [ask to speak with someone who would know and start again **AT A2. IF NO ONE, THEN THANK AND TERMINATE]**
 99. (Refused) **[THANK AND TERMINATE]**

- B2. To ensure our records are correct, can you confirm that you received an incentive for [If 1 measure insert: this / If 2 measures insert: these] upgrades? The incentive may have been in the form of a check from the utility, a utility bill credit, an instant incentive on the product you purchased or a discount applied to your project invoice.
1. (Yes)
 2. (No) **[THANK AND TERMINATE]**
 98. (Don't know) **[ASK TO SPEAK WITH SOMEONE WHO WOULD KNOW AND START AGAIN AT A2. IF NO ONE, THEN THANK AND TERMINATE]**
 99. (Refused) **[THANK AND TERMINATE]**
- B3. How did your organization learn about the incentives or discounts available for this project? **[DO NOT READ LIST; MULTIPLE RESPONSES POSSIBLE]**
1. (Contact with *wattsmart* Business representative through phone, email, or in person)
 2. (*wattsmart* printed program materials)
 3. (*wattsmart* sponsored workshop or event)
 4. (Contact with utility representative)
 5. (Utility mailing, bill insert, or utility Website)
 6. (I contacted my contractor/vendor to ask)
 7. (My contractor/vendor let me know about them)
 8. (Previously participated in program/received an incentive)
 9. (Through a trade association or professional organization) **[SPECIFY: _____]**)
 10. **[IF CHANNEL = MIDSTREAM]** (Through the store where I purchased the LEDs)
 11. (Word of mouth (family, friend, or business colleague))
 12. (Other **[SPECIFY: _____]**)
 98. (Don't know)
 99. (Refused)
- B4. **[UTILITY]** recently combined its business energy efficiency incentive programs under one name—*wattsmart* Business. Before this call today had you heard of the *wattsmart* Business program? **[IF NEEDED: THE PROGRAMS COMBINED INTO WATTSMART BUSINESS ARE: ENERGY FINANSWER, FINANSWER EXPRESS, RECOMMISSIONING, SELF-DIRECTION CREDIT, AND IRRIGATION ENERGY SERVICES]**
1. (Yes)
 2. (No)
 98. (Don't know)
 99. (Refused)

[IF CHANNEL = MIDSTREAM ASK SECTION C]

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

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

- C1. Did your company purchase your LED lighting direct from a retailer or a distributor? **[DO NOT READ LIST; RECORD ONE ANSWER]**?
1. (Retailer)
 2. (Distributor)
 3. (Other) **[SPECIFY: _____]**
 98. (Don't know)
 99. (Refused)

[IF C1=1, 2, OR 3]

- C2. How easy was it to find a **[INSERT ANSWER FROM C1]** offering the instant incentive? Would you say...? **[READ LIST]**
1. Very easy
 2. Somewhat easy
 3. Not too easy
 4. Not at all easy
 98. (Don't know)
 99. (Refused)

[IF C2=2, 3 OR 4]

- C3. What would have made it easier?
1. **[RECORD VERBATIM: _____]**
 98. (Don't know)
 99. (Refused)
- C4. How easy was it to find the LED product you wanted to purchase? Would you say...? **[READ LIST]**
1. Very easy
 2. Somewhat easy
 3. Not too easy
 4. Not at all easy
 98. (Don't know)
 99. (Refused)

[IF C4=2, 3 OR 4]

- C5. What would have made it easier?
1. **[RECORD VERBATIM: _____]**
 98. (Don't know)
 99. (Refused)
- C6. Thinking about the instant incentive you received, how satisfied were you with the amount of the instant incentive? Would you say you were...? **[READ LIST]**
1. Very satisfied
 2. Somewhat satisfied
 3. Not too satisfied
 4. Not satisfied at all
 98. (Don't know)
 99. (Refused)

[IF C6=2, 3 OR 4]

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

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

[RECORD VERBATIM: _____]

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

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

[RECORD VERBATIM: _____]

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

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

[RECORD VERBATIM: _____]

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

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

D. *Small Business-Lighting (SBL) Incentives*

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

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

1. (To save money on energy bills, reduce energy consumption or energy demand)
2. (To obtain a program incentive)
3. (To obtain a tax credit)
4. (To replace old (but still functioning) equipment)
5. (To replace broken equipment)
6. (To improve productivity)
7. (To improve lighting quality)
8. (Other **[SPECIFY _____]**)
98. (Don't know)
99. (Refused)

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

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

[IF D2=2, 3 OR 4]

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

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

RECORD VERBATIM: _____

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

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

RECORD VERBATIM: _____

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

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

RECORD VERBATIM: _____

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

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

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

[IF D4=2, 3 OR 4]

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

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

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

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

[IF D6=1]

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

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

[IF D7=2, 3 OR 4]

- D8. How could the lighting proposal be improved? **[RECORD VERBATIM: _____]**
- 98. (Don't know)
 - 99. (Refused)

[IF D6=1]

- D9. What information in the lighting proposal was most influential in your decision to proceed with your project....? **[PROBE FOR SPECIFICS OF WHAT WAS INFLUENTIAL]**
- 1. **[RECORD VERBATIM: _____]**
 - 2. Nothing
 - 98. (Don't know)
 - 99. (Refused)

- D10. How satisfied were you with the work provided by the contractor? Would you say...? **[READ LIST]**
- 1. Very satisfied
 - 2. Somewhat satisfied
 - 3. Not too satisfied
 - 4. Not satisfied at all
 - 98. (Don't know)
 - 99. (Refused)

[IF D10=2, 3 OR 4]

- D11. Why do you say you were **[INSERT ANSWER FROM D10]** with the work provided by the contractor?
- 1. **[RECORD VERBATIM: _____]**
 - 98. (Don't know)
 - 99. (Refused)

- D12. How satisfied were you with the equipment provided by the contractor? Would you say...? **[READ LIST]**
- 1. Very satisfied
 - 2. Somewhat satisfied
 - 3. Not too satisfied
 - 4. Not satisfied at all
 - 98. (Don't know)
 - 99. (Refused)

[IF D12=2, 3 OR 4]

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

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

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

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

[IF D14=1]

D15. What equipment?

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

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

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

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

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

[ASK IF D17=1]

- D18. What could **[UTILITY]** do to help your company overcome these challenges? **[DO NOT READ LIST, ALLOW MULTIPLE RESPONSES]**
1. (Nothing)
 2. (Higher incentives)
 3. (Offer low-interest loans/financing)
 4. (Simplify the paperwork)
 5. (Provide better/more information about program)
 6. (Other **[RECORD VERBATIM ANSWER_____]**)
 98. (Don't know)
 99. (Refused)

[ASK IF D18=5]

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

- D19. Do you have any suggestions for improving the Small Business-Lighting incentives?
1. (Yes) **[SPECIFY: _____]**
 2. (No)
 98. (Don't know)
 99. (Refused)

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

E. Prescriptive Lighting and Equipment Upgrades

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

- E1. I'm going to read you a short list. Please tell me who, if anyone, was involved in helping you initiate your project where you installed **[INSERT MEASURE1 OR C_MEASURE1, AND MEASURE2 OR C_MEASURE2]**. **[READ LIST AND MARK 1= YES, 2=NO, 98=DON'T KNOW; 99 REFUSED FOR EACH]**
[RANDOMIZE LIST]
1. A wattsmart Business participating vendor
 2. Your independent consultant
 3. Other **[SPECIFY: _____]**
 98. (Don't know)
 99. (Refused)

- E2. Thinking about the general application and any supplemental equipment applications you submitted, how easy would you say this paperwork was to complete? Would you say...? **[READ LIST]**
1. Very easy,
 2. Somewhat easy,
 3. Not too easy, or
 4. Not at all easy?
 98. (Don't know)
 99. (Refused)

[ASK IF E2=2, 3 OR 4]

- E3. What would have made this paperwork easier to complete?
1. **[RECORD VERBATIM: _____]**
 98. (Don't know)
 99. (Refused)
- E4. Thinking about the incentive you received for this project, were you satisfied with the amount of the incentive? Would you say...? **[READ LIST]**
1. Very satisfied
 2. Somewhat satisfied
 3. Not too satisfied
 4. Not satisfied at all
 98. (Don't know)
 99. (Refused)

[IF E4=2, 3 OR 4]

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

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

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

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

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

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

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

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

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

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

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

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

[IF E7=2, 3 OR 4]

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

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

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

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

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

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

[IF E9=2, 3 OR 4]

E10. Why do you say that?

