IDAHO POWER
An IDACORP Company

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April 2, 2019

VIA ELECTRONIC FILING AND U.S. MAIL

Public Utility Commission of Oregon
Filing Center
201 High Street SE, Suite 100
P.O. Box 1088
Salem, Oregon 97308-1088

Re: Docket No. UM 1710
In the Matter of Idaho Power Company's Request for Cost-effectiveness Exceptions for Specific Demand-Side Management Electric Measures and Programs – *2018 Demand-Side Management Annual Report*

Attention Filing Center:

Public Utility Commission of Oregon Order No. 15-200 in the above-mentioned docket states that Idaho Power Company ("Idaho Power" or "Company") is to electronically file the Company's Demand-Side Management annual report in years that Idaho Power does not file for a cost-effectiveness exception request. Although Idaho Power did have a cost-effectiveness exceptions request in 2018, the Company is filing the attached *2018 Demand-Side Management Annual Report*, including Supplements 1 and 2 as an informational copy. Located in Supplement 2 on page 25 are links to the Northwest Energy Efficiency Alliance ("NEEA") reports. Due to the file size, file arrangement, and supplemental nature of the NEEA reports, it is necessary to access the reports through the hyperlinks in Supplement 2.

The *2018 Demand-Side Management Annual Report*, its supplements, and the NEEA links are also available on Idaho Power's website via the following link: https://www.idahopower.com/ways-to-save/energy-efficiency-program-reports/

If you have any questions regarding this filing, please contact Paul Goralski at (208) 388-2608 or pgoralski@idahopower.com.

Sincerely,

Lisa D. Nordstrom

Lisa D. Nordstrom

LDN:kkt
Enclosures

IDAHO POWER®
An IDACORP Company

DEMAND-SIDE MANAGEMENT

2018 ANNUAL REPORT

MARCH 15 • 2019

USING ENERGY EFFICIENCY TO BALANCE OUR ENERGY NEEDS

SAFE HARBOR STATEMENT

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EXECUTIVE SUMMARY

Idaho Power, through its energy efficiency programs, its customer education programs, and its focus on the customer experience, fully supports energy efficiency and demand response and encourages its customers to use energy wisely.

In 2018, Idaho Power's focus was not only on the pursuit of all cost-effective energy efficiency, but also improving the customer experience. One of the highlights was added functionality to My Account, an online energy portal where a customer can register to receive notifications for high or overdue bills via text message or email. Another project was sending a Welcome Kit to customers new to Idaho Power's service. Each Welcome Kit contains four LED lightbulbs, a night light, a "welcome to the neighborhood" greeting card, and an Energy Savings Made Easy "flip book" containing tips and residential program information. Over 30,000 customers were reached with this innovative effort, starting new customers on the path to saving energy.

Another highlight of 2018 was Idaho Power being recognized with the Governor's Award for Excellence in Energy Efficiency. This award honors a single facility or organization that demonstrates a commitment to energy efficiency at all levels through programming, implementation, and promotion. Idaho Gov. C.L. "Butch" Otter presented the award to Idaho Power President and CEO Darrel Anderson during the fall meeting of the Energy Efficiency Advisory Group (EEAG).

Figure 1. Idaho Power Senior Vice President and Chief Operating Officer Lisa Grow, Idaho Governor C.L. "Butch" Otter, Idaho Power President and CEO Darrel Anderson, Idaho Power Vice President of Customer Operations and Business Development Adam Richins, and Idaho Power Customer Relations and Energy Efficiency Senior Manager Theresa Drake

Figure 2. Idaho Power's Facebook post announcing the Governor's Award

Idaho Power's portfolio of energy efficiency program energy savings remains strong, with savings of 183,378 megawatt hours (MWh) in 2018, including the estimated savings from the Northwest Energy Efficiency Alliance (NEEA). These savings represent enough energy to power over 16,000 average homes for one year in Idaho Power's service area. In 2018, the company's energy efficiency portfolio was cost-effective from both the total resource cost (TRC) test and the utility cost test (UCT) perspectives with ratios of 2.26 and 3.04, respectively. The portfolio was also cost-effective from the participant cost test (PCT) ratio, which was 2.85. The savings from Idaho Power's energy efficiency programs alone, excluding NEEA savings, was 158,412 MWh in 2018.

Idaho Power successfully operated all three of its demand response programs in 2018. The total demand response capacity from the company's programs was 382 megawatts (MW). Energy efficiency and demand response are important aspects of Idaho Power's resource planning process. Idaho Power's 2018 achievements in energy savings exceeded the annual savings target identified in Idaho Power's 2017 Integrated Resource Plan (IRP). On a cumulative basis, the company's energy savings have exceeded the IRP targets every year since 2002.

Total expenditures from all funding sources of demand-side management (DSM) activities was $44 million in 2018. DSM program funding comes from the Idaho and Oregon Riders, Idaho Power base rates, and the annual power cost adjustment (PCA). The company's demand response incentives are recovered through base rates and the annual PCA in Idaho, while Oregon demand response incentives are funded through the Oregon Rider.

In 2018, Idaho Power continued to expand the reach and frequency of its residential energy efficiency campaign with digital and print marketing, including an increase in social media activity. The company also continued promoting the three Commercial and Industrial (C&I) Energy Efficiency Program options as a single program.

Idaho Power uses stakeholder input to enhance its programs. The company met regularly with EEAG and individual customers seeking input on program improvement. To find growth in the program portfolio, the company relied on its Program Planning Group (PPG) that was initiated in 2014, NEEA's Regional Emerging Technology Advisory Committee (RETAC), and E Source resources. Additionally, Idaho Power continued to refine its program processes through evaluations, customer surveys, and research to make it easier for its customers to participate.

In 2018, Idaho Power continued to distribute Energy-Saving Kits (ESK) at no cost to customers on request. By the end of the year, 44,691 ESKs were shipped to customer homes: 18,383 kits to homes with electric water heaters and 26,308 to homes with alternate-source water heaters. In 2018, Idaho Power developed an ESK for commercial customers, distributing over 1,600 kits to small commercial customers in Idaho and Oregon.

This *Demand Side Management 2018 Annual Report* provides a review of the company's DSM activities and finances throughout 2018 and outlines Idaho Power's plans for future DSM activities. This report also satisfies the reporting requirements set out in the Idaho Public Utilities Commission's (IPUC) Order Nos. 29026 and 29419. Idaho Power will provide a copy of the report to the Public Utility Commission of Oregon (OPUC) under Oregon Docket Utility Miscellaneous (UM) No. 1710.

INTRODUCTION

Idaho Power, through its energy efficiency programs, its customer education programs, and its focus on the customer experience, fully supports energy efficiency and demand response and encourages its customers to use energy wisely.

Energy efficiency and demand response provide economic and operational benefits to the company and its customers; in 2018, Idaho Power continued to pursue all cost-effective energy efficiency across its service area. Idaho Power focuses on the customer experience when providing information and programs that ensure customers have opportunities to learn about their energy use, how to use energy wisely, and participate in programs.

This report focuses on Idaho Power's demand-side management (DSM) activities and results for 2018 and previews planned activities for 2019. The appendices provide detailed information on the company's DSM activities and detailed financial information from for 2018. *Supplement 1: Cost-Effectiveness* provides detailed cost-effectiveness data and *Supplement 2: Evaluation* provides copies of Idaho Power's evaluations, reports, and research conducted in 2018. *Supplement 2: Evaluation* includes the *Historical DSM Expense and Performance* report (formerly Appendix 4) which details DSM activities and financial information from 2002 to 2018.

Idaho Power's main objectives for DSM programs are to achieve prudent, cost-effective energy efficiency savings and to provide an optimal amount of demand reduction from its demand response programs as determined through the Integrated Resource Plan (IRP) planning process. Idaho Power considers cost-effective energy efficiency the company's least-cost resource and pays particular attention to ensuring the best value to Idaho Power's customers. Idaho Power strives to provide customers with programs and information to help them manage their energy use wisely.

The company achieves these objectives through the implementation and careful management of programs that provide energy and demand savings and through outreach and education. For economic and administrative efficiency and to reduce customer confusion, Idaho Power endeavors to implement identical programs in its Idaho and Oregon service areas. Idaho Power has been locally operated since 1916 and serves more than 550,000 customers throughout a 24,000-square-mile area in southern Idaho and eastern Oregon.

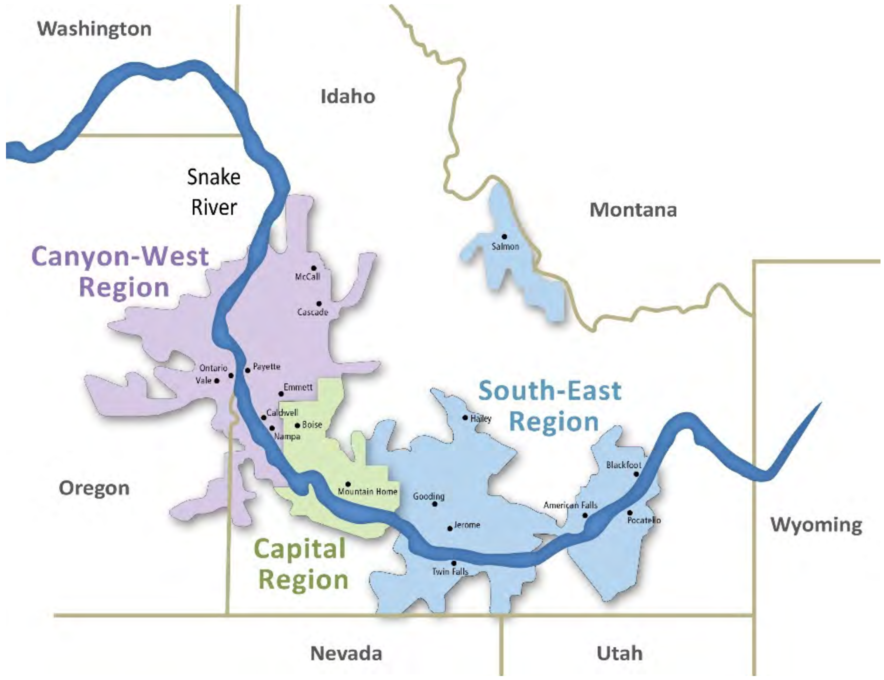

Figure 3. Idaho Power service area map

Idaho Power's energy efficiency programs are available to all customer sectors in Idaho Power's service area and focus on reducing energy use by identifying homes, buildings, equipment, or components for which an energy-efficient design, replacement, or repair can achieve energy savings. Some energy efficiency programs include behavioral components. For example, the Residential Energy Efficiency Education Initiative (REEEI), the Smart-Saver Pledge, the School Cohort, and the Home Energy Report pilot program, which began in 2017, all have behavioral components associated with them.

Savings from energy efficiency programs are measured in terms of energy savings on a kilowatt-hour (kWh) or megawatt-hour (MWh) basis. These programs usually supply energy savings throughout the year at different times depending on the energy efficiency measure put in place. Idaho Power shapes these savings based on the end use to estimate energy reduction at specific times of the day and year. Idaho Power's energy efficiency offerings include programs in residential and commercial new construction (lost-opportunity savings); residential and commercial retrofit applications; and irrigation and industrial system improvement or replacement. Idaho Power's custom incentives offer a wide range of opportunities to its irrigation, industrial, large-commercial, governmental, and school customers to execute energy-saving projects.

Energy efficiency and demand response funding comes from Idaho Power base rates, the Idaho and Oregon Riders (Rider), and the annual power cost adjustment (PCA) in Idaho. Idaho incentives for the company's demand response programs are recovered through base rates and the annual PCA, while Oregon demand response incentives are funded through the Oregon Rider. Total expenditures from all funding sources on DSM-related activities was $ $44 million in 2018 (Figure 5).

Idaho Power started its modern demand response programs in 2002, and now has over 11 percent of its all-time peak load available due to demand response programs. The goal of demand response at Idaho Power is to minimize or delay the need to build new supply-side peaking resources. The company estimates future capacity needs through the IRP planning process and plans resources to mitigate any system peak deficits that exist. Demand response program results are measured by the amount of demand reduction, in megawatts (MW), available to the company during system peak periods. According to 2017 U.S. Energy Information Administration (EIA) data, Idaho Power is one of eight investor-owned utilities with greater than 10 percent of their peak load controlled under demand response programs.

Annual DSM Expense Review Filing

On March 15, 2018, Idaho Power filed Case No. IPC-E-18-03 with the Idaho Public Utilities Commission (IPUC) requesting an order finding the company had prudently incurred $44,145,316 in DSM expenses in 2017, including $37,162,002 in Rider expenses, and $6,983,314 in demand response program incentives.

In Order No. 34141, dated September 11, 2018, the IPUC deemed $37,162,002 in Rider expenses, and $6,983,314 in demand response program incentives as prudently incurred.

DSM Programs Performance

The 2018 savings results consisted of 43,651 MWh from the residential sector, 95,759 MWh from the commercial/industrial sector, and 19,002 MWh from the irrigation sector. The Custom Projects option in the Commercial and Industrial (C&I) Energy Efficiency Program contributed 30 percent of Idaho Power's direct program savings, while the residential sector Energy Efficient Lighting and Educational Distributions programs contributed 80 percent of the residential savings and 22 percent of Idaho Power's direct program savings.

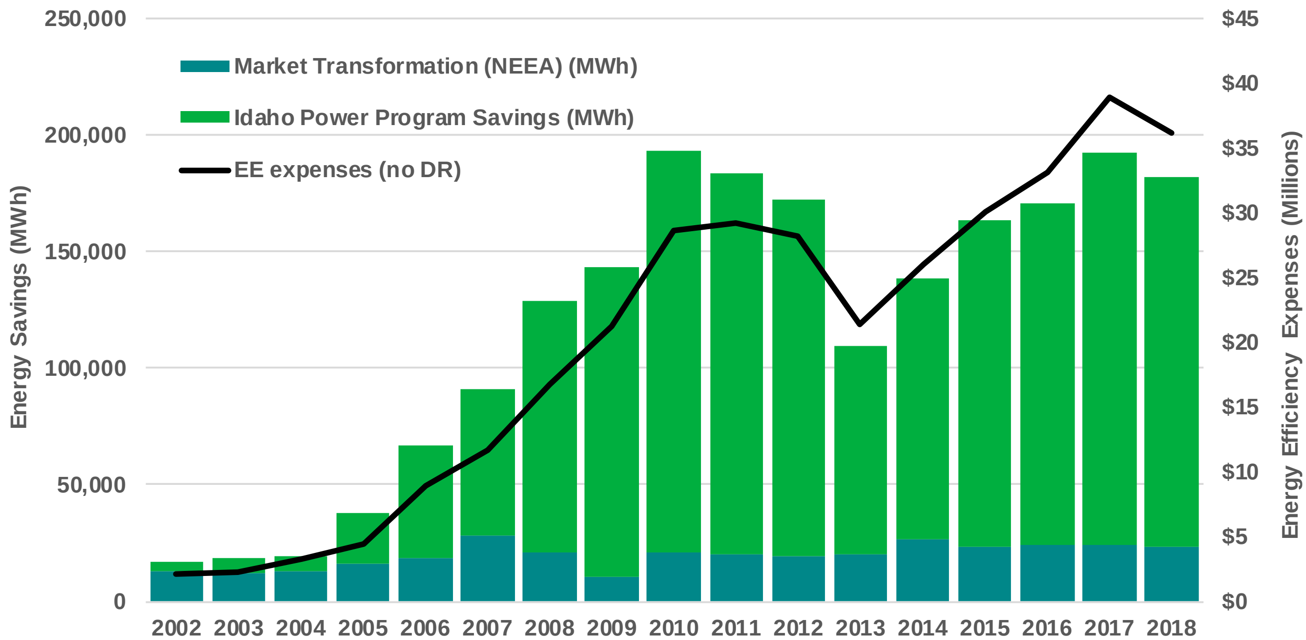

Figure 4. Annual energy savings and energy efficiency program expenses, 2002–2018 (MWh and millions [$])

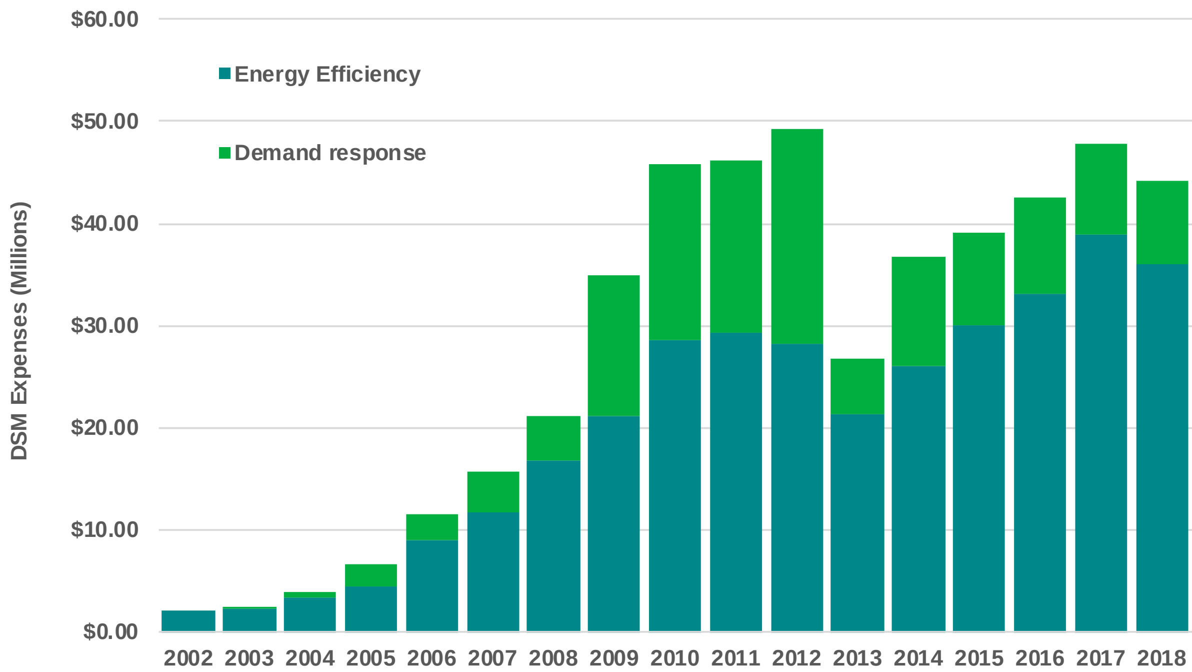

Figure 5. DSM expense history by program type, 2002–2018 (millions [$])

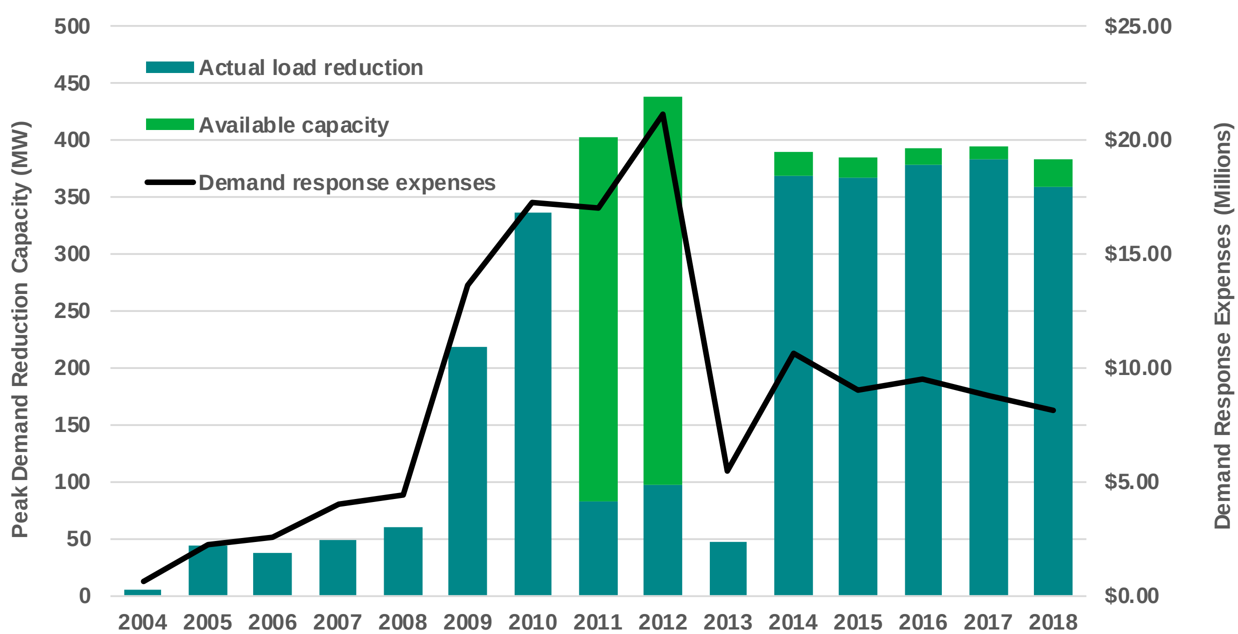

Figure 6. Peak demand-reduction capacity and demand response expenses, 2004–2018 (MW and millions [$])

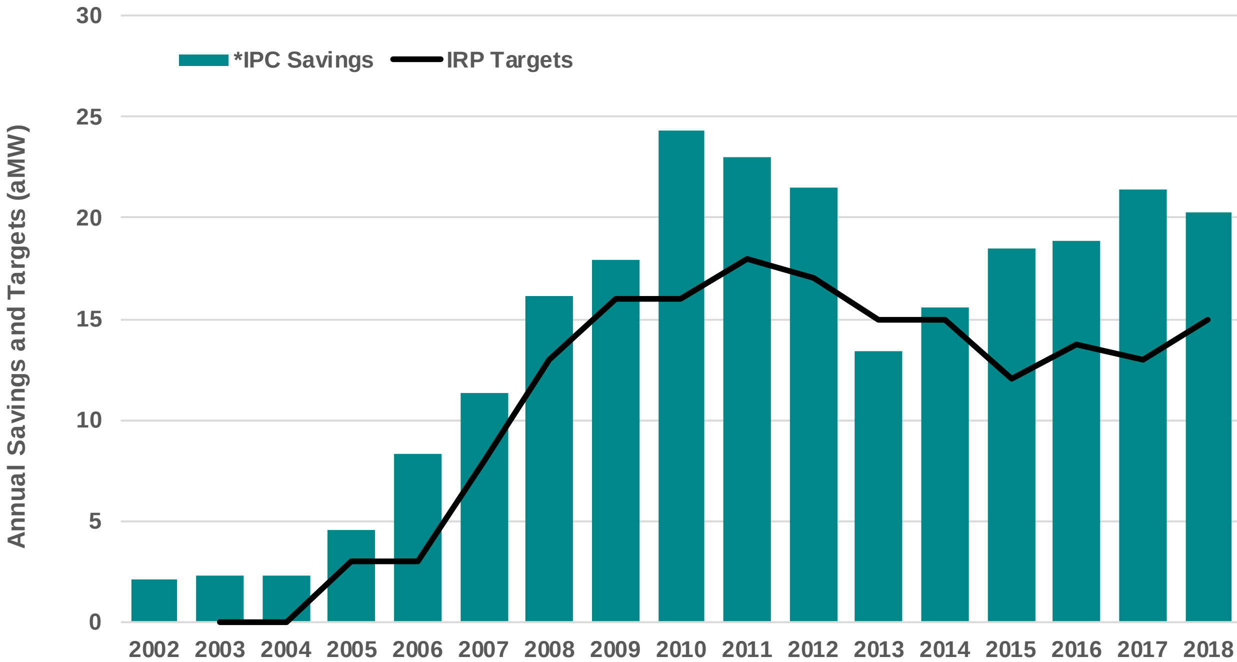

Figure 7. Annual incremental energy efficiency savings (aMW**) compared with IRP targets, 2002–2018
* NEEA codes and standards savings were removed because they are not included in IRP targets
**average megawatt

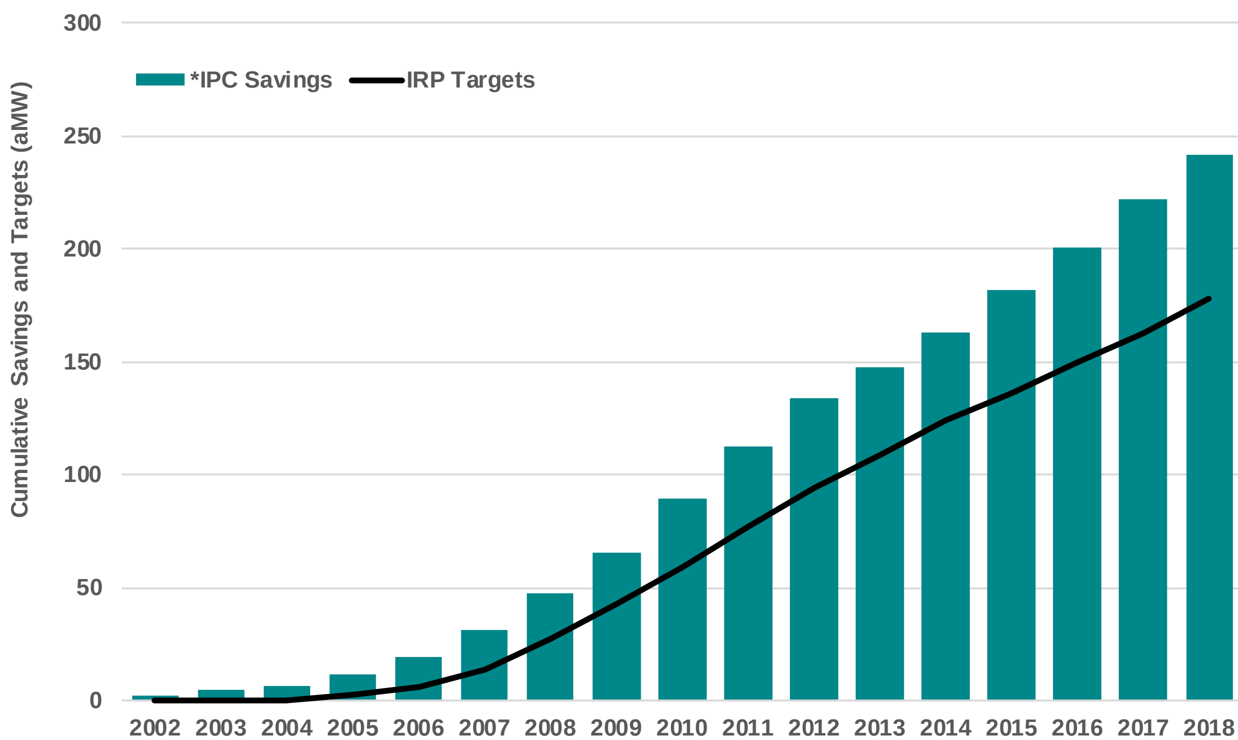

Figure 8. Annual cumulative energy efficiency savings (aMW**) compared with IRP targets, 2002–2018
*NEEA codes and standards savings were removed because they are not included in IRP targets.
**average megawatt

Idaho Power invests significant resources to maintain and improve its energy efficiency and demand response programs. Idaho Power's 2018 achievements in energy savings exceeded the annual savings target identified in Idaho Power's *2017 Integrated Resource Plan*. On a cumulative basis, the company's energy savings have exceeded the IRP targets every year since 2002 (Figure 8).

Demand Response

In summer 2018, Idaho Power had a combined maximum actual non-coincidental load reduction from all three programs of 359 MW at the generation level. The amount of capacity available for demand response varies based on weather, time of year, and how programs are used and managed. The 2018 capacity of demand response programs was 382 MW (Figure 6). The demand response capacity is calculated using total enrolled MW from participants with an expected maximum realization rate for those participants. This maximum realization rate is not always achieved for every program in any given year. The maximum capacity for the Irrigation Peak Rewards program is based on the maximum reduction possible during the hours within the program season. For the Flex Peak Program, the maximum capacity is assumed to be the maximum realized reduction. And for the A/C Cool Credit program, the capacity is calculated based on the number of active participants multiplied by maximum per-unit reduction ever achieved.

Idaho Power has forecast through the IRP that demand response capacity is not currently needed. However, under the terms of IPUC Order No. 32923 and Public Utility Commission of Oregon (OPUC) Order No. 13-482 the company has continued to maintain these programs and use them at least three times per season. In 2018, Idaho Power began conducting analysis and soliciting public input for the 2019 IRP. During this process, the company is analyzing if and when expanded demand response capacity is needed to avoid system peak deficiencies.

Energy Efficiency

Idaho Power's portfolio of energy efficiency program energy savings remains strong in 2018. However, the savings, including the estimated savings from NEEA, slightly decreased to 183,378 MWh compared to the 2017 savings of 192,260 MWh—a 4.6 percent year-over-year decrease. The savings from Idaho Power's energy efficiency programs alone, excluding NEEA savings, was 158,412 MWh in 2018 and 167,819 MWh in 2017—a 5.6 percent year-over year decrease. Even so, the 2018 savings represent enough energy to power over 16,000 average homes in Idaho Power's service area for one year.

In 2018, the company's energy efficiency portfolio was cost effective from both the total resource cost (TRC) test and the utility cost test (UCT) perspectives with ratios of 2.26 and 3.04, respectively. The portfolio was also cost-effective from the participant cost test (PCT) ratio, which was 2.85.

Table 1. DSM programs by sector, operational type, location, and energy savings/demand reduction, 2018

Program by Sector	Operational Type	State	Savings/Demand Reduction
Residential			
A/C Cool Credit	Demand Response	ID/OR	29 MW
Easy Savings: Low-Income Energy Efficiency Education	Energy Efficiency	ID	30 MWh
Educational Distributions	Energy Efficiency	ID/OR	16,052 MWh
Energy Efficient Lighting	Energy Efficiency	ID/OR	18,857 MWh
Energy House Calls	Energy Efficiency	ID/OR	374 MWh
Fridge and Freezer Recycling Program*	Energy Efficiency	ID/OR	74 MWh
Heating & Cooling Efficiency Program	Energy Efficiency	ID/OR	1,556 MWh
Home Energy Audit Program	Energy Efficiency	ID	211 MWh
Home Energy Report Pilot Program	Energy Efficiency	ID	3,282 MWh
Multifamily Energy Savings Program	Energy Efficiency	ID/OR	656 MWh
Oregon Residential Weatherization	Energy Efficiency	OR	0 MWh
Rebate Advantage	Energy Efficiency	ID/OR	285 MWh
Residential New Construction Pilot Program	Energy Efficiency	ID/OR	777 MWh
Shade Tree Project	Energy Efficiency	ID	36 MWh
Simple Steps, Smart Savings™	Energy Efficiency	ID/OR	241 MWh
Weatherization Assistance for Qualified Customers	Energy Efficiency	ID/OR	650 MWh
Weatherization Solutions for Eligible Customers	Energy Efficiency	ID	572 MWh
Commercial/Industrial			
Commercial and Industrial Efficiency Program			
Custom Projects	Energy Efficiency	ID/OR	46,964 MWh
New Construction	Energy Efficiency	ID/OR	13,378 MWh
Retrofits	Energy Efficiency	ID/OR	34,911 MWh
Commercial Energy-Saving Kit	Energy Efficiency	ID/OR	442 MWh
Flex Peak Program	Demand Response	ID/OR	33 MW
Green Motors—Industrial	Energy Efficiency	ID/OR	64 MWh
Oregon Commercial Audits	Energy Efficiency	OR	n/a
Irrigation			
Green Motors—Irrigation	Energy Efficiency	ID/OR	68 MWh
Irrigation Efficiency Rewards	Energy Efficiency	ID/OR	18,934 MWh
Irrigation Peak Rewards	Demand Response	ID/OR	297 MW
All Sectors			
Northwest Energy Efficiency Alliance	Market Transformation	ID/OR	24,966 MWh

* Although the Fridge and Freezer Recycling program was discontinued in 2017, Idaho Power did have a few pickups in 2018.

Table 2. DSM program sector summary and energy usage/savings/demand reduction, 2018

	Energy Efficiency Program Impacts [a]			Idaho Power System Sales		
	Program Expenses	**Energy Savings (kWh)**	**Peak-Load Reduction (MW)[b]**	**Sector Total (MWh)**	**Percentage of Energy Usage**	**Number of Customers**
Residential	$ 10,310,503	43,651,278		5,139,473	35%	459,128
Commercial/Industrial	17,014,509	95,759,049		7,471,683	51%	71,222
Irrigation	2,953,706	19,001,507		1,976,587	13%	20,077
Market Transformation	2,500,165	24,966,000				
Demand Response	8,169,419	n/a				
Direct Overhead/ Other Programs	1,978,570	n/a				
Total Direct Program Expenses	**$ 42,926,872**	**183,377,834**		**14,587,743**	**100%**	**550,427**

[a] Energy, average energy, and expense data have been rounded to the nearest whole unit, which may result in minor rounding differences.
[b] Includes 9.7 percent peak line loss assumptions.

Customer Education

Idaho Power participated in a select group of events impacting large audiences or audiences expected to have a higher receptivity to energy-efficient messaging and behavior change. Idaho Power additionally participated in or sponsored 45 outreach activities, including events, presentations, trainings, and other activities. Idaho Power customer representatives throughout the service area delivered numerous other presentations to local organizations addressing energy efficiency programs and wise energy use. In 2018, Idaho Power's community education team provided 118 presentations on *The Power to Make a Difference* to 3,063 students and 122 classroom presentations on *Saving a World Full of Energy* to 2,803 students. The community education representatives and other staff also completed 24 presentations to senior citizen groups on energy efficiency programs and shared information about saving energy to 1,149 senior citizens in the company's service area.

Since 2008, the company's commercial and industrial training activities have informed and educated commercial and industrial customers regarding energy efficiency, increased awareness of and participation in existing energy efficiency and demand response programs, and enhanced customer satisfaction regarding energy efficiency initiatives. The level of participation in 2018 remained high, with 337 attendees for the technical sessions and almost 90 for the program workshops. The workshops covered the following topics: Commercial/Industrial Motor Efficiency; Commercial/Industrial Adjustable Speed Drives; Compressed Air Challenge Level II—Advanced Management of Compressed Air Systems; Energy Efficiency of Chilled Water Systems; Energy Efficiency of Cooling Towers; Advanced Lighting Control Systems; Energy Efficient Data Center; Industrial Refrigeration Systems Energy Management; Heating, Ventilation, and Air Conditioning (HVAC) Controls Training; and Optimizing Pumping Systems: A Measurement-Based Approach.

Surveying Customer Satisfaction

Idaho Power fields a variety of customer surveys throughout the program year. Some of these are overall customer satisfaction or relationship surveys and others measure customer satisfaction related to specific program offerings. Depending on the nature of the research, these surveys are typically conducted by telephone, online, or through the mail. Surveys are conducted internally or by third-party research vendors. Internally conducted surveys are managed by the customer relations and research coordinator with oversight by program specialists and/or the marketing department.

Based on surveys conducted in the last six months of 2017 and the first six months of 2018, Idaho Power ranked second out of 14 utilities included in the west region midsize segment of *the J.D. Power and Associates 2018 Electric Utility Residential Customer Satisfaction Study*. Fifty-two percent of the residential respondents in this study indicated they were aware of Idaho Power's energy efficiency programs, and on an overall basis, those customers were more satisfied with Idaho Power than customers who are unaware of the programs.

Burke, Inc., conducts quarterly customer relationship surveys to measure the overall customer relationship and satisfaction with Idaho Power among all customer segments. The Burke Customer Relationship Survey measures the satisfaction of a number of aspects of a customer's relationship with Idaho Power, including energy efficiency at a very high level. However, the survey is not intended to measure all aspects of energy efficiency programs offered by Idaho Power.

The 2018 results of Idaho Power's customer relationship survey showed record high overall customer satisfaction including an increase in meeting and exceeding customers' needs by encouraging energy efficiency. Sixty-seven percent of customers indicated their needs were met or exceeded by Idaho Power encouraging energy efficiency among its customers. Figure 9 depicts the percent of customers who indicated Idaho Power met or exceeded their needs concerning the energy efficiency efforts it encouraged each year since 2009.

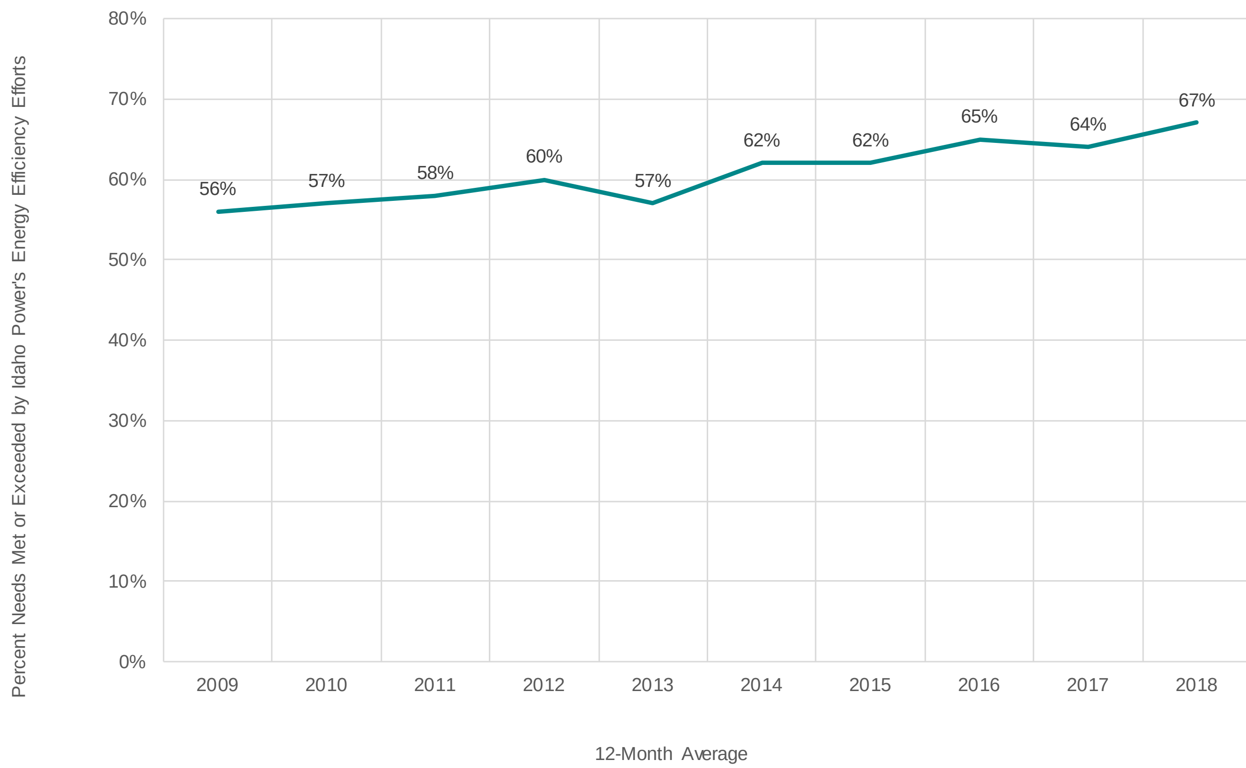

Figure 9. Customers' needs "met" or "exceeded" (percent), 2009–2018

The 2018 survey also asked three questions related to Idaho Power's energy efficiency programs: 1) Have you participated in any of Idaho Power's energy efficiency programs? 2) Which energy efficiency program did you participate in? and 3) Overall, how satisfied are you with the energy efficiency program? In 2018, 45 percent of the survey respondents across all sectors indicated they participated in at least one Idaho Power energy efficiency program, and 92 percent were “very” or “somewhat” satisfied with the program they participated in.

