



## 2021 Idaho Wattsmart Business Program Evaluation

**FINAL REPORT**

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**Prepared for:**

**Rocky Mountain Power**

1407 West North Temple Street

Salt Lake City, Utah 84116



**Prepared by:**

**Cadmus**

Ryan Hughes

Evan Talan

Camila Teagle-Alarcon

Andrew Carollo

Matt Wisnefske

Allie Marshall

Steve Cofer

**VuPoint Research**

## Table of Contents

<b>Introduction</b> .....	<b>1</b>
Objectives .....	2
Methods .....	2
<b>Evaluation Detailed Findings</b> .....	<b>4</b>
Impact Evaluation.....	4
Process Evaluation Findings .....	9
Cost-Effectiveness Results.....	20
<b>Conclusions and Recommendations</b> .....	<b>22</b>
<b>Appendix A. Gross Engineering Analysis Methodology</b> .....	<b>A-1</b>
<b>Appendix B. Net-to-Gross Analysis Methodology</b> .....	<b>B-1</b>
<b>Appendix C. Cost-Effectiveness Methodology and Measure Strata Results</b> .....	<b>C-1</b>

## Tables

Table 1. Evaluation Objectives and Activities .....	2
Table 2. Impact Steps to Determine Evaluated Gross and Net Savings.....	2
Table 3. 2021 Idaho Wattsmart Business Program Impact Sampling Summary .....	4
Table 4. 2021 Idaho Wattsmart Business Program Savings.....	5
Table 5. 2021 Idaho Wattsmart Business Program Measure Mapping .....	5
Table 6. 2021 Idaho Wattsmart Business Program Net-to-Gross Results .....	9
Table 7. 2021 Idaho Wattsmart Business Program Process Activity Sampling.....	10
Table 8. 2021 Participant Survey Completes by Measure Category and Incentive Type .....	10
Table 9. 2021 Evaluated Net Wattsmart Business Program Cost-Effectiveness Summary .....	21
Table A-1. Impact Steps to Determine Evaluated Gross and Net Savings .....	A-1
Table B-1. Idaho Wattsmart Business Program Freeridership Calculation Approach .....	B-3
Table B-2. Idaho Wattsmart Business Program Participant Spillover Calculation Approach .....	B-5
Table B-3. Idaho Wattsmart Business Program Nonparticipant Spillover Analysis Method .....	B-6
Table C-1. Idaho Wattsmart Business Program Benefits and Costs Included in Various Cost-Effectiveness Tests .....	C-2
Table C-2. Idaho Wattsmart Business Program Selected Cost-Effectiveness Analysis Inputs.....	C-2
Table C-3. Idaho Wattsmart Business Program Measure Stratum Cost-Effectiveness Inputs .....	C-3

Table C-4. 2021 Idaho Wattsmart Business Program Energy Management Cost-Effectiveness ..... C-4

Table C-5. 2021 Idaho Wattsmart Business Program Irrigation Cost-Effectiveness ..... C-4

Table C-6. 2021 Idaho Wattsmart Business Program Lighting Cost-Effectiveness ..... C-4

Table C-7. 2021 Idaho Wattsmart Business Program Midstream Lighting Cost-Effectiveness ..... C-5

Table C-8. 2021 Idaho Wattsmart Business Program Motors Cost-Effectiveness ..... C-5

Table C-9. 2021 Idaho Wattsmart Business Program Other Measures Cost-Effectiveness ..... C-5

Figures

Figure 1. Process Evaluation Research Areas and Questions ..... 3

Figure 2. Awareness Sources ..... 11

Figure 3. Who Completed the Application ..... 12

Figure 4. Most Important Reason for Participation ..... 12

Figure 5. Satisfaction with Program Components ..... 13

Figure 6. Project Benefits ..... 14

Figure 7. Awareness Source ..... 18

Figure 8. Most Motivating Reasons to Make Energy-Efficient Upgrades ..... 19

Figure 9. Most Motivating Reasons to Make More Energy-Efficient Purchases or Upgrades ..... 20

Figure B-1. Idaho Wattsmart Business Program Freeridership Calculation Approach ..... B-4

## Introduction

This 2021 report presents the Idaho Wattsmart Business program evaluation findings and a discussion of the Cadmus team's conclusions and recommendations. This evaluation report is intended to be viewed in conjunction with the Idaho Wattsmart Business Evaluation Dashboard,<sup>1</sup> which provides further information on project-level results, trends, and historical performance.

Through its Wattsmart Business program, Rocky Mountain Power (RMP) offers services and incentives to help commercial, industrial, and agricultural customers maximize the energy efficiency of their equipment and operations. These offerings are delivered through downstream, midstream, and direct install incentive mechanisms.

The 2021 program had reported gross electricity savings of 11,863,445 kWh. RMP uses an outsourced delivery model for all demand-side management (DSM) services, in which it contracted with two program administrators—Cascade Energy and Resource Innovations—to implement all 2021 program offerings.

RMP contracted with the Cadmus team (comprising Cadmus and VuPoint Research) to conduct impact and process evaluations of the 2021 Idaho Wattsmart Business program. This report includes details of our 2021 program effectiveness and evaluation findings.

The Cadmus team evaluated several offerings:

- **Typical Upgrades and Custom Analysis:** RMP offers customers prescriptive incentives (typical upgrades) for agricultural equipment, compressed air, HVAC, lighting, motors, building shell measures, food service equipment, and irrigation measures. It also offers custom incentives (custom analysis) for verified first-year energy savings resulting from the installation of qualifying capital equipment upgrades not covered by Typical Upgrades and Custom Analysis incentives or other Wattsmart Business program delivery offerings.
- **Midstream Lighting Instant Incentive.** Through this offering, RMP targets the lighting maintenance market by offering customers instant point-of-purchase incentives on qualified LEDs, occupancy sensors, and retrofit kits purchased through a participating lighting distributor. Customers who purchase through a nonparticipating distributor do not receive an instant discount, but can apply to RMP for incentives after the purchase.
- **Energy Management:** RMP provides expertise and custom incentives for verified savings that are achieved through improved operations and maintenance and management practices. Capital improvements, if eligible, are incentivized through the other Wattsmart Business program offerings. In addition, through this offering, RMP offers year-long strategic energy management training to a cohort of water and wastewater customers.

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<sup>1</sup> The Idaho Wattsmart Business Evaluation Dashboard is available on the website: <https://www.pacificorp.com/environment/demand-side-management.html>

## Objectives

Table 1 lists the study objectives and evaluation activities.

**Table 1. Evaluation Objectives and Activities**

Rocky Mountain Power Evaluation Objectives	Participant Survey	Partial Participant Survey	Trade Ally Interviews	Desk Review	Phone Verification	Net-to-Gross Analysis	Cost-Effectiveness Analysis	Reporting
Document and measure program effects	✓	✓	✓	✓	✓	✓		
Verify installation and savings	✓			✓	✓	✓		
Evaluate the program’s process and the effectiveness of delivery and efficiency	✓	✓	✓					
Understand the motivations of participants, nonparticipants, and trade allies	✓	✓	✓					
Provide data support for program cost-effectiveness assessments	✓			✓	✓	✓	✓	
Identify areas for potential improvements	✓	✓	✓	✓	✓	✓	✓	✓
Document compliance with regulatory requirements								✓

## Methods

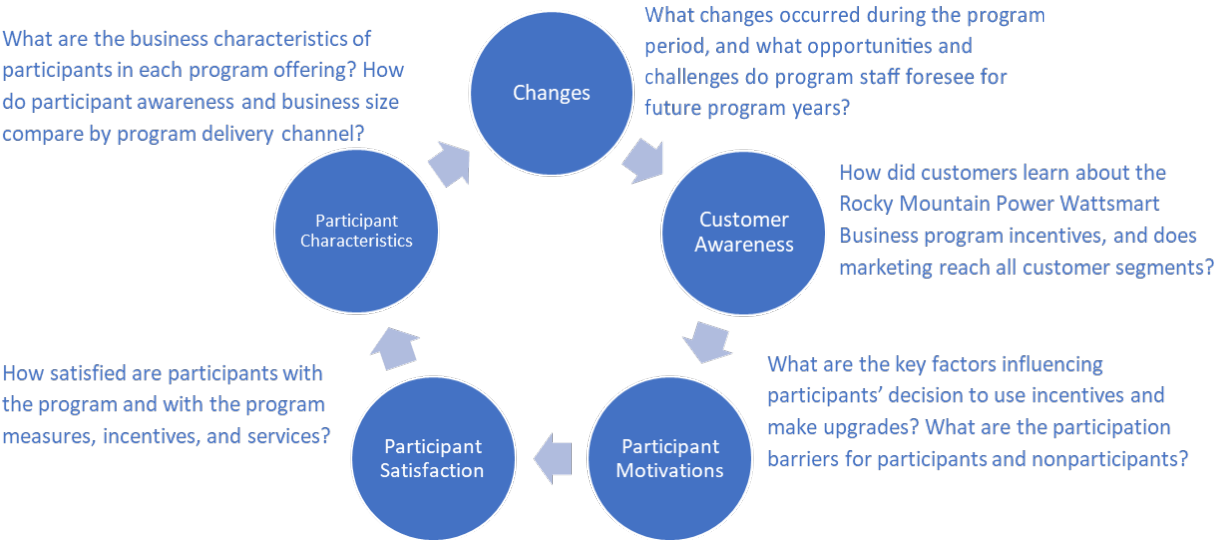
To evaluate energy impacts, the Cadmus team used desk reviews and surveys to inform the engineering analyses, net-to-gross (NTG) analysis, and program cost-effectiveness analysis (as shown in Table 2).

**Table 2. 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 savings based on actual installation rates
	3	Unit Energy Savings: Validate savings calculations (through engineering review, analysis, and meter data)
	4	Realization Rates: Extrapolate realization rates to the population, if applicable
Evaluated Net Savings	5	Attribution: Apply NTG adjustments

Figure 1 shows the research areas and questions addressed through the process evaluation. The Cadmus team relied on an online participant survey, telephone partial participant survey, and nonparticipant and trade ally interviews to assess program delivery and efficacy, bottlenecks, barriers, and opportunities for improvements.

Figure 1. Process Evaluation Research Areas and Questions



## Evaluation Detailed Findings

This chapter provides detailed findings from the Cadmus team’s impact and process evaluations of the Idaho Wattsmart Business program.

### Impact Evaluation

To determine gross savings, the Cadmus team conducted verification and engineering analyses on a sample of 2021 projects (see *Appendix A. Gross Engineering Analysis Methodology* for information on the impact evaluation methodology). To calculate net savings, the Cadmus team conducted a survey of participants to inform freeridership and spillover and a survey of nonparticipants to inform nonparticipant spillover. Additional detail on project-level results across several years can be found in the Evaluation Dashboard.

### Impact Analysis Sampling

Table 3 shows total projects, projects sampled, the sample distribution, associated energy savings, and the sample’s percentage of savings for the 2021 program year. Out of 258 projects, the Cadmus team evaluated 36 projects that represented 39% of the 2021 program savings.