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

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

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

[IF E11=2, 3 OR 4]

E12. Why do you say that?

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

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

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

[IF E13=1]

E14. What equipment?

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

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

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

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

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

[IF E16=1]

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

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

[ASK IF E17=5]

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

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

F. Custom and Custom-Recommissioning Projects

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

- F1. Thinking about your project, how satisfied are you with your experience with the Energy Engineer provided by **[UTILITY]**? Are you ... **[READ LIST]**
1. Very satisfied
 2. Somewhat satisfied
 3. Not too satisfied
 4. Not satisfied at all
 98. (Don't know)
 99. (Refused)

[IF F1=2, 3, OR 4]

- F2. Why do you say you were **[INSERT ANSWER FROM F1]** with the Energy Engineer?
1. **[RECORD VERBATIM: _____]**
 98. (Don't know)
 99. (Refused)

- F3. Thinking about your project, how satisfied are you with your interaction with **[UTILITY]**? Are you ... **[READ LIST]**
1. Very satisfied
 2. Somewhat satisfied
 3. Not too satisfied
 4. Not satisfied at all
 98. (Don't know)
 99. (Refused)

[IF F3=2, 3, OR 4]

- F4. Why do you say you were **[INSERT ANSWER FROM F3]** with **[UTILITY]**?
1. **[RECORD VERBATIM: _____]**
 98. (Don't know)
 99. (Refused)

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

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

[ASK IF F5=2, 3 or 4]

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

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

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

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

[IF F7=1]

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

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

[IF F8=1]

F9. And thinking about the custom energy analysis, how useful was the information you received?

Would you say...? [READ LIST]

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

[IF F9=2, 3 or 4]

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

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

[IF F8=1]

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

1. [RECORD VERBATIM: _____]
2. (Nothing)
98. (Don't know)
99. (Refused)

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

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

[IF F12=2, 3 OR 4]

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

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

RECORD VERBATIM: _____

98. Don't know)

99. (Refused)

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

RECORD VERBATIM: _____

98. (Don't know)

99. (Refused)

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

RECORD VERBATIM: _____

98. (Don't know)

99. (Refused)

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

1. 1-3 weeks

2. 4-6 weeks

3. 7-8 weeks

4. Over 8 weeks

5. (Has not yet arrived?)

98. (Don't know)

99. (Refused)

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

F15. How satisfied were you with the amount of time it took to receive the incentive? Would you say...?

[READ LIST]

1. Very satisfied

2. Somewhat satisfied

3. Not too satisfied

4. Not satisfied at all

98. (Don't know)

99. (Refused)

[IF F15=2, 3 or 4]

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

_____]

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

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

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

[IF F17=1]

F18. What equipment?

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

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

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

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

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

[ASK IF F20=1]

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

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

[ASK IF F21=5]

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

F22. [RECORD VERBATIM _____]

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

G. Freeridership

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

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

- G1. Without the program, meaning without either the technical assistance or the financial incentive, would you have still completed the exact same [MEASURE_#] project?
1. (Yes)
 2. (No) [SKIP TO G3]
 98. (Don’t know) [SKIP TO G3]
 99. (Refused) [SKIP TO G3]
- G2. Without the program, meaning without either the technical assistance or the financial incentive, would you have still installed the [MEASURE_#] at the same time?
1. (Yes) [SKIP TO G7]
 2. (No) [SKIP TO G4]
 98. (Don’t know) [SKIP TO G4]
 99. (Refused) [SKIP TO G4]
- G3. Without the program, would you have installed any [MEASURE_#] equipment?
1. (Yes)
 2. (No) [SKIP TO G8]
 98. (Don’t know) [SKIP TO G8]
 99. (Refused) [SKIP TO G8]
- G4. Without the program, in terms of timing, when would you have installed the [MEASURE_#]?
1. Within one year from original participation date
 2. In one to two years from original participation date
 3. More than two years from original participation date [SKIP TO G8]
 98. (Don’t know)
 99. (Refused)

- G5. Relative to the energy efficiency of [MEASURE_#] installed through the program, how would you characterize the efficiency of equipment you would have installed without the program?
1. Just as efficient as installed with the program
 2. Lower than installed through the program, but better than standard efficiency
 3. Standard efficiency
 98. (Don't know)
 99. (Refused)
- G6. Would you have installed more, less, or the same amount of [MEASURE_#] without the program?
1. (More)
 - G6a. Compared to the installed amount, how much more?
[RECORD PERCENTAGE: _____]
 2. (Less)
 - G6b. Compared to the installed amount, how much less?
[RECORD PERCENTAGE: _____]
 98. (Don't know)
 99. (Refused)
- G7. Prior to hearing about the program, was the cost of [MEASURE_#] included in your organization's most recent capital budget?
1. (Yes)
 2. (No)
 98. (Don't know)
 99. (Refused)

- G8. In your own words, can you please describe what impact the program had on your decision to complete these energy efficiency improvements for [MEASURE_#]?
 [REPEAT QUESTIONS G1 TO G8 FOR MEASURE2/C_MEASURE2 IF MULT_MEASURES=1]
- G9. With the [CHANNEL] program, your company received financial incentives, or credits, or discounts [IF INCENTIVES/BILL CREDIT ARE PROVIDED IN DATA BASE READ, “of [INCENTIVE 1] or [BILL CREDIT1] and [INCENTIVE 2] or [BILL CREDIT2] for installing [MEASURE_1/C_MEASURE1] and [MEASURE_2/C_MEASURE2]. [IF CHANNEL=PRESCRIPTIVE add “You may have also received technical assistance identifying energy saving opportunities”].

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

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

H. Spillover

- H1. Now I’d like to ask about energy efficiency improvements other than those you installed through the program. Since participating in this program, have you purchased and installed any additional energy efficiency improvements on your own without any assistance from a utility or other organization?
1. (Yes)
 2. (No) [SKIP TO SECTION I]
 98. (Don’t know) [SKIP TO SECTION I]
 99. (Refused) [SKIP TO SECTION I]

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

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

- H2. Did you purchase and install any energy efficient improvements that are the same as the [MEASURE_#] you installed through the program?
1. (Yes)
 2. (No) [IF MULTI_MEASURES=1 SET MEASURE_#=MEASURE_2 AND GO BACK/RE-ASK H2; ELSE GO TO H9]
 98. (Don't know) [IF MULTI_MEASURES=1 SET MEASURE_#=MEASURE_2 AND GO BACK/RE-ASK H2; ELSE GO TO H9]
 99. (Refused) [IF MULTI_MEASURES=1 SET MEASURE_#=MEASURE_2 AND GO BACK/RE-ASK H2; ELSE GO TO H9]
- H3. How many did you purchase and install?
1. [RECORD RESPONSE]
 98. (Don't know)
 99. (Refused)
- H4. Relative to the energy efficiency of the equipment installed through the program, how would you characterize the efficiency of this equipment?
1. Just as efficient as installed through the program
 2. Lower than installed through the program, but better than the standard efficiency
 3. Standard efficiency
 98. (Don't know)
 99. (Refused)
- H5. Did you receive an incentive from [UTILITY] or another organization for this equipment?
1. (Yes)
 2. (No)
 98. (Don't know)
 99. (Refused)
- [ASK IF H5=1]
- H6. What program or sponsor provided the incentive?
1. [ENTER PROGRAM OR UTILTY]
 98. (Don't know)
 99. (Refused)
- H7. On a scale from 1 to 5, with 1 being not important at all and 5 being extremely important, please rate how important your experience with the [UTILITY] [CHANNEL] program was in your decision to install [this/these] energy efficient product(s).
1. RECORD RATING: _____]
 98. (Don't know)
 99. (Refused)