Results of sector-level, program-level, and/or marketing-related customer satisfaction surveys can be found later in this report.

Program Evaluation Approach

Idaho Power considers program evaluation an essential component of its DSM operational activities. The company uses third-party contractors to conduct impact, process, and other evaluations on a scheduled and as-required basis. In some cases, research and analyses are conducted internally and managed by Idaho Power’s Research and Analysis team within the Customer Relations and Energy Efficiency (CR&EE) department. Third-party evaluations are specifically managed by the company’s energy efficiency evaluator. Third-party contracts are generally awarded using a competitive-bid process managed by Idaho Power’s Corporate Services department.

Idaho Power uses industry-standard protocols for its internal and external evaluation efforts, including the National Action Plan for Energy Efficiency—Model Energy Efficiency Program Impact Evaluation Guide, the California Evaluation Framework, the International Performance Measurement and Verification Protocol (IPMVP), the Database for Energy Efficiency Resources, and the Regional Technical Forum’s (RTF) evaluation protocols.

The company also supports regional and national studies to promote the ongoing cost-effectiveness of programs, the validation of energy savings and demand reduction, and the efficient management of its programs. Idaho Power considers primary and secondary research, cost-effectiveness analyses, potential assessments, and impact and process evaluations to be important resources in providing accurate and transparent program-savings estimates. Idaho Power uses recommendations and findings from evaluations, research, and industry best practices to continuously refine its DSM programs.

For a summary of evaluation results, recommendations, and responses, see each program section. For copies of 2018 program evaluation reports and past and future evaluation schedules, see *Supplement 2: Evaluation*.

Cost-Effectiveness Goals

Idaho Power considers cost-effectiveness of primary importance in the design, implementation, and tracking of energy efficiency and demand response programs. Idaho Power’s energy efficiency and demand response opportunities are preliminarily identified through the IRP process. Idaho Power uses third-party energy efficiency potential studies to identify achievable cost-effective energy efficiency potential that is added to the resources included in the IRP. Because of Idaho Power’s diversified portfolio of programs, most of the new potential for energy efficiency in its service area is based on additional measures to be added to existing programs, rather than developing new programs.

Prior to the actual implementation of energy efficiency or demand response programs, Idaho Power performs a cost-effectiveness analysis to assess whether a potential program design or measure will be cost-effective from the perspective of Idaho Power and its customers. Incorporated in these models are inputs from various sources that use the most current and reliable information available.

Idaho Power's goal is for all programs to have benefit/cost (B/C) ratios greater than one for the TRC test, UCT test, and PCT at the program and measure level where appropriate. Each cost-effectiveness test provides a different perspective, and Idaho Power believes each test provides value when evaluating program performance. If a measure or program is found to be not cost-effective from one or more of the three tests, Idaho Power assesses the program or measure and runs the cost-effectiveness calculations under a variety of scenarios. There are many assumptions when calculating the cost-effectiveness of a given program or measure. For some measures within the programs, savings can vary based on factors, such as participation levels or the participants' locations. For instance, heat pumps installed in the Boise area will have less savings than heat pumps installed in the McCall area. If program participation and savings increase, fixed costs, such as labor and marketing, are distributed more broadly, and the program cost-effectiveness increases.

When a program or measure is shown to be not cost-effective, Idaho Power works with the Energy Efficiency Advisory Group (EEAG) to obtain input before making its determination on continuing or discontinuing an offering. If the measure or program is indeed offered, the company explains to EEAG and stakeholders why the measure or program was implemented or continued and the steps the company plans to take to improve its cost-effectiveness. The company believes this aligns with the expectations of the IPUC and OPUC.

As part of the public workshops on Case No. IPC-E-13-14, Idaho Power and other stakeholders agreed on a new methodology for valuing demand response. The settlement agreement, as approved in IPUC Order No. 32923 and OPUC Order No. 13-482, defined the annual cost of operating the three demand response programs for the maximum allowable 60 hours to be no more than $16.7 million. The annual value calculation will be updated with each IRP based on changes that include, but are not limited to, need, capital cost, or financial assumptions. This amount was reevaluated in the 2015 IRP to be $18.5 million. Under the 2017 IRP, this value is $19.8 million.

This value is the levelized annual cost of a 170-MW deferred resource over a 20-year life. The demand response value calculation will include this value even in years when the IRP shows no peak-hour capacity deficits. In 2018, the cost of operating the three demand response programs was $8.2 million. Idaho Power estimates that if the three programs were dispatched for the full 60 hours, the total costs would have been approximately $11.3 million and would have remained cost-effective. The settlement agreement also allowed Idaho Power to design its programs such that they can be dispatched three times a year with no variable costs. This is what Idaho Power normally does unless the capacity is needed to meet load.

Details on the cost-effectiveness assumptions and data are included in *Supplement 1: Cost-Effectiveness*.

Energy Efficiency Advisory Group

Formed in 2002, EEAG provides input on enhancing existing DSM programs and on implementing energy efficiency programs. Currently, EEAG consists of 13 members from Idaho Power's service area and the Northwest. Members represent a cross-section of customers from the residential, industrial, commercial, and irrigation sectors, and technical experts, as well as representatives from low-income households, environmental organizations, state agencies, county and city governments, public utility commissions, and Idaho Power.

EEAG meets quarterly and, when necessary, Idaho Power facilitates conference calls and/or webinars to address special topics. In 2018, four EEAG meetings were held: February 8, May 1, August 9, and October 30. EEAG meetings are generally open to the public and attract a diverse audience. Idaho Power appreciates the input from the group and acknowledges the commitment of time and resources the individual members give to participate in EEAG meetings and activities.

During these meetings, Idaho Power discussed new energy efficiency program ideas and new measure proposals, marketing methods, and specific measure details. The company provided the status of energy efficiency expenses and Idaho and Oregon Rider funding, gave updates of ongoing programs and projects, and supplied general information on DSM issues and other important issues occurring in the region. Experts were invited to speak about evaluations, research, and other topics of interest.

Idaho Power relies on input from EEAG to provide a customer and public-interest view of energy efficiency and demand response. Additionally, Idaho Power regularly provides updates on current and future cost-effectiveness of energy efficiency programs and the changes in IRP provides updates on DSM alternate costs, which Idaho Power uses in calculating cost-effectiveness. In each meeting, Idaho Power requests feedback from EEAG members on energy efficiency and demand response programs, specific measures, and incentives. EEAG often recommends presentation ideas for future meetings.

Throughout 2018, Idaho Power relied on input from EEAG on the following important topics.

Residential Energy-Saving Kits

The deemed savings that had been previously applied to the Giveaway Energy-Saving Kits (ESK) were no longer being supported by the RTF, and the new deemed savings did not apply to the Giveaway ESKs as designed. Idaho Power presented options on how to manage the giveaways moving forward, including changing the kits to match the savings that were supported by the RTF or keeping the ESKs as-is and continuing to apply the previous savings. EEAG agreed the company should continue to distribute Giveaway ESKs to customers who call about their high bills and at various events, while continuing to apply the previous deemed savings. EEAG agreed this effort should be continued as this interaction is targeted to a more engaged customer.

Simple Steps, Smart Savings

Idaho Power reported to EEAG that the incremental price difference between standard and high efficiency showerheads had become small and asked the group if the company should continue with incentives for this measure. The group suggested the company should consider market indicators before deciding whether to continue offering this measure. Based on EEAG's feedback and findings from researching the market that indicated inefficient showerheads are still available, the group recommended the company should continue offering these showerheads as part of the program.

School Cohort

EEAG was asked for input regarding continuation with year-two of the School Cohort. The group expressed appreciation that the company is looking for ways to improve and continue this program. The consensus of the group was that Idaho Power should continue this effort for the second year.

A/C Cool Credit

The company informed EEAG that it was unable to communicate with a small number of load control devices and it committed to develop a plan to test these devices. The company provided detailed information regarding the proposed testing protocol and explained that, as a last resort, participants would be removed from the program if reliable communication could not be established. After further discussion, the group was in favor of Idaho Power moving forward with the new testing protocol.

Smart-Saver Pledge

At the October 2017 meeting, Idaho Power updated EEAG regarding the status of the 2018 campaign. Previously, EEAG members were asked to work in groups to help Idaho Power come up with new low-cost or no-cost items to use in the pledge. As a result, four out of the five items listed on the 2018 pledge form came from that break out session.

Idaho Power Field Staff

Idaho Power has a wide array of field personnel who have regular and almost continual contact with its customers provide this service throughout the Idaho Power service area. These expert energy advisors include: major account and combo representatives, customer representatives, agriculture representatives, community education representatives, and customer solutions advisors. All the representatives are subject-matter experts in their respective fields and provide added support for customers through strong working relationships. These representatives promote Idaho Power's energy efficiency programs and help customers to use energy wisely.

Future Plans for DSM Programs

Idaho Power will continue to pursue all prudent cost-effective energy and an appropriate amount of demand response based on the demand response settlement agreement approved in IPUC Order No. 32923 and OPUC Order No. 13-482. The forecast level of energy efficiency and the needed level of demand response are determined by Idaho Power's biennial IRP planning process. Idaho Power includes all achievable cost-effective energy savings as identified in its potential studies in each IRP and considers this achievable potential a reasonable 20-year planning estimate. However, the company does not consider the achievable potential as a ceiling limiting energy efficiency acquisition. The IRP is developed in a public process that details Idaho Power's strategy for economically maintaining the adequacy of its power system into the future. The IRP process balances reliability, cost, risk, environmental concerns, and efficiency to develop a preferred portfolio of future resources to meet the specific energy needs of Idaho Power's customers.

The company will explore new energy-savings potential through third-party resources, conferences, and regional organizations, and will continue to assess and develop new program offerings through its Program Planning Group (PPG). Idaho Power will work in consultation with EEAG to expand or modify its energy efficiency portfolio. Future plans for individual programs are included under each program's *2019 Program and Marketing Strategies* section.

In 2018, Idaho Power will continue to enhance its marketing and outreach efforts as described in the Marketing section of this report and within each program section. Idaho Power will continue to work with NEEA on its market transformation activities during the 2015–2019 funding cycle and will participate in discussions with NEEA concerning its 2020–2024 funding cycle.

The company will complete its research and evaluation, measurement, and verification (EM&V) projects included in the evaluation plan in *Supplement 2: Evaluation*.

DSM Annual Report Structure

The *Demand-Side Management 2018 Annual Report* consists of this main document and two supplements.

The main document contains the following sections related to 2018 DSM activities: 1) program activities by customer sector (residential, commercial/industrial, and irrigation) including marketing efforts, cost-effectiveness analysis, customer satisfaction survey results, and evaluation recommendations and responses for each program; 2) other program and activity details including market transformation; 3) and four appendices of data related to payments, funding, and program-level costs and savings. Where appropriate, plans for 2019 are also discussed. Historical data related to energy efficiency programs and demand response activities that was traditionally reported in Appendix 4, has been moved to *Supplement 2: Evaluation* in the *Other* section.

Supplement 1: Cost-Effectiveness describes the standard cost-effectiveness tests for Idaho Power programs and reports current-year program-level and summary cost-effectiveness and expenses by funding source and cost category.

Supplement 2: Evaluation includes an evaluation and research summary, an evaluation plan, EEAG meeting notes, links to NEEA evaluations, and copies of Integrated Design Lab (IDL) reports, research and survey reports, evaluation reports, and other reports (including the historical program data mentioned above).

2018 DSM Program Activity

DSM Expenditures

Funding for DSM programs in 2018 came from several sources. The Idaho and Oregon Rider funds are collected directly from customers on their monthly bills. The 2018 Idaho Rider was 3.75 percent of base revenues. On November 9, 2018 Idaho Power filed Advice No. 18-10 with the OPUC to increase the Oregon Rider collection percentage from 3 percent to 4 percent of base revenues. Concurrently, Idaho Power filed Advice No. 18-11 to lower the collection percentage of the Solar Photovoltaic Pilot Program Rider, and in both advice filings requested to transfer $5.5 million from the Solar Photovoltaic Pilot Program Rider balance to the Oregon Rider balance. Both advice filings received OPUC approval on December 18, 2018. Additionally, Idaho demand response program incentives were paid through base rates and the annual PCA mechanism. DSM expenses not funded through the Rider are included as part of Idaho Power's ongoing operation and maintenance (O&M) costs.

Total DSM expenses funded from all sources were $44.3 million in 2018. At the beginning of 2018, the Idaho Rider balance was approximately $0.4 million, and by December 31, 2018, the positive balance was $5.3 million. At the beginning of 2018, the Oregon Rider negative balance was approximately $6.3 million, and by year-end, the negative balance was $1.4 million.

Table 3 shows the total expenditures funded by the Idaho and Oregon riders and non-rider funding resulting in Idaho Power's total DSM expenditures of $44,262,080. The non-rider funding category includes the company's demand response Idaho incentives, Weatherization Assistance for Qualified Customers (WAQC) expenses, and O&M costs.

Table 3. 2018 funding source and energy savings

Funding Source	Expenses	MWh Savings
Idaho Rider	$ 33,663,001	176,204
Oregon Rider	1,757,910	6,524
Idaho Power Base Rates	8,841,168	650
Total	**$ 44,262,080**	**183,378**

Table 4 and Figure 10 indicate 2018 DSM program expenditures by category. The Materials & Equipment category includes items that directly benefit customers: ESKs and LED lightbulbs distributed at customer events ($2,255,883) and direct-install weatherization measures ($125,000). The expenses in the Other Expense category include marketing ($1,270,112), program evaluation ($97,448), program training ($168,278), and Custom Projects energy audits ($259,821). The Purchased Services category includes payments made to NEEA and third-party contractors who help deliver Idaho Power's programs.

Table 4. 2018 DSM program expenditures by category

	Total	% of Total
Incentive Expense	$ 25,114,246	57%
Labor/Administrative Expense	3,867,974	8%
Materials & Equipment	2,638,648	6%
Other Expense	2,148,339	5%
Purchased Services	10,492,873	24%
Total 2018 DSM Expenditures by Category	**$ 44,262,080**	**100%**

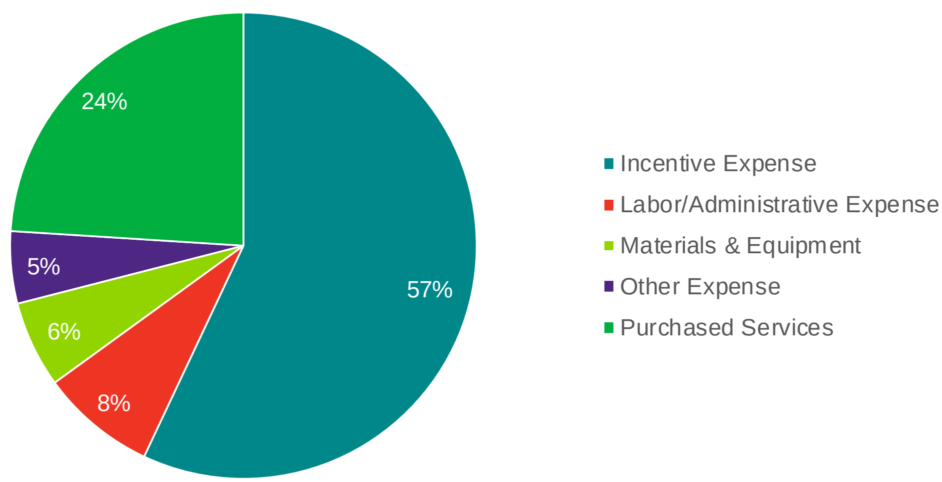

Figure 10. 2018 DSM program expenditures by category

Table 5. 2018 DSM program incentive totals by program type and sector

Program Type—Sector	Total	% of Total
DR[a]—Residential	$ 379,237	2%
DR—Commercial/Industrial	371,496	1%
DR—Irrigation	6,636,510	26%
EE[b]—Residential	2,029,822	8%
EE—Commercial/Industrial	13,180,964	53%
EE—Irrigation	2,516,217	10%
Total Incentive Expense	**$ 25,114,246**	**100%**

[a] DR = demand response
[b] EE = energy efficiency

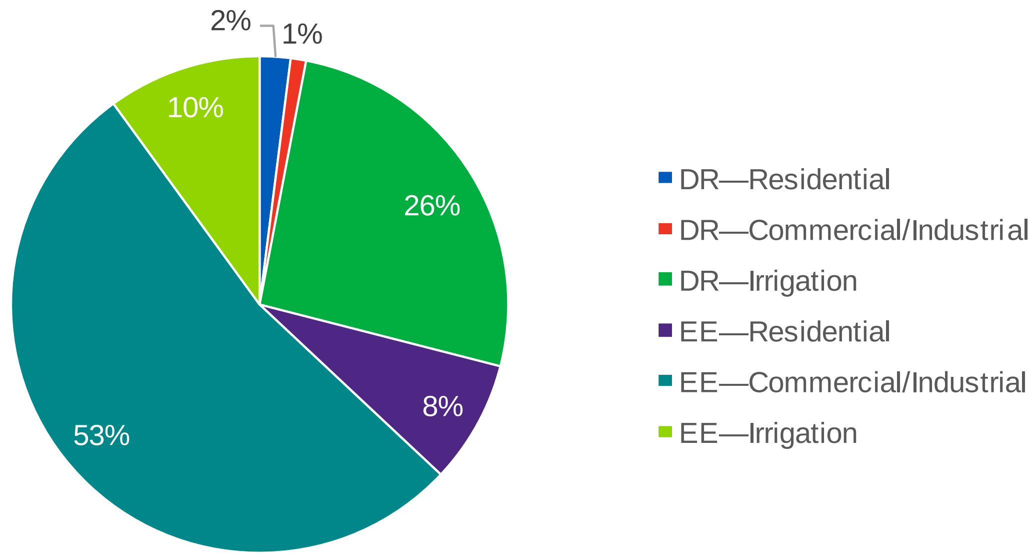

Figure 11. DSM program incentives by segment and sector, 2018

Marketing

Idaho Power used multi-channel marketing and public relations strategies in 2018 to improve communication and increase energy efficiency program awareness among its customers. Idaho Power uses a wide variety of media and marketing. Owned media (social, website, and newsletters) and paid media (advertising and sponsorships) allow Idaho Power to control content. Earned unpaid media (news coverage, Idaho Power's *News Briefs* sent to reporters, third-party publications, and television news appearances) give Idaho Power access to audiences through other channels and help establish credibility and brand trust. Though Idaho Power has less control of the content with earned unpaid media, the value is established from the third-party endorsement.

The following describes a selection of the methods, approaches, and strategies used by Idaho Power to engage with customers regarding energy efficiency, along with their results. See the respective Sector Overviews and program sections later in this report for the company's marketing efforts specific to those areas.

Social Media

Approximately 25 percent of the company's total social media content promoted energy efficiency in 2018. Idaho Power regularly posted messages encouraging energy efficiency behaviors, program enrollment, and customer engagement on Facebook, Twitter, YouTube, and LinkedIn. Social media content also showcased local businesses and organizations that have benefitted from Idaho Power energy efficiency efforts. Idaho Power engaged with customers posting their own social media content about Idaho Power programs such as Energy-Saving Kits and Welcome Kits.

Figure 12. Idaho Power shares energy efficiency tips and engages with customers on social media.

In 2018, Idaho Power continued its *#TipTuesday* posts on Facebook and Twitter. *#TipTuesday* posts provided Idaho Power's Facebook and Twitter followers with an energy efficiency tip or program information every Tuesday of the year, with the exception of a brief hiatus in September while the team worked to update design and strategy. The posts used photos and included the hashtag *#TipTuesday* so the tips could be categorized together and easily identified by social media users. For the first time, the company paid to "boost" a few *#TipTuesday* posts to increase reach to Idaho Power Facebook followers and their friends. Facebook charges a fee to boost a post to target specific audiences.

Idaho Power's Facebook followers increased 9.6 percent in 2018, from 17,645 at the end of 2017 to 19,340 at the end of 2018. Though the number of followers increased overall, the rate Idaho Power added followers is slightly lower in 2018 because Facebook changed to an algorithm that promotes interactions from friends and family over content from businesses or brands. In this new Facebook environment, it is harder to reach followers or gain new followers without paying for advertising.

Idaho Power uses Twitter to communicate with customers, the media, and business partners about media items, large outages, and energy efficiency. Idaho Power's Twitter followers increased 5 percent in 2018, from 5,510 followers to 5,785. Twitter growth is a lower priority for Idaho Power, as Facebook is a much more widely used and more popular platform for engaging directly with all customer demographics.

Idaho Power saw a very favorable increase in followers on LinkedIn: up 24 percent from 2017. The increase is attributed to a concerted effort to engage business and commercial customers in energy efficiency on LinkedIn, as well as position the company as a good corporate citizen and employer of choice.

Website

Idaho Power tracked the number of page views to the main energy efficiency pages—also known as landing pages—on the company's website. In 2018, the company's energy efficiency homepage received 35,326 page views, the residential landing page received 213,183, and the business and irrigation landing pages received 13,394. Idaho Power uses Google Analytics to analyze web activity. Google's definition of page views is the total number of pages viewed, with repeated views of a single page by one user counted as a new view.

Bill Inserts

A February bill insert promoting Idaho Power's Empowered Community, which is often surveyed on topics related to energy efficiency, was sent to 329,379 customers. Read more about the Empowered Community in the Residential Sector Overview. Other program-specific bill inserts were also sent throughout the year. Information about those can be found in each program later in this report.

Public Relations

Idaho Power's public relations (PR) staff supported energy efficiency programs and activities through multiple channels: *eNews* videos telling energy efficiency success stories; *Connections*, a monthly customer newsletter distributed in approximately 410,000 monthly bills and available online; *News Briefs*, a weekly email of interesting news items sent to all media in the company's service area; pitching and participating in news stories; energy efficiency TV segments in three markets (KTVB in Boise, KPVI in Pocatello, and KMVT in Twin Falls); news releases; and public events (such as incentive check presentations).

In 2018, the April and October issues of *Connections* were devoted to energy efficiency. The April issue included stories about Idaho Power's heat pump water heater (HPWH) incentive for residential customers, the winners of the 2017 Smart-Saver Pledge contest, and an energy-saving success story at Alpine Automotive in McCall. The October edition of *Connections* focused on fixing leaks to keep homes cozy, the benefits of Home Energy Audits, and the kickoff of the 2018 Smart-Saver Pledge.

Idaho Power produced a number of videos championing energy efficiency in 2018. Examples include wintertime energy savings tips; ductless heat pumps (DHP); energy-savings success at Alpine Automotive in McCall, Roaring Springs and Wahooz in Meridian, and the Pocatello School District; the Multifamily Energy Saving Program; and a series of quick tip for social media. Collectively, energy efficiency videos posted in 2018 received more than 2,700 views on YouTube and an additional 5,600 views on Facebook.

The monthly energy efficiency television segments continued to receive positive feedback. Topics included energy-saving New Year's resolutions, Energy-Saving Kits, energy efficient spring planting, ways to beat the summer heat, and energy efficient holiday cooking and decorating. Idaho Power representatives conducted the energy efficiency segments on stations in Boise, Twin Falls and Pocatello.

In Pocatello, the station discontinued regular monthly segments because of a format change late in the year, but a customer representative made several TV appearances and was interviewed on the radio for topics related to energy efficiency in October and November.

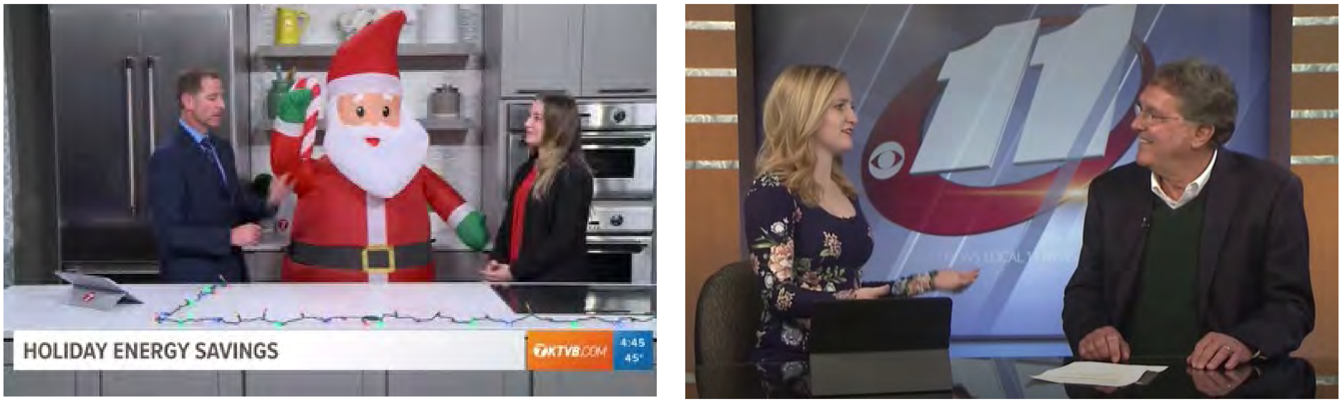

Figure 13. Idaho Power appearances on KTVB and KMVT

Media outreach efforts resulted in a variety of earned media coverage focused on energy efficiency. Energy efficiency topics were pitched in *News Briefs* throughout the year, and the company earned media coverage in multiple markets spanning print, TV, and radio. Some of the most popular story topics included winter savings tips in January, a large incentive check for SUEZ Water in September, and Idaho Power receiving the Governor's Award for Excellence in Energy Efficiency in October.

Staff Activities

Idaho Power staff networks with organizations across the region and industry to ensure it is informed about current and future marketing trends and successes. NEEA and Idaho Power staff held regular meetings throughout 2018 to coordinate, collaborate, and facilitate marketing for all sectors. All marketing activities were reviewed for progress, results, and collaborative opportunities.

To build marketing networks and to learn what works in other regions, Idaho Power staff attended the E Source Utility Marketing Executive Council and E Design Conference in April and the E Source Utility Marketing Executive Council and Forum in September.

2019 Marketing Activities

In 2019, the Idaho Power marketing department plans to introduce new strategies to expand the reach and visibility of the company's energy efficiency ads.

The marketing team will update the Residential Energy Efficiency Awareness Campaign and consider running it on new digital platforms. Idaho Power will continue to support various business organizations and programs focused on promoting energy efficiency and will explore radio advertisements and additional resources targeted toward small businesses. Additionally, the company will continue to update collateral and displays for irrigation programs and trade shows.

See the Sector Overviews for more specific marketing plans for the future.

Cost-Effectiveness Results

In 2018, 18 individual measures in various program are shown to be not cost-effective from either the UCT or TRC perspective. These measures will be discontinued, analyzed for additional non-energy benefits (NEB), modified to increase potential per-unit savings, or monitored to examine their impact on the specific program's overall cost-effectiveness.

Most of Idaho Power's energy efficiency programs were cost-effective from the perspective of all tests, except for the Heating and Cooling Efficiency (H&CE) Program, Shade Tree Project, and the weatherization programs for income-qualified customers.

Heating & Cooling Efficiency Program

The H&CE Program has a UCT of 1.65, TRC of 0.83, and PCT of 1.50. In 2016, Idaho Power reviewed the program's cost-effectiveness and notified EEAG at the August 30, 2016, meeting that the program was anticipated to be not cost-effective from the TRC perspective. Idaho Power has continued to update EEAG of its efforts to improve the program's cost-effectiveness.

Throughout 2017 and into 2018, Idaho Power worked toward improving program cost-effectiveness. These tactics included: 1) reassigning non-program labor, 2) reducing marketing spend while optimizing campaigns, 3) reducing contractor incentives from $150 to $50, and 4) adding heat pump water heaters to the program. These efforts were successful in keeping cost-effectiveness ratios from falling in 2018 over 2017 levels. However, calibrations to end-use load shapes created for the 2016 energy efficiency potential study offset cost-effectiveness gains from cost control efforts in 2018. Had Idaho Power used the same load shape as was used for the 2017 program year, the program would have had a TRC just over 1.0.

Shade Tree Project

The Shade Tree Project has a UCT of 0.71, a TRC of 0.80. The cost-effectiveness for the program is based on the modeled savings for the tree distributed in 2018 and the costs incurred during 2018. It is estimated that these trees will begin saving 35,425 kWh in 2022 and 116,197 kWh by year 2038.

The shade tree calculator assumes a measure life of 20 years for the average tree. However, the most common tree species distributed in 2018 have an average life of 50 to 500 years according to the United States Department of Agriculture and the Urban Forest Ecosystem Institute. While the savings beyond 2038 are unknown, if the energy savings were to stay constant beyond year 20, it can be assumed the program would be cost-effective from both the UCT and TRC perspective if the program life was revised to 30 years.

Weatherization Programs

The WAQC program had a TRC of 0.52 and a UCT ratio of 0.43, and the Weatherization Solutions for Eligible Customers (Weatherization Solutions) program had a TRC of 0.51 and a UCT ratio of 0.37. The programs showed a slight increase in cost-effectiveness ratios over 2017. However, the cost-effectiveness ratios will decline slightly again in 2019 with the full adoption of the 2017 IRP DSM alternate costs. Also in 2019, both WAQC and Solutions will have updated per-home savings based on a billing analysis of the homes weatherized between 2015–2017.

Table 6. Cost-effectiveness summary by energy efficiency program

Program/Sector	UCT	TRC	Ratepayer Impact Measure (RIM)	PCT
Educational Distributions	2.68	4.51	0.58	N/A
Energy Efficient Lighting	4.67	6.64	0.59	13.05
Energy House Calls	1.37	1.74	0.42	N/A
Heating & Cooling Efficiency Program	1.65	0.83	0.47	1.50
Multifamily Energy Savings Program	1.60	3.00	0.47	N/A
Rebate Advantage	1.93	1.08	0.45	2.09
Residential New Construction Pilot Program	2.51	1.23	0.59	1.97
Shade Tree Project	0.71	0.80	0.57	N/A
Simple Steps, Smart Savings	1.44	4.68	0.48	8.54
Weatherization Assistance for Qualified Customers	0.43	0.52	0.25	N/A
Weatherization Solutions for Eligible Customers	0.37	0.51	0.22	N/A
Residential Energy Efficiency Sector	**2.37**	**3.16**	**0.54**	**10.03**
Commercial and Industrial Energy Efficiency Program				
Custom Projects	3.85	2.32	1.18	1.92
New Construction	3.97	1.79	0.89	1.88
Retrofits	3.58	1.45	0.87	1.55
Commercial Energy-Saving Kits	1.56	2.50	0.65	N/A
Commercial/Industrial Energy Efficiency Sector *	**3.75**	**1.87**	**1.01**	**1.76**
Irrigation Efficiency Rewards	4.57	3.03	1.29	2.73
Irrigation Energy Efficiency Sector **	**4.60**	**3.04**	**1.29**	**2.73**
Energy Efficiency Portfolio	**3.04**	**2.26**	**0.83**	**2.85**

* Commercial/Industrial Energy Efficiency Sector cost-effectiveness ratios include savings and participant costs from Green Motors Rewinds.
** Irrigation Energy Efficiency Sector cost-effectiveness ratios include savings and participant costs from Green Motors Rewinds.

Details on the cost-effectiveness assumptions and data are included in *Supplement 1: Cost-Effectiveness.*

Customer Satisfaction Surveys

Idaho Power does not separately survey most energy efficiency program participants each year. This is primarily due to a concern of over-surveying program participants and because the measures and specifics of most program designs do not change annually. To ensure meaningful research in the future, Idaho Power conducts program research periodically (every two to three years), unless there have been major program changes. Throughout 2018, Idaho Power administered several surveys regarding energy efficiency programs to measure customer satisfaction. Some surveys were administered by a third-party contractor; other surveys were administered by Idaho Power either through traditional paper or electronic surveys or through the company's Empowered Community online survey. Results of these studies are included in *Supplement 2: Evaluation*.

The sector-level results of the *2018 Burke Customer Relationship Survey* are available in each Sector Overview of this report: Residential, Commercial and Industrial, and Irrigation.

Evaluations

In 2018, Idaho Power contracted with Tetra Tech MA to conduct three program impact evaluations and one program process evaluation, DNV GL to conduct a program savings determination analysis, Resource Action Programs to conduct two program summary analyses, and Aclara to conduct one program summary analysis. Impact evaluations were performed for Energy Efficient Lighting, Multifamily Energy Savings Program, and the Custom option of the Commercial and Industrial Energy Efficiency Program. A process evaluation was performed for the Multifamily Energy Savings Program and a savings determination analysis was conducted for the Shade Tree Project. Program summary analyses were performed for the Energy-Saving Kit Program, the Energy Wise Program, and the Home Energy Report pilot project. Idaho Power conducted internal analyses of the 2018 demand response events for A/C Cool Credit, Irrigation Peak Rewards, and Flex Peak Program.

A summary of each of these evaluations is available in the respective program section. An evaluation schedule and the final reports from evaluations and research completed in 2018 are provided in *Supplement 2: Evaluation*.

Residential Sector Overview

Idaho Power's residential sector consists of 460,717 customers; Idaho customers number 447,282 and eastern Oregon has 13,435. In 2018, the number of residential sector customers increased by 10,328, an increase of 2.3 percent from 2017. The residential sector represented 35 percent of Idaho Power's actual total electricity usage and 44 percent of overall revenue in 2018.

Table 7 shows a summary of 2018 participants, costs, and savings from the residential energy efficiency programs.

Table 7. Residential sector program summary, 2018

			Total Cost		Savings	
Program	**Participants**		**Utility**	**Resource**	**Annual Energy (kWh)**	**Peak Demand (MW)**
Demand Response						
A/C Cool Credit	26,182	homes	$ 844,369	$ 844,369		29
Total			**$ 844,369**	**$ 844,369**		**29**
Energy Efficiency						
Easy Savings: Low-Income Energy Efficiency Education	282	HVAC tune-ups	$ 147,936	$ 147,936	29,610	
Educational Distributions	94,717	kits/giveaways	3,180,380	3,180,380	16,051,888	
Energy Efficient Lighting	1,340,842	lightbulbs	2,435,130	3,277,039	18,856,933	
Energy House Calls	280	homes	160,777	160,777	374,484	
Fridge and Freezer Recycling Program	304	refrigerators/freezers	33,907	33,907	73,602	
Heating & Cooling Efficiency Program	712	projects	585,211	1,686,618	1,556,065	
Home Energy Audit	466	audits	264,394	321,978	211,003	
Home Energy Report Pilot Program	23,914	treatment size	194,812	194,812	3,281,780	
Multifamily Energy Savings Program	25	projects	205,131	205,131	655,953	
Oregon Residential Weatherization	5	audits	5,507	5,507		
Rebate Advantage	107	homes	147,483	355,115	284,559	
Residential New Construction Pilot Program	307	homes	400,912	926,958	777,369	
Shade Tree Project	2,093	trees	162,995	162,995	35,571	
Simple Steps, Smart Savings	7,377	appliances/ showerheads	90,484	133,101	241,215	
Weatherization Assistance for Qualified Customers	193	homes/non-profits	1,272,973	1,819,491	649,505	
Weatherization Solutions for Eligible Customers	141	homes	1,022,471	1,022,471	571,741	
Total			**$ 10,310,503**	**$13,634,216**	**43,651,278**	

Notes:
See Appendix 3 for notes on methodology and column definitions.
Totals may not add up due to rounding.

Marketing

Idaho Power ran a multi-faceted advertising campaign in the spring (April and May) and fall (October and November) to raise and maintain awareness of the company's energy efficiency programs for residential customers and to demonstrate that saving energy does not have to be challenging (Figure 14). The campaign utilized radio, television, newspaper advertisements (ads), digital ads, Facebook ads, *News Briefs* sent to the media, the *Connections* newsletter, and Idaho Power's website to reach a variety of customer demographics. New in 2018, the company added print publications, YouTube video ads, Idaho Public TV, Google Ads, and digital ads at the Bogus Basin lodge. The company also continued the Smart-Saver Pledge sweepstakes (initiated in 2016) to engage and encourage customers to make an energy-saving behavior change.

Figure 14. Energy efficiency awareness campaign ad example

The company also continued to update individual program materials using the overall campaign imagery and theme to ensure a consistent look and feel among programs.

Below are Idaho Power's numerous marketing efforts to promote energy-saving tips and the company's energy efficiency programs, along with resulting data. Marketing tactics related to a specific sector or program are detailed in those respective sections later in this report.

Email

In May 2018, Idaho Power launched an effort to communicate via email with residential customers who had previously provided their addresses for a variety of reasons. An initial email was sent to 143,579 residential email addresses informing customers that Idaho Power will begin communicating with them via email and encouraging them to set their preferences to identify which categories of information they would like to receive emails about. The email categories included: company news, energy savings, green options, and ways to pay.

Idaho Power sent emails promoting the company's campgrounds, Energy-Saving Kits, paperless and auto pay, the Smart-Saver Pledge, energy-saving tips to prepare for winter, and a powering-the-holidays greeting. The emails had an average unique open rate of about 37 percent and an average unique click rate of about 4 percent. According to SendGrid's 2018 Global Email Benchmark Report, the aggregate open rate for energy and utilities is 31 percent and the aggregate click rate is 4.4 percent.

Figure 15. Idaho Power Smart-Saver Pledge email

Digital

Idaho Power placed ads on weatherbug.com and the WeatherBug app in the spring and in other online venues as part of the spring and fall campaign. The WeatherBug ads received 1,708,993 impressions (defined as the number of times an ad was displayed), 3,696 clicks, and a click-through rate (the percent of customers who clicked the ad and were directed to Idaho Power's Savings For Your Home web page) of 0.22 percent.

In the spring, web users were exposed to 1,785,483 display ads (image ads embedded into a website) based on their demographics, related to online articles they viewed or their use of a particular mobile web page or app. Users clicked on the ads 3,164 times, resulting in a click-through rate of 0.18 percent. In the fall, the display ads received 2,395,638 impressions and 2,393 clicks, resulting in a click-through rate of 0.10 percent.

Idaho Power began using Google search ads in 2018. When people search for terms related to energy efficiency, energy efficiency programs, and individual program measures, the company's ads appear and drive them to the appropriate energy efficiency web page. These ads received 9,643,409 impressions and

116,381 clicks throughout the year. The search terms with the highest engagement were Idaho Power, Idaho power company, idaho power, +Idaho +power rebates, smart thermostat, new +water +heater, idaho power boise, and tankless water heater.

Figure 16. Google search ad example

Idaho Power ran digital ads on radio station websites and on the television screens in the Bogus Basin Lodge during the 2017–2018 ski season. Idaho Power leveraged mobile geolocation services/technology to display digital ads to people in and around select movie theaters. These ads resulted in 243,736 impressions, 3,283 clicks and a click-through rate of 1.31 percent in the spring and 250,770 impressions, 962 clicks and a click-through rate of 0.38 percent in the fall. These digital ads ran in conjunction with on-screen and lobby ads playing within the theaters.

The company also ran ads on Pandora internet radio, YouTube, and Hulu. Those results can be found in the Radio and Television sections, respectively.

Television

Idaho Power used network television, Hulu, and YouTube advertising for the spring and fall campaign. The network television campaign focused on primetime and news programming that reaches the highest percentage of the target market: adults age 25 to 64.