**Table 3. 2021 Idaho Wattsmart Business Program Impact Sampling Summary**

Strata	Projects	Total Reported Savings (kWh)	Unique Sampled Projects		Sample Reported Savings (kWh)	Percentage of Reported Savings Sampled
			Random	Selected		
Energy Management	4	250,345	3	1	250,345	100%
Irrigation	108	3,958,599	6	0	467,183	11.8%
Lighting	76	3,442,459	8	0	786,121	22.8%
Midstream Lighting	50	729,754	8	0	101,755	13.9%
Motors	5	2,671,538	3	1	2,659,958	99.6%
Other	15	810,750	5	1	313,575	38.7%
<b>Total</b>	<b>258</b>	<b>11,863,445</b>	<b>33</b>	<b>3</b>	<b>4,578,937</b>	<b>38.6%</b>

Note: Totals in tables may not sum due to rounding.

Table 4 lists the evaluation findings, including number of projects, gross savings, precision, and net savings. Overall, the Wattsmart Business program achieved a 100.6% gross realization rate for the year, though some variability occurred between measure categories. The impact evaluation achieved ±11.5% precision with 90% confidence overall. The Cadmus team calculated a NTG of 95.3%, yielding evaluated net savings of 11,372,282 kWh. The *Measure Strata Findings* section describes specific details and findings per measure strata.



**Table 4. 2021 Idaho Wattsmart Business Program Savings**

Strata	Projects	Reported Savings (kWh)	Evaluated Gross Savings (kWh)	Gross Realization Rate	Precision <sup>a</sup>	NTG	Evaluated Net Savings (kWh) <sup>b</sup>
Energy Management	4	250,345	217,530	86.9%	0.0%	95% <sup>b</sup>	207,378
Irrigation	108	3,958,599	3,921,158	99.1%	1.2%	98%	3,842,735
Lighting	76	3,442,459	3,662,170	106.4%	31.3%	95%	3,588,927
Midstream Lighting	50	729,754	723,370	99.1%	5.5%	89%	643,800
Motors	5	2,671,538	2,671,509	100.0%	0.0%	95% <sup>b</sup>	2,546,833
Other	15	810,750	733,257	90.4%	14.9%	74%	542,610
<b>Total</b>	<b>258</b>	<b>11,863,445</b>	<b>11,928,994</b>	<b>100.6%</b>	<b>11.5%</b>	<b>95.3%</b>	<b>11,372,282</b>

Note: Totals in tables may not sum due to rounding.

<sup>a</sup> The measure category precision is based on 80% confidence, while the portfolio precision is based on 90% confidence.

<sup>b</sup> The Cadmus team applied the overall savings-weighted NTG for measure strata that had participants responding to the survey, as there was an insufficient number of survey respondents to inform NTG for this specific measure strata estimate. The overall NTG estimate is the savings-weighted average of measure strata that had participants responding to the survey.

### Measure Strata Findings

The following sections provide a high-level summary of the findings for each measure strata. The Evaluation Dashboard provides additional detailed information on each sampled project. PacifiCorp defines a measure as a specific measure type within a measure category. For example, one lighting project may have three different lighting measures, such as high-bay lighting, linear LEDs, and wall sconces. Within each of these three measure types, there are several unit counts. The Cadmus team mapped the measure categories within RMP’s measure database to seven strata. Table 5 describes the measure mapping strategy.

**Table 5. 2021 Idaho Wattsmart Business Program Measure Mapping**

Measure Category	Program Name	Evaluation Strata	Projects
Energy Management	Wattsmart Business - Idaho	Energy Management	4
Irrigation		Irrigation	11
Agriculture		Lighting	179
Lighting		Lighting	240
Lighting	Midstream Lighting - Idaho	Midstream Lighting	87
Motors	Wattsmart Business - Idaho	Motors	8
Building Shell	Wattsmart Business - Idaho	Other	6
Compressed Air			1
Energy Project Manager Co-Fund			1
HVAC			15
Refrigeration			3
<b>Total</b>			<b>555</b>

### Energy Management

During 2021, RMP provided incentives for four energy management projects and reported 250,345 kWh in energy savings, which accounted for 2.1% of all reported energy savings. The Cadmus team evaluated all projects in the population and determined a gross realization rate of 86.9% for the energy

management stratum. Two energy management projects involved retro-commissioning, one project involved compressed air leak repair, and one involved a fume hood exhaust upgrade.

Of the two sampled projects that involved retro-commissioning, the Cadmus team found no discrepancies with one project. The other project involved control speed optimization of a variable frequency drive (VFD) serving an air-handling unit supply fan. The reported calculations assumed that the supply fan speed during the shoulder season was representative of annual operation. The Cadmus team updated the load profile to match the supply fan load profile from the *Uniform Methods Project* for VFDs. These changes resulted in lower evaluated savings (111,811 kWh) than reported saving (142,209 kWh) and a project-level realization rate of 79%.

The Cadmus team found minimal discrepancies with the leak repair and fume hood exhaust optimization projects.

## *Irrigation*

During 2021, RMP provided incentives for 108 irrigation projects and reported 3,958,599 kWh in energy savings, which accounted for 33.4% of all reported energy savings. The Cadmus team evaluated six sampled projects and extrapolated results to the population, determining a realization rate of 99.1% for the irrigation stratum.

The sampled projects involved VFDs serving irrigation pumps, custom irrigation systems, irrigation hardware, and irrigation pump upgrades. For five of the six projects, the Cadmus team found no discrepancies. These projects were well-documented and followed best practices for calculating and reporting savings. For one project involving an irrigation pump upgrade, the Cadmus team calculated 3% lower savings. Although the reported savings results were provided, the calculations used to derive the savings were unavailable for review. Therefore, the Cadmus team calculated savings based on best practices for irrigation pumps, which appear to differ from what was used by the implementer, resulting in a 97% realization rate for the project.

## *Lighting*

During 2021, RMP provided incentives for 76 lighting projects and reported 3,442,459 kWh in energy savings, which accounted for 29.0% of all reported program energy savings. The Cadmus team evaluated eight sampled projects and extrapolated results to the population, determining a realization rate of 106% for the lighting stratum.

RMP uses a prescriptive lighting calculator tool for lighting projects. For most projects, Cadmus found that the supporting documentation matched the lighting tool inputs. RMP's implementer collects hours of use, existing lighting equipment, and building type directly from customers. The Cadmus team calculated savings for projects based on the methodology outlined in the Regional Technical Forum's *Non-Residential Lighting Retrofits* standard protocol. The Cadmus team's evaluated savings did not match RMP's reported savings for seven of eight projects. However, because lighting calculations were not accessible within the calculation workbooks, the Cadmus team was unable to determine the precise source of discrepancy between reported and evaluated savings.

## *Midstream Lighting*

During 2021, RMP provided incentives for 50 Midstream Lighting Instant Incentive projects and reported 729,754 kWh in energy savings, which accounted for 6.2% of all reported program energy savings.

The Cadmus team evaluated eight sampled projects and extrapolated results to the population, determining a realization rate of 99.1% for the midstream stratum. Realization rates for the eight sampled projects ranged from 67% to 152%. For each of the sampled midstream projects, we calculated savings based on the savings methodology outlined in the Regional Technical Forum's *Non-Residential Lighting Midstream* measure, selected the baseline fixture wattage using the lumen equivalence method, and determined the hours of use based on the facility type from the application and the hours of use by facility type from the Regional Technical Forum's *Non-Residential Lighting Retrofits* standard protocol. RMP based reported energy-savings calculations on the average hours of use across the entire Midstream Lighting Instant Incentives offering. The differences between reported and evaluated hours of use were the primary reason for discrepancies in realization rates.

## *Motors*

During 2021, RMP provided incentives for five motors projects and reported 2,671,538 kWh in energy savings, which accounted for 22.5% of all reported energy savings. The Cadmus team evaluated four sampled projects and extrapolated results to the population, for a realization rate of 100.0% for the motors stratum.

All sampled projects reported savings based on custom calculations and used trend data to determine load profiles and hours of operation. The projects were well-documented with baseline and post-implementation performance determined through the use of trend data. We found no discrepancies among the four sampled projects.

## *Other*

During 2021, RMP provided incentives for 15 projects in the "other" category and reported 810,750 kWh in energy savings, which accounted for 6.8% of all reported energy savings. The Cadmus team evaluated six sampled projects and extrapolated results to the population, determining a realization rate of 90.4% for the "other" stratum. This stratum consists of the most varied measure types, with sampled projects including cool roofs, VFDs, air compressors, variable-refrigerant flow systems, and air handling system upgrades.

RMP used deemed savings values for five of the six sampled projects. The actual savings achieved by these sampled projects were higher than reported for one project and lower than reported for four projects. For two projects involving cool roofs, the Cadmus team calculated savings based on the Oak Ridge National Laboratory's Cool Roof Calculator<sup>2</sup> and found lower savings than reported by RMP. RMP used deemed savings for cool roof projects.

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<sup>2</sup> U.S. Department of Energy. n.d. "Cool Roof Calculator." <https://web.ornl.gov/sci/buildings/tools/cool-roof/>

Two of evaluated projects involved VFDs serving HVAC pumps and fans. The Cadmus team evaluated these projects using the VFD measure from the *Idaho Power Technical Reference Manual v2.2*,<sup>3</sup> resulting in an 88% realization rate for one project and 108% realization rate for the other project. The Cadmus team found no discrepancies for a sampled project involving an upgraded VFD air compressor. The performance specifications matched the compressor specifications and the calculation methodology followed best practices.

## Net-to-Gross

NTG estimates are a critical part of DSM 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. The Cadmus team evaluated net savings by conducting a freeridership and spillover analysis using self-reported responses from participating and nonparticipating business customers. The evaluation included three NTG components:

- **Freeridership** refers to energy savings that would have occurred in absence of the program and results in a reduction to program savings.
- **Participant Spillover** refers to additional energy savings obtained by customers who invested in additional energy-efficient projects due to their program participation, for which they did not receive rebates or incentives. These savings are added to program savings.
- **Nonparticipant Spillover** refers to energy savings generated by customers who were motivated by information about energy efficiency provided by RMP, or by past RMP program participation, to invest in energy efficiency projects for which they did not receive an incentive. These savings are added to program savings.

We used self-report surveys from a combined analysis sample of 2020 and 2021 participants to estimate freeridership and participant spillover by measure strata for the 2021 program.<sup>4</sup> The Cadmus team determined the percentage of nonparticipant spillover for the 2021 program based on responses to questions in the 2020 and 2021 general population survey of RMP businesses customers. See *Appendix B. Net-to-Gross Analysis Methodology* for more information on the NTG calculation methodology.

The Cadmus team used the following formula to determine the final NTG for each measure strata:

$$\text{Net-to-gross} = 100\% - \text{Freeridership Percentage} + \text{Participant Spillover Percentage} + \text{Nonparticipant Spillover Percentage}$$

Table 6 summarizes the NTG evaluation results, shown as NTG and evaluated gross savings by program measure strata. The program achieved a 95.3% NTG overall.

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<sup>3</sup> ADM Associates. October 15, 2018. *Technical Reference Manual 2.2*. Prepared for Idaho Power Company. <https://docs.idahopower.com/pdfs/EnergyEfficiency/Reports/2018TRM.pdf><https://docs.idahopower.com/pdfs/EnergyEfficiency/Reports/2018TRM.pdf>

<sup>4</sup> The Cadmus team combined the 2020 and 2021 respondents into one analysis sample due to low number of participants and low number of survey responses.