[ASK IF H5=2]

- H8. Why did you not apply for an incentive from [UTILITY] for this equipment?
1. [RECORD RESPONSE]
 98. (Don't know)
 99. (Refused)

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

- H9. In [PROGRAM YEAR] did you purchase and install any *other* energy efficiency improvements on your own without any assistance (financial or technical) from a utility, vendor or other organization?
1. (Yes)
 2. (No) **[SKIP TO SECTION I]**
 98. (Don't know) **[SKIP TO SECTION I]**
 99. (Refused) **[SKIP TO SECTION I]**

- H10. What type of equipment did you install? **[DO NOT READ LIST. RECORD ALL THAT APPLY]**
1. (Lighting equipment)
 2. (HVAC equipment (heating and cooling))
 3. (Water heating equipment)
 4. (Variable drive)
 5. (Efficient motor)
 6. (Refrigeration equipment)
 7. (Building envelope measure)
 8. (Compressed air equipment)
 9. (Chiller)
 10. (Pump)
 11. (Irrigation equipment (gaskets, drains, sprinklers))
 12. (Other) **[SPECIFY]:** _____
 13. (None of the above) **[SKIP TO SECTION I]**
 98. (Don't know) **[SKIP TO SECTION I]**
 99. (Refused) **[SKIP TO SECTION I]**

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

H10.11 What type of lighting was purchased and installed? [SPECIFY TYPE EXAMPLE: CFL, LED, FLUORESCENT]: _____

H10.12 What is the wattage of the lighting? [SPECIFY]: _____

H10.13 In what location was it installed (Wall/Ceiling/Outdoors)? [SPECIFY]: _____

H10.14 What type of equipment was removed or replaced? [SPECIFY]: _____

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

H10.21 What type of HVAC equipment was purchased and installed? [SPECIFY TYPE]: _____

H10.22 What Fuel type is used? [SPECIFY]: _____

H10.23 What is the efficiency rating of the equipment? [SPECIFY]: _____

H10.24 What is the capacity of the equipment? [SPECIFY]: _____

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

H10.31 What type of water heating equipment was purchased and installed? [SPECIFY TYPE]: _____

H10.32 What Fuel type is used? [SPECIFY]: _____

H10.33 What is the efficiency rating of the equipment? [SPECIFY]: _____

H10.34 (If water heater with storage) What is the capacity of the equipment? [SPECIFY]: _____

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

H10.41 What type of motor was it installed on? [SPECIFY TYPE]: _____

H10.42 What is the horsepower of the motor? [SPECIFY]: _____

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

H10.51 What equipment was the motor installed on? [SPECIFY TYPE]: _____

H10.52 What is the horsepower of the motor? [SPECIFY]: _____

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

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

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

H10.71 What building envelope measure was purchased and installed? **[SPECIFY TYPE]:**

H10.72 What is the efficiency (R-value) of the measure? **[SPECIFY]:** _____

H10.73 In what location was it installed (Wall/Roof/Floor)? **[SPECIFY]:** _____

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

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

H10.82 What is the horsepower of the compressor motor? **[SPECIFY]:** _____

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

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

H10.92 What size chiller did you install? **[SPECIFY]:** _____

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

H10.101 FOR What type of application was the pump purchased and installed? **[SPECIFY APPLICATION]:** _____

H10.102 What is the horsepower of the motor for the pump? **[SPECIFY]** _____

H10.103 What is the efficiency rating of the pump? **[SPECIFY]:** _____

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

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

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

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

1. [RECORD RESPONSE]

98. (Don't know)

99. (Refused)

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

- H12. Just to confirm, did you receive an incentive from [UTILITY] or another organization for this equipment? [ASK FOR EACH MEASURE MENTIONED IN H10]
1. (Yes)
 2. (No)
 98. (Don't know)
 99. (Refused)

[ASK FOR EACH YES IN H12]

- H13. What utility or organization provided the incentive? [ASK FOR EACH MEASURE MENTIONED IN H10]
1. [RECORD UTILITY OR ORGANIZATION]
 98. (Don't know)
 99. (Refused)

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

- H14. What information did you rely upon to determine that the equipment installed was energy efficient? [ASK FOR EACH MEASURE MENTIONED IN H10]
1. [RECORD RESPONSE]
 98. (Don't know)
 99. (Refused)

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

- H15. On a scale from 1 to 5, with 1 being not important at all and 5 being extremely important, please rate how important your experience with the [UTILITY] wattsmart Business program was in your decision to install [this/these] energy efficient product(s). [ASK FOR EACH MEASURE MENTIONED IN H10]
1. [RECORD RATING: _____]
 98. (Don't know)
 99. (Refused)

[ASK SECTION I TO ALL SURVEY RESPONDENTS]

I. Firmographics

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

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

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

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

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

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

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

14. How many people are employed by your company at all locations?
1. (1-10)
 2. (11-25)
 3. (26-50)
 4. (51-75)
 5. (76-100)
 6. (101-200)
 7. (201-500)
 8. More than 500
 98. (Don't know)
 99. (Refused)
15. **[NOT ASKED]** What type of fuel is used for space heating at your facility where the [MEASURE 1] was installed?
1. Electric
 2. Gas
 3. (Other) **[RECORD VERBATIM: _____]**
 98. (Don't know)
 99. (Refused)
16. **[NOT ASKED]** What type of fuel is used for water heating at your facility where the [MEASURE 1] was installed?
1. Electric
 2. Gas
 3. (Other) **[RECORD VERBATIM: _____]**
 98. (Don't know)
 99. (Refused)

J. Closing

- J1. **[NOT ASKED]** Overall, how satisfied would you say you are with the *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)

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

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

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

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

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

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

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

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

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

- J4. In the future, how would you like to stay informed about opportunities available through the wattsmart Business Program? **[DO NOT READ LIST; MULTIPLE RESPONSES POSSIBLE]**
1. (Contact with wattsmart Business representative through phone, email, or in person)
 2. (wattsmart printed program materials)
 3. (wattsmart sponsored workshop or event)
 4. (Contact with utility representative)
 5. (Utility mailing, bill insert, or utility Website)
 6. (Contact with a vendor/contractor)
 7. (Through a trade association, trade publication or professional organization) **[SPECIFY: _____]**)
 8. (Newspaper ad)
 9. (Radio ad)
 10. (TV ad)
 11. (Social Media (e.g., Facebook, Twitter, YouTube))
 12. (Online ads)
 13. (Other **[SPECIFY: _____]**)
 98. (Don't know)
 99. (Refused)

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

**Appendix D. Pacifcorp wattsmart Business Program
(2014/2015) Nonparticipant/Partial Participant Survey**

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

Target Quota:

Nonparticipants:

Utah Managed (20), Nonmanaged (50)
 Washington Managed (20), Nonmanaged (50)
 Idaho Managed (20), Nonmanaged (50)
 Wyoming Managed (20), Nonmanaged (50)