During the spring campaign, an ad ran 1,959 times in the Boise, Pocatello, and Twin Falls media markets. The ads reached 71.5 percent of the Boise target audience, 60.1 percent of Twin Falls target audience, and 70.2 percent of the Pocatello target audience. The targeted customers saw the ad 9.9 times in Boise, 11.5 times in Twin Falls, and 8.3 times in Pocatello. Hulu ads delivered 419,083 completions, meaning that the ad was viewed in its entirety. YouTube video ads resulted in 534,620 impressions and 186,761 views.

During the fall campaign, the spot ran 1,609 times in the Boise, Pocatello, and Twin Falls media markets. The ads reached 68.6 percent of the Boise target audience, 41.3 percent of Twin Falls target audience, and 36.1 percent of the Pocatello target audience. The targeted customers saw the ad 5 times in Boise, 5.7 times in Twin Falls and 4.6 times in Pocatello. Hulu ads received 405,763 completions and YouTube video ads delivered 393,669 impressions and 146,206 views.

New in 2018, Idaho Power sponsored Idaho Public Television's *This Old House* and *Ask This Old House*. Fifty-two 15-second spots ran from April through September; the ads reached 7,634 households.

Radio

As part of its spring and fall campaign, Idaho Power ran 30-second radio spots on major commercial radio stations in the service area. To obtain optimum reach, the spots ran on a variety of station formats, including classic rock, news/talk, country, adult alternative, adult contemporary, and classic hits. The message was targeted toward adults age 25 to 64 throughout Idaho Power's service area.

Results of the spots are provided for the three major markets: Boise, Pocatello, and Twin Falls. During the spring campaign, Idaho Power ran 2,820 English radio spots. These spots reached 69.6 percent of the target audience in Boise, 81 percent in Pocatello, and 85.7 percent in Twin Falls. The target audience in Boise was exposed to the ad 7.6 times, 10.8 times in Pocatello, and 13.8 times in Twin Falls. During the fall campaign, the company ran 2,843 English radio spots. These spots reached 76.7 percent of the target audience in Boise, 47.4 percent of the target audience in Pocatello, and 90.4 percent of the target audience in Twin Falls. The target audience was exposed to the message eight times in Boise, 12.1 times in Pocatello, and 18.4 times in Twin Falls during the fall campaign.

Idaho Power also ran ads on Spanish-speaking radio stations and National Public Radio (NPR) stations in the service area. These ads ran 670 times in the spring and 732 times in the fall.

Idaho Power ran 30-second spots with accompanying visual banner ads on Pandora internet radio, which is accessed by mobile and web-based devices. In the spring, records show 1,049,382 impressions and 162 clicks to the Idaho Power residential energy efficiency web page. The fall ads yielded 1,055,222 impressions and 126 clicks. Other online radio ads resulted in 4,812 impressions and 164 clicks/plays.

Print

As part of the campaign, print advertising ran in the major daily and select weekly newspapers throughout the service area. The company also ran ads in the Idaho Shakespeare Festival program, Boise Hawks program, *Territory Magazine*, *Idaho Magazine*, Broadway in Boise program, and *Sun Valley Magazine*. The ads highlighted individual energy efficiency program options, such as how to get a home energy audit or the benefits of installing a DHP. The ads informed customers that Idaho Power can help them save energy and money regardless of whether they own or rent. The ads were scheduled for 2,168,892 impressions in 2018.

In 2018, Idaho Power developed a spiral-bound guide outlining each of the residential energy efficiency programs, tips, and resources. The guide was included in Welcome Kits mailed out to 30,500 new customers, provided to Weatherization Assistance customers, and handed out at a variety of events including the Building Owners and Managers Association (BOMA) Symposium, Idaho Remodeling & Design Show, Incredible Age Expo, FitOne℠ Expo, Smart Women Smart Money, Eastern Idaho Fair, Portneuf Environmental Fair, home shows in Pocatello, Twin Falls, Boise and Nampa, and more.

Social Media

Idaho Power's Facebook ads averaged 424,248 impressions and received 11,492 link clicks during the spring energy efficiency campaign. During the fall campaign, Facebook ads averaged 284,655 impressions and resulted in 1,384 link clicks, per available data. Due to a lapse in Facebook reporting, data for one November ad is not available, bringing the total impression and link click data down significantly. Fall campaign results may also be lower than previous months (2017 and 2018 campaigns) due to saturation of the market. In targeting the same service area with the same ads over multiple months, Facebook users may have started to scroll past the familiar ad rather than engage. Throughout the year, Idaho Power used Facebook posts and boosted posts for various programs.

Public Relations

Many of the company's PR activities focused on the residential sector. Energy-saving tips videos, TV segments, *News Briefs* content and *Connections* newsletter articles often aim to promote incentive programs and/or educate customers about behavioral or product changes they can make to save energy in their homes. Idaho Power also promoted the Smart-Saver Pledge, including outreach in *Connections*, *News Briefs*, and through regional TV segments.

See the Program Activity section and the Commercial and Industrial Sector Overview for more 2018 PR activities.

Empowered Community

In 2015, Idaho Power created the Empowered Community, an online community of residential customers, to measure customer perceptions on a variety of company-related topics, including energy efficiency. The community has almost 1,800 actively engaged members from across Idaho Power's service area. On average, Idaho Power sends one survey per month to active members. In 2018, Idaho Power included 11 energy efficiency messages with survey invitations to members resulting in over 8,700 touchpoints.

Email Test

In March and April, the company ran a pilot program with a subset of Empowered Community participants who agreed to receive and review a set of four emails and corresponding surveys within a month period. Participants received a text-only email introducing Idaho Power's email plans, an email promoting ESKs that included a combination of text and images, an image-only email promoting paperless billing, and an email with a link to a video about linemen saving a bee colony.

After each email, participants were asked if they received the email or if it ended up in a junk or spam inbox and about their overall impression of the email—if the length was appropriate, whether the call to action was clear, and their impression on the format (i.e., text, image, video or a combination thereof). Responses varied for each of the four emails tested, but overall, participants felt that the emails were clear and concise, included a good mix of images, text, and video, and left them with a neutral or positive impression.

Smart-Saver Pledge Sweepstakes

In 2018, Idaho Power continued the Smart-Saver Pledge sweepstakes to encourage customers in Idaho to make energy-saving changes. The sweepstakes ran from October 1 through November 20. Customers were asked to commit to making an energy-saving change for 21 days, choosing one of the following actions: change the porch light to an LED or add a timer, use a programmable pressure cooker once a week instead of the oven or stove, hang-dry clothes after washing, unplug the cell phone charger when not in use, or use kitchen and bath exhaust fans only when needed. In return, pledge participants were entered to win an ENERGY STAR® electric appliance.

Idaho Power promoted the pledge primarily with a bill insert and email. The bill inserts (Figure 17) went to 318,326 customers and included a sign-up form on the back for customers to mail in. The email was sent to approximately 147,000 customers and included a link to the online sign-up form. The pledge was also promoted through Facebook and Twitter posts. Additional promotion included *News Briefs*, the October issue of *Connections*, and a television news segment on KTVB where customers were directed to sign up on the Smart-Saver Pledge web page.

Figure 17. Smart-Saver Pledge bill insert

Idaho Power received 4,486 pledges throughout the pledge period and a few additional pledges after the pledge ended. In 2017, the company received fewer than 1,000 pledges. In addition to the greatly increased number of participants, the company received positive feedback from customers about the pledge and their energy habits. One customer stated, "Good for Idaho Power in trying to help people use less energy." The company believes the participants were highly engaged and that the results were generally positive.

Customers were asked to complete a follow-up survey as part of the pledge. In return, participants were entered to win a $100 Visa gift card. The company received 2,302 responses to the follow-up survey in 2018 (about 51 percent of pledge participants). In 2017, the survey response rate was 42 percent. Highlights include the following:

- Over 94 percent of respondents fulfilled all 21 days of their pledge.
- Of the respondents who answered the question regarding whether they would continue their energy-saving changes, all but six planned to continue with the energy-saving changes after the pledge ended.
- Just over 61 percent of respondents indicated they were "very likely" to seek out additional ways to save energy.
- After taking the pledge, over 97 percent of respondents were "somewhat likely" or "very likely" to participate in an Idaho Power energy efficiency program.

A copy of the full survey results can be found in *Supplement 2: Evaluation*.

Customer Satisfaction

Idaho Power conducts the Burke Customer Relationship Survey each year. In 2018, 64 percent of residential survey respondents indicated Idaho Power is meeting or exceeding their needs with information on how to use energy wisely and efficiently.

Sixty-six percent of residential respondents indicated Idaho Power is meeting or exceeding their needs by encouraging energy efficiency with its customers. Fifty-three percent of Idaho Power residential customers surveyed indicated the company is meeting or exceeding their needs in offering energy efficiency programs, and 41 percent of the residential survey respondents indicated they have participated in at least one Idaho Power energy efficiency program. Of the residential survey respondents who have participated in at least one Idaho Power energy efficiency program, 90 percent are "very" or "somewhat" satisfied with the program.

Based on surveys conducted in the last six months of 2017 and the first six months of 2018, Idaho Power ranked second out of 14 utilities included in the west region midsize segment of *the J.D. Power and Associates 2018 Electric Utility Residential Customer Satisfaction Study*. Fifty-two percent of the residential respondents in this study indicated they were aware of Idaho Power's energy efficiency programs, and on an overall basis, those customers were more satisfied with Idaho Power than customers who are unaware of the programs.

See the individual programs for program-specific customer satisfaction survey results.

A/C Cool Credit

		2018	2017
Participation and Savings			
	Participants (homes)	26,182	28,214
	Energy Savings (kWh)	n/a	n/a
	Demand Reduction (MW)	29	29
Program Costs by Funding Source			
	Idaho Energy Efficiency Rider	$433,659	$495,142
	Oregon Energy Efficiency Rider	$36,425	$39,493
	Idaho Power Funds	$374,285	$401,637
	Total Program Costs—All Sources	$844,369	$936,272
Program Levelized Costs			
	Utility Levelized Cost ($/kWh)	n/a	n/a
	Total Resource Levelized Cost ($/kWh)	n/a	n/a
Benefit/Cost Ratios			
	Utility Benefit/Cost Ratio	n/a	n/a
	Total Resource Benefit/Cost Ratio	n/a	n/a

Description

Originating in 2003, A/C Cool Credit is a voluntary, dispatchable demand response program for residential customers in Idaho and Oregon. Using communication hardware and software, Idaho Power cycles participants' central air conditioning (A/C) units or heat pumps off and on via a direct load control device installed on the A/C unit. This program enables Idaho Power to reduce system capacity needs during times when summer peak load is high.

Customers' A/C units are controlled using switches that communicate by powerline carrier (PLC). The switch is installed on each participating customer's A/C unit and allows Idaho Power to control the unit during a cycling event.

The cycling rate is the percentage of an hour that the A/C unit will be turned off by the switch. For instance, with a 55 percent cycling rate, the switch should be off for about 33 (nonconsecutive) minutes of each hour. Idaho Power tracks the communication levels to validate whether the signal reaches the switches. There are many reasons why Idaho Power's PLC cannot communicate with a switch. The switch may be disconnected, an A/C unit may not be powered on, the switch may be defective, or the participant's household wiring may prevent communication. Sometimes it is difficult for the company to detect why the switch is not communicating. At the end of the season, Idaho Power evaluates event reductions using methodologies consistent with those established in prior third-party evaluations.

These are the program event guidelines:

- June 15 through August 15 (excluding weekends and July 4)
- Up to four hours per day

- A maximum of 60 hours per season
- At least three events per season

Program Activities

In 2018, about 26,000 customers participated in the program. Four cycling events occurred, and all were successfully deployed (Table 8). The cycling rate was 55 percent and the communication level exceeded 94 percent for each event. The incentive remained $15 per season, paid as a $5 bill credit on the July, August, and September bills.

Table 8. A/C Cool Credit demand response event details

Event Details	Monday, July 16	Wednesday, July 25	Tuesday, July 31	Monday, August 6
Event time	4–7 p.m.	4–7 p.m.	4–7 p.m.	4–7 p.m.
Average temperature	93°F	98°F	96°F	89°F
Maximum load reduction (MW)	29	27.3	27.3	10.4

For the third event, Idaho Power believes that the low results were partially due to low A/C use at the time of the event. In addition, the methodology used to determine the amount of reduction achieved for the event compared recent historical usage patterns to that of the event day. These results may be understated because the customers' use patterns from the prior ten days did not align well with the customer usage patterns on the day of the event, causing the savings to appear lower. For the fourth event, the lower reduction for this event corresponds to the cooler temperatures.

Marketing Activities

Per the settlement agreement reached in Idaho Case No. IPC-E-13-14 and Oregon Case No. UM 1653, Idaho Power did not actively market the A/C Cool Credit program in 2018. Idaho Power communicated with participants in an effort to retain them and with customers who moved into a home where a switch was present in an effort the utilize the installed equipment.

Before the cycling season began, Idaho Power sent current participants a postcard reminding them of the program specifics. Idaho Power also attempted to recruit customers who had moved into a home that already had a load control device installed and previous participants who changed residences to a location that may or may not have a load control device installed. The company used postcards, phone calls, direct-mail letters, and home visits (leaving door hangers for those not home) to recruit these customers. At the end of the summer, a thank-you postcard was sent to program participants.

Cost-Effectiveness

Idaho Power determines cost-effectiveness for its demand response program under the terms of IPUC Order No. 32923 and OPUC Order No. 13-482. Under the terms of the orders and the settlement, all of Idaho Power's demand response programs were cost-effective for 2018.

The A/C Cool Credit program was dispatched for four events (totaling 12 event hours) and achieved a maximum demand reduction of 29.1 MW. The total expense for 2018 was $844,369 and would have remained the same if the program was fully used for 60 hours because there is no variable incentive paid for events beyond the three required events.

A complete description of Idaho Power cost-effectiveness of its demand response programs is included in *Supplement 1: Cost-effectiveness.*

Evaluations

Each year, Idaho Power internally evaluates the program reductions by determining the three days with the highest usage, out of the 10 days prior to an event, and comparing their usage to the event day usage. The baseline methodology performed as expected for three of the four events, but the third event on July 31 was lower than expected partially due to misalignment of the baseline days and the event day. The complete report is available in *Supplement 2: Evaluation*.

2019 Program and Marketing Strategies

Idaho Power does not anticipate any program changes in 2019.

Per the terms of the above-mentioned settlement agreements, Idaho Power will not actively market the A/C Cool Credit program to solicit new participants but will accept them upon request, regardless of whether they previously participated. Attempts will continue to be made to recruit previous participants who have moved, as well as new customers moving into homes that already have a load control device installed.

Easy Savings: Low-Income Energy Efficiency Education

		2018	2017
Participation and Savings			
	Participants (coupons/kits)*	282	2,470
	Energy Savings (kWh)	29,610	280,049
	Demand Reduction (MW)	n/a	n/a
Program Costs by Funding Source			
	Idaho Energy Efficiency Rider	$0	$0
	Oregon Energy Efficiency Rider	$0	$0
	Idaho Power Funds	$147,936	$149,813
	Total Program Costs—All Sources	$147,936	$149,813
Program Levelized Costs			
	Utility Levelized Cost ($/kWh)	$1.37	$0.064
	Total Resource Levelized Cost ($/kWh)	$1.37	$0.064
Benefit/Cost Ratios			
	Utility Benefit/Cost Ratio	n/a	n/a
	Total Resource Benefit/Cost Ratio	n/a	n/a

*In 2017–2018, the program transformed from energy-savings kits to electric heating system tune-up coupons.

Description

As a result of IPUC Case No. IPC-E-08-10 and Order Nos. 30722 and 30754, Idaho Power committed to fund energy efficiency education for low-income customers and provide $125,000 to Community Action Partnership (CAP) agencies in the Idaho Power service area annually, on a prorated basis. These orders specified that Idaho Power provide educational information to Idaho customers who heat their homes with electricity.

From 2009 to 2017, using CAP agency personnel, the program distributed energy-saving kits and corresponding educational materials to participants of the Low Income Home Energy Assistance Program (LIHEAP) who heat their homes with electricity. In 2017, with input from a planning committee consisting of representatives from Community Action Partnership Association of Idaho (CAPAI), CAP Agencies, and the IPUC, Idaho Power discontinued kit distribution and offered a pilot incentive: a coupon for a free HVAC tune-up and one-on-one education with the goal of reducing the energy costs for LIHEAP participants. Contractors were reimbursed up to $300 per redeemed coupon.

Though this report discusses other program activities based on the calendar year, the following program information summarizes activities based on the federal fiscal year because CAP agencies use the fiscal LIHEAP program cycle.

Program Activities

By November 1, 2018, 659 coupons were distributed and 282 were redeemed by customers for heating system tune-ups. Of the $125,000 Idaho Power allotted to CAP Agencies for this pilot, $68,368 was paid to HVAC contractors for their service. Since this was a pilot, the unused funds were designated to provide additional coupons in 2018–2019 program year. Coupons expire at the end of the 2019 program year; no other conditions apply.

To participate, regional HVAC company owners were required to sign the Contractor Guidelines and acknowledge the two-fold goal of the pilot: customer education and equipment tune-up. During the customer visit, HVAC contractors performed the tune-up and taught residents how to change furnace filters. They also explained how regular maintenance improves overall performance and answered questions about the specific heating equipment and ways to save energy. The contractor left behind a customer satisfaction survey that could be mailed to CAPAI or completed online; respondents were entered into a drawing for a gift card.

The planning committee found that the $300-maximum per coupon was frequently inadequate to address all of the costs associated with minor tuning and/or repairing the heating systems. Customers were then referred to the CAP agencies to apply for additional assistance. These referrals caused an unintended strain on weatherization budgets. The Planning Committee also found that limiting eligibility to LIHEAP participants made it difficult to distribute the coupons because CAP agencies are busy assisting people during energy assistance season. As a result, the maximum per-coupon amount was increased to $600 in mid-2018.

Marketing Activities

The Easy Savings pilot is included under “Savings For Your Home” on the Idaho Power website in the “Income Qualified Customers” section.

Cost-Effectiveness

Idaho Power started tracking cost-effectiveness ratios for the program in 2015 when the company began claiming savings for the program. However, since the purpose of Easy Savings is primarily an educational and marketing program, the company determined that, like the Home Energy Audit program, the traditional cost-effectiveness tests should not apply. The cost-effectiveness goal of the program is to find trackable energy savings opportunities while maintaining the educational program mandate.

The Easy Savings HVAC coupon claimed 105 kWh of annual savings for each qualifying customer with air conditioning. The savings value is sourced to the 2016 energy efficiency potential study.

Customer Satisfaction

Information and comments gathered from the 2017–2018 customer survey show that most of the coupons were redeemed by customers during the month of September followed by March and January. October, December, and May had the lowest redemption rate.

Of the 141 surveys returned to CAPAI, 111 customers reported that the contractor demonstrated how to safely change filters. Ninety customers reported that the contractor recommended ways to save energy such as changing furnace filters, properly programming the thermostat, using a ceiling fan instead of air conditioning in the summer, and opening blinds during the day and closing them at night in the winter. One hundred eighteen respondents pledged to change furnace filters as recommended and 71 described other changes they made based on program recommendations.

One hundred seventeen participants reported they were very satisfied with the program and nine were somewhat satisfied.

2018–2019 Program and Marketing Strategies

The planning committee and participating regional HVAC contractors agreed to support Easy Savings a second year as Pilot #2 with these improvements:

1. Increase the maximum dollar amount available to contractors per customer visit to $600. This increase will allow the HVAC contractor to leave behind extra furnace filters and to make minor repairs to furnaces, air conditioners, and heat pumps while providing educational information.
2. Expand eligibility beyond LIHEAP recipients to all Idaho Power customers with electric heat systems who have participated in other income-specific programs in the past four years or to those on the waiting list for weatherization services. This will allow Easy Savings to reach more customers, provide interim assistance while customers wait for weatherization, and help extend the life of HVAC equipment previously installed with weatherization program funding.

Idaho Power revised the coupon and mailed them to CAP agencies in November 2018 for the 2018–2019 program year. Funding came from a combination of unused 2017–2018 and current-year 2018–2019 sources.

Educational Distributions

		2018	2017
Participation and Savings			
	Participants (kits/lightbulbs)	94,717	84,399
	Energy Savings (kWh)	19,333,668	21,187,261
	Demand Reduction (MW)	n/a	n/a
Program Costs by Funding Source			
	Idaho Energy Efficiency Rider	$3,307,782	$3,323,024
	Oregon Energy Efficiency Rider	$67,409	$141,860
	Idaho Power Funds	$0	$1,143
	Total Program Costs—All Sources	$3,375,192	$3,466,027
Program Levelized Costs			
	Utility Levelized Cost ($/kWh)	$0.019	$0.016
	Total Resource Levelized Cost ($/kWh)	$0.019	$0.016
Benefit/Cost Ratios			
	Utility Benefit/Cost Ratio	2.68	3.02
	Total Resource Benefit/Cost Ratio	4.51	6.33

*Program savings include Home Energy Report pilot program savings.

Description

Designated as a specific program in 2015, the Educational Distributions effort is administered through the Residential Energy Efficiency Education Initiative and seeks to use low-cost and no-cost channels to deliver energy efficiency items with energy savings directly to customers. As with the initiative, the goal for these distributions is to drive behavior change and create awareness of and demand for energy efficiency programs in Idaho Power's service area.

Idaho Power selects items for distribution if the initial analysis indicates the measure is either currently cost-effective or expected to be cost-effective. Typically, selected items have additional benefits beyond traditional energy savings, such as educating customers about energy efficiency, expediting the opportunity for customers to experience newer technology, or allowing Idaho Power to gather data or validate potential energy savings resulting from behavior change.

Idaho Power recognizes the need to educate and guide customers to promote behavior change and awareness and will plan program activities accordingly. Items may be distributed at events and presentations, through direct-mail, or during home visits conducted by customer representatives.

Energy-Saving Kits

Idaho Power knows that managing household energy use can be a challenge. To help make it easier for families, Idaho Power works with a kit vendor to offer two versions of its free ESKs: one for homes with electric water heaters and one for homes with alternate-source water heaters. Customers enroll at idahopower.com/save2day, by calling 800-465-6045, or by returning a postcard. A kit is sent directly to the customer's home.

Each ESK contains nine LED lightbulbs (six 800-lumen lightbulbs and three 480-lumen lightbulbs), a digital thermometer (to check refrigerator, freezer, and water temperatures), a shower timer, a water flow-rate test bag, an LED night light, and educational materials. In addition, the kit for homes with electric water heaters contains a high-efficiency showerhead with a thermostatic shower valve (TSV) and three faucet aerators.

Figure 18. Idaho Power's Energy-Saving Kit for homes with electric water heaters

Energy-Saving Kits as Giveaways

Idaho Power offers ESKs as giveaways, in limited quantities, at presentations and small events to garner additional interest in energy efficiency and to encourage immediate action and behavior change. In these circumstances, Idaho Power cannot confirm the source of water heating in the recipient's home or whether the recipient has already received a kit. Therefore, this version of ESK given away is the more basic version for homes with alternate-source water heaters; energy savings is garnered from lighting changes that are not dependent on the source of water heat.

Home Energy Report Pilot

In 2018, Idaho Power continued working with a third-party contractor, Aclara Technologies LLC (Aclara), to pilot the HER program. The objective of the HER pilot is to encourage customer engagement with electricity use in order to produce average annual behavioral savings of 1 to 3 percent. Secondary objectives are to maintain or increase customer satisfaction and obtain information to inform decisions around scalability, projected savings, best target audiences, and other possible program activities in the future.

The periodic reports provide customers with information about how their home's energy use compares with similar homes. The *Home Energy Reports* also give a breakdown of household energy use and offers suggestions to help customers change their energy-related behaviors. Aclara statistically estimates energy savings that result from customers receiving the report by comparing the energy use of the report recipients against the energy use of a similar control group.

LED Lightbulbs as Giveaways

Giving away LED lightbulbs is an effective way to connect Idaho Power with its customers and begin productive conversations around energy efficiency. Idaho Power field staff and energy efficiency program specialists seek opportunities to educate customers about LEDs, and to offer customers a free lightbulb to use immediately in their own homes.

Student Energy Efficiency Kit Program

The SEEK program provides fourth- to sixth-grade students in schools in Idaho Power's service area with quality, age-appropriate instruction regarding the wise use of electricity. Each child who participates receives an energy efficiency kit. The products in the kit are selected specifically to encourage energy savings at home and engage families in activities that support and reinforce the concepts taught at school.

Once a class enrolls in the program, teachers receive curriculum and supporting materials. Students receive classroom study materials, a workbook, and a take-home kit containing the following:

- Three LED lightbulbs
- A high-efficiency showerhead
- An LED nightlight
- A furnace filter alarm
- A digital thermometer for measuring water and refrigerator/freezer temperatures
- A water flow-rate test bag
- A shower timer

At the conclusion of the program, students and teachers return feedback to Idaho Power's vendor indicating how the program was received and which measures were installed. The vendor uses this feedback to provide a comprehensive program summary report showing program results and savings.

Unlike most residential programs offered by Idaho Power, SEEK results are reported on a school-year basis, not by calendar year.

Welcome Kits

Idaho Power uses a vendor to mail Welcome Kits to brand new customers between 35 and 45 days after electric service begins at their residence. Each kit contains four LED lightbulbs, a nightlight, a greeting card and a small flip-book containing energy-saving tips and information about Idaho Power's energy efficiency programs. The kits are intended to encourage first-time customers to adopt energy-efficient behaviors early in their new homes.

Program Activities

Energy-Saving Kits

In 2018, 44,691 kits were shipped to customer homes: 18,383 kits to homes with electric water heaters and 26,308 to homes with alternate-source water heaters. The kits for homes with electric water heaters continued to include an integrated high-efficiency showerhead with a TSV. TSVs reduce the behavioral waste caused by letting the water run unchecked while it warms up. With a TSV, water flow is automatically reduced to a trickle when the water reaches 95°F, sending a signal that the water is ready. Once in the shower, the customer simply pulls a toggle string to resume normal water flow.

Kits were distributed to all geographic regions within Idaho Power's service area: 43,849 to Idaho residences and 842 to Oregon homes.

Energy-Saving Kits as Giveaways

Field staff across Idaho Power's five regions distributed 700 giveaway kits at presentations, small events, and customer visits. The kits were particularly popular and appreciated by senior homeowners who had the opportunity to receive them at events sponsored by senior centers.

Home Energy Report Pilot

Idaho Power, in partnership with Aclara, completed its first full year of the HER pilot program on July 31, 2018.

The pilot was designed based on standard randomized control trial (RCT) methodology with treatment and control groups sized appropriately to detect statistically significant savings at or above 1.2 percent, and allowing for approximately 10 percent attrition over the pilot period. Customers identified to receive customized *Home Energy Reports* were divided into two distinct groups: the HER year-round group and the HER winter-heating group.

The primary difference between reports was the tips and advice for the winter-heating group focused on heating suggestions, whereas tips and suggestions for the year-round group contained a wide-range of topics including air-conditioning.

To finish year one of the pilot, the HER year-round group (approximately 19,100 customers) continued to receive bi-monthly reports in February, April and June, and the winter-heating group (approximately 7,900 customers) received reports in January and February.

The first-year results showed estimated energy savings for the treatment period to be statistically significant for the winter-heating group with participants using an average of 207 fewer kWh per home than their control group counterparts—a savings of 1.5 percent. For participants in the year-round group estimated savings for the period appeared to be statistically significant at about 150 kWh per home (between 1.3 and 1.7 percent below the control group), but only for those using more than 9,000 kWh per year. Within the year-round group, the participants using more than 12,000 kWh annually saw the greatest aggregate kWh savings, while the participants using between 9,000 and 12,000 kWh reduced their use by a higher overall percentage.

Idaho Power's customer solutions advisors responded to 411 HER pilot-related phone calls and inquiries during the first year. The participant-driven opt-out rate was low at .64 percent. In spite of this, the pilot experienced higher-than-expected attrition—15 percent (includes opt-outs, move-outs, etc.).

The customer satisfaction numbers, as collected through a small-sample telephone survey appeared to be favorable.

At the conclusion of the pilot's first year, the company decided to extend it for another year to gather additional information prior to making final decisions regarding scalability. The year-round group was optimized for savings using algorithms provided by the vendor. A new winter-heating group was added to test the effectiveness of a bi-monthly delivery schedule compared to year one's four-report schedule. Additionally, remaining first-year participants were divided into two report-delivery schedules: one receiving bi-monthly and one receiving quarterly reports.

LED Lightbulbs as Giveaways

In 2018, Idaho Power customer representatives delivered educational messages and lightbulbs to seniors in Pocatello, Boise, Nampa, Caldwell, and Payette, Idaho and Nyssa, Ontario, and Vale, Oregon. Participants at the Idaho Remodeling and Design Show, the Idaho Housing and Economic Development Conference, Earth Day events, and employee sustainability and safety fairs in Meridian, Caldwell, Nampa, and Pocatello received lightbulbs, too. Idaho Power was also present with an educational message and LED lightbulbs at Boise's Heart Walk, Meridian Business Days, American Falls Days, Chubbuck Days, and several school district-sponsored events across the service area. Lightbulbs were also distributed at the Smart Women, Smart Money Conference; The Incredible Age Expo; the FitOne℠ Expo; Idaho Power Shade Tree Project events; and at presentations for chambers of commerce, scout groups, and other community and civic organizations.

By the end of the year, Idaho Power employees had personally delivered a brief energy efficiency message and distributed 9,450 lightbulbs directly to customers.

Student Energy Efficiency Kit Program

During the 2017 to 2018 school year, Idaho Power community education representatives actively recruited fourth- to sixth-grade teachers to participate in SEEK. As a result, Resource Action Programs (RAP) delivered 9,439 kits to 332 classrooms in 122 schools within Idaho Power's service area. This resulted in 1,994 MWh of savings.

Welcome Kits

In January, Idaho Power partnered with a third-party vendor, Tinker Programs, to design, build, and distribute a smaller energy efficiency kit. Kits began shipping in February and almost 31,000 kits had been delivered by year-end. Feedback received to-date via social networks and email indicate the kits are well-received.

Figure 19. Example of a customer's social media response to Idaho Power's Welcome Kit

Marketing Activities

Energy-Saving Kits

Marketing efforts included three direct-mail campaigns from the kit vendor: one to about 50,000 customers in January, a second to about 48,000 customers in April, and a third to about 88,000 customers in September. Direct-mail efforts continue to yield enrollments of approximately 18 to 20 percent. Kits continued to be showcased at trade shows throughout the service area and 6,250 bookmarks highlighting instructions on how to order the kit were distributed at events and presentations. Numerous social media posts were used to bolster program awareness. The posts were shared by customers, increasing word of mouth marketing and helping to further promote activity (Figure 20).

Figure 20. Social media post from environmentally focused customer who received ESK

The kit was promoted to recipients of the *Home Energy Reports* in February/March (to those who hadn't already received a kit). It was also featured in two video segments: one Idaho Power representative appearance on KMVT in the Magic Valley (March) and in an Idaho Power produced video on home winter savings that ran on YouTube and Facebook.

The kit was prominently mentioned in the energy efficiency campaign TV and radio commercials that aired during March/April and October/November. Email marketing was a new option for Idaho Power in 2018, so in July and August, 88,000 customers who hadn't yet received a kit received an email promoting it. 29,379 customers opened the email; 5,936 of those who opened the email clicked through to the kit web page.

Energy-Saving Kits as Giveaways

Idaho Power field staff educated customers about energy efficiency by offering a free ESK with educational items and LED lightbulbs to get them started and on their way to saving energy.

Home Energy Report Pilot

Because the HER pilot program is based on the RCT methodology, the reports cannot be requested by customers, therefore the pilot is not marketed. The periodic reports were, however, used to cross-market Idaho Power's other energy efficiency programs.

LED Lightbulbs as Giveaways

In 2018, Idaho Power field staff and energy efficiency program specialists continued to seek opportunities to educate customers about LEDs and offer customers a free LED lightbulb to use immediately in their own homes.

Student Energy Efficiency Kit Program

At the onset of the 2017–2018 school year, Idaho Power community education representatives began using emails in conjunction with flyers to recruit new fourth- to sixth-grade teachers to participate in SEEK.

Welcome Kits

The Welcome Kits are not requested by customers; therefore, they are not marketed. Instead, each week Idaho Power sends a list of new customers to the vendor who fulfills the order.

Cost-Effectiveness

In situations where Idaho Power managed the energy efficiency education and distribution through existing channels, the cost-effectiveness calculations were based on the actual cost of the items. Conversely, if outside vendors were used to assist with distribution, the cost-effectiveness calculations included all vendor-related charges.

Energy-Saving Kits

The RTF provides mail-by-request deemed savings for LED lightbulbs, the integrated high-efficiency showerheads with a TSV, and faucet aerators. The RTF mail-by-request deemed savings values are discounted to reflect the potential that all of the kit items may not be installed. The LED lightbulbs each have a deemed savings value of 8.2 kWh per year. The integrated 1.75 gallon per minute (gpm) low-flow showerhead with TSV saves approximately 240 kWh annually. Because there were no deemed savings from the RTF for faucet aerators, Idaho Power looked to the Energy Trust of Oregon (ETO) which runs a similar kit program for residential customers in Oregon. However, the RTF met in July 2018 and deemed an energy savings value for faucet aerators. Those numbers will be used in 2019. Based on installation rates from participant surveys, ETO claimed 134 kWh for kitchen faucet aerators and 75 kWh for bathroom faucet aerators. Idaho Power reviewed the results of the three-month follow up survey sent to ESK participants and found that the installations rates were similar to ETO's.

The annual savings for an ESK for a home with an electric water heater is approximately 598 kWh. The annual savings for a kit for a home with a non-electric water heater is approximately 74 kWh.

Energy-Saving Kits as Giveaways

The giveaway kits contain the same measures as the non-electric ESK. For the nine LED lightbulbs included in the kit, Idaho Power used the RTF's giveaway deemed savings value of 8.2 kWh per bulb. The annual savings for each giveaway kit is approximately 74 kWh.

Home Energy Report Pilot

Before starting the pilot, the HER pilot program benefit cost-ratios were expected to be between 0.90 and 0.95 assuming 1.5 percent average savings across all treatment groups. The program is cost-effective looking at program year savings (July 2017-July 2018) and 2018 calendar year expenses even while only claiming a one-year savings life.

LED Lightbulbs as Giveaways

For the LED giveaways, Idaho Power used the giveaway deemed savings provided by the RTF. The RTF-deemed annual savings of 8.2 kWh includes assumptions regarding the installation rate, efficiency levels of the existing lightbulb, and the location of the installation.

Student Energy Efficiency Kit Program

The cost-effectiveness analysis for the SEEK offering was based on the savings reported by RAP during the 2017 to 2018 school year. RAP calculated the annual savings based on information collected from the participants' home surveys and the installation rate of the kit items. Questions on the survey included the number of individuals in each home, water-heater fuel type, flow rate of old showerheads, and the wattage of any replaced lightbulbs. The response rate for the survey was approximately 56 percent. The survey gathers information on the efficiency level of the existing measure within the home and which measure was installed. The energy savings will vary for each household based on the measures offered within the kit, the number of items installed, and the existing measure that was replaced. Based on the feedback received from the 2017 to 2018 school year, RAP projects that each kit saved approximately 211 kWh annually per household on average, and the program saved 1,993,950 kWh annually. A copy of the report is included in *Supplement 2: Evaluation*.

Welcome Kits

For the four LED lightbulbs included in the kit, Idaho Power used the RTF's giveaway deemed savings value of 8.2 kWh per bulb. The annual savings for each kit is approximately 33 kWh.

2019 Program and Marketing Strategies

Energy-Saving Kits

Idaho Power will continue offering ESKs in 2019. Promotional materials will be readily available for all customer-facing employees to use at their discretion. The company's social media posts, website, and other advertising will promote ESKs. Targeted direct-mail campaigns will also be employed.

Energy-Saving Kits as Giveaways

Idaho Power will continue to give away limited quantities of the basic kit for homes with alternate-source water heaters at presentations and small events to garner interest in energy efficiency.

Home Energy Report Pilot

Estimated savings and customer satisfaction will continue to be closely monitored. An expanded telephone survey will be conducted in the spring and a full review of customer satisfaction and estimated savings results for year two of the pilot will take place in July/August of 2019. Based on results, the company will finalize the design and decide whether to continue and/or scale the HER pilot.

LED Lightbulbs as Giveaways

Idaho Power plans to continue offering LED lightbulbs during customer visits and at a limited number of community events and presentations.

Student Energy Efficiency Kit Program

Plans for the 2018 to 2019 school year include updating the marketing flyer and marketing email for distribution to more remote schools and districts. The company will continue to leverage the positive relationships Idaho Power's community education representatives have within the schools to maintain program participation levels. It will also work with the vendor to pilot an alternative recruiting strategy in the Twin Falls area—with the vendor reaching out directly to eligible schools. Curriculum will be reviewed for continued relevance to state standards.

Welcome Kits

In 2019, Idaho Power will continue to offer Welcome Kits to first-time customers. The Welcome Kit will cross-promote other energy efficiency programs and encourage new customers to adopt energy-efficient behaviors upon moving into their new homes.

Other Educational Distributions

Idaho Power will continue to look for opportunities to engage customers with new technologies that stress the importance of energy-efficient behaviors at home. Idaho Power is also looking at alternative measures that may sustain the kit programs as lighting savings mature.

Energy Efficient Lighting

		2018	2017
Participation and Savings			
	Participants (lightbulbs)	1,340,842	1,766,758
	Energy Savings (kWh)	18,856,933	37,765,190
	Demand Reduction (MW)	n/a	n/a
Program Costs by Funding Source			
	Idaho Energy Efficiency Rider	$2,343,127	$4,787,259
	Oregon Energy Efficiency Rider	$92,003	$84,223
	Idaho Power Funds	$0	$1,406
	Total Program Costs—All Sources	$2,435,130	$4,872,888
Program Levelized Costs			
	Utility Levelized Cost ($/kWh)	$0.011	$0.012
	Total Resource Levelized Cost ($/kWh)	$0.014	$0.026
Benefit/Cost Ratios			
	Utility Benefit/Cost Ratio	4.67	4.09
	Total Resource Benefit/Cost Ratio	6.64	4.63

Description

Idaho Power and other regional utilities participate in the Simple Steps, Smart Savings™ program which is managed by CLEAResult®. Idaho Power promotes Simple Steps, Smart Savings offerings to customers in two areas: this lighting program and the appliance promotion program (see the Simple Steps, Smart Savings section of this report).

Initiated in 2002, the Energy Efficient Lighting program follows a markdown model that provides incentives directly to manufacturers or retailers, with discounted prices passed on to the customer at the point of purchase. The benefits of this model are low administration costs, better availability of products to the customer, and the ability to provide an incentive for specific products. The program goal is to help Idaho Power's Idaho and Oregon residential customers afford more efficient lighting technology.

ENERGY STAR® lightbulbs are a more efficient alternative to standard incandescent and halogen incandescent lightbulbs. Lightbulbs come in a variety of wattages, colors, and styles, including lightbulbs for three-way lights and dimmable fixtures. ENERGY STAR lightbulbs use 70 to 90 percent less energy and last 10 to 25 times longer than traditional incandescent lightbulbs.

Idaho Power pays CLEAResult a fixed amount for each kWh of energy savings achieved. A portion of the funding Idaho Power provides is used to buy down the price of the product, and a portion is applied to program administration and marketing which varies and can be used for retailer promotions. Promotions include special product placement, additional discounts, and other retail merchandising tactics designed to increase sales.