**Table 6. 2021 Idaho Wattsmart Business Program Net-to-Gross Results**

Strata	Measure Responses (n)			Freeridership	Participant Spillover	Nonparticipant Spillover	NTG	Evaluated Net Program Population Savings (kWh)
	2020	2021	2020/2021 Combined					
Energy Management	N/A	N/A	N/A	N/A	N/A	N/A	95% <sup>c</sup>	207,378
Irrigation	16	1	17	11% <sup>a</sup>	3%	6%	98%	3,842,735
Lighting	7	2	9	9% <sup>a</sup>	1%	6%	98%	3,588,927
Midstream Lighting	3	5	8	22% <sup>a</sup>	5%	6%	89%	643,800
Motors	N/A	N/A	N/A	N/A	N/A	N/A	95% <sup>c</sup>	2,546,833
Other	5	1	6	32% <sup>a</sup>	0%	6%	74%	542,610
<b>Total</b>	<b>31</b>	<b>9</b>	<b>40</b>	<b>12.8%<sup>b</sup></b>	<b>2.1%<sup>b</sup></b>	<b>6.0%</b>	<b>95.3%</b>	<b>11,372,282</b>

<sup>a</sup> This is weighted by evaluated gross program savings.

<sup>b</sup> This is weighted by evaluated gross program population savings.

<sup>c</sup> The Cadmus team applied the overall savings-weighted NTG for measure strata that had participants responding to the survey, as there was an insufficient number of survey respondents to inform NTG for this specific measure strata estimate. The overall NTG estimate is the savings-weighted average of measure strata that had participants responding to the surveys.

## Process Evaluation Findings

The Cadmus team used primary data collected from several groups involved in the Wattsmart Business program to capture insights about how the program is meeting its objectives and serving RMP customers, and where there may be opportunities to strengthen or expand the program.

## Process Sampling

The Cadmus team surveyed participants and partial participants and interviewed trade allies and nonparticipants for the 2021 evaluation, as shown in Table 7. Among the participant groups surveyed, the response rates were 19% for Typical Upgrades and Custom Analysis, 33% for Midstream Lighting Instant Incentives, and 20% for trade allies. From the sampling frame, the Cadmus team used a census approach when conducting the surveys, with the exception of trade ally interviews (for which we had a target of four completed interviews). Note that the number of responses may vary because not all respondents were asked each question due to survey branching and not all survey respondents provided responses to all questions.

**Table 7. 2021 Idaho Wattsmart Business Program Process Activity Sampling**

Program Name/Measure Category	Sampling Frame <sup>a</sup>	Achieved Completes
Agriculture	44	10
Compressed Air	1	1
Custom	2	0
Energy Management Retro-Commissioning	1	0
HVAC	4	1
Irrigation	1	0
Lighting	35	5
Other <sup>b</sup>	5	1
<b>Total Wattsmart Business Program</b>	<b>93</b>	<b>18</b>
<b>Midstream Lighting Instant Incentives</b>	<b>15</b>	<b>5</b>
<b>Trade Allies</b>	<b>12</b>	<b>4</b>
<b>Participant Subtotal</b>	<b>120</b>	<b>27 <sup>c</sup></b>
<b>Partial Participants <sup>d</sup></b>	<b>11</b>	<b>2</b>
<b>Nonparticipants</b>	<b>6,352</b>	<b>193</b>

### Participant Experience

Participants in the Wattsmart Business program answered survey questions about their entry into the program, how they navigated the process to identify projects and submit their applications, and their satisfaction with various aspects of the program. Program participants in 2021 included Typical Upgrades and Custom Analysis participants (n=93), Midstream Lighting Instant Incentive participants (n=15), and trade allies (n=12).

#### *Typical Upgrades and Custom Analysis*

The Cadmus team completed surveys with 18 Typical Upgrades and Custom Analysis participants from five measure categories. This included respondents who completed typical upgrades that were readily available through the program as well as respondents who completed custom incentives and worked with a certified vendor to address their needs. Table 8 shows the breakdown of respondents by measure category and incentive type.

**Table 8. 2021 Participant Survey Completes by Measure Category and Incentive Type**

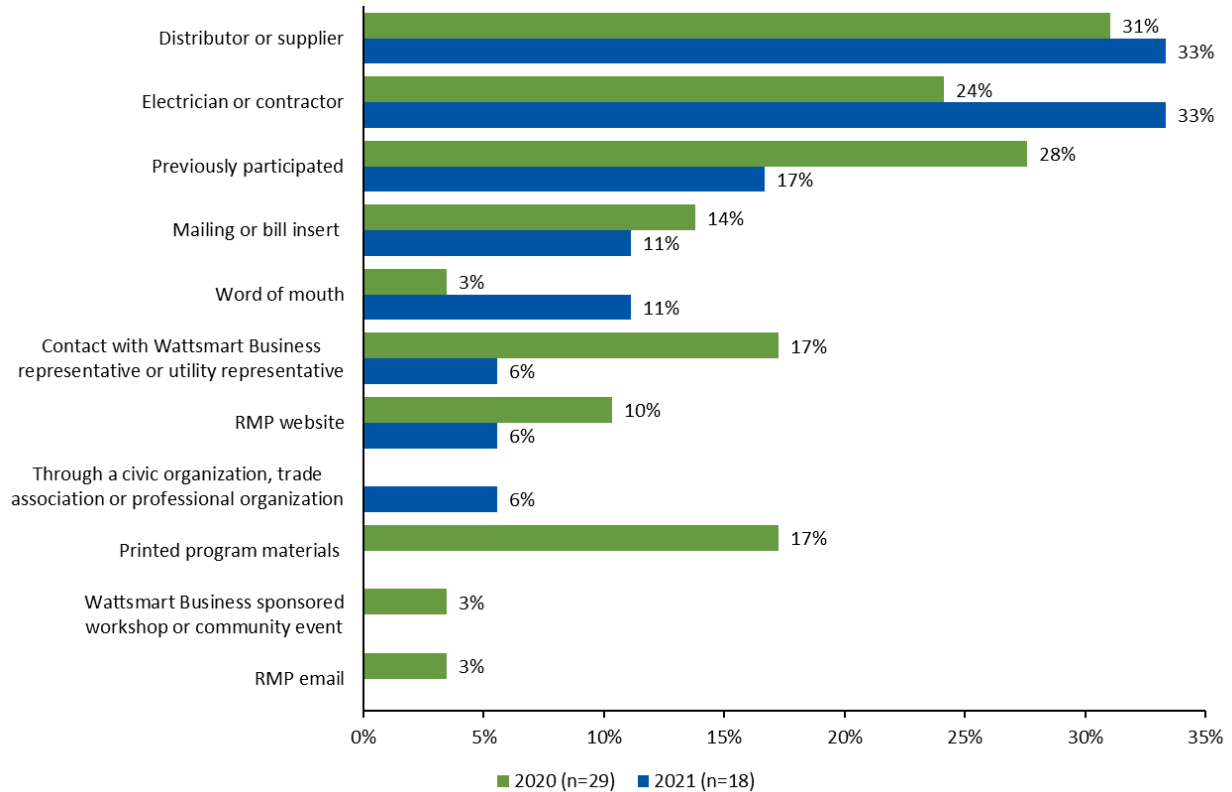
Measure Category	Typical Upgrades	Custom Analysis	Total
Agriculture	0	10	10
Lighting	0	5	5
Compressed Air	1	0	1
HVAC	0	1	1
Other	0	1	1
<b>Total</b>	<b>1</b>	<b>17</b>	<b>18</b>

### Participant Experience

Respondents (n=18) reported that they most often learned about the incentives available for their project through the distributor or supplier where they buy their equipment (33%), through their

electrician or contractor (33%), or through previous participation (17%). This is similar to the 2020 respondents, who most often learned about the incentives available for their project through the distributor or supplier (31%, n=29). Figure 2 shows the full results from 2020 and 2021 respondents.

**Figure 2. Awareness Sources**

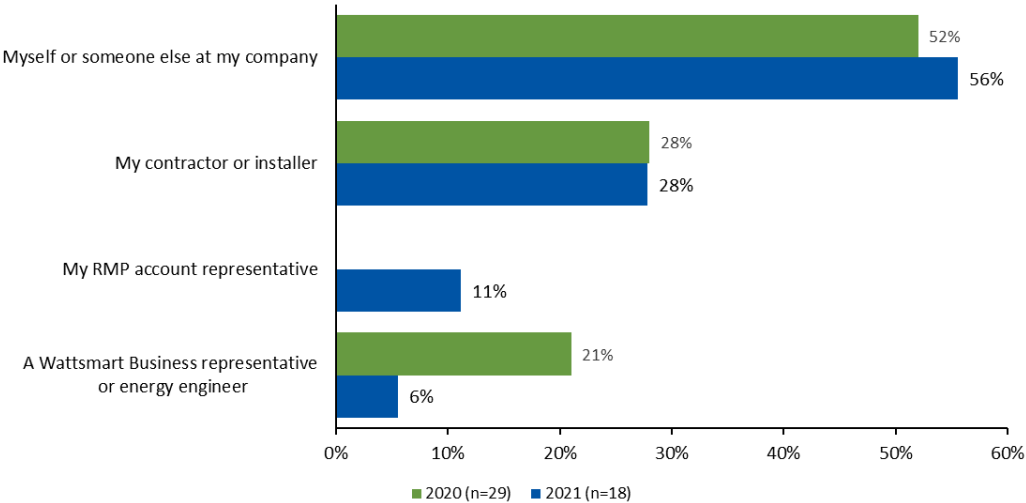


Source: RMP 2020 and 2021 Wattsmart Business Program Participant Survey QA4.  
Don't know and refused responses removed.

Respondents reported that, on average, the incentive they received covered 16% of their project cost (n=18). This is somewhat lower than the 2020 reported average of 24% of project costs covered by incentives (n=29).

Additionally, as shown in Figure 3, respondents most often reported that they or someone else at their company filled out the program application.

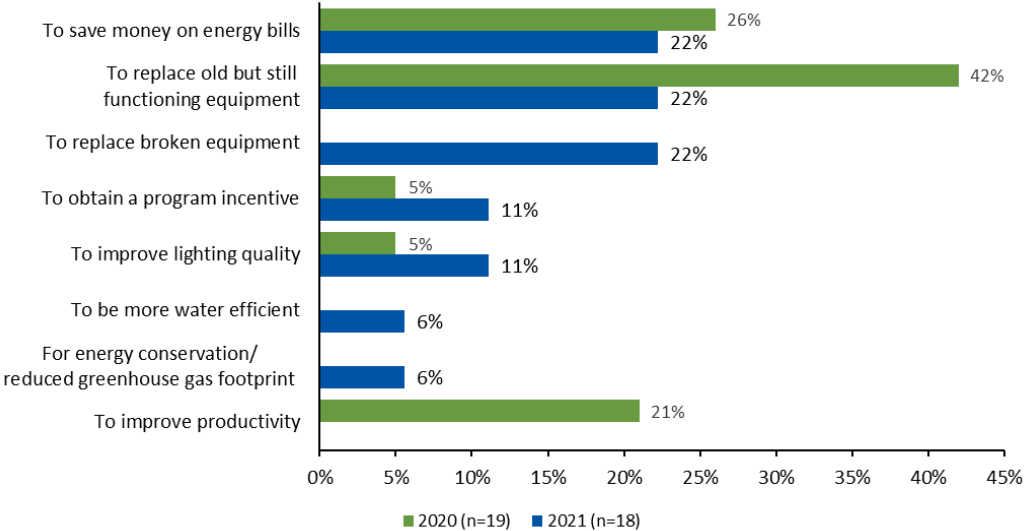
**Figure 3. Who Completed the Application**



Source: RMP 2020 and 2021 Wattsmart Business Program Participant Survey QB2.  
 Don't know and refused responses removed.