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

General Instructions

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

Variables to be Pulled into Nonparticipant Survey

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

Variables to be Pulled into Partial Participant Survey

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

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

A. Introduction

- A1. Hello, I'm **[INSERT NAME]** calling on behalf of **[UTILITY]**. May I speak with **[CONTACT NAME]**? OR **[IF NO NAME OR NAMED RESPONDENT NO LONGER WORKS FOR COMPANY]** May I speak with the person who handles energy decisions for **[CUSTOMER NAME]**? **[IF THAT PERSON IS NOT AT THIS PHONE NUMBER, ASK FOR THEIR NAME AND PHONE NUMBER AND START AGAIN]**
1. (Yes) **[IF CORRECT PERSON, SKIP TO A3. IF TRANSFERRED TO SOMEONE ELSE, READ A2]**
 2. (No or not a convenient time) **[ASK IF RESPONDENT WOULD LIKE TO ARRANGE A MORE CONVENIENT TIME OR IF YOU CAN LEAVE A MESSAGE FOR A MORE APPROPRIATE PERSON]**
 98. (Don't know) **[ASK TO SPEAK WITH SOMEONE WHO KNOWS AND BEGIN AGAIN]**
 99. (Refused) **[THANK AND TERMINATE]**
- A2. Hello, I'm **[INSERT NAME]** calling on behalf of **[UTILITY]**. Are you the person responsible for making energy-efficiency decisions for your company at the **[ADDRESS]** location?
1. (Yes)
 2. (No, person is able to come to phone) **[ASK FOR PERSON WHO IS AND START AGAIN]**
 3. (No, person is not able to come to phone) **[GET NAME AND PHONE NUMBER, SCHEDULE CALL BACK]**
 98. (Don't know) **[ASK TO SPEAK WITH SOMEONE WHO KNOWS AND BEGIN AGAIN]**
 99. (Refused) **[THANK AND TERMINATE]**

- A3. We are conducting an important survey today about **[UTILITY]**'s wattsmart Business program. **[UTILITY]** is actively seeking your opinions to help improve their business efficiency programs and to better understand how to assist customers in saving money and energy. This call may be monitored or recorded for quality assurances purposes. Anything you share with us today will be confidential and not attributed to any one individual or business.
1. **[IF RESPONDENT ASKS HOW LONG, SAY "Approximately 5 to 7 minutes."]**
 2. **[IF NEEDED, STATE "this survey is for research purposes only and this is not a marketing call. This is the primary way for customers to provide input into the incentive programs [UTILITY] offers. Your perspectives help [UTILITY] design energy-efficiency programs to help their customers save money and energy."]**
 3. **[IF CUSTOMER IS UNFAMILIAR WITH "WATTSMART" STATE "between 2013 and 2015 the programs energy Finanswer, Finanswer express, Recommissioning and Self-Direction Credit, and Irrigation Energy Services, were combined under one umbrella, the Wattsmart Business Program."]**
 4. **[ONLY IF ASKED FOR A [UTILITY] CONTACT TO VERIFY THE SURVEY AUTHENTICITY, OFFER [NIKKI KARPAVICH, 801-220-4439]**

B. Screeners

[ASK PARTIAL PARTICIPANTS]

- B1. Our records show that you initiated **[DEPENDING ON MEASURE NAME READ "a" or "an"]** **[MEASURE]** project at **[ADDRESS]** with **[UTILITY]** in 2014 or 2015, but did not complete this project through the wattsmart Business program? Is this correct? **[IF CUSTOMER IS UNFAMILIAR WITH WATTSMART BUSINESS OR UNSURE, READ: You may know the program by another name: Energy Finanswer, Finanswer Express, Recommissioning and Self-Direction Credit, and Irrigation Energy Services.]**
1. (Yes)
 2. (No, wrong year) **[RECORD CORRECT YEAR, IF POSSIBLE]**
 3. (No, wrong address) **[RECORD CORRECT ADDRESS]**
 4. (No, I did not participate) **[THANK AND TERMINATE]**
 98. (Don't know) **[ASK TO SPEAK WITH SOMEONE WHO WOULD KNOW AND START AGAIN AT A2. IF NO ONE, THEN THANK AND TERMINATE]**
 99. (Refused) **[THANK AND TERMINATE]**

[THANK AND TERMINATE TEXT] Those are all the questions we have for you today. Thank you for your help. Have a nice day!

[ASK EVERYONE]

- B2. Did your company receive an incentive from **[UTILITY]**'s *wattsmart* Business program for installing energy efficient equipment in 2014 or 2015? By energy-efficient equipment, I mean high efficiency lighting, HVAC equipment, irrigation or dairy equipment, variable speed drives, building envelope or other energy efficient equipment. **[IF CUSTOMER IS UNFAMILIAR WITH WATTSMART BUSINESS OR UNSURE, READ:** You may know the program by another name: Energy Finanswer, Finanswer Express, Recommissioning and Self-Direction Credit, and Irrigation Energy Services.]
1. (Yes) **[READ:** For this survey, we are seeking those companies who did not receive an incentive. We will not take any more of your time today. Thank you.] **[TERMINATE]**
 2. (No)
 98. (Don't know) **[ASK TO SPEAK WITH SOMEONE WHO WOULD KNOW AND START AGAIN AT A2. IF NO ONE, THEN THANK AND TERMINATE]**
 99. (Refused) **[THANK AND TERMINATE]**

[THANK AND TERMINATE TEXT] Those are all the questions we have for you today. Thank you for your help. Have a nice day!

C. Awareness

[ASK PARTIAL PARTICIPANTS]

- C1. Even though you did not receive an incentive; how did your organization learn about the incentives available for this project? **[DO NOT READ LIST; MULTIPLE RESPONSES POSSIBLE]**
1. (Contact with *wattsmart* Business representative through phone, email, or in person)
 2. (*wattsmart* printed program materials)
 3. (*wattsmart* sponsored workshop or event)
 4. (Contact with utility representative)
 5. (Utility mailing, bill insert, or utility website)
 6. (I contacted my contractor/vendor to ask)
 7. (My contractor/vendor let me know about them)
 8. (Previously participated in program/received an incentive)
 9. (Through a trade association or professional organization) **[SPECIFY: _____])**
 10. (Word of mouth (family, friend, or business colleague)
 11. (Other **[SPECIFY: _____])**
 98. (Don't know)
 99. (Refused)

[ASK EVERYONE]

- C2. **[UTILITY]** recently combined its business energy efficiency incentive programs under one name— *wattsmart* Business. Before this call today had you heard of the *wattsmart* Business program? **[IF NEEDED: THE PROGRAMS COMBINED INTO WATTSMART BUSINESS ARE: ENERGY FINANSWER, FINANSWER EXPRESS, RECOMMISSIONING, SELF-DIRECTION CREDIT, AND IRRIGATION ENERGY SAVERS]**
1. (Yes) **[PARTIAL PARTICIPANTS SKIP TO C4] [NONPARTICIPANTS CONTINUE TO C3]**
 2. (No) **[SKIP TO C5]**
 98. (Don't know) **[SKIP TO C5]**
 99. (Refused) **[SKIP TO C5]**
- C3. How did your organization learn about the *wattsmart* Business Program? **[DO NOT READ LIST; MULTIPLE RESPONSES POSSIBLE]**
1. (Contact with *wattsmart* Business representative through phone, email, or in person)
 2. (*wattsmart* printed program materials)
 3. (*wattsmart* sponsored workshop or event)
 4. (Contact with utility representative)
 5. (Utility mailing, bill insert, or utility website)
 6. (I contacted my contractor/vendor to ask)
 7. (My contractor/vendor let me know about them)
 8. (Previously participated in program/received an incentive)
 9. (Through a trade association or professional organization) **[SPECIFY: _____]**)
 10. (Word of mouth (family, friend, or business colleague)
 11. (Other **[SPECIFY: _____]**)
 98. (Don't know)
 99. (Refused)
- 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. RECORD UP TO THREE RESPONSES]**
1. (Contact with *wattsmart* Business representative through phone, email, or in person)
 2. (*wattsmart* printed program materials)
 3. (*wattsmart* sponsored workshop or event)
 4. (Contact with utility representative)
 5. (Utility mailing, bill insert, or utility website)
 6. (Contact with a vendor/contractor)
 7. (Through a trade association, trade publication or professional organization)
[SPECIFY: _____]
 8. (Newspaper ad)
 9. (Radio ad)
 10. (TV ad)
 11. (Social Media (e.g., Facebook, Twitter, YouTube))
 12. (Online ads)
 13. (Other **[SPECIFY: _____]**)
 14. (Not interested in being informed about incentives for energy-efficient improvements)
 98. (Don't know)
 99. (Refused)

D. *Motivation and Barriers*

[ASK EVERYONE D1]

Thank you. The next few questions are about making energy-efficient improvements for your business.