In addition to managing the program's promotions, CLEAResult is responsible for contracting with retailers and manufacturers, providing marketing materials at the point of purchase, and supporting and training retailers.

Program Activities

In 2018, LED lightbulbs comprised 92 percent of the program's sales for the year, an increase from the 90 percent of lightbulb sales in 2017. LED fixtures comprised approximately 8 percent of program sales, which was an increase from the 5 percent of program sales in 2017.

In 2018, through the Bonneville Power Administration (BPA) Simple Steps, Smart Savings program, Idaho Power worked with 15 participating retailers, representing 99 individual store locations throughout its service area. Of those participating retailers, 48 percent were smaller grocery, drug, and hardware stores, and the remaining 52 percent were large retailers.

Marketing Activities

Several Simple Steps, Smart Savings promotions were conducted through CLEAResult at retail stores in 2018. These promotions generally involved special product placement and signs. CLEAResult staff continued to conduct monthly store visits in 2018 to check stock, point-of-purchase signs, and displays. Additionally, CLEAResult staffed 18 lighting events at Home Depot and Costco stores to educate customers about the importance of using LED lightbulbs and the Simple Steps promotion.

Additional activities in 2018 involved education and marketing. During events where Idaho Power sponsored a booth and distributed LED lightbulbs, customers were informed about the importance of using energy-efficient lighting, the quality of LED lightbulbs, and the special pricing available for the Simple Steps, Smart Savings qualified products.

The company continued to host an Energy Efficient Lighting program website to make available a *Change a Light* program brochure, designed to help customers select the right lightbulb for their needs and to discuss energy efficient lighting with customers at community events. Several *#TipTuesday* posts on social media throughout the year focused on energy efficient lighting. Idaho Power recommended using ENERGY STAR certified LED lightbulbs in its summer *Energy Efficiency Guide*, the January and February issues of *Connections*, the January *Home Energy Report* to the winter-heating group, and the March *Home Energy Report* to the year-round group participants who already received an ESK.

Cost-Effectiveness

In 2018, the Energy Efficient Lighting program provided 43 percent of all energy savings derived from residential energy efficiency customer programs and 12 percent of Idaho Power's direct program savings. Between 2017 and 2018, bulb sales declined nearly 24 percent while savings declined nearly 50 percent.

In January 2017, the RTF updated and revisited the assumptions for LEDs to account for market changes due to the federal standards compliance. Because LEDs are naturally becoming a larger share of the market, the RTF updated the current market baseline for lightbulbs. Due to the timing of the RTF's update, BPA and CLEAResult implemented the new savings in 2018 in the Simple Steps, Smart Savings promotion. The RTF LED workbook version 5.2 was the source of most lighting savings assumptions throughout Idaho Power's residential program offerings.

The annual saving for the most popular bulb type, the general-purpose lightbulb in the 250-1049 lumen range, decreased from 13 kWh to 10 kWh. This bulb type made up 53 percent of the total bulbs sold in the program and nearly 40 percent of the total savings. With the change in per-bulb savings and sales declining just over 15 percent, the total savings for this bulb type declined by nearly 3 million kWh between 2017 and 2018.

The second most popular bulb type is reflector lightbulb in the 250-1049 lumen range which is commonly used in recessed canned light fixtures. The RTF reduced the per bulb savings for this bulb type from 37 kWh to 24 kWh. These reflector bulbs made up just over 19 percent of the total lightbulbs sold in the program and nearly 30 percent of the total savings. In 2018, the 250-1049 lumen reflector lightbulb sales declined 50 percent compared to 2017. With the decline in both sales and deemed savings, the total savings for this bulb type declined over 13 million kWh between 2017 and 2018.

The RTF reviewed and approved new savings for LEDs in December 2017. Based on the timing of when BPA and CLEAResult adopt new savings from the RTF, these updates will be reflected in the 2019 program year. The annual savings for lightbulbs have continued to decline. The reflector lightbulbs in the 250-1049 lumen range will go from 24 kWh to 8 kWh. The RTF met in November 2018 to update the LED savings again. With the final phase of EISA going into effect in January 2020, Idaho Power is monitoring how utilities in the region plan to incorporate the latest RTF numbers beyond January 1, 2020.

The UCT and TRC ratios for the program is 4.67 and 6.64 respectively. While an impact evaluation was conducted for the program in 2018, a majority of the evaluations costs will be incurred in 2019. However, if the amount incurred in 2018 was removed from the program's cost-effectiveness, the UCT and TRC ratios would be 4.68 and 6.65 respectively.

For detailed cost-effectiveness assumptions, metrics, and sources, see *Supplement 1: Cost-Effectiveness*.

Evaluations

Idaho Power retained Tetra Tech MA to conduct an impact evaluation of the Energy Efficient Lighting program. Overall, the evaluation found that the Energy Efficient Lighting program calculations were accurate with little variation by individual LED lightbulb or fixture type. As shown in Table 9, realization rates for each RTF version used were both very close to 100 percent and became even more accurate when RTF version 5.2 was adopted. Much of this increase in accuracy occurred when Idaho Power discontinued rounding the unit savings to the nearest whole number after moving to RTF version 5.2 in October 2017.

Table 9. Savings and realization rate based on RTF version for Energy Efficient Lighting

RTF Applied to Savings	Ex-Ante kWh	Ex-Post kWh	Realization Rate
RTF version 4.2 Applied (10/2016–9/2017)	33,238,504	33,506,134	101%
RTF version 5.2 Applied (10/2017–9/2018)	4,526,238	4,526,469	100%
Program Year 2017	37,764,742	38,032,603	101%

Idaho Power will respond to any 2018 evaluation recommendations during the 2019 program year. The complete report can be found in *Supplement 2: Evaluation*.

2019 Program and Marketing Strategies

Idaho Power will continue to participate in the Simple Steps, Smart Savings lighting program in 2019 by contracting with CLEAResult, who was awarded the annual BPA implementation contract. New savings will be calculated using the new RTF workbook, version 6.1.

Idaho Power will monitor the number of participating retailers and geographic spread of these retailers and develop online promotions that allow customers to access promotional pricing regardless of location. The company will continue to monitor how regional stakeholders respond to the *Energy Independence and Security Act* (EISA) lighting standards that will go into effect on January 1, 2020.

CLEAResult will manage marketing at retailers, including point-of-purchase signs, special product placement, and displays. Idaho Power program specialist and customer representatives will continue to staff educational events to promote the importance of using energy-efficient lighting.

Energy House Calls

		2018	2017
Participation and Savings			
	Participants (homes)	280	335
	Energy Savings (kWh)	374,484	428,819
	Demand Reduction (MW)	n/a	n/a
Program Costs by Funding Source			
	Idaho Energy Efficiency Rider	$146,712	$170,691
	Oregon Energy Efficiency Rider	$14,065	$12,008
	Idaho Power Funds	$0	$336
	Total Program Costs—All Sources	$160,777	$183,035
Program Levelized Costs			
	Utility Levelized Cost ($/kWh)	$0.032	$0.032
	Total Resource Levelized Cost ($/kWh)	$0.032	$0.032
Benefit/Cost Ratios			
	Utility Benefit/Cost Ratio	1.37	1.26
	Total Resource Benefit/Cost Ratio	1.74	1.65

Description

Initiated in 2002, the Energy House Calls program gives homeowners of electrically heated manufactured homes an opportunity to reduce electricity use by improving the home's efficiency. Specifically, this program provides free duct-sealing and additional efficiency measures to Idaho Power customers living in Idaho or Oregon who use an electric furnace or heat pump. Participation is limited to one service call per residence for the lifetime of the program.

Services and products offered through the Energy House Calls program include duct testing and sealing according to Performance Tested Comfort System (PTCS) standards set and maintained by the BPA; installing up to eight LED lightbulbs; testing the temperature set on the water heater; installing water heater pipe covers when applicable; installing up to two low-flow showerheads, one bathroom faucet aerator, and one kitchen faucet aerator; and leaving two replacement furnace filters with installation instructions and energy efficiency educational materials appropriate for manufactured-home occupants.

Idaho Power provides contractor contact information on its website and marketing materials. The customer schedules an appointment directly with one of the certified contractors in their region. The contractor verifies the customer's initial eligibility by testing the home to determine if it qualifies for duct-sealing. Additionally, contractors have been instructed to install LED lightbulbs only in high-use areas of the home, to replace only incandescent lightbulbs, and to install bathroom aerators and showerheads only if the upgrade can be performed without causing damage to a customer's existing fixtures.

The actual energy savings and benefits realized by each customer depend on the measures installed and the repairs and/or adjustments made. Although participation in the program is free, a typical cost for a similar service call would be $400 to $600, depending on the complexity of the repair and the specific measures installed.

Program Activities

In 2018, 280 homes received products and/or services through this program, resulting in 374,484 kWh savings (Figure 21). The decrease in participation is likely due to the program nearing saturation. The program was introduced in 2002 and is one of Idaho Power's longest-running energy efficiency programs. Since participation is limited to once per home for the life of the program and is only available to electrically heated manufactured homes, there are a limited number of available homes that meet the qualifications to participate.

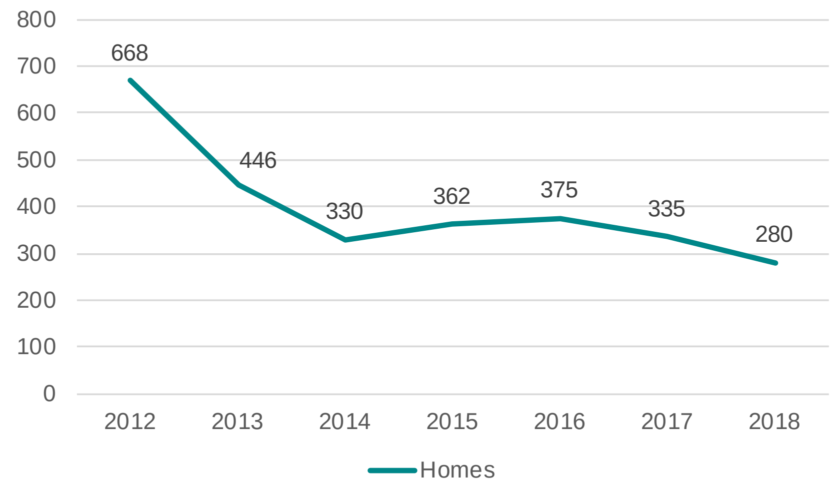

Figure 21. Participation in the Energy House Calls program, 2012–2018

Of the total participating homes, 39 percent were located in the Canyon–West Region, 23 percent were located in the Capital Region, and 38 percent were located in the South–East Region.

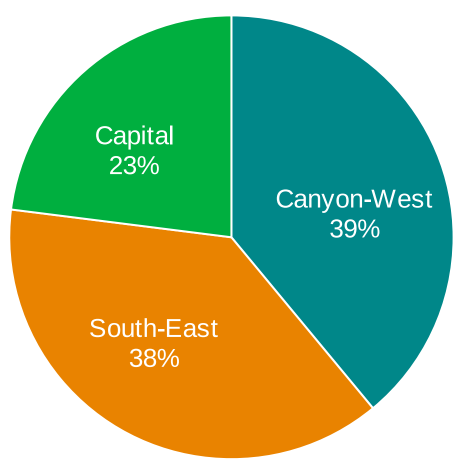

Figure 22. Energy House Calls participation by region

Duct-Sealing

Each year, a number of customers who apply for the Energy House Calls program cannot be served because their ducts do not require duct-sealing or cannot be sealed, for various reasons. These jobs are billed as a test-only job. On some homes, it is too difficult to seal the ducts, or the initial duct blaster test identifies the depressurization to be less than 150 cubic feet (ft) per minute (cfm) and duct-sealing is not needed. Additionally, if after sealing the duct work the contractor is unable to reduce leakage by 50 percent, the contractor will bill the job as a test-only job. Prior to 2015, these test-only jobs were not reported in the overall number of jobs completed for that year, because there was no kWh savings to report. Because Idaho Power now offers direct-install measures in addition to the duct-sealing component, all homes are reported. While some homes may not have been duct-sealed, all would have had some of the direct-install measures included, which would allow Idaho Power to report kWh savings for those homes. Of the 280 homes that participated in 2018, 38 homes were serviced as test-only.

If a home had a blower door and duct blaster test completed, and the contractor determined that only duct-sealing is necessary, it will be billed as a test and seal. For a multisection home with an x-over duct system (one that transfers heated or cooled air from one side to the other) that needs replaced in addition to the duct-sealing, it will be charged as an x-over. When a home requires the existing belly-return system to be decommissioned and have a new return installed along with the duct-sealing, it will be billed as a complex system. A complex system that also requires the installation of a new x-over and duct-sealing will be billed as a complex system and x-over job.

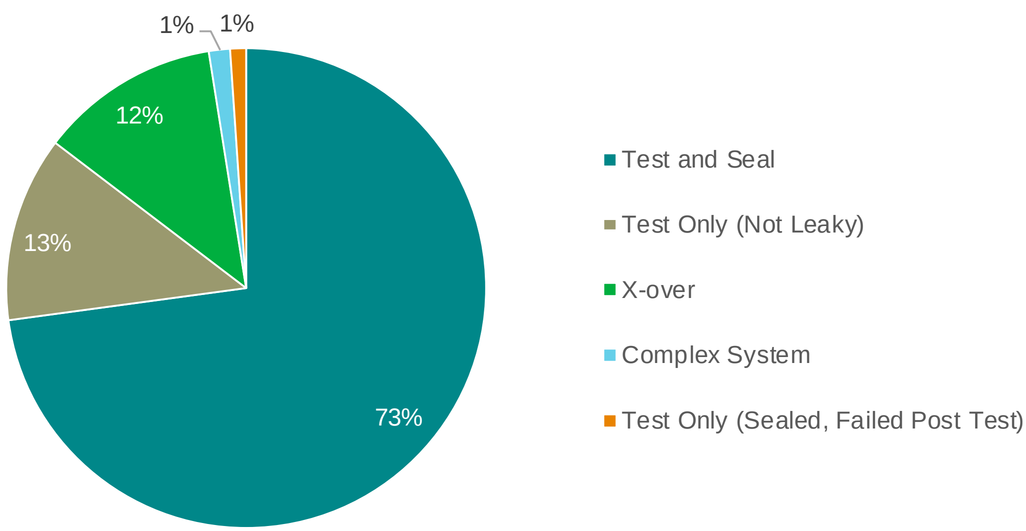

Figure 23. Energy House Calls participation by job type

Direct-Install Measures

In 2018, contractors installed 2,357 LED lightbulbs, 116 showerheads, 151 bathroom aerators, and 150 kitchen aerators. Contractors noted that they've seen a decrease in direct-install measures, as customers have commented that they have already installed the provided products after receiving their free ESKs from Idaho Power. In 2018, 31.4 percent of the Energy House Calls participants have received an ESK, which is up from the 20.2 percent of participants who had received the ESK in 2017.

Marketing Activities

Idaho Power sent two bill inserts to all residential customers in Idaho and Oregon in 2018. The March bill insert was shared with the Rebate Advantage program and sent to 345,506 customers, and the December bill insert was sent to 327,964 customers. The company sent postcards in February and July to residents of electrically heated manufactured homes who had not yet participated in the program. Written in English and Spanish, 9,495 postcards were delivered in February and 9,435 in July.

A Facebook ad ran in June and reached 43,728 people, resulting in 491 website clicks. Idaho Power also ran digital ads in English and Spanish in December. The English ads received 680,274 impressions and 5,242 clicks. The Spanish ads garnered 176,433 impressions and 1,407 clicks. In addition, Idaho Power customer representatives and customer service representatives knowledgeable about the program continued to promote it to qualified customers.

Cost-Effectiveness

In 2018, Idaho Power used the same RTF savings for duct-sealing in manufactured homes as were used in 2017. Savings and a cost-effectiveness analysis for the direct-install measures, including low-flow showerheads and LED lightbulbs, were completed using deemed savings from the RTF. Because there were no deemed savings from the RTF, Idaho Power used faucet aerators savings from the 2016 potential study for the 2018 program year. However, the RTF met in July 2018 and deemed an energy savings value for faucet aerators. Those numbers will be used in 2019.

For more detailed information about the cost-effectiveness savings and assumptions, see *Supplement 1: Cost-Effectiveness*.

2019 Program and Marketing Strategies

Idaho Power will continue to provide free duct-sealing and selected direct-install efficiency measures for all-electric manufactured/mobile homes in its service area. As always, the company will continue to explore additional cost-effective measures to add to the program.

Idaho Power will include program promotional materials in its bills, send direct-mail postcards, and use social media and other proven marketing strategies. Contractors and customer representatives will also distribute program literature at appropriate events and presentations. Idaho Power will continue to provide Energy House Calls program postcards to CAP agencies for distribution to customers who need assistance but do not qualify to receive weatherization assistance through these agencies.

Heating & Cooling Efficiency Program

		2018	2017
Participation and Savings			
	Participants (projects)	712	654
	Energy Savings (kWh)	1,556,065	1,138,744
	Demand Reduction (MW)	n/a	n/a
Program Costs by Funding Source			
	Idaho Energy Efficiency Rider	$565,780	$575,404
	Oregon Energy Efficiency Rider	$19,431	$18,920
	Idaho Power Funds	$0	$2,874
	Total Program Costs—All Sources	$585,211	$597,198
Program Levelized Costs			
	Utility Levelized Cost ($/kWh)	$0.029	$0.041
	Total Resource Levelized Cost ($/kWh)	$0.085	$0.099
Benefit/Cost Ratios			
	Utility Benefit/Cost Ratio	1.65	1.48
	Total Resource Benefit/Cost Ratio	0.83	0.85

Description

The H&CE Program provides incentives to residential customers in Idaho Power's Idaho and Oregon service area for the purchase and proper installation of qualified heating and cooling equipment and services.

Initiated in 2007, the objective of the program is to provide customers with energy-efficient options for electric space heating and cooling in an effort to save energy. Incentives are paid to participating residential customers for all measures; incentives are paid to installing contractors for three measures. To participate in this program, a contractor must first complete the required training regarding program guidelines and technical information on HVAC equipment. Idaho Power requires licensed contractors to perform the installation services related to all of these measures, except evaporative coolers and HPWH.

The H&CE Program's list of measures and incentives includes the following:

- The customer incentive for replacing an existing ducted air-source heat pump with a new ducted air-source heat pump is $250 for a minimum efficiency 8.5 Heating Seasonal Performance Factor (HSPF).
- The customer incentive for replacing an existing oil or propane heating system with a new ducted air-source heat pump is $400 for a minimum efficiency 8.5 HSPF. Participating homes must be located in areas where natural gas is unavailable.
- The customer incentive for replacing an existing electric forced-air or zonal electric heating system with a new ducted air-source heat pump is $800 for a minimum efficiency 8.5 HSPF.

- The incentive for customers or builders of new construction installing a ducted air-source heat pump in a new home is $400 for a minimum efficiency 8.5 HSPF. Participating homes must be located in areas where natural gas is unavailable.
- The customer incentive for replacing an existing ducted air-source heat pump with a new ducted open-loop water-source heat pump is $500 for a minimum efficiency 3.5 coefficient of performance (COP).
- The customer incentive for replacing an existing electric forced-air or zonal electric, oil, or propane heating system with a new ducted open-loop water-source heat pump is $1,000 for a minimum efficiency 3.5 COP. Participating homes with oil or propane heating systems must be located in areas where natural gas is unavailable.
- The incentive for customers or builders of new construction installing a ducted open-loop water-source heat pump in a new home is $1,000 for a minimum efficiency 3.5 COP. Participating homes must be located in areas where natural gas is unavailable.
- The customer incentive for displacing a zonal electric heating system with a new ductless air-source heat pump is $750.
- The customer incentive for duct-sealing services performed in an existing home with an electric forced-air heating system or a heat pump is $350.
- The customer incentive for a whole-house fan (WHF) installed in an existing home with central A/C, zonal cooling, or a heat pump is $200.
- The customer incentive for replacing a Permanent Split Capacitor (PSC) air handler motor with an Electronically Commutated Motor (ECM) in an existing home with oil or propane or natural gas forced-air heat, electric forced-air heat, or a heat pump is $50.
- The customer incentive for installing an evaporative cooler is $150.
- The customer incentive for a smart thermostat installed in an existing home with an electric forced-air furnace or a heat pump is $75.
- The customer incentive for installing a HPWH is $300.

Honeywell, Inc., a third-party contractor, reviews and submits incentive applications and submits requests for payment using a program database portal developed by Idaho Power that is secure yet accessible. Honeywell also provides on-site technical and program support to customers and contractors and performs on-site verifications (OSV).

Program Activities

Idaho Power began offering a cash incentive to customers who installed a HPWH on January 1, 2018. During the development stage of this measure, the company provided updates and requested input from EEAG at quarterly meetings. EEAG's feedback regarding the measure was positive overall.

The 2018 H&CE Program paid incentives are listed in Table 10.

Table 10. H&CE Program incentives in 2018

Incentive Measure	2018 Project Quantity
Ducted Air-Source Heat Pump	172
Ducted Open-Loop Water-Source Heat Pump	14
Ductless Heat Pump	211
Evaporative Cooler	16
Whole-House Fan	41
Electronically Commutated Motor	58
Duct-Sealing	15
Smart Thermostat	155
Heat Pump Water Heater	27

Honeywell performed random OSVs on 10 percent of the completed installations. These OSVs confirmed the information submitted on the paperwork matched what was installed at customers' sites. Overall, the OSV results were favorable.

Supporting, retaining, and expanding Idaho Power's contractor network remained a key growth strategy for the program. In 2018, the company held meetings with many prospective contractors to support this strategy; 16 contractors were added to the program. Idaho Power also provided 22 one-on-one training sessions with contractors in 2018.

Idaho Power made changes to the program based on recommendations from a process and impact evaluation conducted in 2017 by DNV GL. (A copy of the final report can be found in the *Demand-Side Management 2017 Annual Report, Supplement 2: Evaluation*.) A risk and mitigation register was added to the Program Handbook. A revision history was also added along with a list of program measures with their incentive amounts. Though the evaluator suggested adding a logic model, organizational chart, and process flow to the Program Handbook, Idaho Power determined a logic model and organization chart would not provide value to the Program Handbook; therefore, they were not added. A process flow already exists in the Program Handbook.

Additionally, on the submittal forms, fields labeled "homeowner house type" and "existing primary cooling system type" were added to the air source and open loop water-source heat pump installation worksheet forms. Though the evaluator suggested adding the word "primary" to the existing field labeled "Previous/Existing System" on the Incentive Application form, Idaho Power determined that this change would not add value, therefore it was not included.

As recommended, Idaho Power will continue monitoring market transformation related to this program's available measures with input from the RTF and NEEA.

Marketing Activities

In response to the DNV GL evaluation and as part of the company's overall website redesign in early 2018, Idaho Power included a variety of visual content on the program web page. The company also adopted the recommendation to include photos of people displaying positive emotions in its marketing collateral and corrected strange font characters on the web page as recommended by the evaluator.

Idaho Power used multiple marketing methods for its H&CE Program. The company mailed a bill insert to 343,976 residential customers in April and 331,632 residential customers in September. Information about the program was included in the January and July issues of *Home Energy Reports*. Idaho Power sent a direct-mail postcard highlighting each incentive and customized for the season to 34,639 customers in March and 37,790 customers in August. A postcard highlighting whole house fans was sent to 2,990 customers with central air conditioning in May in an effort to better target an individual incentive to a group of customers that were not receiving other H&CE Program postcards.

Figure 24. Whole-house fan advertising postcard

Several social media and *#TipTuesday* posts throughout 2018 focused on heating- and cooling-related tips. Digital ads ran in February, July and August to promote the H&CE Program. The February ads used a new method called geofencing, which delivered ads to users that visit locations that serve targeted customers such as recycling centers and natural food grocery stores. The February digital ads received 1,456,373 impressions and 2,201 clicks. The July and August ads received 8,205,285 impressions and 7,026 clicks. Both ads resulted in a significant increase in web page visits.

The company also ran Facebook ads in February and July promoting the program during extreme temperatures. The February ad reached 126,429 people and resulted in 346,791 impressions and 2,815 clicks to the H&CE web page. The July ad reached 96,192 people and earned 311,908 impressions and 2,609 web page clicks.

Idaho Power created individual flyers for each program measure to use with interested customers and contractors and at events. Additionally, smart thermostats were mentioned in the winter *Energy Efficiency Guide*.

In 2018, Idaho Power continued using an ad promoting DHP as part of the company's overall residential energy efficiency campaign. The DHP ad was featured in a variety of mass-media locations. Full details on where the campaign ads appeared can be found in the Residential Sector Overview.

With the launch of the HPWH incentive in early 2018, Idaho Power conducted a variety of promotions specific to that incentive. The company announced the incentive to employees in *News Scans* and the media in *News Briefs* in early January. In February, the company developed a sticker for customers to place on their existing water heater as a reminder to consider a HPWH when it's time for a replacement. The sticker is included in all ESKs sent to customers with electric water heaters. That same month, HPWHs were promoted during monthly TV segments on KTVB, KPVI, and KMVT. A Facebook ad promoting the incentive ran in March and resulted in 2,279 link clicks, 85,815 people reached and 212,788 impressions. The first customer who received a HPWH incentive was featured on the cover of the April issue of *Connections*. Additionally, letters were mailed to 267 wholesalers and plumbing installers in June and to retailers with copies of the HPWH-specific flyer in July. A pull-up banner displaying a full size HPWH and incentive information was created in February for use at trade shows and events throughout the year. Several social media posts also focused on HPWHs and the incentive.

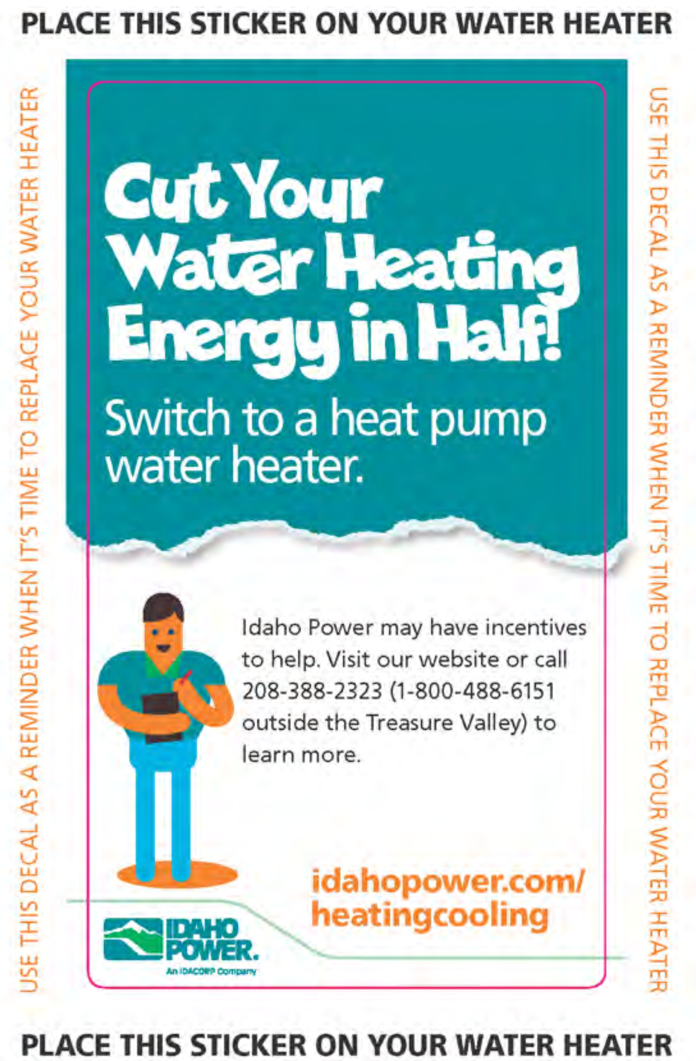

Figure 25. HPWH sticker

Cost-Effectiveness

The H&CE Program has a utility cost test of 1.65 and total resource cost test of 0.83. While the utility cost test improved in 2018 and the total resource test stayed the same when compared to 2017, using the

2017 program load shape, the total resource cost test increased to just over 1.0. Calibrations to end-use load shapes created for the 2016 energy efficiency potential study offset cost-effectiveness gains from cost control efforts in 2018.

Throughout 2017 and into 2018, Idaho Power worked toward improving program cost-effectiveness. These tactics included: 1) reassigning non-program labor, 2) reducing marketing spend while optimizing campaigns, 3) reducing contractor incentives from $150 to $50, 4) and adding HPWHs to the program. These efforts were successful in keeping cost-effectiveness ratios from falling in 2018 over 2017 levels.

DHPs continue to drag down cost-effectiveness of the program. The TRC is 0.96 when removing DHPs from cost-effectiveness calculations while the TRC of ductless systems is 0.69. Market transformation efforts, specifically the market transformation work provided by NEEA, in the region have failed to drive prices down along with lower net savings in colder climates are the two primary problems plaguing DHP cost-effectiveness.

Program savings were positively impacted for ECMs. Savings increased from 515 annual kWh to an average of 2,098 per installation by estimating in-situ savings that are a function of actual customer fan motor usage data collected on the incentive application forms. Customer specific behavior-based savings estimation was recommended in the 2017 program evaluation.

The savings assumptions for most measures including air source heat pumps, open loop water source heat pump, DHPs, and duct sealing remain unchanged from 2017. As a result, DHPs and open-loop water source heat pumps remain not cost-effective. These measures have cost-effectiveness exceptions with the OPUC under UM 1710. In addition to these measures, smart thermostats also remain not cost-effective. Idaho Power received a cost-effectiveness exception with the OPUC under Advice No. 17-09 due to the measure being a pilot. Other measures that are shown to not be cost-effective are heat pumps water heaters and duct-sealing. However, these measures would be cost-effective if administration costs were not included in the cost-effectiveness analysis.

An impact and process evaluation was conducted for the program in 2017 and a majority of the evaluation costs were incurred in 2017. However, a small amount of the evaluation costs carried over into 2018. If the amount incurred in 2018 was removed from the program's cost-effectiveness, the UCT and TRC ratios would be 1.66 and 0.84 respectively.

For detailed information about the cost-effectiveness savings, sources, calculations, and assumptions, see *Supplement 1: Cost-Effectiveness.*

For 2018 savings calculations, Idaho Power updated climate references in the program's databases to match the current values posted on the RTF website based on the evaluator's recommendation.

The evaluator recommended the continued use of the latest RTF data and to note other sources of energy-savings data when used by the program. The company is in alignment with this. The evaluator also recommended that Idaho Power add a variable to Idaho Power's data tracking system to note when its data for a particular incentive application is changed and no longer matches the information on the incentive application forms received. As an alternative, Idaho Power decided to edit the forms to match any changes made to the data, eliminating the need for a variable in the database.

For detailed information about the program evaluation, see the *Demand-Side Management 2017 Annual Report, Supplement 2: Evaluation.*

2019 Program and Marketing Strategies

Idaho Power will continue to provide program training to existing and prospective contractors to assist them in meeting program requirements and furthering their product knowledge. Sessions will be held at contractor businesses. Training sessions remain an important part of the program because they create opportunities to invite additional contractors into the program. The sessions also provide refresher training for contractors already participating in the program and help them increase their customers' participation while improving the contractors' work quality.

Developing the existing network of contractors participating remains a key strategy for the program. The performance of the program is substantially dependent on the contractors' abilities to promote and leverage the measures offered. Idaho Power's primary goal in 2019 is to develop contractors currently in the program while adding new contractors. To meet this objective, the program specialist will arrange frequent individual meetings to discuss the program with contractors in 2019.

The 2019 marketing strategy will include bill inserts, direct-mail, social media, digital and search advertising, and email marketing to promote individual measures and the program as a whole. As recommended by the evaluator, Idaho Power will explore options for updating the marketing materials to use visuals other than the house graphic, research ways to track the effectiveness of marketing campaigns, and consider adding video content to the program web page.

Home Energy Audit

		2018	2017
Participation and Savings			
	Participants (homes)	466	520
	Energy Savings (kWh)	211,003	175,010
	Demand Reduction (MW)	n/a	n/a
Program Costs by Funding Source			
	Idaho Energy Efficiency Rider	$264,394	$281,125
	Oregon Energy Efficiency Rider	$0	$0
	Idaho Power Funds	$0	$1,684
	Total Program Costs—All Sources	$264,394	$282,809
Program Levelized Costs			
	Utility Levelized Cost ($/kWh)	$0.113	$0.146
	Total Resource Levelized Cost ($/kWh)	$0.137	$0.182
Benefit/Cost Ratios			
	Utility Benefit/Cost Ratio	n/a	n/a
	Total Resource Benefit/Cost Ratio	n/a	n/a

Description

The current Home Energy Audit program is based on the insights gained from the Boise City Home Audit project conducted in 2011 and 2012, as described in the *Demand-Side Management 2012 Annual Report*. In 2014, the audit project became Idaho Power's Home Energy Audit program.

A certified, third-party home performance specialist conducts an in-home energy audit to identify areas of concern, and to provide specific recommendations to improve the efficiency, comfort, and health of the home. The audit includes a visual inspection of the crawlspace and attic, a health and safety inspection, and a blower door test to identify and locate air leaks. The home performance specialist collects information on types and quantities of appliances and lighting in each home, then determines which available measures are appropriate for the home. Homeowners and/or landlords approve all direct-install measures prior to installation, which could include the following:

- Up to 20 LED lightbulbs
- One high-efficiency showerhead
- Pipe insulation from the water heater to the home wall (approximately 3 ft)
- Tier 2 Advanced Power Strip

The home performance specialist collects energy-use data and records the quantity of measures installed during the audit using specialized software. After the audit, the software creates a report of findings and recommendations for the customer.

To qualify for the Home Energy Audit program, a participant must live in Idaho and be the Idaho Power customer of record for the home. Renters must have prior written permission from the landlord. Single-family site-built homes, duplexes, triplexes, and fourplexes qualify, though multi-family homes must have discrete heating units and meters for each unit. Manufactured homes, new construction, or buildings with more than four units do not qualify.

Interested customers fill out an application online. If they do not have access to a computer, or prefer talking directly to a person, Idaho Power accepts applications over the phone. Participants are assigned a home performance specialist based on geographical location to save travel time and expense.

Participating customers pay $99 (all-electric homes) or $149 (other homes: gas, propane, or other fuel sources) for the audit and installation of measures, with the remaining cost covered by the Home Energy Audit program. The difference in cost covers the additional testing that is necessary for homes that are not all-electric. These types of energy audits normally cost $300 or more, not including the select energy-saving measures, materials, and labor. The retail cost of the materials installed in each home averages $145.

Program Activities

Because the CAKE Systems audit software was discontinued at the end of 2017, in 2018 the home performance specialists used an audit tool created by Idaho Power when the program was the Boise City Home Audit project. To find a permanent software solution, various software vendors were invited to submit bids through a competitive RFP. A cross-functional team selected the software (SnuggHome) that would best fit the needs of this program, including enhancements to meet strict cyber security requirements. Testing and training has been completed, and home energy audits completed in 2019 will use the new software.

In the first quarter, Idaho Power added a new direct-install audio/visual smart strip to the list of available measures. The smart strip is an eight-outlet power strip that provides constant power to two of the outlets, and on-demand power to the other six. The constant power is for electronics, such as a cable box or recorder, while the on-demand power is used for peripherals, such as a TV, an amplifier, a DVD player, speakers, etc. The smart strip shuts off the on-demand power when a predetermined amount of time has passed since the device was last used.

Three home performance specialist companies served the program in 2018 and completed 466 energy audits. House size ranged from 625 square ft (ft^2) to 9092 ft^2, with 2383 ft^2 being the average-sized home. Houses were built from 1883 to 2018, with the average age of home being 35 years old.

Figure 26 depicts the program's reach across Idaho Power's service area, and Figure 27 depicts the space and water heating fuel types. Figure 28 indicates the total quantity of direct-install measures.