Wattsmart Business respondents reported that the most important reasons for their company deciding to participate in the program were to save money on energy bills (22%), to replace old but still functioning equipment (22%), and to replace broken equipment (22%, n=18; Figure 4). While saving money was consistently a critical factor across 2020 and 2021, replacing equipment and improving productivity were substantially less important in 2021 than in 2020.

**Figure 4. Most Important Reason for Participation**



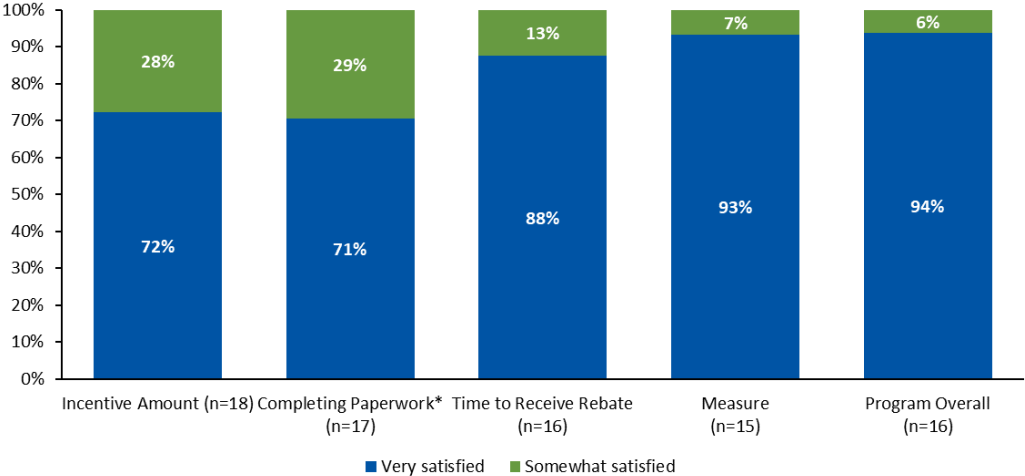
Source: RMP 2020 and 2021 Wattsmart Business Program Participant Survey QB1.  
 Multiple responses allowed. Don't know and refused responses removed.



**Participant Satisfaction**

As shown in Figure 5, all respondents were either *very satisfied* or *somewhat satisfied* with every aspect of the program they were asked about, including the incentive amount, completing paperwork, the time it took to receive the rebate, and the measure, as well as with the program overall. While 2021 satisfaction with the incentive amount was higher than satisfaction in 2020 (97%, n=29), the remaining aspects' overall satisfaction ratings were consistent with the 2020 survey responses.

**Figure 5. Satisfaction with Program Components**

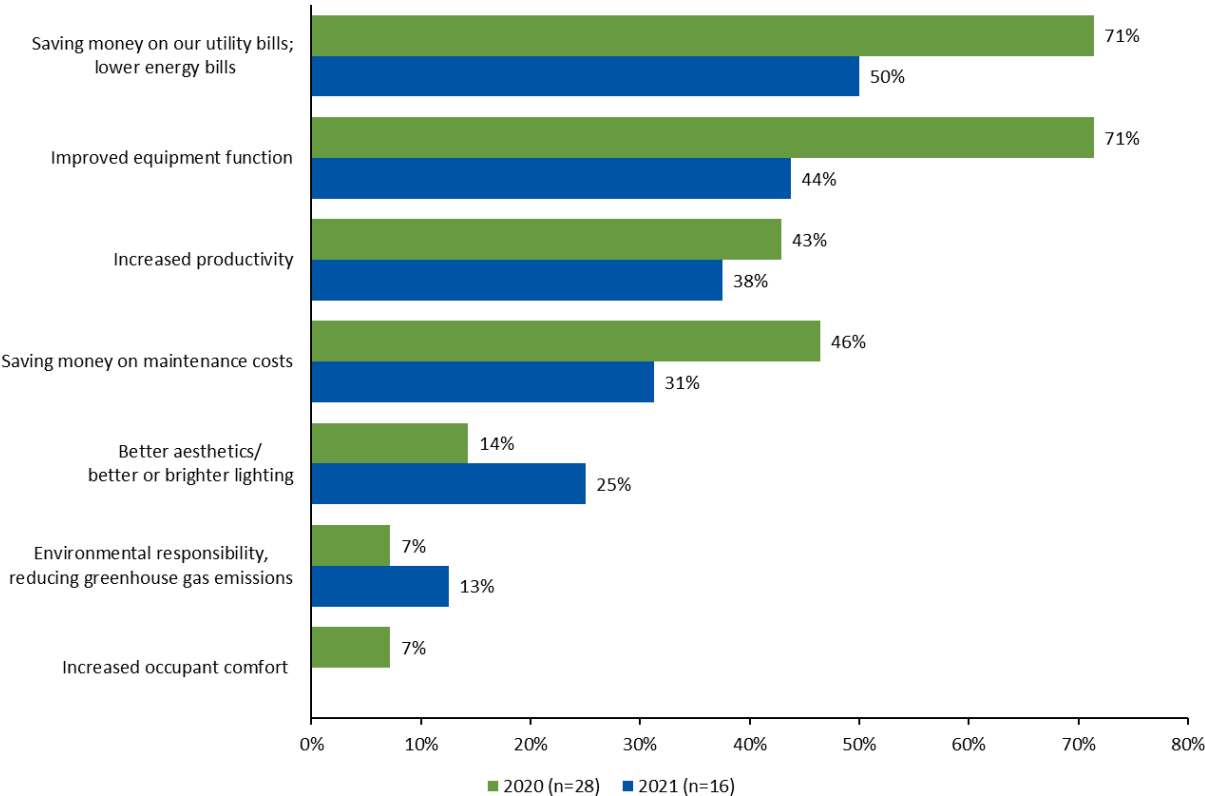


Source: RMP 2021 Wattsmart Business Program Participant Survey QB3, QB5, QB8, QB13, and QB16.  
Don't know and refused responses removed.  
\* This question was asked on a scale using *easy* rather than *satisfied*.

**Project Benefits**

Typical Upgrades and Custom Analysis participants reported one or more benefits that their company experienced from the project they completed. Across 2020 and 2021, respondents consistently reported that lower energy bills was a key benefit. As shown in Figure 6, participants also reported benefits such as improved equipment function, increased productivity, saving money on maintenance costs, and better or brighter lighting, among other benefits.

Figure 6. Project Benefits



Source: RMP 2020 and 2021 Wattsmart Business Program Participant Survey QB15. Multiple responses allowed. Don't know and refused responses removed.

**Firmographics**

Every respondent said their company owns the facility where the improvements were made (n=16). Additionally, 62% of respondents said their company employs 0 to 10 people, while 7.5% said their company employs between 11 and 25 people, 7.5% reported 26 to 50 people, 15% reported 51 to 75 people, and 8% reported having 500 or more people at their company (n=13). Respondents also identified the type of fuel source their facility uses for space and water heating. For space heating, 73% of respondents said their facility uses natural gas and 20% said they use electric sources, while 13% said also they use additional sources (n=15). For water heating, 50% of respondents said they use natural gas and 50% use electric sources (n=16).

*Midstream Lighting Instant Incentives*

The Cadmus team completed surveys with five Midstream Lighting Instant Incentives participants. This included respondents who received an incentive at the point of purchase through a qualified, participating distributor. These participants answered questions about their source of program awareness, their program experience, and their program satisfaction.

## **Program Delivery**

Three of the five respondents learned about the program incentives from a Wattsmart Business representative, while two learned about the program through their contractor, distributor, or lighting supplier. Additionally, all five respondents reported purchasing their equipment through a vendor they had worked with previously. However, when asked if they purchased from the vendor primarily because of the instant incentive, two respondents said yes, one said no, and two were unsure.

Four respondents said it was *very easy* to find a program discount for the equipment they wanted to purchase, and one respondent said it was *somewhat easy*. In terms of their project, three respondents purchased lamps for a larger lighting retrofit or new construction project, while two respondents re-lamped an area of their facility as part of ongoing maintenance. When asked about the incentive levels, two respondents said they were *very satisfied* with the amount of their incentive and three respondents were *somewhat satisfied*.

The Cadmus team asked respondents if they had experienced any challenges while participating in the program. One respondents encountered challenges before they got in contact with a contractor or distributor. Specifically, this respondent had attempted to contact RMP directly and did not get a response. However, once in contact with a contractor or distributor, the problems they had been experiencing were solved.

When asked for program recommendations, one respondent said to clearly indicate on the website that they should work directly with distributors to receive the instant incentive, rather than having to go through a RMP representative. The other four respondents did not have any recommendations to improve the program. Overall, four respondents rated themselves as *very satisfied* with the Midstream Lighting Instant Incentives program offering overall and the one respondent rated themselves as *somewhat satisfied*.

## **Firmographics**

Two respondents said their company is in educational services, one is in retail, one is in construction, and one is in the health care industry. All five respondents said their company owns the facility where the improvements were made. Three respondents said their company employs 1 to 10 people, one said 26 to 50 people, and one preferred not to respond. Four respondents said their facility uses natural gas space heating, while one respondent's facility uses natural gas and electric space heating. Additionally, two respondents said their facility uses natural gas water heating, while one uses electric water heating, one uses both natural gas and electric water heating, and one respondent did not answer.

## *Trade Allies*

The Cadmus team interviewed four trade allies about their program experience including program awareness, the program's impact on their business, their awareness of the small business efforts, their overall program satisfaction, and general company firmographics.

## Trade Ally Experience

The responding trade allies provided a variety of responses for how their company first learned about the Wattsmart Business program:

- One learned through previous exposure to programming, specifically through the Idaho Falls program in 2005
- One knew about the program from their previous employer
- One received an email from the program staff
- One searched the RMP website

Three of the four trade allies chose to become an approved Wattsmart vendor because they wanted to offer the incentives to their customers, while one trade ally became an approved Wattsmart vendor to expand their customer base.

Two trade allies said that 20% of the jobs their company competed in 2021 included the Wattsmart Business incentive, one said 30%, and one said 70%. However, all four respondents said that their participation in the Wattsmart Business program has had a positive effect on their business. One respondent further noted that participating in the program has increased their lighting business.

When asked if there were any barriers to working with the Wattsmart Business program, one respondent said they encounter projects with small incentive options, which makes the program less attractive. Another respondent said they had several large customers lose interest in participating due to program requirements (such as needing to install lighting controls to obtain the rebate).