- D1. What factor is the 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, reduce energy consumption or energy demand)
 2. (To obtain a program incentive)
 3. (To obtain a tax credit)
 4. (To replace old (but still functioning) equipment)
 5. (To replace broken equipment)
 6. (To improve productivity)
 7. (To improve lighting quality)
 8. (Other **[SPECIFY _____]**)
 98. (Don't know)
 99. (Refused)

[NONPARTICIPANTS SKIP TO D7]

[PARTIAL PARTICIPANTS ASK D2-D6]

- D2. Did your company complete the **[MEASURE]** project you initiated with **[UTILITY]** even though you did not receive a *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? **[IF NEEDED: You may have applied under one of the programs that became *wattsmart* Business. These include Energy FinAnswer, FinAnswer Express, Recommissioning, Self-Direction Credit, and Irrigation Energy Services.]**
1. (Yes)
 2. (No) **[SKIP TO D6]**
 98. (Don't know) **[SKIP TO E1]**
 99. (Refused) **[SKIP TO E1]**
- D5. Why did your project not receive an incentive?
1. **[RECORD RESPONSE] [SKIP TO E1]**
 98. (Don't know) **[SKIP TO E1]**
 99. (Refused) **[SKIP TO E1]**
- D6. Why did you not apply for an incentive?
1. (Project did not qualify) **[SKIP TO E1]**
 2. (Other) **[RECORD RESPONSE] [SKIP TO E1]**
 98. (Don't know) **[SKIP TO E1]**
 99. (Refused) **[SKIP TO E1]**

[NONPARTICIPANT ASK D7-D14]

- D7. I'm going to read you six statements describing situations companies experience when considering energy-efficient improvements. Please tell me to what extent you agree with each statement. If it doesn't apply to you, please let me know that. The first statement is: **[RANDOMIZE, READ STATEMENT; THEN JUST FOR THE FIRST STATEMENT READ THE FOLLOWING:** Would you say you strongly agree, somewhat agree, somewhat disagree, or strongly disagree?
[READ LIST AND RECORD 1=STRONGLY AGREE, 2=SOMEWHAT AGREE, 3=SOMEWHAT DISAGREE, AND 4=STRONGLY DISAGREE; 97= NOT APPLICABLE, 98=DON'T KNOW, AND 99=REFUSED]
- D2a. Making upgrades at our facility is an inconvenience.
 - D2b. Making energy efficiency upgrades to this facility is too costly.
 - D2c. We don't replace working equipment even if it is not energy efficient.
 - D2d. My company has made all the energy efficiency improvements we can without a substantial investment.
 - D2e. My company leases space, we do not want to invest in energy efficiency upgrades.
 - D2f. Decisions about equipment upgrades are made at a corporate office, and we don't have much input at this facility.
- D8. When calculating the return on investment for proposed capital upgrades, does your company include savings gained from energy efficiency?
- 1. (Yes)
 - 2. (No)
 - 98. (Don't know)
 - 99. (Refused)
- D9. What would motivate your business to make more energy-efficient purchases or upgrades to your current equipment? **[DO NOT READ LIST; RECORD UP TO 3 RESPONSES]**
- 1. (Lower costs of product/equipment)
 - 2. (Information on return on investment/help with the business case for investment)
 - 3. (More information generally)
 - 4. (Higher incentives)
 - 5. (Incentives on different products/technologies)
 - 6. (Other) **[SPECIFY]**
 - 98. (Don't know)
 - 99. (Refused)

[ASK IF D9=3]

- D10. When you say you would like more information, what kind of information is most useful?
- 1. **[RECORD RESPONSE]**
 - 98. (Don't know) **[SKIP TO D13]**
 - 99. (Refused) **[SKIP TO D13]**

[ASK IF D10=1]

- D11. Who could best to provide you with this information? For example, a *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 2014 or 2015, did you purchase and install any energy efficiency improvements on your own without any assistance (financial or technical) from a utility, vendor or other organization?
1. (Yes)
 2. (No) **[SKIP TO SECTION F]**
 98. (Don't know) **[SKIP TO SECTION F]**
 99. (Refused) **[SKIP TO SECTION F]**

E2. What type of equipment did you purchase and install?

1. (Lighting) **[SPECIFY TYPE EXAMPLE: CFL, LED, FLUORESCENT]:** _____
 - a. How many did you purchase and install **[SPECIFY]:** _____
 - b. What is the wattage of the installed equipment **[SPECIFY]:** _____
 - c. Where is the equipment installed? (Wall/Ceiling/Outdoors) **[SPECIFY]:** _____
 - d. What type of equipment was removed or replaced **[SPECIFY]:** _____
2. (HVAC (heating and cooling)) **[SPECIFY EQUIPMENT]:** _____
 - a. How many did you purchase and install **[SPECIFY]:** _____
 - b. What fuel type does this equipment use **[SPECIFY]:** _____
 - c. What is the efficiency rating of the equipment **[SPECIFY]:** _____
 - d. What is the equipment's rated capacity **[SPECIFY]:** _____
3. (Water heating) **[SPECIFY EQUIPMENT]:** _____
 - a. How may did you purchase and install **[SPECIFY]:** _____
 - b. What fuel type does this equipment use **[SPECIFY]:** _____
 - c. What is the efficiency rating of the equipment **[SPECIFY]:** _____
 - d. What is the capacity of the water heater (if water heater with storage) **[SPECIFY]:** _____
4. (Variable drives)
 - a. How may did you purchase and install **[SPECIFY]:** _____
 - b. What type of motor was it installed on **[SPECIFY]:** _____
 - c. What is the horsepower of the motor **[SPECIFY]:** _____
5. (Efficient motors)
 - a. How many did you purchase and install **[SPECIFY]:** _____
 - b. What type of equipment is the motor installed on **[SPECIFY]:** _____
 - c. What is the horsepower of the motor **[SPECIFY]:** _____
6. (Refrigeration) **[SPECIFY EQUIPMENT]:** _____
 - a. How much did you purchase and install **[SPECIFY]:** _____
7. (Building envelope) **[SPECIFY TYPE]:** _____
 - a. How may square feet did you purchase and install **[SPECIFY]:** _____
 - b. What is the efficiency (R-value, thickness) **[SPECIFY]:** _____
 - c. Where was it installed (Wall/Roof/Floor) **[SPECIFY]:** _____
8. (Compressed air) **[SPECIFY TYPE OF PROJECT]:** _____
 - a. How many did you purchase and install **[SPECIFY]:** _____
 - b. What is the horsepower of the compressor motor **[SPECIFY]:** _____
9. (Chillers) **[SPECIFY TYPE OF EQUIPMENT]:** _____
 - a. How many did you purchase and install **[SPECIFY]:** _____
 - b. What size unit did you install **[SPECIFY]:** _____
10. (Pumps) **[SPECIFY WHAT IS IT INSTALLED ON]:** _____
 - a. How many did you purchase and install **[SPECIFY]:** _____
 - b. What is the horsepower of the pump motor **[SPECIFY]:** _____