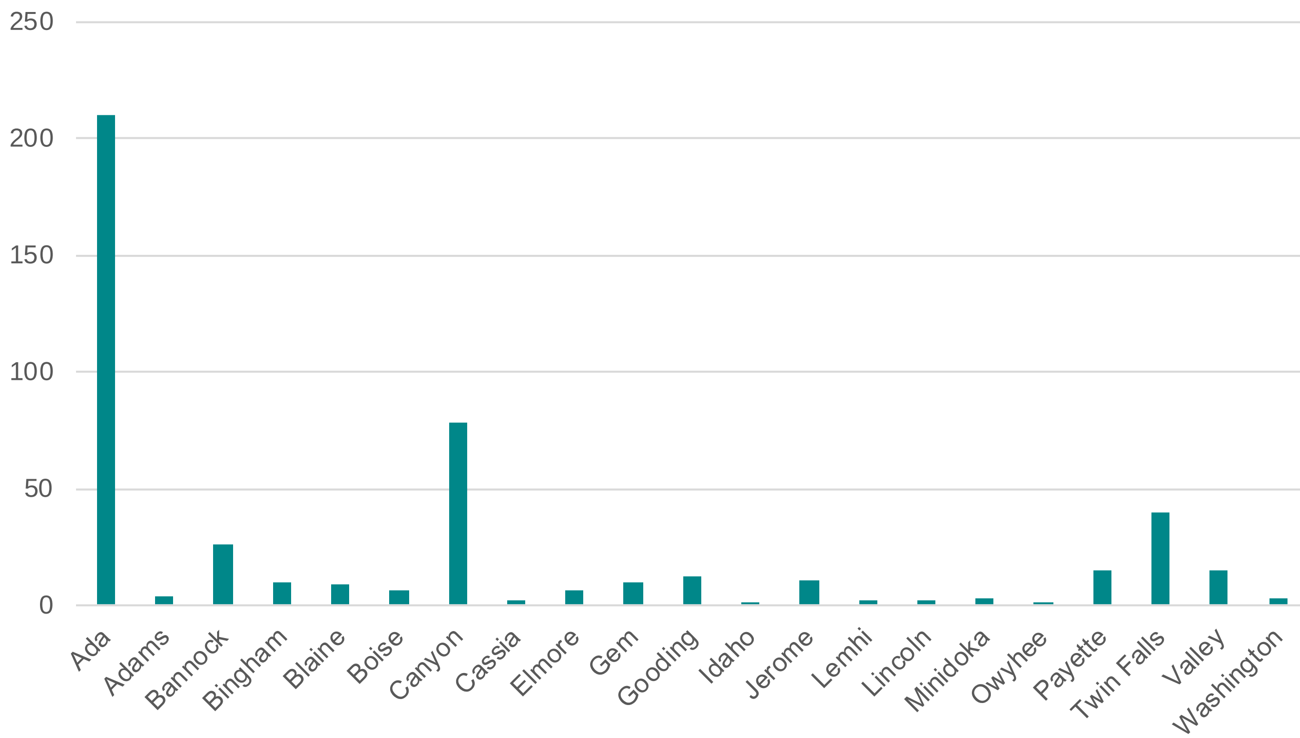

Figure 26. Home Energy Audit summary of participating homes, by county

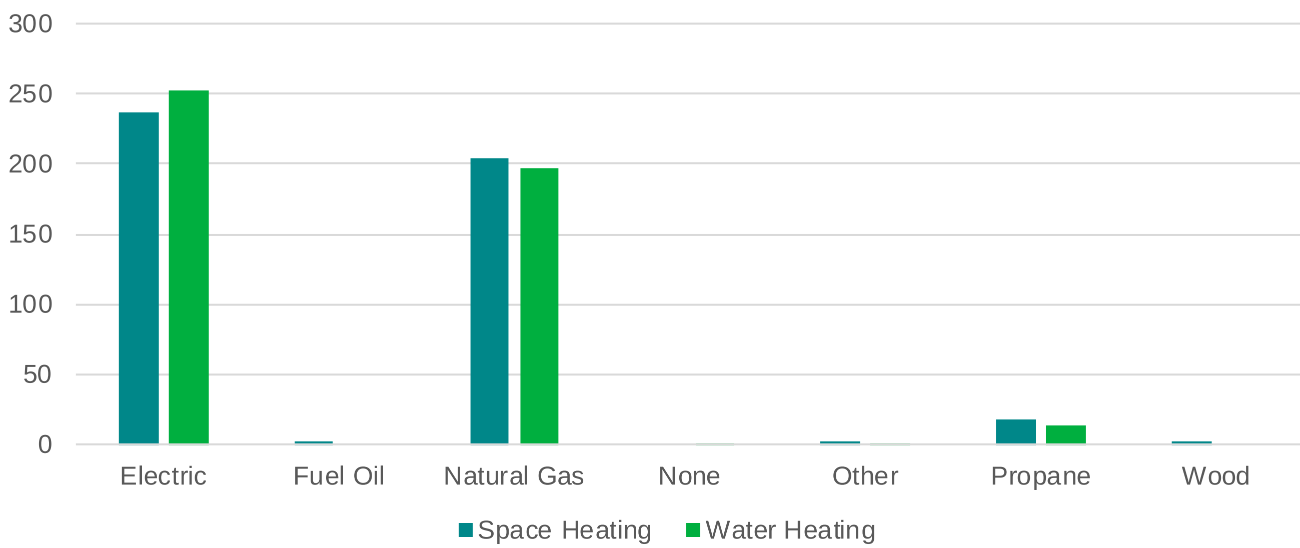

Figure 27. Home Energy Audit summary of space and water heating fuel types

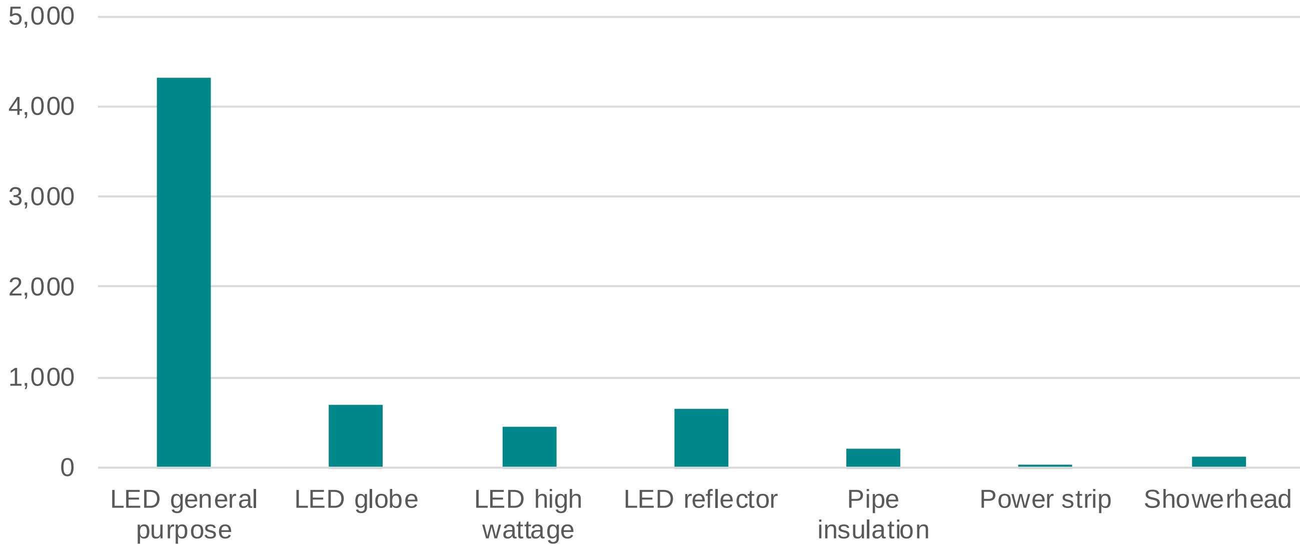

Figure 28. Home Energy Audit measures installed in participating homes

The QA goal for the program was inspection of 5 percent of all audits, translating into approximately 23 audits in 2018. Ultimately, 26 QAs were completed in 2018, with all audits passing inspection.

Marketing Activities

In 2018, the Home Energy Audit marketing collateral (including bill inserts, flyers, posters, print and digital advertisements, etc.) continued the illustrated look and feel of the 2017 campaign. Idaho Power recruited participants using small batches of direct-mail letters to ensure customers who sign up are contacted within a short timeframe and to avoid a large backlog of work which could result in a poor customer experience.

Figure 29. Home Energy Audit program bill insert

In November 2018, Idaho Power collaborated with the University of Idaho's Valley County Extension Office to host an energy efficiency workshop in Cascade, Idaho. Letters were sent to residents inviting the community to attend the afternoon and evening workshops. The workshop was attended by approximately 12 residents and was well received. Attendees learned how to check their homes for efficiency, how to make improvements, what incentives are available through Idaho Power, and how a professional energy assessment could help improve energy efficiency. Each participant received a Giveaway ESK.

Program-related bill inserts were sent to 334,335 residential customers in March, 329,995 customers in June, and 325,425 in December. The program was prominently featured in the overall energy efficiency residential marketing campaign, including a specific call-out in the television, print, and digital advertisements. The company also featured the Home Energy Audit in an article in the October issue of *Connections*. The *2018 Summer Energy Efficiency Guide* featured ways to save energy at home and referred customers to the Home Energy Audit web page. The guide appeared in regional newspapers in July and August.

In September, digital display ads ran on a variety of websites based on user demographics, search behavior, and other targeted factors (Figure 30). The ads generated 676,000 impressions and a 0.16 percent click-through rate. In February and June, digital ads ran on Facebook and generated 55,930 and 146,757 impressions, respectively. The February ad was boosted in March, generating an additional 7,667 impressions. In June, another post about the program was boosted, resulting in 9,237 impressions. In March, KPVI in Pocatello interviewed an Idaho Power customer representative who shared information about the Home Energy Audit program.

Figure 30. Home Energy Audit program digital ad

Customers who enrolled in the Home Energy Audit program throughout the year were asked where they heard about the program. Responses included the following: information in the mail, 50 percent; other, 30 percent; family member or friend, 10 percent; Idaho Power employee, 9 percent; social media, 1 percent.

Cost-Effectiveness

One of the goals of the Home Energy Audit program is to increase participants' understanding of how their home uses energy and to encourage their participation in Idaho Power's energy efficiency programs. Since the Home Energy Audit program is primarily an educational and marketing program, the company does not apply the traditional cost-effectiveness tests to the program.

For the items installed directly in the homes, Idaho Power used RTF savings for direct-install lightbulbs, which range from 16 to 61 kWh per year. This was a slight increase over the 2017 lightbulb savings which ranged from 14 to 47 kWh per year. The savings attributed to the directly installed LEDs increased nearly 40 MWh between 2017 and 2018. This increase is offset slightly by lower savings and fewer installations of showerheads and pipe wraps. These changes account for the 36 MWh increase in total reported savings between 2017 and 2018.

The RTF savings for 2.0 gpm showerheads directly installed in an electrically water heated home are approximately 144 kWh per year. However, showerheads that were installed on non-electrically water heated homes do have a small amount of electric savings. The RTF calculates the energy saved from the water not processed at a wastewater treatment facility. The RTF estimates that a 2.0 gpm showerhead installed on a non-electric water heater saves approximately 4 kWh per year. In Idaho Power's *Energy Efficiency Potential Study,* Applied Energy Group (AEG) estimates that pipe wraps save 130 kWh per year. Savings for both showerheads and pipe wrap were counted for homes with electric water heaters.

Idaho Power contracted with DNV GL to perform an impact evaluation of the program in 2017. DNV GL recommended that Idaho Power use the pipe wrap savings of 130 kWh for from the 2016 potential study. Because of the timing of the result of that study, Idaho Power did not incorporate those savings prior to the 2018 program year. However, the pipe wrap savings from the 2016 study were used in the 2018 program year. Additionally, AEG provided new estimates for pipe wrap savings with the 2018 potential study update. These new savings will be applied in 2019.

DNV GL also recommended claiming NEBs for pipe wrap insulation and showerheads in homes with gas water heat. Idaho Power has calculated the gas and water savings for showerheads installed in gas water heat homes. While Idaho Power does not calculate a cost-effectiveness ratio for the Home Energy Audit program, those values have been included in the sector and portfolio cost-effectiveness.
Idaho Power has also converted the 130 kWh of pipe wrap savings to 4.43 therms and those gas savings are included in the sector and portfolio cost-effectiveness.

Customer Satisfaction

Throughout 2018, a survey was sent to 456 customers who had participated in the program between October 2017 and September 2018. The purpose of the survey was to assess customers' satisfaction with program enrollment, the scheduling, the auditor, the personalized report, and the information learned. Participants who supplied an email address on the initial program enrollment form were sent an electronic survey (301 participants); those without an email address were sent a hard copy of the survey with a postage-paid envelope (155 participants). The response rate was about 34 percent, with 156 participants responding.

When asked a series of questions about their experience with the program, about 90 percent of respondents "strongly agree" or "somewhat agree" they would recommend the program to a friend or relative, and nearly 91 percent of respondents "strongly agree" or "somewhat agree" they were satisfied with their overall experience with the program. Nearly 97 percent of the respondents indicated it was "very easy" or "somewhat easy" to apply for the program. Home performance specialists were rated on a number of attributes, including courteousness, professionalism, explanation of work/measurement to be performed, explanation of audit recommendations, and overall experience. Respondents rated their home performance specialist as "good" or "excellent" 90 to 99 percent of the time.

When asked how strongly they agree or disagree with statements about what they learned during the audit process, over 93 percent of respondents "strongly agree" or "somewhat agree" they were more informed about the energy use in their home. Over 77 percent reported they "strongly agree" or "somewhat agree" they were more informed about energy efficiency programs available through Idaho Power. Over 84 percent indicated they "strongly agree" or "somewhat agree" they learned what additional no-cost to low-cost actions they could take.

A copy of the survey results can be found in *Supplement 2: Evaluation.*

2019 Program and Marketing Strategies

Idaho Power will continue recruiting participants through small batches of targeted direct-mailings, social media posts, advertising, and bill inserts. Additional digital advertising may be considered if the program needs to be strategically promoted in specific regions.

Beginning January 2019, based on the results of the RFP, Idaho Power will use SnuggHome residential auditing software from SnuggPro.

Multifamily Energy Savings Program

	2018	2017
Participation and Savings		
Participants (projects)	25	12
Energy Savings (kWh)	655,963	617,542
Demand Reduction (MW)	n/a	n/a
Program Costs by Funding Source		
Idaho Energy Efficiency Rider	$205,131	$167,342
Oregon Energy Efficiency Rider*	$0	$0
Idaho Power Funds	$0	$874
Total Program Costs—All Sources	$205,131	$168,216
Program Levelized Costs		
Utility Levelized Cost ($/kWh)	$0.030	$0.026
Total Resource Levelized Cost ($/kWh)	$0.030	$0.026
Benefit/Cost Ratios		
Utility Benefit/Cost Ratio	1.60	1.75
Total Resource Benefit/Cost Ratio	3.00	3.55

* Idaho Rider charges of $13,264 were reversed and charged to the Oregon Rider in March 2019. Oregon savings should have been 67,270 kWh.

Description

The Multifamily Energy Savings Program provides for the direct installation of energy-saving products in multi-family dwellings with electrically heated water in Idaho and Oregon. These energy-saving products are installed by an insured contractor hired by Idaho Power at no cost to the property owner, manager, or tenant. Idaho Power defines a multi-family dwelling as a building consisting of five or more rental units. The products installed are: ENERGY STAR® LED lightbulbs, high-efficiency TSV showerheads, kitchen and bathroom faucet aerators, and water heater pipe insulation.

To ensure energy savings and eligibility, each building is pre-approved by Idaho Power and the contractor who will install the energy efficiency measures. Upon approval, the no-cost, direct installation is scheduled and completed. Tenants in participating apartment complexes receive a tailored door hanger before the service date notifying them that contractors will be entering their home to install energy-saving products.

Program Activities

Twenty-five projects across the Idaho and Oregon service area were completed as program participation increased significantly in 2018. Between these 25 projects, a total of 810 apartment units received the energy-saving products, compared to 687 apartment units in 2017.

Marketing Activities

To increase awareness and promote participation in the Multifamily Energy Savings Program, three alternating, clickable ads were added to the Landlord/Property Manager Requests page of Idaho Power's website (Figure 31). Letters describing the program, its benefits, and eligibility requirements were mailed to targeted audiences (landlords and property owners) to further increase awareness.

Figure 31. Three Multifamily Energy Saving Program promotional ads on website

In mid-2018, a new marketing video was added to the Multifamily Energy Savings Program web page. The video explains the eligibility requirements, the no-cost direct-install measures available to landlords/tenants, the installation process, and the potential for residents to save on their monthly bills and be more comfortable in their home. Contact information is provided at the end of the video.

As customers participated in the program throughout the year, Idaho Power communicated with them before and after their installations. A pre-installation door hanger explained the schedule and the types of products a contractor would install inside the customers' homes (Figure 32). Once installation was complete, Idaho Power left materials to explain the new energy efficiency measures and to provide contact information should the tenant have any questions. Lastly, customers were asked to participate in a survey, rating their satisfaction for installed measures and overall product and program satisfaction. The responses will help Idaho Power improve marketing activities in the future.

Figure 32. Multifamily Energy Saving Program post-project customer survey

Cost-Effectiveness

The RTF provides deemed savings for direct-install LED lightbulbs and low-flow showerheads. The LED lightbulbs have a deemed savings value of 16 to 61 kWh per year depending on the type and lumens of the lightbulb and the location of the lightbulb installation. The integrated 1.75 gpm showerheads with TSV were installed in most apartments. These showerheads save approximately 267 kWh per year. Some apartments had the 2.0 gpm showerhead installed which save approximately 102 kWh. For the faucet aerator and pipe wrap, the RTF does not provide a deemed savings estimate. In Idaho Power's *Energy Efficiency Potential Study*¸ AEG estimated the annual faucet aerator savings to be 56 kWh and the annual pipe wrap savings to be 81 kWh.

In 2018, the RTF reviewed and updated the savings assumptions for LED lightbulbs and deemed savings values for faucet aerators. These new savings will be applied in 2019.

The UCT and TRC ratios for the program is 1.60 and 3.00 respectively. Impact and process evaluations were conducted for the program in 2018. If the evaluation costs incurred in 2018 were removed from the program's cost-effectiveness, the UCT and TRC ratios would be 1.96 and 3.66 respectively.

For detailed cost-effectiveness assumptions, metrics, and sources, see *Supplement 1: Cost-Effectiveness*.

Customer Satisfaction

Idaho Power included a satisfaction survey with the leave-behind materials in each apartment. Both an online and mail-in option were offered. The response rate was low, with only 52 out of over 700 residents responding by mailing in the stamped survey cards; no online surveys were submitted. Residents were asked to rate several attributes on a scale with 1 being very dissatisfied to 5 being very satisfied. Overall, the residents that responded to the survey were satisfied with the project. Respondents rated the quality of the products at 4.54 and rated the overall project at 4.67.

Evaluations

In 2018, Idaho Power retained Tetra Tech to conduct an impact evaluation of 2017 reported savings and a process evaluation of current program processes. The results of the evaluations revealed a successful first-year program.

The impact evaluation found that Idaho Power used the incorrect savings values from the 2016 potential study which resulted in an overall realization rate of 84 percent. The transcribed error was corrected for the 2018 program year.

The process evaluation found that the program specialist and installation contractors work well to deliver the program. Contractors indicated that current processes effectively streamline program activity and reduce additional visits that burden property managers and tenants. They also found the program materials to be professional, informative, and educational.

Idaho Power will consider all recommendations from the process and impact evaluations; responses will be reported in the *Demand-Side Management 2019 Annual Report*. See the complete process and impact evaluation report in *Supplement 2: Evaluation*.

2019 Program and Marketing Strategies

Idaho Power plans to increase energy-efficient direct-installation projects in multi-family dwellings throughout its service area in 2019. Following a suggestion from EEAG, Idaho Power anticipates adding attic insulation to the list of direct-install measures in 2019. To qualify, current insulation must be rated R7 or below.

Idaho Power will continue to use informative notifications, pre-installation door hangers, and post-installation informational marketing pieces as well as survey cards. Direct-mailings will be continued to encourage engagement and participation from property owners/managers and to increase program visibility.

Oregon Residential Weatherization

		2018	2017
Participation and Savings			
	Participants (audits/projects)	5	7
	Energy Savings (kWh)	n/a	2,154
	Demand Reduction (MW)	n/a	n/a
Program Costs by Funding Source			
	Idaho Energy Efficiency Rider	$0	$0
	Oregon Energy Efficiency Rider	$5,507	$2,384
	Idaho Power Funds	$0	$0
	Total Program Costs—All Sources	$5,507	$2,384
Program Levelized Costs			
	Utility Levelized Cost ($/kWh)	n/a	$0.063
	Total Resource Levelized Cost ($/kWh)	n/a	$0.099
Benefit/Cost Ratios			
	Utility Benefit/Cost Ratio	n/a	n/a
	Total Resource Benefit/Cost Ratio	n/a	n/a

Description

Idaho Power offers free energy audits for electrically heated customer homes within the Oregon service area. This is a program required by Oregon Revised Statute (ORS) 469.633 and has been offered under Oregon Tariff Schedule 78 since 1980. Upon request, an energy audit contractor hired by Idaho Power visits the customer's home to perform a basic energy audit and analyze it for energy efficiency opportunities. An estimate of costs and savings for recommended energy efficient measures is given to the customer. Customers may choose either a cash incentive or a 6.5-percent interest loan for a portion of the costs for weatherization measures.

Program Activities

In 2018, five customers returned a card from the program brochure indicating interest in a home energy audit, weatherization loan, or incentive payment. All five of these customers met the program requirements and received audits, though none chose to move forward with the recommended energy efficiency upgrades. Therefore, no loans or incentives were issued in 2018.

Marketing Activities

During May, as required, Idaho Power sent every Oregon residential customer an informational brochure about energy audits and home weatherization financing.

Cost-Effectiveness

The Oregon Residential Weatherization program is a statutory program described in Oregon Schedule 78, which includes a cost-effectiveness definition of this program. Pages three and four of the schedule identify the measures determined to be cost-effective and the specified measure life cycles for each. This schedule also includes the cost-effective limit (CEL) for measure lives of seven, 15, 25, and 30 years.

No audits translated to efficiency projects in 2018.

2019 Program and Marketing Strategies

Idaho Power will complete requested audits, fulfill all incentives deemed cost-effective, and process loan applications as required under Tariff Schedule 78. The company will market the program to customers with a bill insert/brochure and add a program web page to the Savings For Your Home section of the Idaho Power website in 2019.

Rebate Advantage

		2018	2017
Participation and Savings			
	Participants (participants)	107	66
	Energy Savings (kWh)	284,559	214,479
	Demand Reduction (MW)	n/a	n/a
Program Costs by Funding Source			
	Idaho Energy Efficiency Rider	$105,770	$93,891
	Oregon Energy Efficiency Rider	$41,714	$10,861
	Idaho Power Funds	$0	$244
	Total Program Costs—All Sources	$147,483	$104,996
Program Levelized Costs			
	Utility Levelized Cost ($/kWh)	$0.027	$0.025
	Total Resource Levelized Cost ($/kWh)	$0.064	$0.055
Benefit/Cost Ratios			
	Utility Benefit/Cost Ratio	1.93	1.88
	Total Resource Benefit/Cost Ratio	1.08	1.19

Description

Initiated in 2003, the Rebate Advantage program helps Idaho Power customers in Idaho and Oregon with the initial costs associated with purchasing a new, energy-efficient, ENERGY STAR® qualified manufactured home. This enables the homebuyer to enjoy the long-term benefit of lower electric bills and greater comfort provided by these homes. The program also provides an incentive to the sales consultants to encourage more sales of ENERGY STAR qualified homes and more discussion of energy efficiency with their customers during the sales process.

In addition to offering financial incentives, the Rebate Advantage program promotes and educates buyers and retailers of manufactured homes about the benefits of owning energy-efficient models. The Northwest Energy Efficient Manufactured (NEEM) housing program establishes quality control (QC) and energy efficiency specifications for qualified homes. NEEM is a consortium of manufacturers and state energy offices in the Northwest. In addition to specifications and quality, NEEM tracks the production and on-site performance of ENERGY STAR qualified manufactured homes.

Program Activities

In 2018, the residential customer incentive for this program was $1,000; the sales staff incentive was $200 for each qualified home they sold. Idaho Power paid 107 incentives on new manufactured homes, which accounted for 284,559 annual kWh savings. This included a 32-home development in Ontario, Oregon.

Marketing Activities

In March, Rebate Advantage was promoted through a bill insert (shared with the Energy House Calls program) sent to 345,506 customers. The insert had information about the potential energy and dollar savings to customers and referred customers to the program website.

In May 2018, the company updated Rebate Advantage program collateral, including flyers and posters. Idaho Power continued to support manufactured home dealerships by providing them with updated Rebate Advantage collateral, as well as 10 vinyl banners (Figure 33).

Figure 33. Rebate Advantage dealership banner

A Facebook ad ran in September aimed at reaching Spanish- and English-speaking customers age 35-65+ with at least a high school education and an interest in manufactured housing. The ad reached 11,836 people and resulted in 38,444 impressions.

Cost-Effectiveness

The Rebate Advantage program has a UCT of 1.93 and a TRC of 1.08. In February 2017, the RTF updated savings for new construction manufactured homes. The RTF updated the heating system measure identifier for these new manufactured homes. Previously, the savings for these homes differed by heating system type: electric forced air furnace vs. heat pump. The RTF models savings for the new home "shell." When compared to an inefficiently built home, efficient homes with an electric forced-air furnace technically save more energy than those built with a heat pump because the savings come from the shell and not the heating source. The RTF was concerned that while manufactured homes would leave the factory with an electric forced-air furnace; some of these homes would have a heat pump installed within a year. If this would occur, savings could be double counted within Rebate Advantage and H&CE Program. To address this, the RTF blended the heating system type to be split 75 percent forced-air furnace and 25 percent heat pump. As a result, the average annual savings per home declined by 18 percent between 2017 and 2018.

For detailed information for all measures within the Rebate Advantage program, see *Supplement 1: Cost-Effectiveness*.

2019 Program and Marketing Strategies

Idaho Power will continue to support manufactured home dealers by providing them with program materials. The company will also distribute a bill insert to Idaho and Oregon customers and will explore digital advertising to promote the program to potential manufactured home buyers.

Residential New Construction Pilot Program

	2018	2017
Participation and Savings		
Participants (participants)	307	277
Energy Savings (kWh)	777,369	608,292
Demand Reduction (MW)	n/a	n/a
Program Costs by Funding Source		
Idaho Energy Efficiency Rider	$400,910	$320,637
Oregon Energy Efficiency Rider	$2	$2,232
Idaho Power Funds	$0	$651
Total Program Costs—All Sources	$400,912	$323,520
Program Levelized Costs		
Utility Levelized Cost ($/kWh)	$0.027	$0.028
Total Resource Levelized Cost ($/kWh)	$0.061	$0.051
Benefit/Cost Ratios		
Utility Benefit/Cost Ratio	2.51	2.36
Total Resource Benefit/Cost Ratio	1.23	1.47

Description

The Residential New Construction Pilot Program launched in March 2018, replacing the ENERGY STAR® Homes Northwest Program. The Residential New Construction Pilot Program offers builders a cash incentive to build energy-efficient, single-family homes that use heat pump technology in Idaho Power's Idaho service area. These homes must meet strict requirements that make them at least 20 percent more energy efficient than homes built to standard state energy code.

The RTF and NEEA have created specific modeling requirements and program guidelines to ensure the program provides reliable energy savings for utilities across the Northwest. These homes feature high-performance HVAC systems, high-efficiency windows, increased insulation values, and tighter building shells to improve comfort and save energy. Idaho Power claims energy savings based on each home's individual modeled savings.

Builders must contract with a Residential Energy Services Network (RESNET)-certified rater to ensure the home design will meet program qualifications. The rater will work with the builder from the design stages through project completion; perform the required energy modeling using REM/Rate modeling software; perform site inspections and tests; and enter, maintain, and submit all required technical documentation in the REM/Rate modeling software and the AXIS database. This data is used to determine the energy savings and the percent above code information needed to certify the home. NEEA maintains the regional AXIS database.

Program Activities

The ENERGY STAR® Homes Northwest Program was phased out in 2018, and only homes that were started prior to January 31, 2018 and certified by December 31, 2018 could qualify for that incentive. Two hundred ninety-two of these homes were certified and received the $1,000 incentive in 2018.

The incentive for homes certified under the Residential New Construction Pilot Program is $1,500. The company paid incentives on 15 Residential New Construction Pilot Program homes, accounting for savings of 64,889 kWh.

Marketing Activities

Idaho Power maintained a strong presence in the building industry by supporting the Idaho Building Contractors Association (IBCA) and several of its local affiliates throughout Idaho Power's service area in 2018. The company participated in the IBCA Summer Board Meeting, the Building Contractors Association of Southwestern Idaho (BCASWI) builder's expo, and the Snake River Valley Building Contractors Association (SRVBCA) builder's expo.

Idaho Power supported Parade of Homes events with full-page ads in the Parade of Homes magazines of the following BCAs: The Magic Valley Builders Association (MVBA), the BCASWI, and the SRVBCA. A print ad was created for the Pocatello Parade of Homes and a poster for the Twin Falls Home Show. Print and digital ads also appeared in the *Idaho Business Review* in June (Figure 34).

Figure 34. Residential New Construction Pilot Program ad

On the April and May billing statements, Idaho Power added messages informing residential customers of Parade of Homes events in their area. A bill insert was sent to 342,687 Idaho customers in May to promote the program.

New informational program brochures and a new program web page were created in March to educate and inform program stakeholders and customers of the new program.

Cost-Effectiveness

Residential New Construction cost-effectiveness improved in 2018 because of increased savings and decreased incremental costs. The RTF updated prescriptive deemed savings numbers for new construction townhomes for Idaho and Montana in spring of 2017. The increase savings from 2,196 to 2,440 annual kWh better reflected Idaho building code baselines. The updated RTF savings were applied to the 292 legacy ENERGY STAR® homes submitted by builders in 2018. Savings for the 15 energy-modeled homes varied between 2,100 and 8,700 kWh per home depending on which efficiency upgrades were included to meet the 20-percent over code program requirement.

Incremental costs of efficient measures dropped by over $400 per home for legacy homes contributing to improved benefit-cost ratios. Incremental costs for the 15 modeled homes were calculated on a project-by-project basis looking at the average upgrades in efficiency within the two communities. For more detailed information about the cost-effectiveness savings and assumptions, see *Supplement 1: Cost-Effectiveness*.

2019 Program and Marketing Strategies

Idaho Power plans to continue to promote this program to Idaho builders and new home buyers. These marketing efforts include ads in Parade of Homes magazines for the BCASWI, SRVBCA, MVBA, and the Building Contractors Association of Southeast Idaho (BCASEI). A bill insert is planned for spring 2019. The company also plans to continue supporting the general events and activities of the IBCA and its local affiliates. Social media and other advertising will be considered based on past effectiveness.

Shade Tree Project

		2018	2017
Participation and Savings			
	Participants (trees)	2,093	2,711
	Energy Savings (kWh)	35,571	n/a
	Demand Reduction (MW)	n/a	n/a
Program Costs by Funding Source			
	Idaho Energy Efficiency Rider	$162,995	$194,695
	Oregon Energy Efficiency Rider	$0	$0
	Idaho Power Funds	$0	$1,122
	Total Program Costs—All Sources	$162,995	$195,817
Program Levelized Costs			
	Utility Levelized Cost ($/kWh)	$0.307	n/a
	Total Resource Levelized Cost ($/kWh)	$0.307	n/a
Benefit/Cost Ratios			
	Utility Benefit/Cost Ratio	0.71	n/a
	Total Resource Benefit/Cost Ratio	0.80	n/a

Description

The Shade Tree Project began as a pilot in 2013. According to the DOE, a well-placed shade tree can reduce energy used for summer cooling by 15 percent or more. Utility programs throughout the country report high customer satisfaction with shade tree programs and an enhanced public image for the utility related to sustainability and environmental stewardship. Other utilities report energy savings between 40 kWh per year (coastal climate San Diego) and over 200 kWh per year (Phoenix) per tree planted.

To be successful, trees should be planted to maximize energy savings and ensure survivability. Two technological developments in urban forestry—the state-sponsored Treasure Valley Urban Tree Canopy Assessment and the Arbor Day Foundation's Energy-Saving Trees tool—provided Idaho Power with the information to facilitate a shade tree project.

The Shade Tree Project operates in a small geographic area each spring and fall, offering no-cost shade trees to residential customers. Participants enroll using the online Energy-Saving Trees tool and pick up their tree at specific events. Unclaimed trees are donated to cities and schools.

Using the online enrollment tool, participants locate their home on a map, select from a list of available trees, and evaluate the potential energy savings associated with planting in different locations. During enrollment, participants learn how trees planted to the west and east save more energy over time than trees planted to the south and north.

Ensuring the tree is planted properly helps it grow to provide maximum energy savings. At the tree pickup events, participants receive additional education on where to plant trees for maximum energy savings and other tree care guidance from experts. Local specialists include city arborists from participating municipalities; Idaho Power utility arborists; county master gardeners; and College of Southern Idaho horticulture students.

Each fall, Idaho Power sends participants from the previous two offerings a newsletter filled with reminders on proper tree care and links to resources, such as tree care classes and educational opportunities in the region. This newsletter was developed after the 2015 field audits identified common customer tree care questions and concerns.

Program Activities

In 2018, Idaho Power expanded the Shade Tree Project to include additional counties. In the spring, the project was open to customers in Twin Falls, Jerome, Gooding, Camas, Lincoln, Minidoka, and Cassia counties. In the fall, the project was open to customers in Ada, Canyon, Elmore, Gem, Payette, Owyhee, and Washington counties. Overall, Idaho Power distributed 2,093 trees to residential customers through the Shade Tree Project. Because the best time to plant shade trees is in the spring and fall, Idaho Power held offerings in April and October, with 954 trees and 1,139 trees distributed, respectively.
Idaho Power purchased the trees from a local wholesale nursery in advance of each event. The species offered for each event depended on the trees available at the time of purchase. Idaho Power worked with city and state arborists to select a variety of large-growing, deciduous trees that traditionally grow well in the climate and soils of the participating counties.

Participants picked up the trees at events throughout the project area—two in the spring and four in the fall. Staging several pickup days, locations, and times helps maximize the number of trees picked up. In 2018, 85 percent of all trees were distributed to homeowners.

Idaho Power continues to track the program data in the DSM database. The database is also used to screen applicants during enrollment to determine whether participants meet the eligibility requirements for the project, such as residential status within the eligible counties (customer type and location).

Marketing Activities

For both spring and fall offerings, Idaho Power developed a direct-mailing list using Idaho Power customer information to identify customers who lived in a house that had been constructed within the last 10 years. Approximately 8,330 direct-mailers were sent to targeted customers in the spring and 9,501 in the fall.

For both offerings, Idaho Power also sent emails to customers who had requested information about the project through Idaho Power's website. The cities of Nampa, Meridian, Boise, and Payette shared information through their networks. Idaho Power announced its Shade Tree Project to the Treasure Valley Canopy Network. The company also distributed program flyers at local events, where appropriate, and created a vinyl banner for the first event held in Twin Falls.

A cloth poster was available in 2018 to showcase what each tree would look like at full maturity and was a useful reference for customers who had questions. In June, the program was featured in *Connections*, citing the recent visit to Twin Falls and directing customers to the program website to sign up to be notified of future events.

Each recipient of a shade tree received a packet containing planting directions, tips, illustrations, and other useful information. In September 2018, a newsletter was sent to the last season's program participants. Articles discussed the expansion of the program to new locations and tips on how to keep trees healthy. The company also ran a social media post in April thanking the participants and host who made the Twin Falls event a success (Figure 35). The program was also promoted in the *Home Energy Reports*.

Figure 35. Thank-you post from Idaho Power after Twin Falls Shade Tree Project event

Cost-Effectiveness

For the Shade Tree Project, Idaho Power utilizes the Arbor Day Foundation’s software which calculates energy savings and other NEBs based on tree species and orientation and distance from the home. This tool, i-Tree software, estimates these benefits for years 5, 10, 15, and 20 after the tree planting year. However, the savings from the tool assumes that each tree is planted as planned. In 2018, Idaho Power contracted with DNV GL to evaluate the program to determine a realization rate based on the survival rate for these trees and to develop a model to calculate average values per tree.

The cost-effectiveness for the program is based on the modeled savings for the tree distributed in 2018 and the costs incurred during 2018. As shown in Table 11, it is estimated these trees will begin saving 35,425 kWh in 2022 and 116,197 kWh by year 2038. Based on the model, the project has as UCT ratio of 0.71 and a TRC ratio of 0.80.

For the calculator, DNV GL assumed a measure life of 20 years. This is because i-Tree software only estimates saving at 5, 10, 15, and 20 years. In 2018, the bur oak, northern red oak, Greenspire® littleleaf linden, and tulip tree were the most common species distributed in the project. According to the United States Department of Agriculture (USDA), a bur oak can live 300 to 400 years, and a northern red oak can live up to 500 years. The Urban Forest Ecosystem Institute estimates the littleleaf linden can live 50 to 150 years, and the tulip trees can live beyond 150 years. Idaho Power acknowledges the potential energy savings for a tree may continue to increase beyond year 20, but the savings will be capped at some point regardless of how large the tree grows. For the trees distributed in 2018, data around the survivorship beyond 2038 is also unknown. While the energy savings in 2038 is estimated to be 116,197 kWh, the savings may continue to increase at a diminishing rate before eventually declining due to increased mortality. However, if energy savings were to stay constant beyond year 20, it can be assumed that the program would be cost-effective from both the UCT and RTC perspective if the program life was revised to 30 years.

For non-energy impacts, i-Tree software estimates a monetary benefit value for improved air quality and avoided runoff from stormwater. However, these benefits are largely offset by the heating detriment caused by the winter shade from the tree that requires extra heating for the home. Also, while the tree does remove carbon dioxide from the air, there is also an increase in carbon dioxide from the increased winter home heating.

While an evaluation was conducted for the program in 2018, the evaluations costs will be incurred in 2019. At that time, Idaho Power will calculate the cost-effectiveness ratios with and without evaluation costs.

For more detailed information about the cost-effectiveness savings and assumptions, see *Supplement 1: Cost-Effectiveness*.

Customer Satisfaction

After each offering, a survey was emailed to participants. The survey asked questions related to program marketing, tree-planting education, and participant experience with the enrollment and tree pickup processes. Results are compared, offering to offering, to look for trends to ensure the program processes are still working, and to identify opportunities for improvement. Data are also collected about where and when the participant planted the tree. These data will be used by Idaho Power to refine energy-savings estimates.

In total, the survey was sent to 1,170 Shade Tree Project participants. The company received 696 responses for a response rate of over 59 percent. Participants were asked how much they would agree or disagree that they would recommend the project to a friend; nearly 96 percent of respondents said they “strongly agree,” and nearly 3 percent said they “somewhat agree.” Participants were asked how much they would agree or disagree that they were satisfied with the overall experience with the Shade Tree Project; over 92 percent of respondents indicated they “strongly agree,” and nearly 7 percent “somewhat agree” they were satisfied. View the complete survey results in *Supplement 2: Evaluation*.

Evaluations

In 2018, DNV GL was retained to estimate kWh savings for trees planted during program years 2013 through 2018. DNV GL reconciled program enrollment data with data obtained during Idaho Power audits of a random selection of the trees planted in 2013 to 2016. The audits recorded actual orientation and distance from the home and recalculated savings based on those actual values. The audits also provided mortality data.

DNV GL used estimated kWh savings from i-Trees software to calculate average realization rates and benefits for each planting year, by audited tree species for years 5, 10, 15, and 20 after planting. They assigned these average realization rate assumptions to the unaudited trees and calculated the evaluated savings rates. DNV GL then averaged all values per planting year to calculate the average per-tree benefits and interpolated annual per-tree average benefits for all years.

The total savings and benefits were calculated by multiplying the per-tree average savings by the number of trees planted each year and the estimated survival rate for that year. DNV GL recommends Idaho Power claim future benefits and energy savings as noted in Table 11.

Table 11. Suggested energy savings from DNV GL for the Shade Tree Project

	Incremental Annual Savings (kWh)					
Planting Year	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
2013	3,724	860	783	756	729	703
2014		34,511	7,974	7,253	7,006	6,759
2015			32,361	7,477	6,802	6,570
2016				34,883	8,060	7,332
2017					45,884	10,602
2018						35,425
Incremental Claimable Annual Savings*	3,724	35,371	41,118	50,370	68,482	67,390
Total Current Year Savings**	3,724	39,095	303,848	277,729	254,723	203,262
Cumulative Savings***	3,724	42,818	346,666	624,395	879,119	1,082,381

*Incremental savings over previously claimed annual savings.
**Total annual savings for trees from all planting years.
***Cumulative savings since program inception.

Idaho Power will respond to any 2018 evaluation recommendations during the 2019 program year. The complete report, including additional calendar-year savings recommendations, can be found in *Supplement 2: Evaluation*.

2019 Program and Marketing Strategies

Idaho Power plans to continue the Shade Tree Project in 2019, returning it to the Twin Falls area in the spring and expanding it to the Pocatello area for the first time in the fall. The project will use the Arbor Day enrollment tool, and trees will be distributed at multiple events.

Idaho Power will continue to market the program through direct-mail, focusing on customers identified using the Urban Tree-Canopy Assessment tool in the Treasure Valley and customer information to identify those customers who live in newly constructed homes. The program will be promoted in the April 2019 *Home Energy Report*. In addition, Idaho Power maintains a waiting list of customers who were unable to enroll because previous offerings filled. Idaho Power will reach out to these customers through direct-mail or email for the 2019 offerings. Idaho Power will continue to leverage allied interest groups and use social media and boosted Facebook posts if enrollment response rates decline.

Simple Steps, Smart Savings™

	2018	2017
Participation and Savings		
Participants (products)	7,377	12,556
Energy Savings (kWh)	241,215	900,171
Demand Reduction (MW)	n/a	n/a
Program Costs by Funding Source		
Idaho Energy Efficiency Rider	$86,721	$185,354
Oregon Energy Efficiency Rider	$3,762	$5,811
Idaho Power Funds	$0	$456
Total Program Costs—All Sources	$90,484	$191,621
Program Levelized Costs		
Utility Levelized Cost ($/kWh)	$0.034	$0.020
Total Resource Levelized Cost ($/kWh)	$0.050	$0.051
Benefit/Cost Ratios		
Utility Benefit/Cost Ratio	1.44	2.38
Total Resource Benefit/Cost Ratio	4.68	5.05

Description

Initiated in 2015, the Simple Steps, Smart Savings™ program is designed to increase sales of qualified energy-efficient appliances through promotion-based incentives. Incentives are shared by the retailer, manufacturer, and the customer, though they may differ among promotions and among retailers and manufacturers.