The Cadmus team asked trade allies about their awareness of the scorecards<sup>5</sup> for approved vendors or of any additional material provided to trade allies. Two respondents said they often interact with the materials provided by program staff. One said that the scorecards are not very helpful, but that they are nice for seeing the number of their projects. Another respondent said that the scorecards are helpful because they show feedback. Although RMP introduced the online application portal, all four trade allies submitted paperwork through the program staff.

When asked what additional products might be a good fit for the program, one respondent said to expand the HVAC offerings, while the remaining three respondents could not think of any products that should be added or areas of expansion.

## Satisfaction

When asked about their overall satisfaction with the Wattsmart Business program, all four respondents rated themselves as *satisfied*. Respondents also provided two recommendations to improve the participation process for customers and vendors:

- Ensure that the website is always up to date

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<sup>5</sup> RMP introduced scorecards to approved vendors to help them keep track of their projects.

- Provide incentives more quickly after installation

Overall, all four respondents said that Pacific Power is responsive to their needs and provides them with the information and support they need to be successful.

## **Firmographics**

One interviewed trade ally is the certified lighting specialist for a lighting motor and VFD company, one works with retrofit customers for a lighting company, one is the director of operations and handles the rebate work for a food service HVAC company, and one works in sales and completed a lighting audit for a lighting controls company. Two trade allies primarily serve commercial customers and two serve both commercial and residential customers. One trade ally said their company serves all the RMP areas, another serves southeast Idaho and one serves north of Blackfoot, while one respondent did not provide a geographic area where their company serves. Two respondents said their company had less than 10 employees in 2021, while one had 12 employees and one had between 25 and 30 employees.

## **Partial Participant Experience**

The Cadmus team surveyed two partial participants: one who considered (or began) a project with a packaged terminal heat pump system and one who considered (or began) an energy efficiency upgrade. Partial participants answered questions about their program awareness, whether they completed the projects, what motivated them to complete the projects, and their satisfaction with Pacific Power.

## **Awareness**

One respondent learned about the program through a vendor, distributor, or supplier where they purchased the lighting equipment, while the other respondent did not provide a source. Neither respondent had previously received a Wattsmart Business program incentive for lighting improvements; however, one respondent said they were *very likely* to request an incentive for a project in the next six months (while the other respondent is *not at all likely*). Both respondents said the best way for RMP to keep them informed about incentives for energy efficiency improvements is through utility mailings, emails, newsletters with bills, or bill inserts.

## **Motivation and Barriers**

Both respondents said their company's most important motivating factor when making decisions about energy-efficient upgrades is saving money on energy bills.

One respondent said their company completed the project they initiated through the Wattsmart Business program; however, the upgrades they made did not qualify for the rebate. The other respondent said their company did not complete the project (and they were unsure why).

When asked how the COVID-19 pandemic and related economic impacts had affected their company's investments in building and equipment improvements, one respondent said their company is investing about the same amount in building and equipment improvements, while one respondent did not know.

## Satisfaction

One respondent reported being *somewhat satisfied* with the program overall and the other was *not at all satisfied*. When asked what RMP could do to improve their experiences with the program, the unsatisfied respondent recommended expanding the selection of eligible equipment.

## Firmographics

One respondent was from a health care services company and one was from a professional scientific and technical services company. Both respondents said their company owns the facility where their business is located. One respondent said their company employs 1 to 10 people, while the other said their company employs 51 to 75 people. One respondent said their facility uses natural gas space heating, while the other said their facility uses both natural gas and electric space heating. One respondent said their facility uses natural gas for water heating, while one said their facility uses electricity.

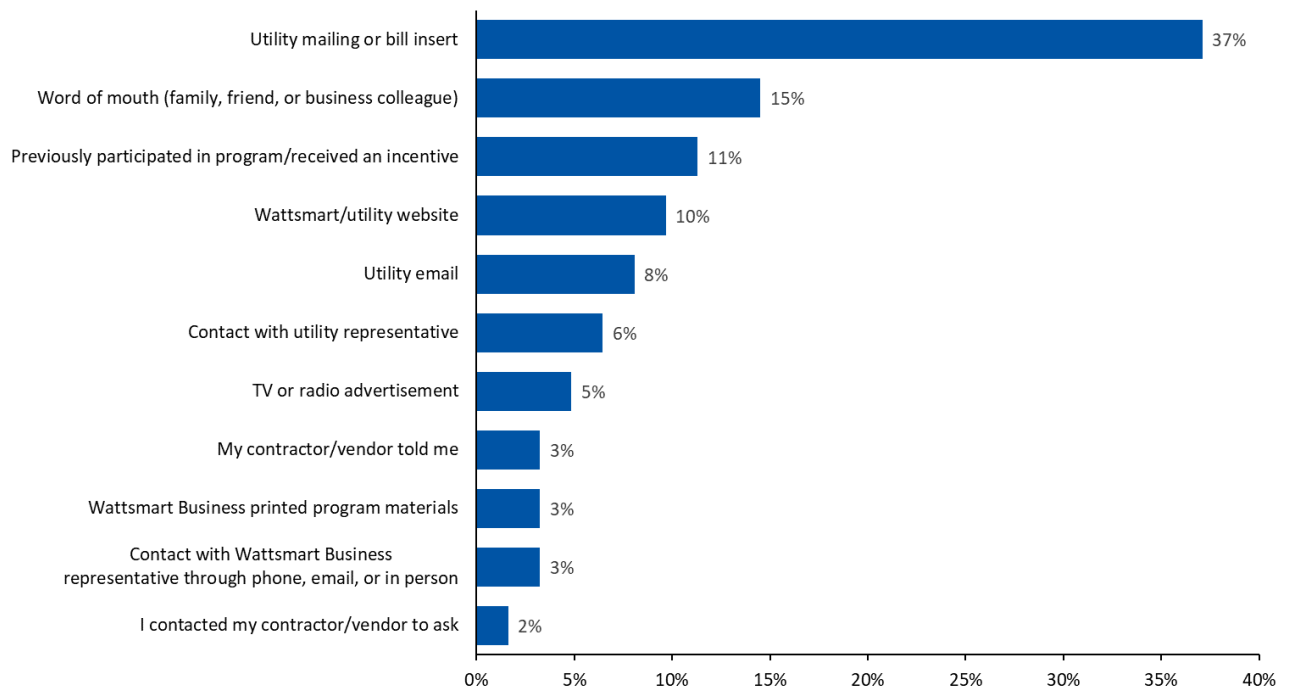
## Nonparticipant Experience

The Cadmus team interviewed 193 nonparticipants to learn about their program awareness, motivations and barriers to energy efficiency upgrades, and general firmographics.

## Awareness

Prior to the interview, 40% of respondents said they were aware of the Wattsmart Business program offerings (n=189). Of those who were aware, 37% (n=62) learned about the program through a utility mailing or bill insert, as shown in Figure 7.

**Figure 7. Awareness Source**



Source: RMP 2020 and 2021 Wattsmart Business Program Nonparticipant Survey Question C3 (n=62).

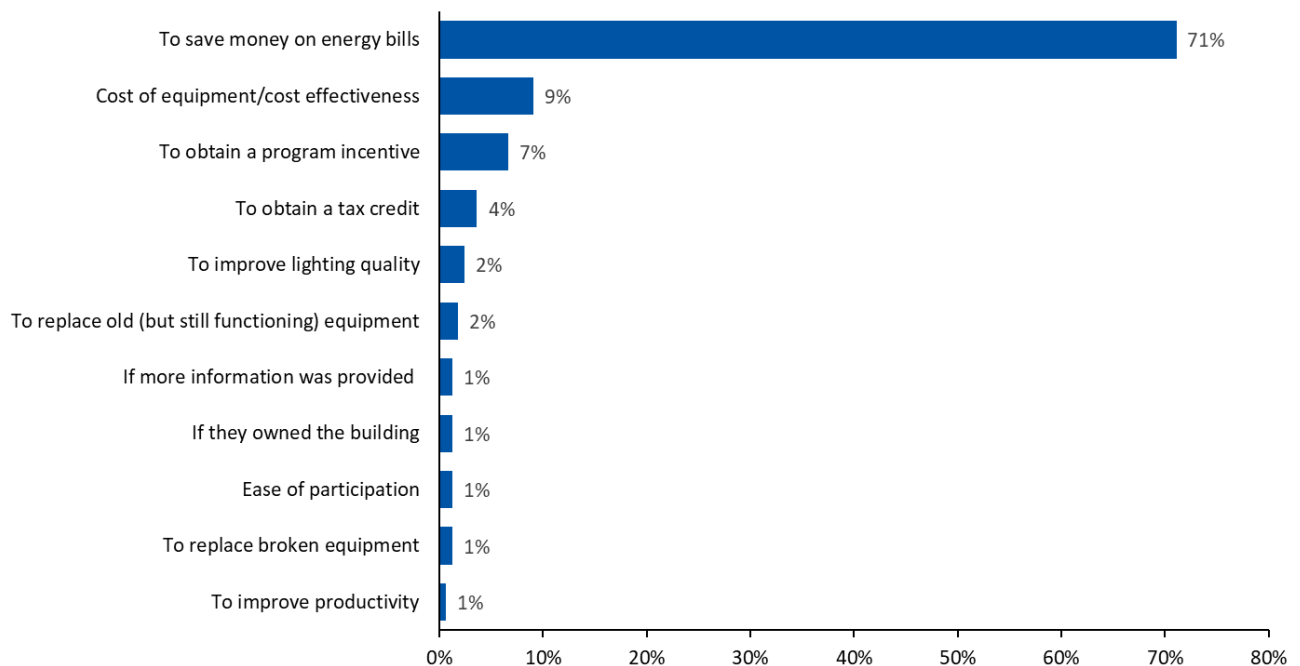
We asked nonparticipants who were aware of the program offerings whether their company had ever received a Wattsmart Business program incentive in the past: 27% said they had (n=67). Additionally, 27% of these respondents said they were either *very likely* or *somewhat likely* to request a program incentive in the future (n=30).

Furthermore, 63% of respondents said they did not participate in Wattsmart Business in the past two years because they do not know enough about the program (n=187). Eighty-three percent of all respondents said the best way for Pacific Power to keep them informed about incentives for energy-efficient improvements is through utility mailing, email, newsletter with the bill, or a bill insert (n=193). Other respondents said the best way to keep them informed is through contact with a Wattsmart Business representative, printed program materials, their electrician or contractor, or the vendor, distributor, or supplier where they purchase lighting.

### Motivation and Barriers

As shown in Figure 8, 71% of respondents said the most important factor to motivate their company to make energy-efficient upgrades is to save money on energy bills (n=166).