- c. What is the efficiency rating of the pump **[SPECIFY]**: _____
- 11. (Irrigation (gaskets, drains, sprinklers)) **[SPECIFY]**: _____
 - a. How many did you purchase and install **[SPECIFY]**: _____
- 12. (Other) **[SPECIFY]**: _____
 - a. How many did you purchase and install **[SPECIFY]**: _____
- 98. (Don't know) **[SKIP TO F1]**
- 99. (Refused) **[SKIP TO F1]**

[ASK IF E2=1-12]

- E3. Just to confirm, did you receive an incentive from **[UTILITY]** or another organization for any of these measures? **[RECORD FOR EACH MEASURE MENTIONED IN E2]?**
 - 1. (Yes)
 - 2. (No) **[SKIP TO E5]**
 - 98. (Don't know) **[SKIP TO E5]**
 - 99. (Refused) **[SKIP TO E5]**

[ASK FOR EACH YES IN E3]

- E4. What program or sponsor provided the incentive(s)? **[RECORD FOR EACH MEASURE MENTIONED IN E2]**
 - 1. **[UTILITY]**
 - 98. (Don't know)
 - 99. (Refused)

[ASK IF E2=1-12]

- E5. For these purchases, on a scale from 1 to 5, with 1 being not important at all and 5 being very important, please rate how important were each of the following on your decision to purchase and install [this/these] energy efficient improvement(s). If a factor is not applicable to you, please say so. **[NOTE: RESPONDENTS CAN ALSO STATE THAT A PARTICULAR FACTOR IS NOT APPLICABLE, PLEASE CODE N/A AS 6]**

E5.1 General information about energy efficiency provided by **[UTILITY]** _____

If needed: on a scale from 1 to 5, with 1 being not important at all and 5 being very important
If a factor is not applicable to you, please say so

E5.1a **[ASK IF 5E.1 = 1-3]** Does this rating differ for any of the improvements you mentioned?

- 1. YES
- 2. NO
- 3. Don't Know

E5.1b [ASK IF E5.1a=1] Which of the following equipment would you rate differently on the General information about energy efficiency provided by [UTILITY]? [Display equipment mentioned in E2. Multiple Response Allowed]

ASK RATING FOR EACH EQUIPMENT SELECTED. [If needed read: On a scale from 1 to 5, with 1 being not important at all and 5 being very important].

- Lighting
- HVAC (heating and cooling)
- Water heating
- Variable drives
- Efficient motors
- Refrigeration
- Building envelope
- Compressed air
- Chillers
- Pumps
- Irrigation
- [Other Specify]
- None of the above

E5.2 Information from [UTILITY] program staff or contractors. ____

If needed: on a scale from 1 to 5, with 1 being not important at all and 5 being very important
If a factor is not applicable to you, please say so

E5.2a [ASK IF E52 =1-3] Does this rating differ for any of the other improvements you mentioned?

- YES
- NO
- Don't Know

ASK RATING FOR EACH EQUIPMENT SELECTED. [If needed read: On a scale from 1 to 5, with 1 being not important at all and 5 being very important].

E5.2b [ASK IF E52a = 1] Which of the following equipment would you rate differently on the Information from [UTILITY] program staff or contractors? [Display equipment mentioned in E2. Multiple Response Allowed]

[If needed read: If needed: on a scale from 1 to 5, with 1 being not important at all and 5 being very important]. If needed, record rating 1 to 5 for each response.

- Lighting
- HVAC (heating and cooling)
- Water heating
- Variable drives
- Efficient motors
- Refrigeration
- Building envelope
- Compressed air
- Chillers
- Pumps
- Irrigation
- [Other Specify]
- None of the above

E5.3 Your experience with a past [UTILITY] energy efficiency program. ____

If needed: on a scale from 1 to 5, with 1 being not important at all and 5 being very important

If a factor is not applicable to you, please say so

E5.3a [ASK IF E53=1-3] Does this rating differ for any of the other improvements you mentioned?

YES

NO

Don't Know

ASK RATING FOR EACH EQUIPMENT SELECTED. [If needed read: On a scale from 1 to 5, with 1 being not important at all and 5 being very important].

E5.3b [ASK IF E53a = 1] Which of the following equipment would you rate differently on your experience with a past **[UTILITY]** energy efficiency program? [Display equipment mentioned in E2. Multiple Response Allowed]

Lighting
HVAC (heating and cooling)
Water heating
Variable drives
Efficient motors
Refrigeration
Building envelope
Compressed air
Chillers
Pumps
Irrigation
[Other Specify]
None of the above

[ASK SECTION F TO ALL SURVEY RESPONDENTS]

F. Firmographics

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

F1. What industry is your company in? **[DON'T READ RESPONSES UNLESS NECESSARY]**

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

F2. How many locations does your company operate in **[PROJECT STATE]**?

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

F3. Does your organization lease or own the facilities or facilities?

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

- F4. How many people are employed by your company at all locations?
1. (1-10)
 2. (11-25)
 3. (26-50)
 4. (51-75)
 5. (76-100)
 6. (101-200)
 7. (201-500)
 8. More than 500
 9. (Other) [RECORD VERBATIM: _____]
 98. (Don't know)
 99. (Refused)
- F5. What type of fuel is used for space heating at your facility?
1. Electric
 2. Gas
 3. (Other) [RECORD VERBATIM: _____]
 98. (Don't know)
 99. (Refused)
- F6. What type of fuel is used for water heating at your facility?
1. Electric
 2. Gas
 3. (Other) [RECORD VERBATIM: _____]
 98. (Don't know)
 99. (Refused)

G. Closing

[PARTIAL PARTICIPANTS ONLY: ASK G1-G3] [NONPARTICIPANTS GO TO CLOSING STATEMENT]

- G1. Overall, how satisfied would you say you are with the *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 WATSMART 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 end-use category level, cost-effectiveness was reported for evaluated net savings. Net results apply the evaluated NTG to evaluated gross savings. Table C1 shows cost-effectiveness inputs for net results.

Table C1. Wyoming wattsmart Business End-Use Category Cost-Effectiveness Inputs

Input Description	2014	2015	Total
Average Measure Life*			
Lighting	14	14	14
HVAC	15	15	15
Refrigeration	12	15	15
Motor Systems	15	15	15
Compressed Air	15	15	15
Agricultural	15	7	9
Other	15	15	15
Evaluated Net Energy Savings (kWh/year)**			
Lighting	3,167,931	4,116,692	7,284,623
HVAC	163,787	502,371	666,159
Refrigeration	3,327	165,911	169,239
Motor Systems	3,181,707	10,469,525	13,651,231
Compressed Air	273,449	235,387	508,836
Agricultural	108,241	242,904	351,145
Other	197,380	439,101	636,481
Total Utility Cost (including incentives)***			
Lighting	\$1,258,460	\$1,464,626	\$2,723,086
HVAC	\$64,514	\$197,040	\$261,554
Refrigeration	\$1,331	\$47,302	\$48,633
Motor Systems	\$1,038,201	\$3,102,143	\$4,140,345
Compressed Air	\$111,871	\$80,168	\$192,039
Agricultural	\$56,363	\$31,834	\$88,197
Other	\$96,804	\$209,723	\$306,528
Incentives			
Lighting	\$568,632	\$887,775	\$1,456,407
HVAC	\$22,850	\$114,804	\$137,654
Refrigeration	\$700	\$27,047	\$27,747
Motor Systems	\$375,286	\$1,698,440	\$2,073,726
Compressed Air	\$53,665	\$47,926	\$101,591
Agricultural	\$46,215	\$17,180	\$63,395
Other	\$51,196	\$144,432	\$195,628
Commercial Retail Rate	\$0.0864	\$0.0888	N/A



Industrial Retail Rate	\$0.0637	\$0.0653	N/A
Irrigation Retail Rate	\$0.0919	\$0.0931	N/A

*Weighted average measure category lives are based on individual measure lifetimes and weighted by savings and the frequency of installations.