Idaho Power may provide incentives to the retailer or manufacturer as co-marketing dollars to fund activities such as promotional events, special product placement, point-of-purchase signage, retailer activities, event kits, sales associate training, training material, and other marketing activities during the promotional periods.

Customer rewards may include, but are not limited to, retailer gift cards, free related products, or reduced pricing. Each promotion is available in Idaho and Oregon.

Idaho Power also participates in the BPA-sponsored, Simple Steps, Smart Savings energy-efficient lighting program, which is discussed further in the Energy Efficient Lighting program section of this report. All Simple Steps, Smart Savings promotions are administered by the BPA and coordinated by a third-party contractor, CLEAResult.

Program Activities

In 2018, the qualified products included select ENERGY STAR® rated clothes washers and high-efficiency showerheads. The incentive provided by Idaho Power through this program for clothes washers was applied during special promotions, which aligned with holidays or events throughout the year at retail stores. The promotion for showerheads ran the entire year.

Appliances

In 2018, Idaho Power participated in five major Simple Steps, Smart Savings appliance promotions with these retailers: Sears, Sears Hometown, and RC Willey.

At each event, CLEAResult personnel staffed a table and answered customer questions about the appliance promotion. To further educate customers about the promotions, CLEAResult created an Idaho Power-branded promotional landing page that highlights promotion details and participating retailers.

The five promotions took place as follows: 1) the 2017 Black Friday promotion took place in November through the first week of December—because invoice of sales for this promotion is not received until the following month, they are included with the remaining four 2018 promotions; 2) the President’s Day promotion ran for two weeks in February; 3) the Memorial Day promotion ran the last week in May through the first week in June; 4) the Independence Day promotion ran the last week in June through the first two weeks in July; and 5) the Labor Day promotion ran the last week in August through the first week in September. In-store events were held at all participating retailers in Idaho Power’s service area during the promotions.

Incentives for the purchase of a qualified ENERGY STAR clothes washer included a $25 gift card at Sears, a $25 instant markdown at Sears Hometown, and a $25 gift card at RC Willey. RC Willey added $10 to the $25 provided to allow them to offer a $35 gift card to customers for the first three promotions. The additional $10 was not included in the incentive for the Independence Day and Labor Day promotions.

Showerheads

In 2018, Idaho Power worked with seven participating retailers on the high-efficiency showerhead promotion. There were 6,558 qualified showerhead sales, as compared to 11,528 in 2017. Of those sales, 14 percent were 1.50 gpm, 8 percent were 1.75 gpm, and 78 percent were 2.0 gpm showerheads. One possible reason for the large decrease in showerhead sales may be a result of the reduction in incentive amount from 2017 to 2018. In 2017, customers received a $7 instant markdown for the purchase of a qualified showerhead. In 2018, the instant markdown incentive was decreased to $6 for 1.75 and 1.50 gpm showerheads and $2 for 2.0 gpm showerheads.

Marketing Activities

To help support the appliance promotions, table tents and static clings were displayed on all qualifying appliances. These pieces informed customers about the promotion and the incentive they would receive. In-store gift cards were placed in gift card holders that displayed the Idaho Power logo. For purchases from Sears Hometown, where the customer received an instant markdown, customers also received a thank-you card with the Idaho Power logo. Additionally, CLEAResult field support staffed a table at 15 appliance promotion events to educate customers and sales staff of the Idaho Power incentives.

Several Simple Steps, Smart Savings promotions were conducted through CLEAResult at retail stores in 2018. These promotions generally involved special product placement and signs. CLEAResult staff continued to conduct monthly store visits in 2018 to check on stock, point-of-purchase signs, and displays.

During the promotions, Idaho Power placed Facebook and Twitter posts to notify customers of the details. Idaho Power posted information about the appliance promotions on its Appliances web page and promoted ENERGY STAR washers in its winter *Energy Efficiency Guide*.

Cost-Effectiveness

In late 2016, the RTF reviewed and updated the savings assumptions for showerheads. Due to the timing of the RTF update, BPA and CLEAResult implemented the new savings in 2018. Previously, the annual savings for showerheads ranged between 65 to 111 kWh. Based on the new workbook, showerhead annual savings are now between 15 and 64 kWh. The parameters that impacted the savings for showerheads include assumptions regarding the baseline showerhead, installation rate, and shower duration. As with past RTF workbooks, Idaho Power adjusts the assumptions regarding electric water heating saturation from the regional average of 60 percent to the company's average of 49 percent from the 2016 residential end-use study.

Despite the reduction in savings, showerheads remain cost-effective because there is no incremental cost between the efficient showerhead and the baseline showerhead. The RTF researched the pricing for showerheads and found that the cost did not differ significantly between similar models with varying flow rates.

The clothes washer assumptions did not change between 2017 and 2018. Idaho Power applied the per-unit savings from the approved BPA unit energy savings (UES) Measure List. While BPA applies the annual generator busbar savings of 109 kWh per unit, Idaho Power applies the annual site savings of 101 kWh per unit. This difference is due to the different line losses applied by Idaho Power and BPA. For the NEBs, Idaho Power used RTF's clothes washer workbook to determine the water and wastewater savings for the ENERGY STAR clothes washers.

For detailed information for all measures within the Simple Steps, Smart Savings program, see *Supplement 1: Cost-Effectiveness*.

2019 Program and Marketing Strategies

Idaho Power has committed to participate in the 2019 Simple Steps, Smart Savings appliance promotions, providing incentives only for products that meet Idaho Power's cost-effectiveness requirements. In 2019, the appliance promotion will work on becoming a year-round promotion. Beginning in February, RC Willey plans to begin offering incentives on qualified products throughout the year. CLEAResult will work with Sears Hometown and Lowe's to finalize contracts to begin offering the promotion year-round at their stores. Idaho Power and CLEAResult are in the process of contacting additional retailers to determine interest levels.

Idaho Power will also continue participation in the Simple Steps, Smart Savings energy-efficient showerheads buy-down program in 2019.

CLEAResult will continue to manage marketing at retailers, including point-of-purchase signs, Idaho Power-branded gift card holders, and thank-you cards. Idaho Power will notify customers of the promotions on its website, Facebook, and Twitter pages.

Weatherization Assistance for Qualified Customers

	2018	2017
Participation and Savings		
Participants (homes/non-profits)	193	203
Energy Savings (kWh)	649,505	669,538
Demand Reduction (MW)	n/a	n/a
Program Costs by Funding Source		
Idaho Energy Efficiency Rider	$0	$0
Oregon Energy Efficiency Rider	$0	$0
Idaho Power Funds	$1,272,973	$1,307,485
Total Program Costs—All Sources	$1,272,973	$1,307,485
Program Levelized Costs		
Utility Levelized Cost ($/kWh)	$0.111	$0.111
Total Resource Levelized Cost ($/kWh)	$0.159	$0.152
Benefit/Cost Ratios		
Utility Benefit/Cost Ratio	0.43	0.37
Total Resource Benefit/Cost Ratio	0.52	0.48

Description

The WAQC program provides financial assistance to regional CAP agencies in Idaho Power's service area. This assistance helps fund weatherization costs of electrically heated homes occupied by qualified customers who have limited incomes. Weatherization improvements enable residents to maintain a more comfortable, safe, and energy-efficient home while reducing their monthly electricity consumption. Improvements are available at no cost to qualified customers who own or rent their homes.
These customers also receive educational materials and ideas on using energy wisely in their homes. Local CAP agencies determine participant eligibility according to federal and state guidelines. The WAQC program also provides limited funds to weatherize buildings occupied by non-profit organizations that serve primarily special-needs populations, regardless of heating source, with priority given to the electrically heated.

In 1989, Idaho Power began offering weatherization assistance in conjunction with the State of Idaho Weatherization Assistance Program (WAP). In Oregon, Idaho Power offers weatherization assistance in conjunction with the State of Oregon WAP. This allows CAP agencies to combine Idaho Power funds with federal LIHEAP weatherization funds to serve more customers with special needs in electrically heated homes.

Idaho Power has an agreement with each CAP agency in the service area for the WAQC program that specifies the funding allotment, billing requirements, and program guidelines. Currently, Idaho Power oversees the program in Idaho through five regional CAP agencies: Eastern Idaho Community Action Partnership (EICAP), El Ada Community Action Partnership (EL ADA), Metro Community Services (Metro Community), South Central Community Action Partnership (SCCAP), and Southeastern Idaho Community Action Agency (SEICAA). In Oregon, Community Connection of Northeast Oregon, Inc. (CCNO), and Community in Action (CINA) provide weatherization services for qualified customers.

The Idaho Department of Health and Welfare (IDHW) uses the DOE-approved energy audit program (EA5) for the Idaho WAP and, therefore, the Idaho CAP agencies use the EA5. The EA5 is energy audit software approved for use by the DOE.

Annually, Idaho Power requires physical verification of approximately 10 percent of the homes weatherized under the WAQC program. This is done through two methods. The first method uses Idaho's and Oregon's state monitoring process that reviews weatherized homes. Utility representatives; weatherization personnel from the CAP agencies; CAPAI; and a Building Performance Institute (BPI)-certified quality control inspector review homes weatherized by each of the CAP agencies. The quality control inspector is hired by the state to ensure measures were installed to DOE and state WAP specifications.

For the second method, Idaho Power contracts with two companies—Kent Kearns Enterprises and Momentum, LLC (Momentum)—that employ building performance specialists to verify installed measures in customer homes. Kent Kearns Enterprises verifies homes weatherized for the WAQC program in Idaho Power's eastern and southern Idaho regions. Momentum verifies weatherization services provided through the WAQC program in the Capital and Canyon–West regions of Idaho and in the company's Oregon service area. After these companies verify installed measures, any required follow-up is done by CAP agency personnel.

Idaho Power reports the activities related to the WAQC program in compliance with IPUC Order No. 29505, as updated in Case No. IPC-E-16-30, Order No. 33702. This order approved Idaho Power's request to modify Order No. 29505 to consolidate the WAQC Annual Report with the DSM Annual Report each year.

This report includes the following required topics:

- Review of weatherized homes and non-profit buildings by county
- Review of measures installed
- Overall cost-effectiveness
- Customer education and satisfaction
- Plans for 2019

Program Activities

Weatherized Homes and Non-Profit Buildings by County

In 2018, Idaho Power made $1,315,372 available to Idaho CAP agencies. Of the funds provided, $1,184,987 were paid to Idaho CAP agencies in 2018, while $130,384 were accrued for future funding. Of the funds paid in 2018, $1,041,175 directly funded audits, energy efficiency measures, and health and safety measures for qualified customers' homes (production costs) in Idaho, and $104,117 funded administration costs to Idaho CAP agencies for those homes weatherized.

These funds provided for the weatherization of 188 Idaho homes and two Idaho non-profit buildings. The production cost of the non-profit building weatherization measures was $36,085, while $3,609 in administrative costs were paid for the Idaho non-profit building weatherization jobs. In Oregon, Idaho Power paid $11,805 in production costs for three qualified homes and $1,181 in CAP agency administrative costs for homes in Malheur County. Table 12 shows each CAP agency, the number of homes weatherized, production costs, the average cost per home, administration payments, and total payments per county made by Idaho Power.

Table 12. WAQC activities and Idaho Power expenditures by agency and county in 2018

Agency/County	Number of Homes		Production Cost		Average Cost		Administration Payment to Agency		Total Payment
Idaho Homes									
EICAP									
Lemhi	3	$	11,625	$	3,875	$	1,163	$	12,788
Agency Total	**3**	**$**	**11,625**	**$**	**3,875**	**$**	**1,163**	**$**	**12,788**
EL ADA									
Ada	58		331,742		5,720		33,174		364,917
Elmore	20		120,555		6,028		12,056		132,611
Owyhee	13		64,501		4,962		6,450		70,951
Agency Total	**91**	**$**	**516,799**	**$**	**5,679**	**$**	**51,680**	**$**	**568,479**
Metro Community Services									
Boise	2		7,240		3,620		724		7,964
Canyon	24		137,944		5,748		13,794		151,738
Gem	3		19,446		6,482		1,944		21,391
Payette	3		12,559		4,186		1,255		13,815
Valley	16		95,987		5,999		9,598		105,586
Agency Total	**48**	**$**	**273,177**	**$**	**5,691**	**$**	**27,318**	**$**	**300,494**
SCCAP									
Blaine	2		11,016		5,508		1,101		12,118
Gooding	6		33,819		5,636		3,382		37,200
Jerome	4		36,046		9,011		3,604		39,650
Twin Falls	15		88,071		5,871		8,807		96,878
Agency Total	**27**	**$**	**168,952**	**$**	**6,257**	**$**	**16,895**	**$**	**185,847**
SEICAA									
Bannock	9		29,767		3,307		2,977		32,744
Bingham	8		30,559		3,820		3,056		33,615
Power	2		10,296		5,148		1,030		11,325
Agency Total	**19**	**$**	**70,622**	**$**	**3,717**	**$**	**7,062**	**$**	**77,685**
Total Idaho Homes	**188**	**$**	**1,041,175**	**$**	**5,538**	**$**	**104,117**	**$**	**1,145,293**
Non-Profit Buildings									
Twin Falls	1		24,042		24,042		2,404		26,446
Power	1		12,043		12,043		1,204		13,248
Total Non-Profit Buildings	**2**	**$**	**36,085**	**$**	**18,043**	**$**	**3,609**	**$**	**39,694**
Oregon Homes									
CCNO									
Baker	0		0		0		0		0
Agency Total	**0**	**$**	**0**		**0**	**$**	**0**	**$**	**0**
CINA									
Malheur	3		11,805		3,935		1,181		12,986
Agency Total	**3**	**$**	**11,805**	**$**	**3,935**	**$**	**1,181**	**$**	**12,986**

Agency/County	Number of Homes		Production Cost		Average Cost		Administration Payment to Agency		Total Payment
Total Oregon Homes	**3**	**$**	**11,805**	**$**	**3,935**	**$**	**1,181**	**$**	**12,986**
Total Program	**193**	**$**	**1,089,066**	**$**	**5,643**	**$**	**108,907**	**$**	**1,197,972**

Note: Dollars are rounded.

The base funding for Idaho CAP agencies is $1,212,534 annually, which does not include carryover from the previous year. Idaho Power's agreements with CAP agencies include a provision that identifies a maximum annual average cost per home up to a dollar amount specified in the agreement between the CAP agency and Idaho Power. The intent of the maximum annual average cost allows the CAP agency flexibility to service some homes with greater or fewer weatherization needs. It also provides a monitoring tool for Idaho Power to forecast year-end outcomes. The average cost per home weatherized is calculated by dividing the total annual Idaho Power production cost of homes weatherized by the total number of homes weatherized that the CAP agencies billed to Idaho Power during the year.
The maximum annual average cost per home the CAP agencies were allowed under the 2018 agreement was $6,000. In 2018, Idaho CAP agencies had a combined average cost per home weatherized of $5,538. In Oregon, the average was $3,935 per home weatherized.

There is no maximum annual average cost for the weatherization of buildings occupied by non-profit agencies.

CAP agency administration fees are equal to 10 percent of Idaho Power's per-job production costs. The average administration cost paid to agencies per Idaho home weatherized in 2018 was $554, and the average administration cost paid to Oregon agencies per Oregon home weatherized during the same period was $394. Not included in this report's tables are additional Idaho Power staff labor, marketing, home verification, and support costs for the WAQC program totaling $49,218 for 2018. These expenses were in addition to the WAQC program funding requirements in Idaho specified in IPUC Order No. 29505.

In compliance with IPUC Order No. 29505, WAQC program funds are tracked separately, with unspent funds carried over and made available to Idaho CAP agencies in the following year. In 2018, $102,838 in unspent funds from 2017 were made available for expenditures in Idaho. Table 13 details the funding base and available funds from 2017 and the total amount of 2018 spending.

Table 13. WAQC base funding and funds made available in 2018

Agency		2018 Base		Available Funds from 2017		Total 2018 Allotment		2018 Spending
Idaho								
EICAP	$	12,788	$	0	$	12,788	$	12,788
EL ADA		568,479		0		568,479		568,479
Metro Community Services*		302,259		-1,765		300,494		300,494
SCCAP		167,405		70,397		237,802		185,847
SEICAA		111,603		7,871		119,474		77,685
Non-profit buildings		50,000		26,334		76,334		39,694
Idaho Total	**$**	**1,212,534**	**$**	**$102,838**	**$**	**$1,315,372**	**$**	**$1,184,987**

Note: Dollars are rounded.
*Overspending of Metro Community Services in 2017 was deducted from 2018 MCS base funding.

Weatherization Measures Installed

Table 14 details home and non-profit building counts for which Idaho Power paid all or a portion of each measure cost during 2018. The home counts column shows the number of times any percentage of that measure was billed to Idaho Power during the year. If totaled, measure counts would be higher than total homes weatherized because the number of measures installed in each home varies.

WAQC and other state Weatherization Assistance Programs nationwide are whole-house programs that offer several measures that have costs but do not necessarily save energy, or for which the savings cannot be measured. Included in this category, as required by DOE, are health and safety measures and home energy audits. Health and safety measures are necessary to ensure weatherization activities do not cause unsafe situations in a customer's home or compromise a home's existing indoor air quality. Idaho Power contributes funding for the installation of items that do not save energy such as smoke and carbon monoxide detectors, vapor barrier, electric panel upgrades, floor registers, boots, kitchen range fans, and venting of bath and laundry areas. While these items increase health, safety, and comfort and are required for certain energy-saving measures to work properly, they increase costs of the job.

Table 14. WAQC review of measures installed in 2018

	Home Counts	Production Costs
Idaho Homes		
Audit	133	$ 17,052
Ceiling Insulation	79	68,597
CFLs	46	1,639
Doors	94	69,497
Ducts	39	24,205
Floor Insulation	46	55,500
Furnace Repair	4	626
Furnace Replacement	139	571,223
Health and Safety	25	7,305
Infiltration	111	38,714
Other	24	26,898
Pipes	18	1,640
Refrigerator Replacement	2	1,920
Vents	11	1,031
Wall Insulation	5	1,229
Water Heater	4	5,284
Windows	91	148,817
Total Idaho Homes		**$ 1,041,175**
Oregon Homes		
Ceiling Insulation	1	1,577
CFLs	1	51
Ducts	2	774
Floor Insulation	3	8,065
Health and Safety	1	561
Infiltration	3	778
Windows	0	0
Total Oregon Homes		**$ 11,805**

	Home Counts		Production Costs
Idaho Non-Profits			
Audit	2		1,033
Ceiling Insulation	2		3,553
CFLs	0		0
Doors	1		1,718
Ducts	2		4,868
Floor Insulation	1		222
Furnace Replacement	1		4,082
Health and Safety	1		483
Infiltration	2		2,720
Other	2		9,064
Pipes	1		816
Vents	1		41
Wall Insulation	1		1,725
Windows	2		5,761
Total Idaho Non-Profit Measures		**$**	**36,085**

Note: Dollars are rounded.

Marketing Activities

Idaho Power developed and distributed a brochure that provided information about both the WAQC program and Weatherization Solutions for Eligible Customers program. This was meant to help customers realize the company offers more than one way to qualify for weatherization services. Idaho Power actively informed customers about WAQC through energy and resource fairs and other customer contacts, including communication from its Customer Service Center. Information about WAQC is located on the Income Qualified Customers page of Idaho Power's website.

Cost-Effectiveness

Program cost-effectiveness increased in 2018 from both the utility cost and total resource cost perspective. The utility cost ratio ticked up to 0.43 from 0.37, and the TRC B/C ratio increased to 0.52 from 0.48. Cost-effectiveness ratios will decline slightly again in 2019 with full adoption of the 2017 IRP DSM alternate cost assumptions.

Table 15 shows the updated results that identify the difference between homes that received weatherization only vs. homes that were weatherized and upgraded with an efficient heat pump.

Table 15. 2018 savings values for WAQC program

	Weatherization only		Weatherization and heating system change	
Home Type	**kWh/project**	**kWh/ft^2**	**kWh/project**	**kWh/ft^2**
Single-family Homes	1,797	1.16	4,154	2.48
Manufactured Homes	1,734	1.36	4,418	4.30
Multi-family Homes	n/a	1.16	n/a	2.48
Non-profit Buildings	n/a	1.16	n/a	2.48

There were no changes to the values used for reporting between 2016 to 2018. The savings values were updated in 2016 to better align savings by home type and measures installed with the associated installation costs. Per-home savings were updated in late 2018 using 2015 through 2017 weatherization project energy consumption data to keep savings in line with home size, measure bundles, and furnace replacements occurring in the field.

While final cost-effectiveness is calculated based on measured consumption data, cost-effectiveness screening begins during the initial contacts between CAP agency weatherization staff and the customer. In customer homes, the agency weatherization auditor uses the EA5 to conduct the initial audit of potential energy savings for a home. The EA5 compares the efficiency of the home prior to weatherization to the efficiency after the proposed improvements and calculates the value of the efficiency change into a savings-to-investment ratio (SIR). The output of the SIR is similar to the PCT ratio. If the EA5 computes an SIR of 1.0 or higher, the CAP agency is authorized to complete the proposed measures. The weatherization manager can split individual measure costs between Idaho Power and other funding sources with a maximum charge of 85 percent of total production costs to Idaho Power. Using the audit form to pre-screen projects ensures each weatherization project will result in energy savings. The use of the audit tool drives consistent and predictable results from billing analysis of weatherization projects.

The 2018 cost-effectiveness analysis continues to incorporate the following directives from IPUC Order No. 32788:

- Applying a 100-percent net-to-gross (NTG) value to reflect the likelihood that WAQC weatherization projects would not be initiated without the presence of a program
- Claiming 100 percent of project savings
- Including an allocated portion of the indirect overhead costs
- Applying the 10-percent conservation preference adder
- Claiming $1 of benefits for each dollar invested in health, safety, and repair measures
- Amortizing evaluation expenses over a three-year period

Customer Education and Satisfaction

The CAP agency weatherization auditor explains to the customer which measures are analyzed and why. Further education is done as the crew demonstrates the upgrades and how they will help save energy and provide an increase in comfort. Idaho Power provides each CAP agency with energy efficiency guides and energy-savings tips for distribution during home visits. Any customers whose homes are selected for post-weatherization home verification receive additional information and have the opportunity to ask the home verifiers more questions.

Idaho Power used independent, third-party verification companies to ensure the stated measures were installed in the homes and to discuss the program with these customers. In 2018, home verifiers randomly selected and visited 24 homes, requesting feedback about the program. When asked how much customers learned about saving electricity, 18 customers answered they learned “a lot” or “some.”

When asked how many ways they tried to save electricity, 20 customers responded “a lot” or “some.” Three customers did not answer.

A customer survey was used to assess major indicators of customer satisfaction throughout the service area. All program participants in all regions were asked to complete a survey after their homes were weatherized. Survey questions gathered information about how customers learned of the program, reasons for participating, how much customers learned about saving energy in their homes, and the likelihood of household members changing behaviors to use energy wisely.

Idaho Power received survey results from 155 of 191 households weatherized by the program in 2018. Of the 155 completed surveys, 152 were from Idaho customers and three were from Oregon customers. Some highlights include the following:

- Over 35 percent of respondents learned of the program from a friend or relative, and another almost 19 percent learned of the program from an agency flyer. Nearly 5 percent learned about the weatherization program from direct-mail.
- Over 79 percent of the respondents reported that their primary reason for participating in the weatherization program was to reduce utility bills, and over 39 percent wanted to improve the comfort of their home.
- Over 76 percent reported they learned how air leaks affect energy usage, and just over 66 percent indicated they learned how insulation affects energy usage during the weatherization process.
- Over 60 percent of respondents said they learned how to use energy wisely. Eighty-five percent reported they were very likely to change habits to save energy, and almost 69 percent reported they have shared all of the information about energy use with members of their household.
- Over 91 percent of the respondents reported they think the weatherization they received will significantly affect the comfort of their home, and almost 97 percent said they were very satisfied with the program.
- Over 84 percent of the respondents reported the habit they were most likely to change was turning off lights when not in use, and 67 percent said that washing full loads of clothes was a habit they were likely to adopt to save energy. Turning the thermostat up in the summer was reported by over 54 percent of the respondents and turning the thermostat down in the winter was reported by 58 percent as a habit they and members of the household were most likely to adopt to save energy.

A summary of the survey is included in *Supplement 2: Evaluation*.

2019 Program and Marketing Strategies

As in previous years, unless directed otherwise, Idaho Power will continue to provide financial assistance to CAP agencies while exploring changes to improve program delivery. The company will continue to provide the most benefit possible to special-needs customers while working with Idaho and Oregon WAP personnel.

Idaho Power will continue to participate in the Idaho and Oregon state monitoring process of weatherized homes and will continue to verify approximately 10 percent of the homes weatherized under the WAQC program via home-verification companies.

In 2019, Idaho Power will support the whole-house philosophy of the WAQC program and Idaho and Oregon WAP by continuing to allow a $6,000 annual maximum average per-home cost.

In Idaho during 2019, Idaho Power expects to contribute the base amount plus available funds from 2018 to total approximately $1,342,900 in weatherization measures and agency administration fees. Of this amount, approximately $86,600 will be provided to the non-profit pooled fund to weatherize buildings housing non-profit agencies that primarily serve qualified customers in Idaho.

Idaho Power will continue to maintain the program on its website and other marketing collateral.

Weatherization Solutions for Eligible Customers

		2018	2017
Participation and Savings			
	Participants (homes)	141	164
	Energy Savings (kWh)	571,741	604,733
	Demand Reduction (MW)	n/a	n/a
Program Costs by Funding Source			
	Idaho Energy Efficiency Rider	$998,233	$1,137,209
	Oregon Energy Efficiency Rider	$0	$(56,571)*
	Idaho Power Funds	$24,237	$28,224
	Total Program Costs—All Sources	$1,022,471	$1,108,862
Program Levelized Costs			
	Utility Levelized Cost ($/kWh)	$0.112	$0.115
	Total Resource Levelized Cost ($/kWh)	$0.112	$0.117
Benefit/Cost Ratios			
	Utility Benefit/Cost Ratio	0.37	0.34
	Total Resource Benefit/Cost Ratio	0.51	0.45

*Oregon Rider charges were reversed and charged to the Idaho Rider in February 2017

Description

Weatherization Solutions for Eligible Customers is an energy efficiency program designed to serve Idaho Power residential customers in Idaho whose income falls between 175 percent and 250 percent of the current federal poverty level. Initiated in 2008, the program is designed to mirror the WAQC program. These customers often do not have disposable income to invest in energy efficiency upgrades, and they typically live in housing similar to WAQC customers.

The Weatherization Solutions program also benefits certain customers on the WAQC waiting list. When customer income overlaps both programs, this program may offer an earlier weatherization date than WAQC, resulting in less wait time for the customer and quicker energy savings.

Potential participants are interviewed by a participating contractor to determine household occupant income eligibility, as well as to confirm the home is electrically heated. If the home is a rental, the landlord must agree to maintain the unit's current rent for a minimum of one year, and to help fund a portion of the cost of weatherization. If the customer is eligible, an auditor inspects the home to determine which upgrades will save energy, improve indoor air quality, and/or provide health and safety for the residents. To be approved, energy efficiency measures and repairs must have an SIR of 1.0 or higher, interact with an energy-saving measure, or be necessary for the health and safety of the occupants.

The Weatherization Solutions for Eligible Customers program uses a home audit tool called the HAT14.1 which is similar to the EA5 audit tool used in WAQC. The home is audited for energy efficiency measures, and the auditor proposes upgrades based on the SIR ratio calculated by HAT14.1. As in WAQC, if the SIR is 1.0 or greater, the contractor is authorized to upgrade that measure. Measures considered for improvement are window and door replacement; ceiling, floor, and wall insulation; HVAC repair and replacement; water heater repair and replacement; and pipe wrap. Also included is the potential to replace lightbulbs and refrigerators. Contractors invoice Idaho Power for the project costs, and if the home is a rental, a minimum landlord payment of 10 percent of the cost is required.

Idaho Power's agreement with contractors includes a provision that identifies a maximum annual average cost per home. The intent of the maximum annual average cost is to allow contractors the flexibility to service homes with greater or fewer weatherization needs. It also provides a monitoring tool for Idaho Power to forecast year-end outcomes.

Program Activities

In 2018, contractors weatherized 141 Idaho homes for the program: nine in eastern Idaho by Savings Around Power and Energy Solutions; 60 in Idaho Power's Canyon–West Region by Metro Contractors Services, LLC.; 50 in south-central Idaho by Home Energy Management, LLC (HEM-LLC); and 22 in the company's Capital Region by Power Savers. Of those 141 homes weatherized, 95 were single-family, 42 were manufactured homes, and four were multi-family units.

Marketing Activities

The company used several strategies to reach customers in income-eligible electrically heated homes. In February, a bill insert was sent to 346,672 customers in Idaho and another was mailed to 330,390 in October. The program was promoted at events targeting customers with limited incomes, including seniors. Ads and articles promoted the program in the *Senior BlueBook* in both spring and fall. Letters were mailed to targeted customers in the South-East Region in September (6,156 customers) and to customers in the Capital Region in October (4,938). The program was also highlighted in Idaho Power's November *Connections* newsletter, which is sent to all customers. A *News Scans* article highlighted a Weatherization Solutions customer in July.

Idaho Power ran Facebook ads in March and July 2018 and regular Facebook and Twitter posts in June (Figure 36). The regular posts reached 2,500 people on Facebook, with 21 likes and 4 shares. The March paid ad reached 107,000 people with 357,225 impressions. The July ad reached 95,376 people and had 334,810 impressions. Weatherization tips were also mentioned in various social media posts.

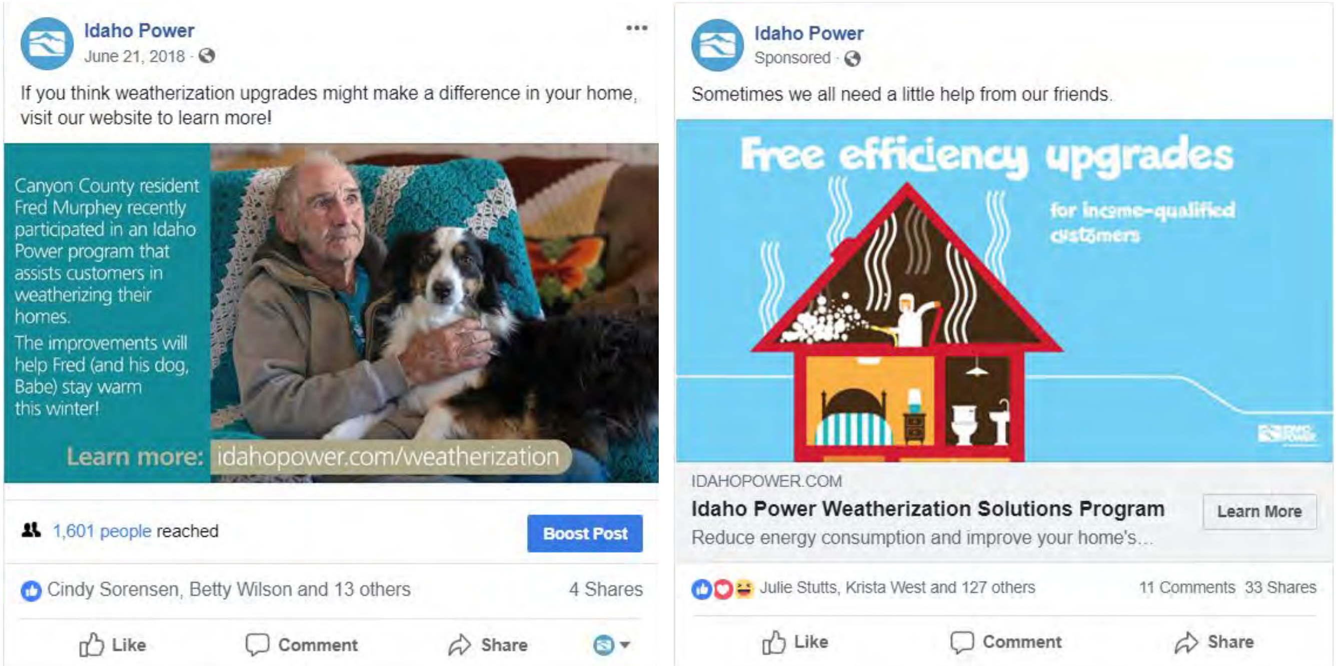

Figure 36. Social media post and paid ad for Weatherization Solutions for Eligible Customers program

Idaho Power's community relations representatives, education representatives, and customer representatives promoted the program at meetings and events in their communities such as American Falls Days. The program specialist and customer representatives promoted the program to home healthcare provider groups, senior groups, and members of the Idaho Nonprofit Center. CAP Agency personnel also promoted the program at community events such as the National Alliance on Mental Illness (NAMI) resource fair and the Treasure Valley Community Resource Fair. Updated brochures (in English and Spanish) that included current income qualifications and location-specific contractor information were used by all. The program was also cross-marketed with other residential energy efficiency programs, such as Home Energy Audit.

Cost-Effectiveness

Benefit-cost ratios increased slightly in 2017. The 2018 utility cost B/C ratio is 0.37, up from 0.34, and the TRC B/C ratio is 0.51 compared with 0.45 in 2017.

Weatherization Solutions for Eligible Customers projects, similar to WAQC program guidelines, benefit from a pre-screening of measures through a home audit process. The home audit process ensures there is an adequate number of kWh savings to justify the project and provides more consistent savings for billing analysis. See WAQC cost-effectiveness for a discussion of the audit and prescreening process, which is similar for both programs. Weatherization solutions savings will be updated in 2019 from the 2015 to 2017 billing analysis as the nearly 1,000 projects will be analyzed jointly to increase sample sizes and provide more robust model estimates.

For further details on the overall program cost-effectiveness assumptions, see *Supplement 1: Cost-Effectiveness*.

Customer Satisfaction

A customer survey was used to assess major indicators of customer satisfaction with the program throughout the service area. All program participants in all regions were asked to complete a survey after their homes were weatherized. Survey questions gathered the following information: how customers learned of the program, reasons for participating, how much customers learned about saving energy in their homes, and the likelihood of household members changing behaviors to use energy wisely.

Idaho Power received survey results from 109 of 141 households weatherized by the program in 2018. Some highlights include the following:

- Over 24 percent of respondents learned of the program from a friend or relative, and another almost 18 percent learned of the program from an agency flyer. Over 37 percent learned about the weatherization program from direct-mail.
- Over 80 percent of the respondents reported that their primary reason for participating in the weatherization program was to reduce utility bills, and over 29 percent wanted to improve the comfort of their home.
- Over 88 percent reported they learned how air leaks affect energy usage, and nearly 78 percent indicated they learned how insulation affects energy usage.
- Over 65 percent of respondents said they learned how to use energy wisely. Seventy-four percent reported they were very likely to change habits to save energy, and almost 69 percent reported they have shared all of the information about energy use with members of their household.
- Over 84 percent of the respondents reported they think the weatherization they received will significantly affect the comfort of their home, and almost 95 percent said they were very satisfied with the program.
- Over 73 percent of the respondents reported the habit they were most likely to change was turning off lights when not in use, and over 59 percent said that washing full loads of clothes was a habit they were likely to adopt to save energy. Turning the thermostat up in the summer was reported by over 57 percent of the respondents and turning the thermostat down in the winter was reported by nearly 72 percent as a habit they and members of the household were most likely to adopt to save energy.

A summary of the survey is included in *Supplement 2: Evaluation*.

Two independent companies performed random verifications of weatherized homes and visited with customers about the program. In 2018, 22 homes were verified, and 17 (77 percent) of those customers reported they learned "a lot" or "some" about saving electricity in their home. Twenty-one customers (95 percent) reported they had tried "a lot" or "some" different ways to save electricity in their home.

2019 Program and Marketing Strategies

Idaho Power does not anticipate any program operating changes in 2019. Idaho Power will update brochures as necessary to help spread the word about the program in all communities. Additional marketing for the program will include bill inserts and advertisements in various regional publications, particularly those with a senior and low-income focus. Social media ads and boosts will be considered to target specific regions to increase and maintain program awareness. Regional marketing will also be based on need as evidenced by any regional contractor's waiting list for Weatherization Solutions services. The program will again be promoted at county fairs, home shows, and resource fairs, as needed.

Commercial/Industrial Sector Overview

Idaho Power's commercial sector consists of over 71,104 commercial, governmental, school, and small-business customers. In 2018, the number of commercial sector customers increased by 1,254 or 1.8 percent from 2017. The energy usage of commercial customers varies from a few kWh each month to several hundred thousand kWh per month. The commercial sector represents 26 percent of Idaho Power's total electricity sales.

The industrial and special contract customers are Idaho Power's largest individual energy consumers. There are 118 Rate 19 and special contract industrial customers. These customers account for approximately 23 percent of Idaho Power's total electricity sales.

The three C&I Energy Efficiency Program options are available to all commercial, industrial, governmental, schools, and small-business customers. DVL GL conducted a process evaluation for the program in 2017, and the company responded to recommendations in 2018. Also in 2018, the company distributed industry-specific, no-cost ESKs to small commercial customers.

The 2018 season was the fourth year of the internally managed Flex Peak Program, a demand response program designed to reduce the demand on Idaho Power's system during periods of extreme peak electricity use. Program results were slightly reduced from the 2017 season, with a maximum achieved reduction of 33 MW. The program included 65 participants at 140 sites.

Idaho Power also offers the statutory-required Oregon Commercial Audits program to medium and small commercial customers.

Table 16. Commercial/industrial sector program summary, 2018

			Total Cost		Savings	
Program	**Participants**		**Utility**	**Resource**	**Annual Energy (kWh)**	**Peak Demand (MW)**
Demand Response						
Flex Peak Program	140	sites	$ 433,313	$ 433,313		32.9
Total			**$ 433,313**	**$ 433,313**		**32.9**
Energy Efficiency						
Commercial Energy-Saving Kit	1,652	kits	$ 146,174	$ 146,174	442,170	
Custom Projects	248	projects	8,808,512	16,112,540	46,963,690	
Green Motors—Industrial	25	motor rewinds			64,167	
New Construction	104	projects	2,069,645	5,054,215	13,378,315	
Retrofits	1,358	projects	5,990,179	16,253,716	34,910,707	
Total			**$ 17,014,509**	**$ 37,566,644**	**95,759,049**	

Note: See Appendix 3 for notes on methodology and column definitions.

Marketing

In 2018, Idaho Power continued to market the C&I Energy Efficiency Program as a single entity with incentives for New Construction, Retrofits, Custom Projects, and the new Commercial Energy-Saving Kits, in addition to the company's demand response program, Flex Peak. Marketing activities were targeted toward the following customers: commercial, industrial, governmental, schools, small businesses, architects, engineers, and other design professionals.

Bill Inserts

In March, a bill insert highlighting how Idaho Power's incentives can save customers money was included in 36,782 business customers' bills. A similar bill insert was sent in 36,097 business customers' bills in August to promote the program.

Print Advertising

Idaho Power expanded its ad campaign (Figure 37) for the C&I Energy Efficiency Program, featuring former program participants and iconic local landscapes to capture the readers' attention. The ads targeted small to large businesses and showed that saving energy and money is for everyone.