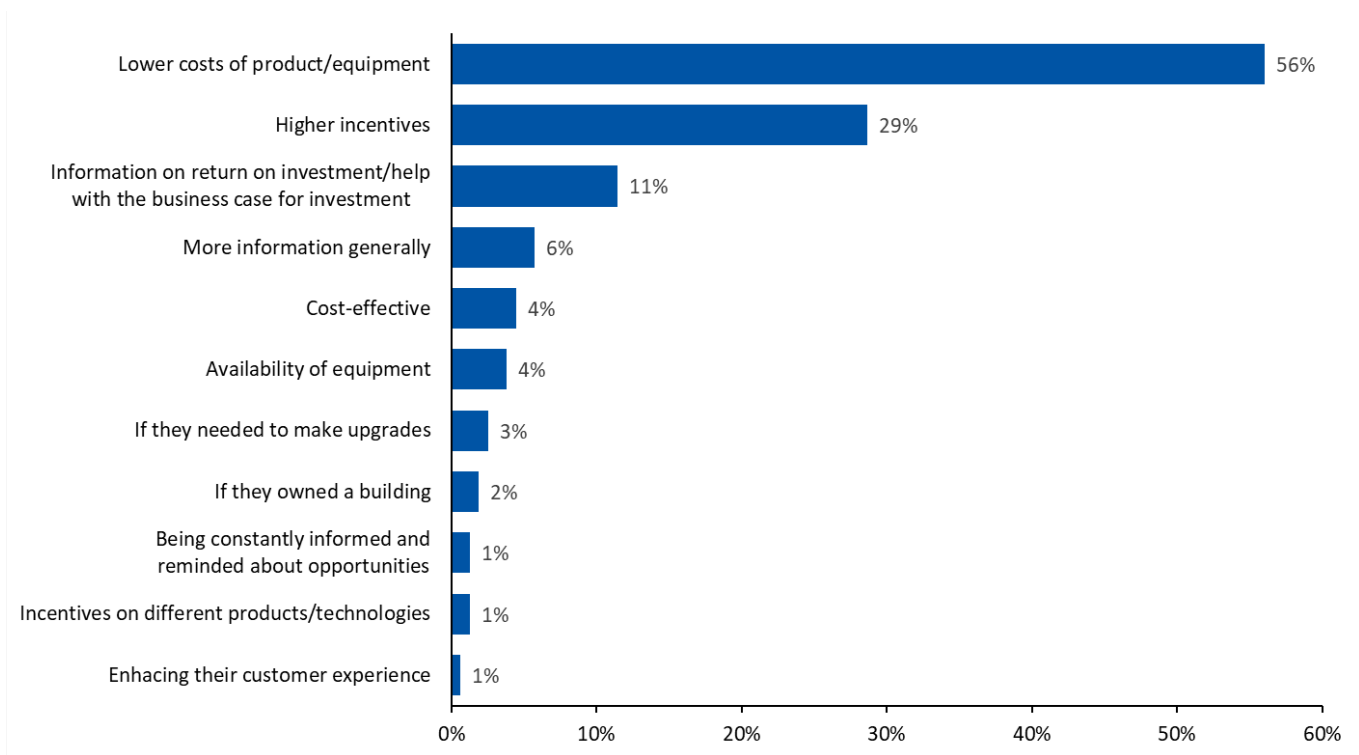
**Figure 8. Most Motivating Reasons to Make Energy-Efficient Upgrades**



Source: RMP 2020 and 2021 Wattsmart Business Program Nonparticipant Survey Question D1 (n=166).

As shown in Figure 9, when asked what would motivate their business to make *more* energy-efficient purchases or upgrades, respondents most often cited ways to make upgrades more affordable (such as lowering the cost of equipment or increasing incentives).

**Figure 9. Most Motivating Reasons to Make More Energy-Efficient Purchases or Upgrades**



Source: RMP 2020 and 2021 Wattsmart Business Program Nonparticipant Survey Question D9 (n=157).

The Cadmus team also asked respondents about how the COVID-19 pandemic and related economic impacts had affected their company’s investments in building and equipment improvements (n=188):

- Fifty-nine percent said their company is investing about the **same** amount in building and equipment improvements as before the pandemic.
- Twenty-seven percent said their company is now investing **less** in building and equipment improvements.
- Fourteen percent said their company is now investing **more** in buildings and equipment improvements.

**Firmographics**

Sixty-one percent of respondents said their company employs 1 to 10 people, while 20% employ 11 to 25 people, 10% employ 26 to 50 people, and 9% employ 51 or more people (n=176).

*Cost-Effectiveness Results*

As shown in Table 9, the Wattsmart Business program proved cost-effective for the 2021 evaluation period based on four test perspectives, with a PacifiCorp Total Resource Cost test (PTRC) benefit/cost ratio of 1.26, a Total Resource Cost test (TRC) benefit/cost ratio of 1.15, a Utility Cost Test (UCT) benefit/cost ratio of 2.11, and a Participant Cost Test (PCT) benefit/cost ratio of 2.71. It was not cost-effective from the Ratepayer Impact Measure test (RIM) perspective. Please see *Appendix C. Cost-Effectiveness Methodology and Measure Strata Results* for more information on cost-effectiveness.



**Table 9. 2021 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 (TRC + 10% conservation adder)	\$0.0573	\$6,257,582	\$7,886,669	\$1,629,087	1.26
Total Resource Cost Test (TRC no adder)	\$0.0573	\$6,257,582	\$7,169,699	\$912,117	1.15
Utility Cost Test (UCT)	\$0.0311	\$3,392,844	\$7,169,699	\$3,776,854	2.11
Ratepayer Impact Measure Test (RIM)	-	\$13,638,612	\$7,169,699	(\$6,468,913)	0.53
Participant Cost Test (PCT)	-	\$4,523,093	\$12,256,398	\$7,733,305	2.71
Life Cycle Revenue Impacts (\$/kWh)					\$0.000244610
Discounted Participant Payback (years)					2.96

## Conclusions and Recommendations

This section provides the Cadmus team’s conclusions, along with key findings and associated recommendations.

### **The Wattsmart Business program realized 100.6% of reported energy savings.**

The Cadmus team sampled 36 projects and 38.6% of all reported savings in 2021 and determined that the program realized 100.6% of reported savings. The evaluated savings closely matched reported savings for irrigation, midstream lighting, and motors projects. While there was variability among the sampled projects, aggregated gross results were within 1% of reported savings for each of these strata.

The energy management stratum realized the lowest energy savings, with a gross realization rate of 86.9%. The Cadmus team sampled all the 2021 energy management projects, but the small sample (of four) prevents us from drawing conclusions about areas of improvement. Discrepancies resulting in differences between reported and evaluated savings were unique and inconsistent among the sampled projects.

The “other” stratum realized the second lowest energy savings, with a realization rate of 90.4%. The Cadmus team found variances in realized energy savings for measures where RMP used a deemed value to report savings, which is expected when comparing deemed values to evaluated. We evaluated these projects using project- and location-specific calculation inputs to evaluate savings, and found that 66% of the sampled “other” projects realized lower energy savings than reported.

### **The Wattsmart Business program was successfully implemented and participants were satisfied; however, there are still opportunities to expand awareness.**

Typical Upgrades and Custom Analysis participants reported 100% satisfaction with all aspects of the program. These ratings were generally consistent with the 2020 survey results. Additionally, all three participant groups surveyed (Typical Upgrades and Custom Analysis, Midstream Lighting Instant Incentives, and trade allies) gave the program a 100% satisfaction rating overall, consistent with 2020 results.

However, there were notable differences in how respondents learned about the program.

Nonparticipant respondents who were aware of the program most commonly reported that they learned about the program and its offerings through mailing or bill inserts—this is in contrast to participants, who most commonly learned about the program through a distributor, supplier, electrician, contractor, or program representative.

### **Customers continue to be motivated to make energy-efficient upgrades in order to replace equipment and save money on energy bills.**

Across three surveyed groups (Typical Upgrades and Custom Analysis participants, partial participants, and nonparticipants), respondents identified replacing old but still functioning equipment or saving money on energy bills as their top two motivations for participating in the Wattsmart Business program, consistent with 2020 results. Among Typical Upgrades and Custom Analysis respondents, 22% said their

key motivation was to replace old but still functioning equipment, 22% said it was to replace broken equipment, and 22% said it was to save money on energy bills (n=18). In addition, both partial participants said their company's most important motivating factor was saving money on energy bills (n=2). Furthermore, 71% of nonparticipant respondents said that saving money on energy bills would motivate them to participate in the Wattsmart Business program (n=166). Two of four trade allies reported that their motivation for participating was to provide their customers with incentives.

**The 2021 Idaho Wattsmart Business program was cost-effective, achieving a PTRC benefit/cost ratio of 1.26.**

Under the PTRC test perspective, the program generated more benefits (\$7,886,669) than costs (\$6,257,582), producing positive net benefits. The program was also cost-effective according to the PCT and UCT perspectives. In 2020, the Idaho Wattsmart Business program achieved a PTRC benefit/cost ratio of 0.97. In 2019, the program achieved a PTRC benefit/cost ratio of 0.94, and in the 2018 and 2019 program cycle achieved a combined PTRC benefit/cost ratio of 0.98. The program generated less energy savings in 2021 than in 2020 but achieved slightly greater overall benefits, and also incurred proportionally lower administrative, incentive, and incremental project costs, resulting in higher levels of net benefits compared to past program years.

## Appendix A. Gross Engineering Analysis Methodology

The Cadmus team incorporated several activities into the Wattsmart Business program impact evaluation:

- Customer interviews
- Engineering analysis
- Site-level billing analysis

This appendix addresses reported gross savings, evaluated gross savings, and evaluated net savings. Reported gross savings are kilowatt-hour electricity savings that RMP reported in its *Energy Efficiency and Peak Reduction Annual Reports*.<sup>6</sup> Evaluated gross savings are the savings achieved after applying installation rates and realization rates from an engineering analysis of a sample of projects. Evaluated net savings are program savings, net of what would have occurred in the program’s absence. These savings reflect observed impacts attributable to the program.

To determine evaluated gross savings, the Cadmus team applied Steps 1 through 4, as shown in Table A-1 and described below the table. To determine evaluated net savings, the team applied the fifth step (discussed in Appendix B. *Net-to-Gross Analysis Methodology*).

**Table A-1. 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 reported savings match annual reports
	2	Verification: Adjust gross savings based on actual installation rates
	3	Unit Energy Savings: Validate saving calculations (through engineering review and analysis)
	4	Realization Rates: Extrapolate realization rates to the population
Evaluated Net Savings	5	Attribution: Apply NTG adjustments

**Step 1:** To verify the accuracy of data in the participant database, the Cadmus team reviewed the database to ensure that the number of participants and reported savings matched annual reports.

**Step 2:** The team selected a sample of sites from the RMP program database and stratified the distribution of measures among sampled sites, primarily by end-use type. The team used phone interviews and customer-provided photos and site documentation to verify measure installations.

**Step 3:** For sampled projects, the team reviewed all project documentation; developed an evaluation, measurement, and verification plan; and performed virtual site assessments for a few projects to verify the installation, specifications, and operations of incented measures. The team also collected trend data for nine projects to document historical performance.

**Step 4:** Next, the team reviewed measure savings assumptions, equations, and inputs, and conducted a billing analysis for selected measures. For complicated or custom measures, the team conducted an

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<sup>6</sup> These reports are available online: <https://www.pacificorp.com/environment/demand-side-management.html>

engineering analysis using the appropriate measurement and verification options listed in the *International Performance Measurement and Verification Protocol*.<sup>7</sup> The team used interviews and other operational data to determine the hours of use or power consumption for metered equipment types. In some instances, customers provided trend data from their building management systems, which the team used to determine equipment load profiles, hours of use, and performance characteristics.