**Evaluated savings reflect impacts at the customer meter.

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

Lighting

Table C2, Table C3, and Table C4 show the lighting end-use category cost-effectiveness results for net evaluated savings. The lighting end-use category proved cost-effective from all perspectives except for the RIM (Table C2).

**Table C2. Wyoming Lighting 2014-2015 Net
(2014 Decrement East System 70% – Load Shape Commercial Lighting)
(2015 Decrement East Commercial Lighting 53% – Load Shape Commercial Lighting)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	\$0.067	\$4,831,776	\$5,543,127	\$711,351	1.15
TRC	\$0.067	\$4,831,776	\$5,039,206	\$207,430	1.04
UCT	\$0.036	\$2,631,633	\$5,039,206	\$2,407,573	1.91
RIM		\$9,099,241	\$5,039,206	(\$4,060,035)	0.55
PCT		\$5,144,451	\$10,640,414	\$5,495,963	2.07
Lifecycle Revenue Impacts (\$/kWh)					\$0.000037243
Discounted Participant Payback (years)					5.46

**Table C3. Wyoming Lighting 2014 Net
(2014 Decrement East System 70% – Load Shape Commercial Lighting)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	\$0.073	\$2,374,238	\$2,754,076	\$379,838	1.16
TRC	\$0.073	\$2,374,238	\$2,503,706	\$129,467	1.05
UCT	\$0.039	\$1,258,460	\$2,503,706	\$1,245,246	1.99
RIM		\$4,120,836	\$2,503,706	(\$1,617,130)	0.61
PCT		\$2,406,301	\$4,657,740	\$2,251,440	1.94
Lifecycle Revenue Impacts (\$/kWh)					\$0.000015685
Discounted Participant Payback (years)					5.18

Table C4. Wyoming Lighting 2015 Net
(2015 Decrement East Commercial Lighting 53% – Load Shape Commercial Lighting)

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	\$0.062	\$2,621,209	\$2,974,801	\$353,592	1.13
TRC	\$0.062	\$2,621,209	\$2,704,365	\$83,155	1.03
UCT	\$0.035	\$1,464,626	\$2,704,365	\$1,239,738	1.85
RIM		\$5,309,968	\$2,704,365	(\$2,605,603)	0.51
PCT		\$2,920,511	\$6,381,120	\$3,460,609	2.18
Lifecycle Revenue Impacts (\$/kWh)					\$0.000023901
Discounted Participant Payback (years)					4.20

HVAC

Table C5, Table C6, and Table C7 show the HVAC end-use category cost-effectiveness results for net evaluated savings. The HVAC end-use category proved cost-effective from all perspectives except for the RIM (Table C5).

Table C5. Wyoming HVAC 2014-2015 Net
(2014 Decrement East System 70% – Load Shape HVAC)
(2015 Decrement East Commercial Cooling 14% – Load Shape HVAC)

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	\$0.047	\$321,540	\$819,925	\$498,385	2.55
TRC	\$0.047	\$321,540	\$745,386	\$423,847	2.32
UCT	\$0.036	\$249,250	\$745,386	\$496,136	2.99
RIM		\$869,173	\$745,386	(\$123,787)	0.86
PCT		\$289,679	\$1,016,089	\$726,411	3.51
Lifecycle Revenue Impacts (\$/kWh)					\$0.000001136
Discounted Participant Payback (years)					3.01

Table C6. Wyoming HVAC 2014 Net
(2014 Decrement East System 70% – Load Shape HVAC)

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	\$0.047	\$82,485	\$153,574	\$71,089	1.86
TRC	\$0.047	\$82,485	\$139,613	\$57,127	1.69
UCT	\$0.037	\$64,514	\$139,613	\$75,099	2.16
RIM		\$219,760	\$139,613	(\$80,147)	0.64
PCT		\$58,316	\$244,629	\$186,313	4.19
Lifecycle Revenue Impacts (\$/kWh)					\$0.000000746
Discounted Participant Payback (years)					1.79



**Table C7. Wyoming HVAC 2015 Net
(2015 Decrement East Commercial Cooling 14% – Load Shape HVAC)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	\$0.047	\$254,975	\$710,730	\$455,755	2.79
TRC	\$0.047	\$254,975	\$646,118	\$391,143	2.53
UCT	\$0.036	\$197,040	\$646,118	\$449,078	3.28
RIM		\$692,664	\$646,118	(\$46,546)	0.93
PCT		\$246,771	\$822,840	\$576,068	3.33
Lifecycle Revenue Impacts (\$/kWh)					\$0.000000427
Discounted Participant Payback (years)					2.13

Refrigeration

Table C8, Table C9, and Table F10 show the refrigeration end-use category cost-effectiveness results for net evaluated savings. The refrigeration end-use category proved cost-effective from all perspectives except for the RIM (Table C8).

**Table C8. Wyoming Refrigeration 2014-2015 Net
(2014 Decrement East System 70% – Load Shape Refrigeration)
(2015 Decrement East Industrial 40% – Load Shape Refrigeration)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	\$0.039	\$66,222	\$121,334	\$55,112	1.83
TRC	\$0.039	\$66,222	\$110,304	\$44,082	1.67
UCT	\$0.027	\$45,679	\$110,304	\$64,625	2.41
RIM		\$201,024	\$110,304	(\$90,720)	0.55
PCT		\$66,573	\$247,980	\$181,406	3.72
Lifecycle Revenue Impacts (\$/kWh)					\$0.000008988
Discounted Participant Payback (years)					3.70

**Table C9. Wyoming Refrigeration 2014 Net
(2014 Decrement East System 70% – Load Shape Refrigeration)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	\$0.026	\$791	\$2,433	\$1,642	3.08
TRC	\$0.026	\$791	\$2,212	\$1,421	2.80
UCT	\$0.043	\$1,331	\$2,212	\$881	1.66
RIM		\$4,021	\$2,212	(\$1,809)	0.55
PCT		\$228	\$4,542	\$4,314	19.92
Lifecycle Revenue Impacts (\$/kWh)					\$0.000000019
Discounted Participant Payback (years)					0.21

**Table F10. Wyoming Refrigeration 2015 Net
(2015 Decrement East Industrial 40% – Load Shape Refrigeration)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	\$0.039	\$69,789	\$126,820	\$57,031	1.82
TRC	\$0.039	\$69,789	\$115,291	\$45,502	1.65
UCT	\$0.027	\$47,302	\$115,291	\$67,989	2.44
RIM		\$210,124	\$115,291	(\$94,833)	0.55
PCT		\$70,764	\$259,650	\$188,886	3.67
Lifecycle Revenue Impacts (\$/kWh)					\$0.000000870
Discounted Participant Payback (years)					2.14

Motor Systems

Table C11, Table C12, and Table C13 show the motor systems end-use category cost-effectiveness results for net evaluated savings. The motor systems end-use category proved cost-effective from all perspectives except for the RIM (Table C11).