The ads ran in the *Idaho Business Review* in April, May, August, September, October, and November; the *Business Insider* in January, February, April, May, June, and September; the *BOC Bulletin* in February and August; Alaska Airline's *Horizon Air Magazine* in October; and the *East Idaho Business Journal* in May, September, and November. Ads also ran in the BOMA membership directory and symposium program, Grow Smart Awards event program, *Idaho Business Review* Top Projects Awards publication, and the Idaho Association of General Contractors membership directory. Additionally, Idaho Power sponsored the Construction section in the *Idaho Business Review's Book of Lists*, which included an ad, company logo in the table of contents, and an article highlighting Idaho Power and the company's energy efficiency programs.

Figure 37. Example of C&I Energy Efficiency Program ad

Direct Mail

Idaho Power sent a direct-mailer to 4,335 small-business customers in November informing them of energy-saving programs and encouraging them to contact their customer representative to order a free Commercial ESK for their business. In response to the recommendation for the program's evaluation, Idaho Power tracked the number of calls to customer solutions advisors as a result of the mailing. The letter resulted in 25 customer calls, 12 of which led to a visit by a customer representative.

Newsletters

Idaho Power promotes energy efficiency and its programs through the company's *Energy@Work* newsletter. Written for small- and medium-sized business customers, Idaho Power mailed this newsletter to 23,916 customers in April and 24,140 customers in November 2018. Content included customer success stories and information on the company's training opportunities, energy efficiency tools and programs, energy portfolio, rates, energy advisors, environmental stewardship, customer satisfaction surveys, system reliability, and more.

Idaho Power also sent a quarterly email newsletter, *Energy Insights*, to its large-commercial and industrial customers. Topics included customer success stories, power quality, improving building performance, the benefits of electric forklifts, training opportunities, rate changes, Idaho Power's energy portfolio, how to improve chiller performance, energy-saving maintenance strategies for cooling towers, energy trends, energy management systems, and more.

Print Materials

In 2018, Idaho Power began updating its industry-specific tip brochure to incorporate recommendations from the program's process evaluation to start with the energy-use breakdown for the facility type, focus on the most energy intense systems and how to make them more efficient, and mention NEBs. The company also created a new tip brochure for retail facilities.

Airport Advertising

In 2018, approximately 3.8 million people traveled through the Boise Airport; according to airport officials, half of them are traveling for business. To reach the business customer, Idaho Power placed two backlit display ads throughout the airport in 2018. An ad featuring program participants was located in the baggage claim area, while an ad on alternating airport display boards highlighted that all customers want to save money.

Success Stories

The company released success story videos on YouTube featuring Alpine Automotive, Roaring Springs and Wahooz (Figure 38) and the Pocatello School District. The videos were shared on Idaho Power's social media pages and provided a more in-depth look into the companies' experiences working with Idaho Power, the incentives earned, and the energy savings achieved.

Figure 38. Example of success story videos on Idaho Power’s YouTube channel

The *Connections* newsletter shared the energy-saving success story of Holt Arena in January and Alpine Automotive in April.

Digital

New in 2018, Idaho Power ran digital display ads targeting business customers. The ads ran on the *Idaho Statesman* business news pages, blogs, and *Business Insider* web pages from March through May. The ads received 985,065 impressions and 1,343 clicks. The company also used search-engine marketing ads—paid ads that appear in online keyword search results—which received 6,506 impressions and 417 clicks.

The company ran digital ads on the *Idaho Business Review* website, and in their weekly and daily email newsletters throughout the year. These ads received 85,378 impressions and 80 clicks to the Idaho Power Savings For Your Business web page. Idaho Power also placed sponsored content articles on the *Idaho Business Review* website in February and March. These articles are written by Idaho Power and appear as online news stories. The sponsored content articles received 148,514 impressions and 139 clicks. In December, Idaho Power began sponsoring the online Business News section of the *Idaho Business Review* which the company plans to continue in 2019.

Social Media

Idaho Power continued using weekly LinkedIn posts focused on energy-saving tips, program details, incentives, and event information. These posts also highlighted companies who used the program and included photos of large-format check presentations and success story videos. When appropriate, these messages were also shared on Idaho Power’s Facebook and Twitter pages.

The company continued using paid LinkedIn ads to promote the C&I Energy Efficiency Program. Idaho Power placed several ads targeted toward a variety of job titles that typically have an interest in or input about energy efficiency projects including C-suite executives; engineers; architects; and sustainability, maintenance, and facilities contacts. Targeting was only available to LinkedIn users in the Boise and Pocatello areas—approximately 93,000 individuals. The ads resulted in 237,402 impressions and 389 website clicks.

Public Relations

Idaho Power provides public relations support to customers who want to publicize the work they have done to become more energy efficient. Upon request, Idaho Power creates large-format checks that are used for media events and/or board meetings. Idaho Power will continue to assist customers with public relations opportunities by creating certificates for display within their buildings and speaking at press events, if requested.

In 2018, Idaho Power produced checks and/or sent news releases for several companies and organizations, including the City of Fruitland, the Nampa School District, the City of Pocatello and Pocatello School District, and SUEZ Water in Boise. SUEZ received an incentive check for $422,083 that will help pay for energy efficiency measures that are saving the water utility more than 2.3 million kWh—enough energy to power about 202 average-sized homes for a year.

Figure 39. Check presentation to SUEZ Water in Boise

As outlined in the Success Stories section above, the public relations team also helped produce a variety of high-quality videos used to promote C&I Energy Efficiency Program across a variety of media.

Association and Event Sponsorships

Idaho Power's C&I Energy Efficiency Program sponsors a number of associations and events, including the Grow Smart awards; Top Projects Awards; BOMA symposium; American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE) Technical Conference: American Institute of Architects (AIA) Idaho Chapter Design Awards and the U.S. Green Building Council (USGBC).

Idaho Power sponsored the BOMA Commercial Real Estate Symposium February 13, in Boise. The Idaho Power vice president of customer operations and business development spoke about how the company is positioned to support commercial activity with low rates, renewable energy portfolio, high customer satisfaction and reliability, and energy efficiency programs. The company was acknowledged on the AIA Design Awards web page and displayed table tents and brochures throughout the event.

Outreach

Idaho Power reached out to the Idaho Retailers Association and Idaho Restaurant & Lodging Association to inquire about opportunities to share information about the company's C&I Energy Efficiency Program, provide members with industry-specific tip sheets, and promote the Commercial ESKs for Businesses. The company has not received a response from either association.

Customer Satisfaction

Idaho Power conducts the Burke Customer Relationship Survey each year. In 2018, 59 percent of small business survey respondents indicated Idaho Power is meeting or exceeding their needs with information on how to use energy wisely and efficiently.

Sixty-four percent of small business respondents indicated Idaho Power is meeting or exceeding their needs by encouraging energy efficiency with its customers. Fifty-one percent of Idaho Power small-business customers surveyed in 2018 indicated the company is meeting or exceeding their needs in offering energy efficiency programs, and 28 percent of the small business survey respondents indicated they have participated in at least one Idaho Power energy efficiency program. Of the small business survey respondents who have participated in at least one Idaho Power energy efficiency program, 94 percent are "very" or "somewhat" satisfied with the program.

In 2018, 62 percent of large commercial and industrial survey respondents indicated Idaho Power is meeting or exceeding their needs with information on how to use energy wisely and efficiently.

Seventy-six percent of large commercial and industrial respondents indicated Idaho Power is meeting or exceeding their needs by encouraging energy efficiency with its customers. Seventy-two percent of Idaho Power large commercial and industrial customers surveyed in 2018 indicated the company is meeting or exceeding their needs in offering energy efficiency programs, and 78 percent of the large commercial and industrial survey respondents indicated they have participated in at least one Idaho Power energy efficiency program. Of the large commercial and industrial survey respondents who have participated in at least one Idaho Power energy efficiency program, 93 percent are "very" or "somewhat" satisfied with the program.

Training and Education

In 2018, Idaho Power engineers, program staff, field representatives, and hired consultants continued to provide technical training and education to help customers learn how to identify opportunities to improve energy efficiency in their facilities. The company has found that these activities increase awareness and participation in its energy efficiency and demand response programs and enhance customer satisfaction. To market this service and distribute the training schedule and resources, Idaho Power used its website and *Energy@Work* and *Energy Insights* newsletters. Also, major customer representatives and program energy efficiency engineers emailed training announcements to existing customers.

During each training session, a major customer representative gave an overview of the commercial and industrial programs available to customers. Idaho Power posted prior years' webinar recordings and related files on its Commercial and Industrial Energy Efficiency training web page.

As part of this outreach activity, Idaho Power collaborated with and supported stakeholders and organizations such as: IDL, BOMA, USGBC, ASHRAE, and International Building Operators Association (IBOA). Using Idaho Power funding, the IDL performed several tasks aimed at increasing the energy efficiency knowledge of architects, engineers, trade allies, and customers. Specific activities included sponsoring a Building Simulation Users Group (BSUG), conducting Lunch & Learn sessions held at various design and engineering firms, and offering a Tool Loan Library (TLL).

Idaho Power delivered 10 technical classroom-based training sessions and two industrial DSM program workshops in 2018 at no cost to the Idaho Power customers. Of the 10 technical sessions, three were two-day classes (one class was presented twice in Boise and Pocatello) and the others were one-day classes. Topics included the following:

- Commercial/Industrial Motor Efficiency (Pocatello)
- Commercial/Industrial Adjustable Speed Drives (Pocatello)
- Compressed Air Challenge Level II—Advanced Management of Compressed Air Systems (Boise)
- Energy Efficiency of Chilled Water Systems (Twin Falls)
- Energy Efficiency of Cooling Towers (Twin Falls)
- Advanced Lighting Control Systems (Boise and Pocatello)
- Energy Efficient Data Center (held live in Boise and video conferenced to Pocatello)
- Industrial Refrigeration Systems Energy Management (Twin Falls)
- HVAC Controls Training (Nampa)
- Optimizing Pumping Systems: A Measurement-Based Approach (Nampa)

The level of participation in 2018 remained high, with 337 attendees for the technical sessions and almost 90 for the program workshops. Customer feedback indicated the average satisfaction level was 94 percent. Idaho Power's average cost to deliver the technical trainings in 2018 was approximately $5,002 per class.

Idaho Power paid at least 50 percent of the cost for Idaho Power customers to take part in IBOA educational classes including the Building Operator Certification (BOC) Level 1 (consisting of eight, day-long classes) and Level 2 (consisting of seven, day-long classes). In 2018, 15 Idaho Power customers attended the Level 1 classes and 10 attended the Level 2 classes.

Field Staff Activities

Idaho Power field staff are on site with customers each day. The field staff uses a variety of Idaho Power-developed programs, tools, and services to help customers with their energy-related questions and challenges. The company sets activity goals for its customer representatives designed to engage customers in the energy efficiency programs such as a specific number of site visits or projects. Additionally, program specialists and engineers work closely with residential and commercial customer representatives to leverage established customer relationships. For example, residential and commercial customer representatives distribute informational materials to trade allies and other market participants who, in turn, support and promote Idaho Power's energy efficiency programs.

Customers regularly ask how to get the most out of their energy dollar. Idaho Power staff has been trained to properly advise customers in the wise use of energy-specific energy efficiency measures and, when needed, can recommend where to find answers. Idaho Power is equipped with experienced engineers, technically proficient personnel, and an extensive network of nationally recognized organizations, contacts at neighboring western electrical utilities, and energy efficiency clearing houses to handle energy-related questions.

Commercial and Industrial Energy Efficiency Program

		2018*	2017
Participation and Savings			
	Participants (projects/kits)	3,387	1,441
	Energy Savings (kWh)**	95,759,049	85,425,027
	Demand Reduction (MW)	n/a	n/a
Program Costs by Funding Source* **			
	Idaho Energy Efficiency Rider	$16,281,639	$14,732,314
	Oregon Energy Efficiency Rider	$720,714	$701,336
	Idaho Power Funds	$12,156	$23,701
	Total Program Costs—All Sources	$17,014,509	$15,457,351
Program Levelized Costs			
	Utility Levelized Cost ($/kWh)	$0.015	$0.015
	Total Resource Levelized Cost ($/kWh)	$0.032	$0.032
Benefit/Cost Ratios			
	Utility Benefit/Cost Ratio	3.75	3.42
	Total Resource Benefit/Cost Ratio	1.87	1.81

*Metrics for each option (New Construction, Custom Projects, Retrofits, and Commercial ESKs) are reported separately in appendices and in *Supplement 1: Cost-Effectiveness.*

**2018 total includes 64,167 kWh of energy savings from 25 Green Motors projects.

***Dollars include totals for New Construction, Custom Projects, Retrofits, and Commercial ESKs

Description

Three major program options targeting different energy efficiency projects are available to commercial, industrial, governmental, schools, and small-business customers in the company's Idaho and Oregon service areas: Custom Projects, New Construction, and Retrofits. Idaho Power also offers no-cost, industry-specific ESKs filled with items intended to target smaller commercial customers and introduce them to energy-saving measures.

Custom Projects

The Custom Projects option incentivizes energy efficiency modifications for new and existing facilities. The goal is to encourage energy savings in Idaho and Oregon service areas by helping customers implement energy efficiency upgrades. Incentives reduce customers' payback periods for custom modifications that might not be completed otherwise. The Custom Projects option offers an incentive level of 70 percent of the project cost or $0.18 per kWh for first-year estimated savings, whichever is less. The Custom Projects option also offers energy auditing services to help identify and evaluate potential energy-saving modifications or projects.

Interested customers submit a pre-approval application to Idaho Power for potential modifications that have been identified by the customers, Idaho Power, or by a third-party consultant. Idaho Power reviews each application and works with the customer and vendors to gather sufficient information to support the energy-savings calculations.

Once the project is completed, customers submit a payment request; in some cases, large, complex projects may take as long as two years or more to complete. Every payment application is verified by

Idaho Power staff or an Idaho Power contractor. All lighting projects use the Idaho Power Lighting Tool to calculate the annual energy savings and to determine the incentive.

Each project is reviewed to ensure energy savings are achieved. Idaho Power engineering staff or a third-party consultant verifies the energy savings methods and calculations. Through the verification process, end-use measure information, project photographs, and project costs are collected.

On many projects, especially the larger and more complex projects, Idaho Power or a third-party consultant conducts on-site power monitoring and data collection before and after project implementation. The measurement and verification (M&V) process helps ensure the achievement of projected energy savings. Verifying applicants' information confirms energy savings are obtained and are within program guidelines. If changes in scope take place in a project, Idaho Power will recalculate energy savings and incentive amounts based on the actual installed equipment and performance.

New Construction

The New Construction option enables customers in Idaho Power's Idaho and Oregon service areas to apply energy-efficient design features and technologies to new construction, expansion, or major remodeling projects. New construction and major renovation project design and construction life is much longer than small retrofits and often encompasses multiple calendar years. Originated in 2004, the option currently offers a menu of measures and incentives for efficient lighting, cooling, building shell, controls, appliances, refrigeration, office equipment, and compressed air options. The customer may otherwise lose savings opportunities for these types of projects.

Thirty-three prescriptive measures are offered for: lighting, HVAC, building shell, controls, appliances with electric water heating, refrigeration, office equipment, and compressed air equipment.

Retrofits

The Retrofits option is Idaho Power's prescriptive measure option for existing facilities. This part of the program encourages customers in Idaho and Oregon to implement energy efficiency upgrades by offering incentives on a defined list of measures. Eligible measures cover a variety of energy-saving opportunities in lighting, HVAC, building shell, food-service equipment, and other commercial measures. Customers can also apply for non-standard lighting incentives. A complete list of the measures offered through Retrofits is included in *Supplement 1: Cost-Effectiveness*.

Commercial Energy-Saving Kits

In 2018, Idaho Power began offering industry-specific Commercial ESKs to its commercial customers in Idaho and Oregon as a means to talk about the benefits of each kit item and other energy efficiency program offerings. Each kit contains installation instructions and a variety of items intended to help save energy related to lighting, hot water use, and intermittently used electrical devices. After talking with customers, the company sends the kits through the mail or an energy advisor delivers the kits to area businesses.

Table 17. Commercial Energy-Saving Kit contents by industry

Restaurant	Retail	Office
(3) 9-watt LED Lightbulbs	(2) 9-watt LED Lightbulbs	(2) 9-watt LED Lightbulbs
(2) Bathroom Aerator 1.0 gpm	(2) 8- watt LED BR30	(2) Bathroom Aerator 1.0 gpm
(2) Kitchen Aerator 1.5 gpm	(1) Bathroom Aerator 1.0 gpm	(1) Kitchen Aerator 1.5 gpm
(2) Exit Sign Retrofit	(2) Exit Sign Retrofit	(2) Exit Sign Retrofit
(1) Pre-rinse Spray Valve		(1) Advanced Power Strip

Program Activities

In 2018, Idaho Power made several improvements to the C&I Energy Efficiency Program in response to recommendations from the 2017 process evaluation by DNV GL. Program-level changes are detailed below; option-level changes are detailed in the subsequent subsections. The complete evaluation report is available in the *Demand-Side Management 2017 Annual Report: Supplement 2, Evaluation*.

After the evaluation, Idaho Power contracted with Tetra Tech to create a formal, written logic model to better understand how specific program activities produce results; this will be incorporated into internal program information.

Idaho Power understands the risks related to program operation and example risk registers identified by the evaluator. Idaho Power plans for these risks by utilizing the Energy Efficiency Potential Study which is forward looking and measures the future energy efficiency that can be targeted. Idaho Power utilizes a third party to create a TRM to evaluate an energy efficiency measure's savings and costs. Idaho Power also utilizes EEAG to help plan future program changes. Through these methods Idaho Power believes future risks will be identified and addressed as they arise.

Each year Idaho Power evaluates and moves measures from the Custom Projects option to the Retrofits or New Construction option for better visibility and customer participation when the average savings has been determined by the RTF or through Idaho Power's TRM. Idaho Power also continues to add new measures as appropriate. The evaluator recommended changing the program design to one that intervened at a different level in the market. Idaho Power feels that changing the design to an upstream model (at the manufacturer's level) or midstream model (at the distributor and installer level) is an entirely different program approach that would be considered if the current approach proves inadequate.

To promote the adoption of efficient technologies to standard practice, as recommended by the evaluator, Idaho Power continued to support the work being done by both the RTF and NEEA in the area of market transformation. New measures are evaluated by Idaho Power annually for program applicability and for cost-effectiveness. Idaho Power also uses a third party to create a TRM that evaluates energy savings and equipment costs. On Custom Projects, Idaho Power determines if measures are standard practice before it calculates savings.

Idaho Power has considered the recommendation to consolidate the internal program manuals. The company determined that the program options require different processes and integrating each of the processes into one program manual has limited benefit to program administration.

Idaho Power has considered consolidating the program tracking files, as recommended, and has determined that the program options require different processes and data; integrating to one program database would require significant effort with limited benefit to program administration and would not lead to any additional actual kWh savings for the program.

Custom Projects

Incentive levels for the non-lighting projects remained the same in 2018, at 18 cents per kWh of first-year savings. Idaho Power reimburses customers up to 70 percent of the project cost.

The Custom Projects option had another successful year with a total of 248 completed projects, 10 of which were in Oregon. Custom Projects achieved energy savings of 46,964 MWh. Energy savings increased in 2018 by nearly 5 percent over 2017. Idaho Power also received 329 new applications representing a potential of 61,251 MWh of savings on future projects.

Over 90 percent of large commercial and industrial customers have participated in the Custom Projects option. With the high percentage of customers who have taken advantage of the program, achieving deeper energy savings continues to be challenging. The company is addressing this ongoing challenge by continuing to use multiple channels to reach customers and to encourage new energy-saving modifications. Table 18 indicates the program's 2018 annual energy savings by primary option measures.

Table 18. Custom Projects annual energy savings by primary option measure, 2018

Option Summary by Measure	Number of Projects	kWh Saved
Retro-commissioning	12	1,062,168
Compressed Air	32	10,468,627
Controls	3	2,663,614
HVAC	3	156,094
Lighting	151	17,131,292
Other	4	339,252
Pump	3	567,331
Refrigeration	10	6,351,813
Variable Frequency Drive (VFD)	30	8,223,499
Total*	**248**	**46,963,690**

*Does not include Green Motor Initiative project counts and savings.

Idaho Power has found providing facility energy auditing, customer technical training, and education services are key to encouraging customers to consider energy efficiency modifications. The 2018 activities not already described in the Commercial and Industrial Sector Overview are below.

Custom Projects engineers and the major customer representatives visited large-commercial and industrial customers to conduct initial facility walk-throughs, commercial/industrial efficiency program informational sessions, and training on specific technical energy-saving opportunities. Idaho Power also hosted a booth at the 2018 Idaho Rural Water Conference. Custom Projects engineers gave presentations on Idaho Power programs and offerings at the 2018 Association of Idaho Cities Annual Conference, the ASHRAE and USGBC Combined Chapter Meeting, the Boise School District Sustainability Summit, the 2018 Idaho Green Building and Energy Conference, and the 2018 Department of Environmental Quality (DEQ) Engineers meeting.

Idaho Power funds the cost of engineering services, up to $4,500, for conducting energy scoping audits to encourage its larger customers to adopt energy efficiency improvements. This was increased from

$3,500 in 2018. Eleven firms contracted to provide scoping audits and general energy efficiency engineering support services. In 2018, an RFP was announced to select a new set of consultants; five firms were selected to provide these services in to 2019.

In 2018, Idaho Power consultants initiated 36 scoping audits and four detailed audits on behalf of Idaho Power customers. These audits identified over 16,300 MWh of savings potential. These audits will be used to promote future projects and will potentially result in energy efficiency projects in the future.

Cohorts and Offerings

The Municipal Water Supply Optimization Cohort (MWSOC), Wastewater Energy Efficiency Cohort (WWEEC), and CEI Cohort for Schools program offerings are also driving a significant number of new projects in addition to increasing vendor engagement from the Streamlined Custom Efficiency (SCE) offering. The company continues to expand the cohort offerings to new customers. In 2018, Custom Projects continued four offerings in an effort to increase the total program savings—WWEEC Continuation, MWSOC, SCE, and the CEI Cohort for Schools—and launched the Eastern Idaho Water Cohort in a joint effort with BPA and Rocky Mountain Power.

Wastewater Energy Efficiency Cohort

In January 2014, Custom Projects launched WWEEC, a cohort training approach for low-cost or no-cost energy improvements for municipal wastewater facilities. WWEEC was a two-year engagement with 11 Idaho Power service area municipalities which continued until 2016. Idaho Power decided to extend the WWEEC to further engaged customers. Seven of the 11 original participants are engaged in the WWEEC Continuation.

Year-three incentives and savings totaled $1,349 and 895,492 kWh/yr. In all cases, the incentive did not exceed 70 percent of the eligible costs. Year-three incentives and savings were processed in 2018. Additionally, some WWEEC participants completed capital projects that were encouraged and discussed in the workshops and energy audits. These capital projects’ savings are significant; they are captured separately and recorded as custom projects—not included as WWEEC savings number. In the third year, the consultant contacted participants to check on progress, to discuss opportunities, and to address energy model data updates.

Municipal Water Supply Optimization Cohort

The MWSOC officially launched in January 2016. The goal of the cohort was to equip water professionals with the skills necessary to independently identify and implement energy efficiency opportunities and to ensure that these energy and cost savings are maintained long term.

A final workshop was held in 2018. Participants presented their challenges, successes, and future plans for energy efficiency. Year-one incentives and savings totaled $11,027 and 743,744 kWh/yr with most incentives paid at 70 percent of the eligible cost. Year-one incentives were processed, and savings were reported in 2018. Additionally, some Water Supply Cohort participants completed capital projects that were encouraged and discussed in the workshops and energy audits. These capital projects’ savings are significant and recorded as custom projects. The savings are not included as MWSOC savings.

In year-two of the offering, Idaho Power's contractor contacted participants to check on project progress and opportunities and to address energy model data updates. A draft year-two report was created in late 2018 and savings and incentives will be processed in 2019. Due to involvement with the water and wastewater cohort offerings, Custom Projects engineers delivered multiple informational meetings with area civil engineers who specialize in water and wastewater designs to educate them on the C&IE Energy Efficiency Program, the audit process, energy efficiency opportunities, and available tools and resources.

Eastern Idaho Water Cohort

The Eastern Idaho Water Cohort launched in January 2018. The goal of the cohort was to offer the Municipal Water Optimization Supply Cohort to the eastern part of Idaho Power service area. This was accomplished in collaboration with Rocky Mountain Power and BPA to deliver joint workshops for customers located in eastern Idaho. Two Idaho Power customers participated. The first-year savings report is anticipated in 2019.

Continuous Energy Improvement Cohort for Schools

The goal of this cohort is to equip school district personnel with hands-on training and guidance to help them get the most out of their systems while reducing energy consumption. Year-one of The Cohort for Schools ran through the 2017 calendar year. Nine school districts were represented and introduced to the Continuous Energy Improvement (CEI) concepts and planned activities for the cohort. The cohort is implemented by a third-party consultant that provided final M&V reports in early 2018, which resulted in a total energy savings of 1,131,697 kWh/yr for year-one participants.

After year-one reports were reviewed by Idaho Power and incentives paid to the participants, activities were suspended until year-two activities commenced over the summer of 2018. Six participants from year-one continued into the year-two program. Of those six, one district added four new facilities and another district added five new facilities to the program.

Activities in 2018 included opportunity register management for each facility detailing low-cost and no-cost opportunities to reduce energy consumption based on site visits. The consultant worked with each participant to complete as many opportunity register items as possible. The consultant conducted a monthly check-in and coaching call for each school district to review opportunity register items and to discuss their current activities. Scoping audits were initiated by Idaho Power for each new facility that was added to the program, which will identify capital project opportunities, in addition to the low-cost measures being implemented via the cohort, to help aid in the strategic capital planning process. Idaho Power provided program and incentive information, along with numerous other energy-saving resources pertinent to school facilities, in hard copy and on flash drive to each school district.

Year-two activities will continue until May 31, 2019. Then, Idaho Power will review final M&V reports to establish energy savings and eligible costs for year two and to distribute the corresponding incentives to participating school districts.

Streamlined Custom Efficiency

Started in 2013, the SCE offering continues to keep vendor engagement high. The SCE offering provides custom incentives for small compressed-air system improvements, fast-acting doors in cold-storage spaces, refrigeration controllers for walk-in coolers, and process-related VFDs. This offering targets projects that may have typically been too small to participate in the Custom Projects option due to the resources required to adequately determine measure savings. Idaho Power contracted with a third party to manage SCE data collection and analysis for each project. In 2018, the SCE offering processed 48 projects, totaling 4,193,931 kWh of savings and $562,745 in incentives.

In August 2018, the fast-acting doors and small compressed air measures were moved out of SCE to prescriptive Retrofits and New Construction offerings because Idaho Power had developed a good understanding of the appropriate energy savings, projects costs, and incentives for these types of projects based on SCE experience. The consultant managing SCE will continue to support vendors and customers working with these measures to ensure the correct incentive paperwork and supporting information is submitted to the prescriptive programs.

Custom Efficiency Process Improvements

In 2018, Idaho Power responded to the three recommendations for the Custom Projects option from the 2017 evaluation; all were related to the database where Idaho Power enters customer information. Idaho Power chose not to implement the evaluator's suggestion to store one type of information in each column/variable or to create new variables. It is common for Idaho Power to have the customer's pre- and post-kWh usage for a project, but when that data is unavailable, the company populates the kWh savings in the "kWh before variable" and a zero in the "kWh after variable." The kWh savings are the data that the company is interested in for reporting and recording the data this way provides the same results. The company revised the publicly available option manual to clarify this practice.

The company did adopt the other two recommendations to adjust the database output report. Idaho Power renamed the column/variable titles to clarify the measure and began filling in measure data in chronological order to ensure information is populated in the correct columns.

New Construction

In 2018, 104 projects were completed, resulting in 13,378,315 kWh in energy savings in Idaho and Oregon.

Maintaining a consistent offering is important for large projects with long construction periods, however, changes are made to enhance customers' choices or to meet new code changes. Idaho Power tries to keep the New Construction option consistent by making changes approximately every other year. Idaho Power performed a review of the New Construction measures in 2018 based on the 2015 International Energy Conservation Code (IECC) information updated in the TRM. This review resulted in the addition or modification of several measures and the removal of the evaporative pre-coolers on air cooled condenser measure because it was not cost-effective.

These measures were continued in 2018:

- Exterior lighting
- Daylight photo controls
- Occupancy sensors
- Direct evaporative coolers

- Reflective roof treatment
- HVAC variable-speed drives
- Kitchen hood variable-speed drives
- Onion/potato shed ventilation variable-speed drives
- Efficient laundry machines
- ENERGY STAR® under-counter dishwashers
- ENERGY STAR® commercial dishwashers
- Refrigeration head-pressure controls
- Refrigeration floating-suction controls
- Efficient condensers
- Smart power strips

These measures were added:

- High-volume low-speed fans
- Diary vacuum pump variable speed drives
- Wall/engine block heater controls
- Refrigerator/freezer strip curtains
- Automatic high-speed doors
- Air compressor variable speed drives
- No-loss condensate drain
- Low-pressure drop filters
- Cycling refrigerated compressed air dryers
- Efficiency compressed air nozzles

The following measures were modified due to small clarification issues or changes in measure cost, cost-effectiveness, or code baseline updates:

- Interior lighting
- High-efficiency exit signs
- Efficient A/C and heat pump units
- Efficient variable refrigerant flow units
- Efficient chillers
- Air side economizers

- Energy-management HVAC control systems
- Guest room energy-management HVAC systems

The Professional Assistance Incentive is an incentive given to architects and/or engineers for supporting technical aspects and documentation of the project. It is equal to 10 percent of the participant's total incentive, up to a maximum amount of $2,500. In 2018, 44 projects received this incentive compared to 39 projects in 2017, and 30 projects in 2016.

Idaho Power representatives visited nine architectural and engineering firms in Boise and Pocatello, and four organizations and municipalities in Boise in 2018. Representatives visited with 134 professionals to build relationships with the local design community, and to discuss Idaho Power's C&I Energy Efficiency program.

The New Construction option continued random installation verification on 10 percent of projects in 2018. The purpose of the verifications is to confirm program guidelines and requirements are adequate and to ensure participants are able to provide accurate and precise information with regard to energy efficiency measure installations. The IDL completed on-site field verifications on 12 of the 104 projects, which encompass over 11.5 percent of the total completed projects in the program. Out of the 12 projects verified, only one project verification identified a discrepancy. Idaho Power will review the discrepancy to determine if clarification of program requirements is needed or additional information is required from participants.

In 2018, Idaho Power responded to the two recommendations for the New Construction option from the 2017 evaluation. The company did not adopt the recommendation to eliminate empty cells in the database because the data provided in the application is transferred electronically into a tracking system. The placement of each value is specific to a field in the tracking system. Empty cells are common for measures the participant is not applying for and are required for the proper transfer of data from the application to the tracking system. Idaho Power updated the online application with instructional text based on the evaluator's second recommendation. For example, Idaho Power added mouse-over text to entry cells on the HVAC tab to inform participants of the acceptable size range of units that are eligible for a specific incentive. Idaho Power will continue to make improvements as the applications are updated and modified.

Retrofits

The Retrofits option experienced high participation and energy savings in 2018. Once again, lighting retrofits comprised the majority of the projects.

Idaho Power performed a review of the Retrofits lighting and non-lighting measures. This review resulted in removing some measures from the program due to cost-effectiveness, modifying some measures, and adding new measures to the incentive menu.

Idaho Power facilitated seven program update workshops across its service area targeting electrical contractors, electrical suppliers and large customers, with 143 in attendance. To help contractors understand advanced lighting controls, and in preparation for rolling out Retrofits program changes mid-year, Idaho Power hosted two hands-on technical Advanced Lighting Controls classes with 43 electricians and large customers in attendance. The class was an updated version of the pilot course Idaho Power hosted in 2017. The courses were offered by the DesignLights Consortium (DLC), and NEEA contributed funds through its Luminaire Level Lighting Controls (LLLC) Initiative. Attendees provided positive feedback and indicated they would like additional training in the area of advanced lighting controls.

Idaho Power staff and contractors continued to work with electrical contractors and electrical equipment suppliers across its service area to respond to inquiries, strengthen relationships, encourage participation, increase knowledge of the incentives, and receive feedback about the market and individual experiences. As Idaho Power staff developed program changes, they contacted various contractors and suppliers for their opinions and feedback to aid in program design.

Idaho Power continued its contracts with Evergreen Consulting Group, LLC; Honeywell, Inc.; and RM Energy Consulting to provide ongoing program support for lighting and non-lighting reviews and inspections, as well as contractor outreach. The Honeywell contract expired at the end of 2018, and Idaho Power retained KW Engineering to replace Honeywell in support of the Retrofits non-lighting project reviews and inspections.

In 2018, Idaho Power responded to the two recommendations for the Retrofits option from the 2017 evaluation. The company is investigating the first recommendation to minimize manual data entry when transferring information from non-lighting project application forms to the program's database, similar to the process used for lighting projects where the data is electronically uploaded to the program database.

To address the second recommendation to improve the application forms, Idaho Power added text to the Lighting Tool Welcome tab to direct the applicant to complete the information in the white cells and to notify them that the blue cells would automatically populate. The company also added written instruction for entering information in the Lighting Operation Schedule section. To eliminate confusion, the company spelled out acronyms throughout the Lighting Tool.

Commercial Energy-Saving Kits

Idaho Power distributed more than 1,600 kits to its commercial customers. Nearly 80 percent of the kit distribution was initiated after a customer spoke with a company representative over the phone.

Table 19. Kit distribution and savings by kit type and state, 2018.

State	Kit Type	Total Distributed	kWh Savings
Idaho	Restaurant	264	187,477
	Retail	155	37,288
	Office	1,202	209,196
Oregon	Restaurant	5	3,550
	Retail	2	481
	Office	24	4,177

Marketing Activities

Since combining the separate commercial and industrial programs into this larger, simplified program, Idaho Power has continued to market the C&I Energy Efficiency Program options to contractors, customers, and professional consultants. See the Sector Overview for the company's efforts to market the C&I Energy Efficiency Program as a single offering.

In response to the 2017 program process evaluation, the company is continuing to update its materials to add more appealing content. The company made the success story videos available on the C&I Energy Efficiency Program web pages and increased its use of customer testimonials and stories in its advertising campaign and elsewhere, when appropriate. Idaho Power also updated its C&I Energy Efficiency slide deck to outline the incentives available and incorporate customer stories. The company continues to use energy efficiency program marketing to enhance Idaho Power's image by informing customers of the programs during high bill calls, explaining why the company encourages energy efficiency and what some of the NEBs are, sharing tips and program information in the *Connections* newsletter, participating in community events when relevant, and more.

Below are the option-specific marketing efforts for 2018.

Custom Projects

In addition to promotion activities mentioned above, Idaho Power produced large-format checks and sent news releases for media events, city council meetings, and/or board meetings.

New Construction

In September, Idaho Power updated its New Construction brochure to incorporate the program changes implemented in August. The company mailed out the brochure along with a letter promoting the New Construction offering to 243 architects and engineers in October.

Idaho Power also began placing banners (Figure 40) on select construction sites highlighting that the facility is being built or enhanced with energy efficiency in mind. Banners were placed at Wilson Elementary in Caldwell and Peace Valley Charter School in Boise.

Figure 40. Idaho Power banner displayed at Wilson Elementary, Caldwell

Retrofits

Idaho Power sent a direct-mail to 23,700 business customers in February highlighting the Retrofits option and informing customers of the New Construction and Custom Project incentives. The direct-mail makes customers aware of the company's energy-saving opportunities and encourages them to contact their customer representative to learn more.

Commercial Energy-Saving Kits

When Idaho Power launched the Commercial ESKs, it intended to use them as a tool for customer representatives to communicate with small businesses. Idaho Power ran a small commercial customer campaign offering direct-mailed kits, created a promotional flyer and web page, sent a press release to media, and mailed a letter to small-business customers.

Cost-Effectiveness

Custom Projects

All projects submitted through the Custom Projects option must meet cost-effectiveness requirements, which include TRC, UCT, and PCT tests from a project perspective. The program requires all costs related to the energy efficiency implementation and energy-savings calculations are gathered and submitted with the program application. Payback is calculated with and without incentives, along with the estimated dollar savings for installing energy efficiency measures. As a project progresses, any changes to the project are used to recalculate energy savings and incentives before the incentives are paid to the participant. To aid in gathering or verifying the data required to conduct cost-effectiveness and energy-savings calculations, third-party engineering firms are sometimes used to provide a scoping audit, a detailed audit, or engineering measurement and verification services available under the Custom Projects option.

The UCT and TRC ratios for the program are 3.85 and 2.32 respectively. An impact evaluation was conducted for the program in 2018. If the amount incurred for the 2018 evaluation was removed from the program's cost-effectiveness, the UCT would be 3.87 while the TRC would remain unchanged at 2.32.

Details for cost-effectiveness are in *Supplement 1: Cost-Effectiveness*.

New Construction

To calculate energy savings for the New Construction option, Idaho Power verifies the incremental efficiency of each measure over a code or standard practice installation baseline. Savings are calculated through two main methods. When available, savings are calculated using actual measurement parameters, including the efficiency of the installed measure compared to code-related efficiency. Another method for calculating savings is based on industry standard assumptions, when precise measurements are unavailable. Since the New Construction option is prescriptive and the measures are installed in new buildings, there are no baselines of previous measurable kWh usage in the building. Therefore, Idaho Power uses industry standard assumptions from the IECC to calculate the savings achieved over how the building would have used energy absent of efficiency measures.

New Construction incentives are based on a variety of methods depending on the measure type. Incentives are calculated mainly through a dollar-per-unit equation using square footage, tonnage, operating hours, or kW reduction.

Based on the current deemed savings value from the TRM, nearly all measures were cost-effective, with the exception of some A/C units and heat pump units. Idaho Power determined these measures met at least one of the cost-effectiveness exceptions outlined in OPUC Order No. 94-590. Idaho Power had received a cost-effectiveness exception on these measures when it filed changes to the program in 2018 under Advice No. 18-08.

To prepare for 2018 program changes, ADM, under contract with Idaho Power, updated the TRM for the New Construction option in 2018. The TRM, which provides savings and costs related to existing and new measures for the New Construction option, will be updated to include the IECC 2015 baseline.

The new savings will be reflected on all applications initiated after the August 2018 program update.

Complete updated measure-level details for cost-effectiveness can be found in the 2018 *Supplement 1: Cost-Effectiveness*. Assumptions for measures prior to the mid-year update can be found in the *Demand-Side Management 2017 Annual Report, Supplement 1: Cost-Effectiveness.*

Retrofits

For the majority of 2018, Idaho Power used most of the same savings and assumptions as were used in 2017 for the Retrofits option. For all lighting measures, Idaho Power uses a Lighting Tool developed by Evergreen Consulting, Group LLC. An initial analysis was conducted to see if the lighting measures shown in the tool were cost-effective based on the average input of watts and hours of operation, while the actual savings for each project are calculated based on specific information regarding the existing and replacement fixture. For most non-lighting measures, deemed savings from the TRM or RTF are used to calculate the cost-effectiveness. To prepare for 2018 program changes, ADM, under contract with Idaho Power, updated the TRM for the Retrofits option. The TRM provides savings and costs related to existing and new measures for the Retrofits option. The new savings will be reflected on all applications submitted after the August 2018 program update.

Several measures that are not cost-effective remain in the program. These measures include high-efficiency A/C units and heat pump units. After reviewing these measures, Idaho Power determined the measures met at least one of the cost-effectiveness exceptions outlined in OPUC Order No. 94-590. These cost-effectiveness exceptions were approved by the OPUC in Advice No. 18-08.