**Step 5:** The team used the participant survey to calculate freeridership using an industry-standard self-report methodology. In addition, the team surveyed nonparticipants to determine if nonparticipant spillover could be credited to the program (for projects that did not receive incentives).

## Project Review

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

The team performed three tasks for each site within the sample:

- Reviewed the reported documentation to verify that the quantity and specifications of equipment receiving incentives matched the associated reported energy-savings calculations and confirmed that installed equipment met program eligibility requirements
- Performed a detailed review of site project files to collect additional necessary data for each site’s savings analyses
- Where applicable, conducted a phone interview with facility personnel to gather information such as equipment types replaced and hours of operation

## Engineering Analysis

In general, the Cadmus team referenced current measure workbooks and saving estimation methodologies from the *Idaho Power Technical Reference Manual* and the Regional Technical Forum website.<sup>8</sup> The *Idaho Power Technical Reference Manual* was updated in 2018 and relies on sources from entities such as the Northwest Power and Conservation Council, Northwest Energy Efficiency Alliance, the Energy Trust of Oregon, the Bonneville Power Administration, third-party consultants, and other regional utilities, as well as the *Database for Energy Efficiency Resources*.

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

<sup>8</sup> Regional Technical Forum. Accessed January 2021. “UES Measures.” <https://rtf.nwcouncil.org/measures>

## Appendix B. Net-to-Gross Analysis Methodology

NTG estimates are a critical part of DSM program impact evaluations because they indicate the portions of gross energy savings that were influenced by and are attributable to DSM programs. This appendix describes the NTG methodology used by the Cadmus team for the Wattsmart Business program.

### Overview

To determine net savings, the team estimated freeridership and spillover using a survey self-report approach—this approach is typically considered the most cost-effective, transparent, and flexible method for estimating NTG and, consequently, is the NTG methodology most frequently employed in the industry.

$$\text{Net-to-gross} = 100\% - \text{Freeridership Percentage} + \text{Participant Spillover Percentage} + \text{Nonparticipant Spillover Percentage}$$

Using self-reported responses, the Cadmus team estimated net savings by assessing the program's influence on the participant's decision to implement an energy efficiency project and determining what would have occurred absent the program intervention. This estimate includes an examination of the program's influence on three key characteristics of the project: its timing, its level of efficiency, and its scope (or size). This estimate is known as freeridership and represents the amount of gross savings that would have occurred without program intervention.

The Cadmus team then estimated program influence on the broader market as a result of the indirect effects of the program's activities. This estimate, known as spillover, represents the amount of savings that occurred because of the program's intervention and influence but that is not currently claimed by the program. Spillover savings can come from participants and nonparticipants. Participant spillover savings occur when program participants install additional energy-efficient equipment. Nonparticipant spillover savings occur when market allies who were influenced by the program install or influence nonparticipants to install energy-efficient equipment (for example, when trade allies promote energy-efficient equipment to all customers as a result of their program training).

### Freeridership Estimate

To determine freeridership, the Cadmus team scored respondents' answers to a series of questions regarding their decision to install the equipment promoted by the program. A score of 1 indicates that the respondent is a complete freerider—that 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 indicates that the respondent is not a freerider—that without the program they either would not have installed any equipment within 12 months or would have installed baseline efficiency equipment.

As the first step in scoring, the Cadmus team reviewed the 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 a complete freerider. If not, the team reviewed the responses to determine whether the project would have occurred at all within the same 12-month period. If not, the

respondent is a non-freerider. If the project would have occurred within the same 12-month period but was altered in respect to its size or efficiency level, the respondent is a partial freerider.

To assess the level of partial freeridership, the Cadmus team used the respondent's 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 freeridership:

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

We then adjusted the initial freeridership score to account for the influence of prior program participation, which the respondent ranked on a scale of 1 to 5, where 5 meant *extremely important*. Given RMP's efforts to cross-promote its entire portfolio of energy efficiency programs, a respondent's prior participation in a 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 prior program was responsible for the influence. However, given RMP's portfolio-level marketing approach, respondents are unlikely to be able to identify the prior program by name. Therefore, the Cadmus team attributed the savings credit to the Wattsmart Business program. To calculate this credit, the team reviewed the respondents' rating of the influence of the prior program. If the respondent rated their previous participation as a 4 or 5 in terms of importance, we reduced the respondent's freeridership by 50% or 75%, respectively.

After adjusting the initial freeridership for past program participation, the Cadmus team reviewed a series of consistency check questions. These questions asked about the influence of the program's interventions (such as the financial incentives and technical assistance) and addressed the counterfactual (what would have happened without the program). For example, if a respondent rated the financial incentive as *extremely important* to their decision but said they would have installed the exact same equipment at the same time without the program, the Cadmus team asked the respondent to describe in their own words what impact the program had on their decision. During the scoring process, we reviewed these responses to determine which scenario was more accurate, then scored the respondent accordingly to create an adjusted freeridership score. Table B-1 provides detailed scoring and descriptions of each question.

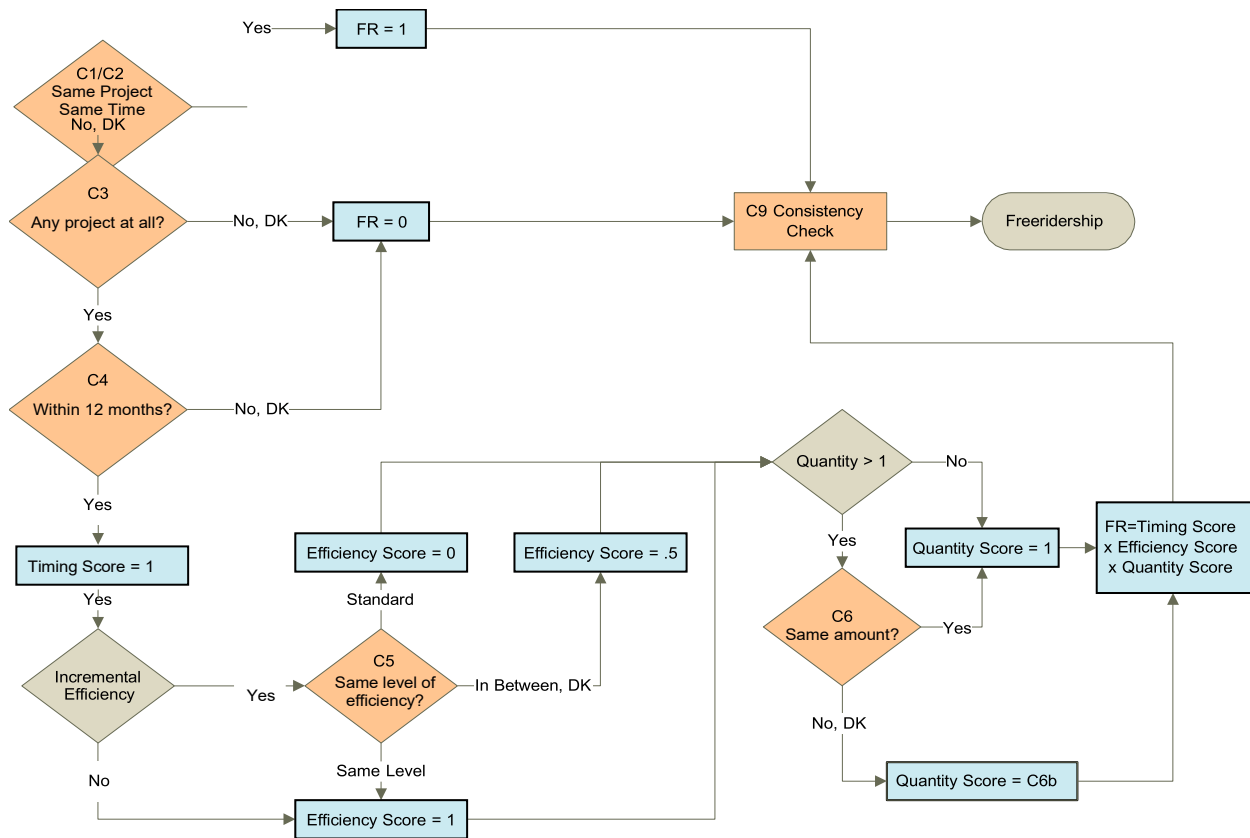
**Table B-1. Idaho Wattsmart Business Program Freeridership Calculation Approach**

Question	Question Text	Freeridership Scoring
C1	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
C2	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 C2=yes and C1=yes, then freeridership=1
C3	Without the program, would you have installed any [MEASURE] equipment?	If C4=no, freeridership=0
C4	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
C5	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
C6	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
C9.6	On a scale from 1 to 5, with 1 being <i>not at all important</i> and 5 being <i>extremely important</i> , how important was your previous participation with a Rocky Mountain Power program in deciding which equipment to install?	If C9.6=5, reduce initial freeridership by 75% If C9.6=4, reduce initial freeridership by 50%
C9.2	On a scale from 1 to 5, with 1 being <i>not at all important</i> and 5 being <i>extremely important</i> , how important was information provided by Rocky Mountain Power on energy-saving opportunities in deciding which equipment to install?	None; consistency check
C9.4	On a scale from 1 to 5, with 1 being <i>not at all important</i> and 5 being <i>extremely important</i> , how important was the Rocky Mountain Power incentive or discount in deciding which equipment to install?	None; consistency check
C8	In your own words, can you please describe what impact the program had on your decision to complete these energy efficiency improvements for [MEASURE]?	Considered if C9.2 or C9.4=4 or 5 Initial freeridership score reduced by 50% if C8 response merits adjusting freeridership by 50%

Figure B-1 shows the freeridership calculation approach.



**Figure B-1. Idaho Wattsmart Business Program Freeridership Calculation Approach**



## Participant Spillover Estimate

Participant spillover occurs when a program influences participants to install additional energy-efficient equipment without a program incentive. The Cadmus team asked a sample of participants whether they completed any subsequent energy-saving projects and whether they received an incentive for those projects. The team also asked these respondents to rate the relative importance of the Wattsmart Business program (and incentives) on their decision to pursue additional energy-efficient activities.

The analysis only included survey respondents who:

- Installed additional energy-savings measure(s) after participating in the Wattsmart Business program,
- Rated the program as highly important in their decision to install the additional measure(s), and
- Did not obtain a Wattsmart Business program incentive for the additional measure(s).

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 similar to the equipment offered through the program. Table B-2 provides detailed scoring and descriptions of each like spillover question.

**Table B-2. Idaho Wattsmart Business Program Participant Spillover Calculation Approach**

Question	Question Text	Scoring
D8	Since participating in this program, have you purchased and installed any other energy efficiency improvements on your own without any assistance from a utility or other organization?	If no, potential spillover savings=0
D9	What type of equipment did you install?	N/A
D10.# Series	This series addresses measure-specific efficiency, capacity, and fuel type	If responses indicated non-program qualifying unit, potential spillover savings=0
D10.b	How many [MEASURE] did you purchase and install?	D10.b x program-evaluated per-unit savings = potential spillover savings
D11	Did you receive an incentive from Rocky Mountain Power or another organization for this equipment?	If yes, potential spillover savings=0
D14	On a scale from 1 to 5, with 1 being <i>not at all important</i> and 5 being extremely important, please rate how important your experience with the [UTILITY] [CATEGORY] program was in your decision to install [this/these] energy-efficient product(s).	5 rating=potential spillover savings attributed to program

As it has no comparative program savings data, “unlike” spillover can only be characterized qualitatively. The Cadmus team asked detailed follow-up questions for unlike spillover responses that could be credited to the program as participant spillover if adequate information was provided for us to estimate savings.