**Table C11. Wyoming Motor Systems 2014-2015 Net
(2014 Decrement East System 70% – Industrial Machinery General)
(2015 Decrement East Industrial 40% – Industrial Machinery General)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	\$0.032	\$4,287,338	\$9,618,216	\$5,330,877	2.24
TRC	\$0.032	\$4,287,338	\$8,743,832	\$4,456,494	2.04
UCT	\$0.029	\$3,946,643	\$8,743,832	\$4,797,190	2.22
RIM		\$13,160,819	\$8,743,832	(\$4,416,986)	0.66
PCT		\$3,297,670	\$15,130,781	\$11,833,112	4.59
Lifecycle Revenue Impacts (\$/kWh)					\$0.000040517
Discounted Participant Payback (years)					2.02

**Table C12. Wyoming Motor Systems 2014 Net
(2014 Decrement East System 70% – Industrial Machinery General)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	\$0.037	\$1,228,597	\$2,644,997	\$1,416,400	2.15
TRC	\$0.037	\$1,228,597	\$2,404,543	\$1,175,946	1.96
UCT	\$0.031	\$1,038,201	\$2,404,543	\$1,366,342	2.32
RIM		\$3,261,635	\$2,404,543	(\$857,092)	0.74
PCT		\$808,117	\$3,551,620	\$2,743,503	4.39
Lifecycle Revenue Impacts (\$/kWh)					\$0.000007975
Discounted Participant Payback (years)					1.22



**Table C13. Wyoming Motor Systems 2015 Net
(2015 Decrement East Industrial 40% – Industrial Machinery General)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	\$0.030	\$3,262,453	\$7,437,635	\$4,175,181	2.28
TRC	\$0.030	\$3,262,453	\$6,761,486	\$3,499,033	2.07
UCT	\$0.029	\$3,102,143	\$6,761,486	\$3,659,343	2.18
RIM		\$10,558,469	\$6,761,486	(\$3,796,983)	0.64
PCT		\$2,655,357	\$12,350,334	\$9,694,977	4.65
Lifecycle Revenue Impacts (\$/kWh)					\$0.000034830
Discounted Participant Payback (years)					0.99

Compressed Air

Table C14, Table C15, and Table C16 show the compressed air end-use category cost-effectiveness results for net evaluated savings. The compressed air end-use category proved cost-effective from all perspectives (Table C14).

**Table C14. Wyoming Compressed Air 2014-2015 Net
(2014 Decrement East System 70% – Load Shape Industrial Machinery General)
(2015 Decrement East Industrial 40% – Load Shape Industrial Machinery General)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	\$0.040	\$206,628	\$387,258	\$180,630	1.87
TRC	\$0.040	\$206,628	\$352,053	\$145,424	1.70
UCT	\$0.036	\$187,033	\$352,053	\$165,020	1.88
RIM		\$538,231	\$352,053	(\$186,178)	0.65
PCT		\$168,849	\$600,310	\$431,461	3.56
Lifecycle Revenue Impacts (\$/kWh)					\$0.000001708
Discounted Participant Payback (years)					2.15

**Table C15. Wyoming Compressed Air 2014 Net
(2014 Decrement East System 70% – Load Shape Industrial Machinery General)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	\$0.043	\$121,367	\$227,322	\$105,955	1.87
TRC	\$0.043	\$121,367	\$206,657	\$85,289	1.70
UCT	\$0.039	\$111,871	\$206,657	\$94,786	1.85
RIM		\$302,962	\$206,657	(\$96,305)	0.68
PCT		\$90,231	\$326,653	\$236,422	3.62
Lifecycle Revenue Impacts (\$/kWh)					\$0.000000896
Discounted Participant Payback (years)					1.49

**Table C16. Wyoming Compressed Air 2015 Net
(2015 Decrement East Industrial 40% – Load Shape Industrial Machinery General)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	\$0.037	\$90,940	\$170,588	\$79,648	1.88
TRC	\$0.037	\$90,940	\$155,080	\$64,140	1.71
UCT	\$0.032	\$80,168	\$155,080	\$74,911	1.93
RIM		\$250,938	\$155,080	(\$95,858)	0.62
PCT		\$83,854	\$291,883	\$208,029	3.48
Lifecycle Revenue Impacts (\$/kWh)					\$0.000000879
Discounted Participant Payback (years)					1.67

Agricultural

Table C17, Table 18, and Table C19 show the agriculture end-use category cost-effectiveness results for net evaluated savings. The agricultural end-use category proved cost-effective from all perspectives except for the RIM (Table C17).

**Table C17. Wyoming Agricultural 2014-2015 Net
(2014 Decrement East System 70% – Load Shape Irrigation)
(2015 Decrement East Industrial 40% – Load Shape Irrigation)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	\$0.050	\$131,115	\$203,522	\$72,407	1.55
TRC	\$0.050	\$131,115	\$185,020	\$53,905	1.41
UCT	\$0.033	\$86,209	\$185,020	\$98,811	2.15
RIM		\$253,003	\$185,020	(\$67,983)	0.73
PCT		\$153,183	\$300,599	\$147,416	1.96
Lifecycle Revenue Impacts (\$/kWh)					\$0.000000650
Discounted Participant Payback (years)					4.00

**Table 18. Wyoming Agricultural 2014 Net
(2014 Decrement East System 70% – Load Shape Irrigation)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	\$0.042	\$48,863	\$104,457	\$55,593	2.14
TRC	\$0.042	\$48,863	\$94,961	\$46,097	1.94
UCT	\$0.049	\$56,363	\$94,961	\$38,598	1.68
RIM		\$132,003	\$94,961	(\$37,043)	0.72
PCT		\$55,308	\$154,273	\$98,965	2.79
Lifecycle Revenue Impacts (\$/kWh)					\$0.000000345
Discounted Participant Payback (years)					0.99



**Table C19. Wyoming Agricultural 2015 Net
(2015 Decrement East Industrial 40% – Load Shape Irrigation)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	\$0.057	\$87,730	\$105,663	\$17,933	1.20
TRC	\$0.057	\$87,730	\$96,057	\$8,327	1.09
UCT	\$0.021	\$31,834	\$96,057	\$64,223	3.02
RIM		\$129,058	\$96,057	(\$33,001)	0.74
PCT		\$104,394	\$156,071	\$51,677	1.50
Lifecycle Revenue Impacts (\$/kWh)	\$0.000000500				
Discounted Participant Payback (years)	4.15				

Other

Table C20, Table C21, and Table C22 show the other end-use category cost-effectiveness results for net evaluated savings. The other end-use category proved cost-effective from all perspectives except for the RIM (Table C20).

**Table C20. Wyoming Other 2014-2015 Net
(2014 Decrement East System 70% – Load Shape Commercial Plug Load)
(2015 Decrement East Commercial Cooling 14% – Load Shape HVAC)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	\$0.053	\$349,346	\$757,598	\$408,251	2.17
TRC	\$0.053	\$349,346	\$688,725	\$339,379	1.97
UCT	\$0.044	\$293,432	\$688,725	\$395,293	2.35
RIM		\$893,061	\$688,725	(\$204,336)	0.77
PCT		\$346,462	\$1,043,223	\$696,760	3.01
Lifecycle Revenue Impacts (\$/kWh)	\$0.000001641				
Discounted Participant Payback (years)	3.08				

**Table C21. Wyoming Other 2014 Net
(2014 Decrement East System 70% – Load Shape Commercial Plug Load)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	\$0.051	\$107,223	\$173,456	\$66,234	1.62
TRC	\$0.051	\$107,223	\$157,688	\$50,465	1.47
UCT	\$0.046	\$96,804	\$157,688	\$60,883	1.63
RIM		\$285,077	\$157,688	(\$127,390)	0.55
PCT		\$88,021	\$320,158	\$232,137	3.64
Lifecycle Revenue Impacts (\$/kWh)	\$0.000001010				
Discounted Participant Payback (years)	1.54				

**Table C22. Wyoming Other 2015 Net
(2015 Decrement East Commercial Cooling 14% – Load Shape HVAC)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	\$0.054	\$258,249	\$623,045	\$364,796	2.41
TRC	\$0.054	\$258,249	\$566,405	\$308,156	2.19
UCT	\$0.044	\$209,723	\$566,405	\$356,681	2.70
RIM		\$648,476	\$566,405	(\$82,071)	0.87
PCT		\$275,654	\$771,221	\$495,568	2.80
Lifecycle Revenue Impacts (\$/kWh)					\$0.000000659
Discounted Participant Payback (years)					2.44