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

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

### Nonparticipant Spillover Estimate

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 motivate them to take efficiency actions outside the utility’s program. This is generally called nonparticipant spillover, and results in energy savings caused by, but not rebated through, utilities’ DSM activities.

To understand whether RMP’s general and program marketing efforts generated energy efficiency improvements outside the company’s incentive programs, the Cadmus team collected spillover data through a nonparticipant survey, conducted with randomly selected nonresidential, nonparticipating customers. The team randomly selected and surveyed 200 nonparticipating customers from a sample of randomly generated nonresidential nonparticipant accounts provided by RMP.

Using a 1 to 5 scale, with 1 meaning *not at all important* and 5 meaning *very important*, surveyed customers rated the importance of several factors on their decisions to install energy-efficient equipment without receiving an incentive from RMP. The Cadmus team used this question to determine

whether RMP’s energy efficiency initiatives motivated energy-efficient purchases. The survey respondents addressed three factors:

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

The Cadmus team estimated nonparticipant spillover savings from respondents who rated any of the above factors as *very important* for any energy-efficient actions or installations reported. We used estimated gross savings for the reported measures from the Wattsmart Business program evaluation activities.

Using the variables shown in Table B-3, the Cadmus team determined total nonparticipant spillover generated by RMP’s marketing and outreach efforts.

**Table B-3. Idaho Wattsmart Business Program Nonparticipant Spillover Analysis Method**

Variable	Metric	Source
A	Total Spillover Savings from Survey Respondents (kWh)	Survey data and engineering analysis
B	Total Nonparticipant Customers Surveyed	Survey disposition
C	Sample Usage	RMP customer database
D	Sample Nonparticipant Spillover	$A \div C$
E	Total Population Usage (kWh)	RMP customer database
F	Nonparticipant Spillover Savings Applied to Population (kWh)	$D \times E$
G	Total Gross Program-Evaluated Savings (kWh)	Wattsmart Business program evaluation
H	Nonparticipant Spillover as a Percentage of Total Wattsmart Business Evaluated Savings (kWh)	$F \div G$

## Appendix C. Cost-Effectiveness Methodology and Measure Strata Results

In assessing the Wattsmart Business program’s cost-effectiveness, the Cadmus team analyzed program benefits and costs from five different perspectives using Cadmus’ DSM Portfolio Pro model.<sup>9</sup> 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 Test (PTRC):** This test examines program benefits and costs from RMP and from 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 Test (TRC):** This test also examines program benefits and costs from RMP’s and from 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 Test (RIM):** All ratepayers (participants and nonparticipants) may experience rate increases due to decreased kilowatt-hour sales. The benefits include avoided energy costs, capacity costs, and line losses. Costs include all RMP program costs and decreased revenues.

The RIM test measures program impacts on customers’ rates. Most energy efficiency programs do not pass the RIM test. Although energy efficiency programs reduce energy delivery costs, they also reduce energy sales. As a result, average rates per energy unit may increase. A RIM benefit/cost ratio greater than 1.0 indicates that rates—as well as costs—will fall due to the program. Typically, this only happens for demand response programs or programs targeting the highest marginal cost hours (when marginal costs exceed rates).

- **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 C-1 summarizes the five tests’ components.

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<sup>9</sup> 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 C-1. Idaho Wattsmart Business Program Benefits and Costs  
Included in Various Cost-Effectiveness Tests**

Test	Benefits	Costs
PTRC	Present value of avoided energy and capacity costs, <sup>a</sup> 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 <sup>a</sup>	Program administrative and marketing costs and costs incurred by participants
UCT	Present value of avoided energy and capacity costs <sup>a</sup>	Program administrative, marketing, and incentive costs
RIM	Present value of avoided energy and capacity costs <sup>a</sup>	Program administrative, marketing, and incentive costs, plus the present value of decreased revenues
PCT	Present value of bill savings and incentives received	Incremental measure and installation costs

<sup>a</sup> These tests include avoided line losses.

Table C-2 shows needed cost-effectiveness inputs for each year, all of which RMP provided to the Cadmus team for analysis.

**Table C-2. Idaho Wattsmart Business Program Selected Cost-Effectiveness Analysis Inputs**

Input Description	2021
Discount Rate	6.92%
Commercial Line Loss	3.83%
Industrial Line Loss	9.05%
Irrigation Line Loss	9.06%
Commercial Retail Rate (\$/kWh)	\$0.0872
Industrial Retail Rate (\$/kWh)	\$0.0636
Irrigation Retail Rate (\$/kWh)	\$0.0907
Inflation/Escalation Rate	2.28%

The Wattsmart Business program benefits included energy savings and their associated avoided costs. For the cost-effectiveness analysis, the Cadmus team used this study’s evaluated net energy savings (incorporating freeridership and spillover) and measure lives documented in the program’s tracking data. Table C-3 shows cost-effectiveness inputs for each measure stratum in the Idaho Wattsmart Business program.

**Table C-3. Idaho Wattsmart Business Program Measure Stratum Cost-Effectiveness Inputs**

Input Description	Input Value
<b>Average Measure Life<sup>a</sup></b>	
Energy Management	4.5
Irrigation	12.0
Lighting	14.5
Midstream Lighting	12.0
Motors	15.0
Other	15.0
<b>Evaluated Net Energy Savings (kWh/year)<sup>b</sup></b>	
Energy Management	217,530
Irrigation	3,921,158
Lighting	3,662,170
Midstream Lighting	723,370
Motors	2,671,509
Other	733,257
<b>Total Utility Cost (including incentives)<sup>c</sup></b>	
Energy Management	\$27,056
Irrigation	\$996,343
Lighting	\$1,021,638
Midstream Lighting	\$181,838
Motors	\$924,698
Other	\$241,273
<b>Incentives</b>	
Energy Management	\$5,007
Irrigation	\$462,042
Lighting	\$426,534
Midstream Lighting	\$84,554
Motors	\$368,873
Other	\$150,457

<sup>a</sup> Stratum measure lives are based on individual measure lives, weighted by reported gross savings as listed in the program tracking data.

<sup>b</sup> Evaluated net energy savings reflect impacts at the customer meter.

<sup>c</sup> RMP provided program costs and incentives in annual report data, allocating program costs by weighted savings.

### *Energy Management*

As shown in Table C-4, the energy management measure stratum proved cost-effective according to all test perspectives except the RIM test.

**Table C-4. 2021 Idaho Wattsmart Business Program Energy Management Cost-Effectiveness**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	\$0.0313	\$28,392	\$91,747	\$63,354	3.23
TRC	\$0.0313	\$28,392	\$83,406	\$55,014	2.94
UCT	\$0.0298	\$27,056	\$83,406	\$56,350	3.08
RIM	--	\$102,450	\$83,406	(\$19,044)	0.81
PCT	--	\$6,409	\$84,097	\$77,689	13.12
Lifecycle Revenue Impacts (\$/kWh)					\$0.000002748
Discounted Participant Payback (years)					0.07

### Irrigation

As shown in Table C-5, the irrigation measure stratum proved cost-effective according to all test perspectives except the RIM test.

**Table C-5. 2021 Idaho Wattsmart Business Program Irrigation Cost-Effectiveness**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	\$0.0547	\$1,900,487	\$2,223,225	\$322,738	1.17
TRC	\$0.0547	\$1,900,487	\$2,021,114	\$120,627	1.06
UCT	\$0.0287	\$996,343	\$2,021,114	\$1,024,771	2.03
RIM	--	\$4,191,176	\$2,021,114	(\$2,170,062)	0.48
PCT	--	\$1,385,174	\$3,723,970	\$2,338,795	2.69
Lifecycle Revenue Impacts (\$/kWh)					\$0.000090680
Discounted Participant Payback (years)					2.70

### Lighting

As shown in Table C-6, the lighting measure stratum proved cost-effective according to all test perspectives except the RIM test.

**Table C-6. 2021 Idaho Wattsmart Business Program Lighting Cost-Effectiveness**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	\$0.0548	\$2,092,256	\$2,476,227	\$383,971	1.18
TRC	\$0.0548	\$2,092,256	\$2,251,116	\$158,860	1.08
UCT	\$0.0268	\$1,021,638	\$2,251,116	\$1,229,478	2.20
RIM	--	\$4,446,102	\$2,251,116	(\$2,194,986)	0.51
PCT	--	\$1,519,002	\$3,920,885	\$2,401,884	2.58
Lifecycle Revenue Impacts (\$/kWh)					\$0.000069638
Discounted Participant Payback (years)					3.08

### Midstream Lighting

As shown in Table C-7, the midstream lighting measure stratum proved cost-effective according to all test perspectives except the RIM test.

**Table C-7. 2021 Idaho Wattsmart Business Program Midstream Lighting Cost-Effectiveness**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	\$0.0215	\$125,345	\$404,799	\$279,453	3.23
TRC	\$0.0215	\$125,345	\$367,999	\$242,653	2.94
UCT	\$0.0311	\$181,838	\$367,999	\$186,161	2.02
RIM	--	\$717,151	\$367,999	(\$349,152)	0.51
PCT	--	\$21,233	\$684,572	\$663,339	32.24
Lifecycle Revenue Impacts (\$/kWh)					\$0.000014590
Discounted Participant Payback (years)					N/A

**Motors**

As shown in Table C-8, the motors measure stratum proved cost-effective according to all test perspectives except the RIM test.

**Table C-8. 2021 Idaho Wattsmart Business Program Motors Cost-Effectiveness**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	\$0.0592	\$1,603,648	\$2,312,786	\$709,139	1.44
TRC	\$0.0592	\$1,603,648	\$2,102,533	\$498,886	1.31
UCT	\$0.0341	\$924,698	\$2,102,533	\$1,177,836	2.27
RIM	--	\$3,411,529	\$2,102,533	(\$1,308,996)	0.62
PCT	--	\$1,081,115	\$2,977,645	\$1,896,530	2.75
Lifecycle Revenue Impacts (\$/kWh)					\$0.000041529
Discounted Participant Payback (years)					3.30

**Other**

As shown in Table C-9, the “other” measure stratum proved cost-effective according to the UCT and PCT tests.

**Table C-9. 2021 Idaho Wattsmart Business Program Other Measures Cost-Effectiveness**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
PTRC (TRC + 10% Conservation Adder)	\$0.0879	\$507,453	\$377,884	(\$129,569)	0.74
TRC	\$0.0879	\$507,453	\$343,531	(\$163,922)	0.68
UCT	\$0.0418	\$241,273	\$343,531	\$102,258	1.42
RIM	--	\$770,203	\$343,531	(\$426,673)	0.45
PCT	--	\$510,160	\$865,228	\$355,068	1.70
Lifecycle Revenue Impacts (\$/kWh)					\$0.000013537
Discounted Participant Payback (years)					13.18