Complete updated measure-level details for cost-effectiveness can be found in *Supplement 1: Cost-Effectiveness*. Assumptions for measures prior to the mid-year update can be found in *the Demand-Side Management 2017 Annual Report, Supplement 1: Cost-Effectiveness.*

Evaluations

In 2018, Tetra Tech MA (Tetra Tech) was retained to conduct an impact evaluation for the Custom Projects option of the C&I Energy Efficiency Program and found an overall realization rate of 100.4 percent.

The results revealed a successfully run program with only minor savings adjustments made mainly due to changes to customer operation after equipment installation. Overall, findings from the impact evaluation show the program savings calculations were reasonable, had accurate equipment descriptions, well substantiated and conservative assumptions, and technically correct calculations for most of the evaluated projects.

Idaho Power will consider any recommendations from this evaluation in 2019. See the complete impact evaluation report in *Supplement 2: Evaluation*.

2019 Program and Marketing Strategies

Idaho Power will expand its promotion of the C&I Energy Efficiency Program to additional online and print business publications. The three options will continue to be marketed as part of Idaho Power's C&I Energy Efficiency Program. Below are specific strategies that apply to the individual components of the program for 2019.

Custom Projects

Over the years, the Custom Projects option has achieved a high service-area penetration rate. As stated previously, more than 90 percent of the large-power service customers have participated in the Custom Projects option. The company is actively working to support these customers in new ways and find additional opportunities for cost-effective energy-saving projects.

Additional program offerings are currently under consideration for implementation in 2019, including an SEM Continuation of Services offering for MWSOC participants who are interested in continuing their success, or have improved their readiness for SEM engagement.

Activities and coaching will continue for the WWEEC continuation participants and the Eastern Idaho Water Cohort. Idaho Power is also investigating details related to continuation and/or expansion of the CEI Cohort for Schools offering beyond the year-two completion scheduled for summer of 2019.

Idaho Power will continue to provide site visits by Custom Projects engineers and energy scoping audits for project identification and energy-savings opportunities; M&V of larger, complex projects; technical training for customers; and funding for detailed energy audits for larger, complex projects.

New Construction

Idaho Power will continue to perform random post-project verifications on a minimum of 10 percent of completed projects, sponsor technical training through the IDL to address the energy efficiency education needs of design professionals throughout the Idaho Power service area, and build relationships with local design professionals and organizations.

Retrofits

Idaho Power will coordinate with NEEA and the Lighting Design Lab (LDL) to offer an advanced lighting controls class to lighting contractors.

Commercial Energy-Saving Kits

In 2019, Idaho Power will continue sending these kits to commercial customers upon request. The company will consider more actively marketing the kits to customers through various methods including social media and direct-mail.

Flex Peak Program

		2018	2017
Participation and Savings			
	Participants (sites)	140	141
	Energy Savings (kWh)	n/a	n/a
	Demand Reduction (MW)	33	36
Program Costs by Funding Source			
	Idaho Energy Efficiency Rider	$58,727	$86,861
	Oregon Energy Efficiency Rider	$64,316	$231,285
	Idaho Power Funds	$310,270	$340,010
	Total Program Costs—All Sources	$433,313	$658,156
Program Levelized Costs			
	Utility Levelized Cost ($/kWh)	n/a	n/a
	Total Resource Levelized Cost ($/kWh)	n/a	n/a
Benefit/Cost Ratios			
	Utility Benefit/Cost Ratio	n/a	n/a
	Total Resource Benefit/Cost Ratio	n/a	n/a

Description

The Flex Peak Program is a voluntary program where participants are eligible to earn a financial incentive for reducing load. The program is available to Idaho and Oregon commercial and industrial customers with the objective to reduce the demand on Idaho Power's system during periods of extreme peak electricity use.

These are the program event guidelines:

- June 15 to August 15 (excluding weekends and July 4)
- Up to four hours per day between 2:00 p.m. and 8:00 p.m.
- Up to 15 hours per week
- No more than 60 hours per season
- At least three events per season

Customers with the ability to offer load reduction of at least 20 kW are eligible to enroll in the program. The 20-kW threshold allows a broad range of customers to participate in the program. Participants receive notification of a load reduction event two hours prior to the start of the event.

The program originated in 2009 as the FlexPeak Management program managed by a third-party contractor. In 2015, Idaho Power took over full administration, and changed the name to Flex Peak Program. The IPUC issued Order No. 33292 on May 7, 2015, while the OPUC approved Advice No. 15-03 on May 1, 2015, authorizing Idaho Power to implement an internally managed Flex Peak Program (Schedule No. 82 in Idaho and Schedule No. 76 in Oregon) and to continue recovering its demand response program costs in the previous manner.

Program Activities

In 2018, 65 participants enrolled 140 sites in the program—five of those sites were new. Existing customers were automatically re-enrolled in the program. Participants had a committed load reduction of 29.4 MW in the first week of the program and ended the season with an amount of 29.6 MW. This weekly commitment, or nomination, was comprised of all 140 sites. The maximum realization rate during the season was 108 percent, and the average for the three events was 89 percent. This is an overall increase from 81 percent in 2017. The realization rate is the percentage of load reduction achieved versus the amount of load reduction committed for an event. The highest hourly load reduction achieved was 33 MW (at generation level) during the July 31 event (Table 20).

Table 20. Flex Peak Program demand response event details

Event Details	Monday, July 16	Wednesday, July 25	Tuesday, July 31
Event time	4–8 p.m.	4–8 p.m.	4–8 p.m.
Average temperature	93°F	98°F	96°F
Maximum load reduction (MW)	27	22	33

Marketing Activities

The Flex Peak Program continued to be included along with the C&I Energy Efficiency Program collateral. Additional details can be found in the Commercial/Industrial Sector Overview.

Customer representatives conducted field visits with 2017 participants in the offseason and early spring to ensure re-enrollment was successful; verify load size, load traits, and type of operation; and to communicate available incentive amounts based on customer load size.

Cost-Effectiveness

Idaho Power determines cost-effectiveness for its demand response program under the terms of IPUC Order No. 32923 and OPUC Order No. 13-482. Under the terms of the orders and the settlement, all of Idaho Power's demand response programs were cost-effective for 2017.

The Flex Peak Program was dispatched for 12 event hours and achieved a maximum reduction of 29.1 MW. The total cost of the program in 2018 was $433,313. Had the Flex Peak Program been used for the full 60 hours, the cost would have been approximately $703,000.

A complete description of Idaho Power cost-effectiveness of its demand response programs is included in *Supplement 1: Cost-Effectiveness.*

Evaluations

As required each year by IPUC and OPUC, Idaho Power conducted an internal evaluation of the program's potential load reduction impacts. The goal of the review was to calculate the load reduction in MW for the program. The analysis also verified load reduction per site and per event. A copy of the results of this study is in *Supplement 2: Evaluation*.

2019 Program and Marketing Strategies

The company will continue to communicate the value proposition with enrolled customers and the importance of active participation when events are called. Idaho Power will meet with existing participants during the off-season to discuss past-season performance and upcoming season details.

For the upcoming season, Idaho Power will update the program brochure to match the look and feel of other C&I Energy Efficiency Program materials. Though the terms of IPUC Order No. 32923 and OPUC Order No. 13-482 do not require program marketing, Idaho Power customer representatives regularly communicate with current participants and encourage them to enroll new sites. Idaho Power will promote the program along with Idaho Power's C&I Energy Efficiency Program, when applicable.

Oregon Commercial Audits

		2018	2017
Participation and Savings			
	Participants (audits)	0	13
	Energy Savings (kWh)	n/a	n/a
	Demand Reduction (MW)	n/a	n/a
Program Costs by Funding Source			
	Idaho Energy Efficiency Rider	$0	$0
	Oregon Energy Efficiency Rider	$1,473	$8,102
	Idaho Power Funds	$0	$0
	Total Program Costs—All Sources	$1,473	$8,102
Program Levelized Costs			
	Utility Levelized Cost ($/kWh)	n/a	n/a
	Total Resource Levelized Cost ($/kWh)	n/a	n/a
Benefit/Cost Ratios			
	Utility Benefit/Cost Ratio	n/a	n/a
	Total Resource Benefit/Cost Ratio	n/a	n/a

Description

Oregon Commercial Audits identifies opportunities for all commercial and industrial building owners, governmental agencies, schools, and small businesses to achieve energy savings. Initiated in 1983, this statutory required program (ORS 469.865) is offered under Oregon Tariff Schedule No. 82.

Through this program, Idaho Power provides free energy audits, evaluations, and educational products to customers through a third-party contractor. During the audits, the contractor inspects the building shell, HVAC equipment, lighting systems, and operating schedules, if available, and reviews past billing data. These visits provide a venue for contractor to discuss available incentives and specific business operating practices for energy savings. The contractor may also distribute energy efficiency program information and remind customers that Idaho Power personnel can offer additional energy-savings tips and information. Business owners can decide to change operating practices or make capital improvements designed to use energy wisely.

Program Activities

During 2018, no customers requested audits through this program. As in 2017, EnerTech Services was available to conduct the audits, and Idaho Power personnel were available to assist customers.

The 2018 program costs were lower than 2017 because the contractor did not perform any audits.

Marketing Activities

Idaho Power sent its annual direct-mailing to 1,520 Oregon commercial customers in September to explain the program’s no-cost or low-cost energy audits and the available incentives and resources.

Cost-Effectiveness

As previously stated, the Oregon Commercial Audits program is a statutory program offered under Oregon Schedule 82, the Commercial Energy Conservation Services Program. Because the required parameters of the Oregon Commercial Audit program are specified in Oregon Schedule 82 and the company abides by these specifications, this program is deemed to be cost-effective. Idaho Power claims no energy savings from this program.

2019 Program and Marketing Strategies

Idaho Power does not expect to make any operational changes to the program in 2019.

Idaho Power will continue to market the program through the annual customer notification and will consider additional opportunities to promote the program to eligible customers.

Irrigation Sector Overview

The irrigation sector is comprised of agricultural customers operating water-pumping or water-delivery systems to irrigate agricultural crops or pasturage. End-use electrical equipment primarily consists of agricultural irrigation pumps and center pivots. The irrigation sector does not include water pumping for non-agricultural purposes, such as the irrigation of lawns, parks, cemeteries, golf courses, or domestic water supply.

In December 2018, the active and inactive irrigation service locations totaled 20,077 system-wide. This was an increase of 1.5 percent compared to 2017, primarily due to the addition of service locations for pumps and pivots to convert land previously furrow or surface irrigated to sprinkler irrigation. Irrigation customers accounted for 1,976,587 MWh of energy usage in 2018, which was an increase from 2017 of approximately 12 percent, primarily due to variations in weather. This sector represented nearly 14 percent of Idaho Power's total electricity sales, and approximately 29 percent of July sales. Energy usage for this sector has not changed significantly in many years; however, there is substantial yearly variation in usage due primarily to the impact of weather on customer irrigation needs.

Idaho Power offers two programs to the irrigation sector:

1. Irrigation Efficiency Rewards, an energy efficiency program designed to encourage the replacement or improvement of inefficient systems and components.
2. Irrigation Peak Rewards, a demand response program designed to provide a system peak resource.

The Irrigation Efficiency Rewards program, including the Green Motor Initiative, experienced increased annual savings, from 16,888 MWh in 2017 to 19,002 MWh in 2018.

Idaho Power recruited the majority of 2017 Irrigation Peak Rewards participants in 2018, with an increase of 1.7 percent in eligible service points.

Table 21 summarizes the overall expenses and program performance for both the energy efficiency and demand response programs provided to irrigation customers.

Table 21. Irrigation sector program summary, 2018

		Total Cost		Savings	
Program	**Participants**	**Utility**	**Resource**	**Annual Energy (kWh)**	**Peak Demand (MW)**
Demand Response					
Irrigation Peak Rewards	2,335 service points	$ 6,891,737	$ 6,891,737		297
Total		**$ 6,891,737**	**$ 6,891,737**		**297**
Energy Efficiency					
Irrigation Efficiency Rewards	1,022 projects	$ 2,953,706	$11,948,469	18,933,831	
Green Motors—Irrigation	26 motor rewinds			67,676	
Total		**$ 2,953,706**	**$11,948,469**	**19,001,507**	

Note: See Appendix 3 for notes on methodology and column definitions.

Marketing

In 2018, the company mailed a spring and fall edition of *Irrigation News* to all irrigation customers in its service area. The spring edition focused on Idaho Power's efforts to improve irrigation customer satisfaction, rate changes, rewards for custom projects, and contact information for regional agriculture representatives. Two versions of the spring newsletter were created to cater to the differences in rate changes for Oregon and Idaho customers. The fall edition again noted customer satisfaction efforts and featured information on online tools for account management and outages, a 2019 calendar of events for agriculture shows, energy efficiency incentives, and Idaho Power's overhead power line safety video specifically made for the irrigation community. This newsletter provides an opportunity to increase transparency and trust and to promote the Irrigation Efficiency Rewards program.

Throughout 2018, changes to program brochures, project applications, and other marketing collateral made the materials more consistent with each other and other Idaho Power publications.

The company also placed numerous ads in print agricultural publications to reach the target market in smaller farming communities. Publications included: *Capital Press*, *Gem State Producer*, *Times–News*, *Owyhee Avalanche*, *Idaho Press*, *Power County Press*, *Potato Grower Magazine*, *Idaho Cattle Association Guide*, *Malheur Enterprise*, and *Post Register*. Idaho Power utilized radio advertising to promote its presence at the Agri-Action show and to show support of Future Farmers of America and Ag Week conferences.

In spring 2018, Idaho Power partnered once again with the Twin Falls County Pest Abatement District to promote irrigation equipment efficiency while educating the public on mosquito abatement—preventing large pools of water where mosquitoes breed. The promotion ran as a commercial on KMVT and through digital ads in the Twin Falls area March through April. Digital advertising was used to drive traffic to the Irrigation Efficiency web page; the click-through rate was 0.14 percent—well above the industry average of 0.08 percent.

Customer Satisfaction

Idaho Power conducts the Burke Customer Relationship Survey each year. In 2018, 61 percent of irrigation survey respondents indicated Idaho Power is meeting or exceeding their needs with information on how to use energy wisely and efficiently.

Seventy percent of irrigation respondents indicated Idaho Power is meeting or exceeding their needs by encouraging energy efficiency with its customers. Fifty-six percent of Idaho Power irrigation customers surveyed in 2018 indicated the company is meeting or exceeding their needs in offering energy efficiency programs, and 37 percent of the irrigation survey respondents indicated they have participated in at least one Idaho Power energy efficiency program. Of the irrigation survey respondents who have participated in at least one Idaho Power energy efficiency program, 91 percent are "very" or "somewhat" satisfied with the program.

Training and Education

Idaho Power continued to market its irrigation programs by varying the location of workshops and offering new presentations to irrigation customers. In 2018, Idaho Power provided eight workshops promoting the Irrigation Efficiency Rewards program. Approximately 200 customers attended workshops in Vale, Oregon and Aberdeen, Mountain Home, Nampa, Eagle, Burley, Leadore, and Emmett, Idaho. The company displayed exhibits at regional agricultural trade shows, including the Idaho Irrigation Equipment Association Winter Show, Eastern Idaho Agriculture Expo, Western Idaho Agriculture Expo, the Agri-Action Ag show, and the Treasure Valley Irrigation Conference.

Field Staff Activities

Idaho Power's agricultural representatives offer customer education, training, and irrigation-system assessments and audits across the service area. Agricultural representatives also engage agricultural irrigation equipment dealers in training sessions with the goal of sharing expertise about energy-efficient system designs and increasing awareness about the program. Agricultural representatives and the irrigation segment coordinator, a licensed agricultural engineer, participate in annual training to maintain or obtain their Certified Irrigation Designer and Certified Agricultural Irrigation Specialist accreditation. This training allows Idaho Power to maintain its high level of expertise in the irrigation industry and is sponsored by the nationally based Irrigation Association.

Irrigation Efficiency Rewards

		2018	2017
Participation and Savings			
	Participants (projects)	1,048	801
	Energy Savings (kWh)*	19,001,507	16,888,049
	Demand Reduction (MW)	n/a	n/a
Program Costs by Funding Source			
	Idaho Energy Efficiency Rider	$2,681,664	$2,230,798
	Oregon Energy Efficiency Rider	$233,916	$192,416
	Idaho Power Funds	$38,126	$52,463
	Total Program Costs—All Sources	$2,953,706	$2,475,677
Program Levelized Costs			
	Utility Levelized Cost ($/kWh)	$0.019	$0.018
	Total Resource Levelized Cost ($/kWh)	$0.075	$0.060
Benefit/Cost Ratios			
	Utility Benefit/Cost Ratio	4.57	4.75
	Total Resource Benefit/Cost Ratio	3.03	3.64

*2018 total includes 67,676 kWh of energy savings from 26 Green Motors projects

Description

Initiated in 2003, the Irrigation Efficiency Rewards program encourages energy-efficient equipment use and design in irrigation systems. Qualified irrigators in Idaho Power's service areas can receive financial incentives and reduce their electricity usage through participation in the program. Two options help meet the needs for major or minor changes to new or existing systems: Custom Incentive and Menu Incentive.

Custom Incentive Option

The Custom Incentive Option is offered for extensive retrofits to existing systems or the installation of an efficient, new irrigation system.

For a new system, Idaho Power determines whether the equipment is more energy efficient than standard before approving the incentive. If an existing irrigation system is changed to a new water source, this program considers it a new irrigation system. The incentive for a new system is 25 cents per annual kWh saved, not to exceed 10 percent of the project cost.

For existing system upgrades, the incentive is 25 cents per annual kWh saved or $450 per kW demand reduction, whichever is greater. The incentive is limited to 75 percent of the total project cost.

The qualifying energy efficiency measures include any hardware changes that result in a reduction of the potential kWh use of an irrigation system or that result in a potential demand reduction. Idaho Power reviews, analyzes, and makes recommendations on each project after considering prior usage history, invoices, and, in most situations, post-installation demand data to verify savings and incentives.

Menu Incentive Option

The Menu Incentive Option covers a portion of the costs of repairing and replacing specific components that help the irrigation system use less energy. This option is designed for systems where small maintenance upgrades provide energy savings from these 11 separate measures:

- New flow-control type nozzles
- New nozzles for impact, rotating, or fixed-head sprinklers
- New or rebuilt impact or rotating type sprinklers
- New or rebuilt wheel-line levelers
- New complete low-pressure pivot package
- New drains for pivots or wheel-lines
- New riser caps and gaskets for hand-lines, wheel-lines, and portable mainlines
- New wheel-line hubs
- New pivot gooseneck and drop tube
- Leaky pipe repair
- New center pivot base boot gasket

Payments are calculated on a predetermined kWh savings per component.

Program Activities

In 2018, 1,022 irrigation efficiency projects were completed as follows: 843 utilized the Menu Incentive Option and provided an estimated 12,170 MWh of energy savings and 23.8 MW of demand reduction; 179 utilized the Custom Incentive Option (82 were new systems and 97 were on existing systems) and provided 6,987 MWh of energy savings.

Marketing Activities

In addition to training and education activities mentioned in the Irrigation Sector Overview, Idaho Power targeted a select number of nonparticipants to increase program awareness. Idaho Power maintained a database of irrigation dealers and vendors for direct-mail communication, as they are key to the successful marketing of the program.

Cost-Effectiveness

Idaho Power calculates cost-effectiveness using different savings and benefits assumptions and measurements under the Custom Incentive Option and the Menu Incentive Option of Irrigation Efficiency Rewards.

Each application under the Custom Incentive Option received by Idaho Power undergoes an assessment to estimate the energy savings that will be achieved through a customer’s participation in the program. On existing system upgrades, Idaho Power calculates the savings of a project by determining what changes are made and comparing it to the service point’s previous five years of electricity usage history on a case-by-case basis. On new system installations, the company uses standard practices as the baseline and determines the efficiency of the applicant's proposed project. Based on the specific equipment to be installed, the company calculates the estimated post-installation energy consumption of the system. The company verifies the completion of the system design through aerial photographs, maps, and field visits to ensure the irrigation system is installed and used in the manner the applicant's documentation describes.

Each application under the Menu Incentive Option received by Idaho Power also undergoes an assessment to ensure deemed savings are appropriate and reasonable. Payments are calculated on a prescribed basis by measure. In some cases, the energy-savings estimates in the Menu Incentive Option are adjusted downward from deemed RTF savings to better reflect known information on how the components are actually being used. For example, a half-circle rotation center pivot will only save half as much energy per sprinkler head as a full-circle rotation center pivot. All deemed savings are based on seasonal operating hour assumptions by region. If a system's usage history indicates it has lower operating hours than the assumptions, like the example above, the deemed savings are adjusted.

In March 2018, the RTF updated the irrigation hardware measure analysis, which resulted in a reduction of savings between 34 to 94 percent from the previous workbook. The major assumption driving the measure savings change in the program involves the calculation of the leakage per hardware item, which caused savings to decrease nearly 80 percent on average for several irrigation hardware types. Idaho Power has requested the RTF reconvene the irrigation subcommittee in 2019 and re-examine the assumptions such as leakage and flow rate, as well as the calculation methodology behind these irrigation measure. In the meantime, the company plans to use the current workbook for 2019. However, if the RTF approves a new workbook in 2019, Idaho Power will reevaluate and may retroactively apply those updated savings for 2019.

Complete measure-level details for cost-effectiveness can be found in *Supplement 1: Cost-Effectiveness*.

2019 Program and Marketing Strategies

Idaho Power does not expect to make any changes to the Custom Incentive Option in 2019. However, the company will be adjusting Menu Option savings due to new savings numbers being created by the RTF. Idaho Power will also initiate work with the RTF and regional irrigation experts to review the RTF savings adjustments to determine if additional research or information is needed to improve accuracy of savings calculations.

Marketing plans include conducting at least six customer-based irrigation workshops to promote energy efficiency technical education as well as program specifics. Idaho Power will continue to participate in three regional agricultural trade shows, in addition to sponsoring the Idaho Irrigation Equipment Association Show & Conference and the Soil Health Symposium. Marketing the program to irrigation vendors will continue to be a priority. Idaho Power will continue to promote the program in agriculturally focused editions of newspapers and magazines, and to provide valuable information in its *Irrigation News* newsletter.

Irrigation Peak Rewards

		2018	2017
Participation and Savings			
	Participants (participants)	2,335	2,307
	Energy Savings (kWh)	n/a	n/a
	Demand Reduction (MW)	297	318
Program Costs by Funding Source			
	Idaho Energy Efficiency Rider	$230,953	$743,948
	Oregon Energy Efficiency Rider	$180,865	$205,528
	Idaho Power Funds	$6,479,919	$6,273,625
	Total Program Costs—All Sources	$6,891,737	$7,223,101
Program Levelized Costs			
	Utility Levelized Cost ($/kWh)	n/a	n/a
	Total Resource Levelized Cost ($/kWh)	n/a	n/a
Benefit/Cost Ratios			
	Utility Benefit/Cost Ratio	n/a	n/a
	Total Resource Benefit/Cost Ratio	n/a	n/a

Description

Idaho Power's Irrigation Peak Rewards program is a voluntary, demand response program available to agricultural irrigation customers with metered service locations who have participated in the past. Initiated in 2004, the purpose of the program is to minimize or delay the need to build new supply-side resources.

The program pays irrigation customers a financial incentive to interrupt the operation of specific irrigation pumps using of one or more control devices. Historically, the Irrigation Peak Rewards program provides approximately 320 MW, or nearly 9 percent of Idaho Power's all-time system peak of load reduction.

The program offers two interruption options: Automatic Dispatch Option and Manual Dispatch Option. Automatic Dispatch Option pumps are controlled by an Advanced Metering Infrastructure (AMI) or a cellular device that remotely turns off the pump(s). Manual Dispatch Option pumps can participate if they have 1,000 cumulative horsepower (hp) or the AMI or cellular technology has been determined to not function properly. These customers nominate a kW reduction and are compensated based on the actual load reduction during the event.

For either interruption option, these are the program event guidelines:

- June 15 to August 15 (excluding Sundays and July 4)
- Up to four hours per day between 1:00 p.m. and 9:00 p.m.
- Up to 15 hours per week

- No more than 60 hours per season
- At least three events per season

The incentive structure consists of fixed and variable payments. The fixed incentive is $5.00/kW with an energy credit of $0.0076/kWh. The demand (kW) credit is calculated by multiplying the monthly billing kW by the demand-related incentive amount. The energy (kWh) credit is calculated by multiplying the monthly billing kWh usage by the energy-related incentive amount. The incentive is applied to monthly bills, and credits are prorated for periods when reading/billing cycles do not align with the program season dates. An additional variable credit of $0.148/kWh applies to the fourth and subsequent events that occur between 1:00 p.m. and 8:00 p.m. and is increased to $0.198/kWh when customers allow Idaho Power to interrupt their pumps until 9:00 p.m.

Program rules allow customers the ability to opt out of dispatch events up to five times per service point. The first three opt outs each incur a penalty of $5 per kW, while the remaining two incur a penalty of $1 per kW based on the current month's billing kW. The opt-out penalties may be prorated to correspond with the dates of program operation and are accomplished through manual bill adjustments. The penalties will never exceed the amount of the incentive that would have been paid with full participation.

Program Activities

Idaho Power enrolled 2,335 service points in 2018, an increase of 1.7 percent over 2017. The enrolled service points accounted for 85.2 percent of the eligible service points. The total nominated kW increased to 416.8 MW from 411.2 MW in 2017.The company utilized two electrical contractors during the spring of 2018 to maintain and troubleshoot the AMI devices and cellular devices for dispatching. Identification and correction of device failures is an ongoing effort before the season begins and throughout the season.

Table 22. Irrigation Peak Rewards demand response event details

Event Details	Friday, July 13	Tuesday, July 17	Wednesday, August 1
Event time	2–9 p.m.	2–9 p.m.	2–9 p.m.
Average temperature	95°F	94°F	98°F
Maximum load reduction (MW)	296.7	256.6	263.8

The program administration expenses were less in 2018 because the company completed the upgrade of load control communication devices located on participating customers' pump electrical panels in 2017. Third-party load control devices were exchanged from cellular communication to Idaho Power's AMI communication. Third-party device management discontinued in December 2016. The lower 2018 expenses reflect the program in a maintenance mode with the devices being managed internally.

Marketing Activities

Idaho Power used workshops, trade shows, and direct-mailings to encourage past participants to re-enroll in the program. The company updated a program brochure to improve readability and answer common questions. The brochure, sign-up worksheet, and contract agreement were mailed to all eligible participants in March 2018. See the Irrigation Sector Overview section for additional marketing activities.

Cost-Effectiveness

Idaho Power determines cost-effectiveness for the demand response programs under the terms of IPUC Order No. 32923 and OPUC Order No. 13-482. Under the terms of the orders and the settlement, all of Idaho Power's demand response programs were cost-effective for 2018.

The Irrigation Peak Rewards program was dispatched for 12 event hours and achieved a maximum demand reduction of 296.7 MW. The total expense for 2018 was $6.9 million and would have been approximately $9.8 million if the program was operated for the full 60 hours.

A complete description of cost-effectiveness results for Idaho Power's demand response programs is included in *Supplement 1: Cost-Effectiveness.*

Evaluations

Each year, Idaho Power produces an internal report of the Irrigation Peak Rewards program. This report includes a load-reduction analysis, cost-effectiveness information, and program changes. A breakdown of the load reduction for each event day and each event hour including line losses is shown in Table 23. A copy of the 2018 Irrigation Peak Rewards program report is included in *Supplement 2: Evaluation*.

Table 23. Irrigation Peak Rewards program MW load reduction for events

Event Date	2:00–3:00 p.m.	3:00–4:00 p.m.	4:00–5:00 p.m.	5:00–6:00 p.m.	6:00–7:00 p.m.	7:00–8:00 p.m.	8:00–9:00 p.m.
July 13	75.9	149.3	231.8	296.7	218.0	139.3	58.3
July 17	71.3	125.9	206.8	256.6	180.9	121.5	43.6
August 1	54.3	117.3	206.8	263.8	208.5	142.7	54.6

2019 Program and Marketing Strategies

Idaho Power will continue to recruit past participants in this program for the 2019 irrigation season; no program changes are expected. The company will include information on the program at its irrigation workshops in conjunction with the Irrigation Efficiency Program. Each eligible customer will be sent a comprehensive packet containing an informational brochure, sign-up worksheet, and contract agreement encouraging their participation. Idaho Power agricultural representatives will continue one-on-one customer contact to inform and encourage program participation.

Other Programs and Activities

Green Motors Initiative

Idaho Power participates in the Green Motors Practices Group's (GMPG) Green Motors Initiative (GMI). Under the GMI, service center personnel are trained and certified to repair and rewind motors in an effort to improve reliability and efficiency. If a rewind returns a motor to its original efficiency, the process is called a "Green Rewind." By rewinding a motor under this initiative, customers may save up to 40 percent when compared to buying a new motor. The GMI is available to Idaho Power's agricultural, commercial, and industrial customers.

Twenty-four service centers in Idaho have the training and equipment to participate in the GMI and perform an estimated 1,200 Green Rewinds annually. Of the 24 service centers, currently nine have signed on as GMPG members in Idaho Power's service area. The GMPG will work to expand the number of service centers participating in the GMI, leading to market transformation and an expected kWh savings in southern Idaho and eastern Oregon.

Under the initiative, Idaho Power pays service centers $2 per hp for each National Electrical Manufacturers Association (NEMA)-rated motor up to 5,000 hp that received a verified Green Rewind. Half of that incentive is passed on to customers as a credit on their rewind invoice. The GMPG requires all member service centers to sign and adhere to the GMPG Annual Member Commitment Quality Assurance agreement. The GMPG is responsible for verifying quality assurance.

In 2018, a total of 51 motors were rewound under the GMI. Table 24 provides a breakdown of energy savings and the number of motors by customer segment.

Table 24. Green Motor Initiative savings, by sector and state

Sector	State	Number of Motors	Sum of kWh Savings
Irrigation	ID	26	67,676
	OR	0	0
Irrigation Total		**26**	**67,676**
Commercial and Industrial	ID	25	64,167
	OR	0	0
Commercial and Industrial Total		**25**	**64,167**
Grand Total		**51**	**131,843**

Local Energy Efficiency Funds

The purpose of Local Energy Efficiency Funds (LEEF) is to provide modest funding for short-term projects that do not fit within Idaho Power's energy efficiency programs but provide a direct benefit to the promotion or adoption of beneficial energy efficiency behaviors or activities. Idaho Power received four LEEF applications in 2018: two from residential customers and two from commercial customers. None were funded.

The residential applications were reviewed and deemed not appropriate for LEEF because the products referenced in the submittal were found to be standard and widely available. For example, one applicant was seeking funds to replace an older door and windows. An Idaho Power residential program specialist and/or a customer representative followed up with the applicants to discuss other available incentives and to address other needs.

The two commercial customers requested assistance with LED lighting retrofits. In these cases, a program specialist directed applicants to program incentive information currently available from Idaho Power to support their projects.

Idaho Power's Internal Energy Efficiency Commitment

Idaho Power continues to upgrade the company's substation buildings across its service area. The existing grass and low-level evergreen shrub landscaping at the Fremont substation in Pocatello was removed and replaced with gravel. The irrigation system was greatly reduced to promote water conservation and reduced O&M expenses related to watering, mowing, and disposal of landscaping debris. This xeriscape approach will be considered for other substations. Efforts in 2018 also focused on providing energy-efficient heating and cooling. In 2018, Idaho Power replaced the make-up air handlers in the corporate headquarters (CHQ). The inefficient single-fan/single-speed units were replaced with state-of-the-art FANWALL® technology. Each unit consists of 12 VFD fans and will reduce energy consumption at the CHQ building while delivering a more consistent air flow for employees.

Renovation projects continued at the CHQ in downtown Boise, with a project to exchange the old T-12 parabolic lighting fixtures with LED lighting throughout 2019. Remodels continued to incorporate energy efficiency measures, such as lower partitions, other lighting retrofits, and automated lighting controls.

In Blackfoot, Pocatello, Twin Falls, and many other areas within Idaho Power's service area, the company continued to replace existing high bay lighting in truck bays and shops with more efficient LED lighting and to install smart thermostats throughout the enterprise.

In 2018, the design was completed for the new HVAC system at the Maintenance and Electrical Shops; construction on these projects is scheduled for 2019. These improvements to the shops will reduce energy consumption in coming years.

The Idaho Power CHQ building participated in the Flex Peak Program again in 2018 and committed to reduce up to 200 kW of electrical demand during events. Unlike other program participants, Idaho Power does not receive any financial incentives for its participation. Idaho Power's CHQ participated in all three demand response events in 2018. Idaho Power's other internal energy efficiency projects and initiatives are funded by non-rider funds.

Idaho Power continued a major sustainability initiative to educate employees about the purchase and use of electric vehicles (EV). A 2018 Chevy Bolt, with a range of 238 miles per charge, was purchased for use as a CHQ employee fleet car. Additionally, the company purchased and upfitted eight Ford F-150s with XLP™ Plug-in Hybrid systems designed to improve gas mileage and decrease emissions before placing them in service. These hybrid trucks are the first step in a transition to an all-electric truck fleet in the future. EV charging stations were installed to charge these vehicles.

Figure 41. Vehicles wrapped with graphics to promote Idaho Power's use of EVs

Market Transformation: NEEA

Market transformation is an effort to permanently change the existing market for energy efficiency goods and services by engaging and influencing large national companies to manufacture or supply more energy-efficient equipment. Through market transformation activities, participants promote the adoption of energy-efficient materials and practices before they are integrated into building codes. Idaho Power achieves market transformation savings primarily through its participation in the NEEA.

Idaho Power has funded NEEA since its inception in 1997. NEEA's role is to look to the future to find emerging opportunities for energy efficiency and to create a path forward to make those opportunities a reality in the region.

NEEA's current, five-year funding cycle began 2015. In this cycle, the NEEA business plan is forecast to obtain 145 average megawatts (aMW) of regional energy savings at a cost of about $13.5 million or approximately $2.7 million per year for Idaho Power customers. The NEEA plan also offered some optional programs and activities to prevent overlapping activities when local utilities have the capability to provide the same services at a lower cost or more effectively.

In 2018, NEEA and its funders began planning the next five-year cycle which will be from 2020–2024. The estimated cost for Idaho Power's customers in this funding cycle is $14.7 million, or $3 million per year.

Idaho Power participates in all of NEEA's committees and workgroups, including representation on the Regional Portfolio Advisory Committee and the Board of Directors. Idaho Power representatives participate in the Regional Portfolio Advisory Committee, Cost-Effectiveness and Evaluation Advisory Committee, Residential Advisory Committee, Commercial Advisory Committee, Regional Emerging Technologies Advisory Committee, Idaho Energy Code Collaborative, Ductless Heat Pump Workgroup, Heat Pump Water Heater Workgroup, and the Northwest Regional Strategic Market Plan for Consumer Products Group. The company also participates in NEEA's initiatives including the Residential Building Stock Assessment, Commercial Building Stock Assessment, Commercial Code Enhancement (CCE), Strategic Energy Management, Commercial Lighting - Reduced Wattage Lamp Replacement, Top-Tier Trade Ally and Luminaire Level Lighting Controls

NEEA performs several market progress evaluation reports (MPER) on various energy efficiency efforts each year. In addition to the MPERs, NEEA provides market-research reports, through third-party contractors, for energy efficiency initiatives throughout the Pacific Northwest. Copies of these and other reports mentioned below are referenced in *Supplement 2: Evaluation* and on NEEA's website under Resources & Reports. For information about all committee and workgroup activities, see the information below.

NEEA Marketing

As stated in Idaho Power's agreement with NEEA for the 2015 to 2019 funding cycle: "Idaho Power will fund, create, and deliver specific market transformation activities for all initiatives that are relevant for the Idaho Power service area." In 2018, these activities included educating residential customers on HPWH and ductless heat pumps, and educating commercial customers and participating contractors on reduced-wattage lightbulb replacement, NXT Level Lighting Training, and LLLC.

Idaho Power promoted ductless heat pumps and HPWH as part of its H&CE Program. The company also promoted DHPs as part of its residential marketing campaign. Full details can be found in the H&CE Program's Marketing section.

Idaho Power continued to encourage trade allies to take the NXT Level Lighting Training. The company also handed out flyers at seven trade ally lighting workshops in July and August.

To promote LLLC, Idaho Power held training classes in February in Boise and March in Pocatello. The company also rolled out a networked lighting control incentive in August.

NEEA Activities: All Sectors

Cost-Effectiveness and Evaluation Advisory Committee

The advisory group meets three to four times a year to review evaluation reports, cost-effectiveness, and savings assumptions. One of the primary functions of the work group is to review all savings assumptions that have been updated since the previous reporting cycle. The process usually requires a webinar and an all-day meeting. Other activities for 2018 included reviewing NEEA evaluation studies and data-collection strategies and previewing forthcoming research and evaluations.

Idaho Energy Code Collaborative

Since 2005, the State of Idaho has been adopting a state-specific version of the IECC. The Idaho Energy Code Collaborative is a group of individuals with varying backgrounds and levels of association with the building construction industry. The group's work is facilitated by NEEA. The purpose of the group is to make recommendations to the Idaho Building Code Board (IBCB) on the adoption of certain construction and energy codes in the residential and commercial sectors. Idaho Power is a member of this group and participates in the group's meetings.

The IBCB adopted the 2017 Idaho Energy Conservation Code (2015 IECC commercial provisions and 2012 IECC residential provisions with Idaho amendments) effective January 1, 2018.

In September 2018, commercial and residential construction and energy codes were published by the International Code Council (ICC). The publications include the *2018 International Building Code, 2018 International Existing Building Code*, *2018 International Residential Code*, *2018 International Energy Conservation Code* (residential), and the *2018 International Energy Conservation Code* (commercial). The Idaho Energy Code Collaborative reviewed these publications in detail, comparing them to the prior codes published in 2015. The results of the comparison were provided to the IBCB as the they began formally reviewing these publications in November for potential adoption.

Idaho Power participated and offered support in those collaborative meetings, which were attended by members of the building industry, local building officials, code development officials, and other interested stakeholders. Idaho Power also attended the IBCB public meetings. The Idaho Energy Code Collaborative is an effort in which Idaho Power will continue to participate.

Regional Emerging Technologies Advisory Committee

Idaho Power participated in Regional Emerging Technologies Advisory Committee (RETAC) which met quarterly to review the emerging technology pipeline for BPA, NEEA, and the Northwest Power and Conservation Council (NWPCC) Seventh Power Plan. Throughout 2018, RETAC focused on technologies for residential HVAC, commercial HVAC, and water heating. RETAC discussed the gaps and issues that exist for these technologies and how NEEA and the regional utilities can address those issues. This discussion will continue in 2019.

Regional Portfolio Advisory Committee

The Regional Portfolio Advisory Committee (RPAC) is responsible for overseeing NEEA's market transformation programs and their advancement through key milestones in the "Initiative Lifecycle." RPAC members must reach a full-consent vote at selected milestones in order for a program to advance to the next stage; members can exercise a "challenge flag" at any stage if a program goes beyond the scope agreed upon by the committee.

RPAC convenes in-person for quarterly meetings and by webinar as needed. In 2018, the RPAC conducted three quarterly meetings and five marketing-related meetings with a group that was labeled RPAC+, which included regular RPAC members and marketing representatives from each organization.

In the first regular quarterly meeting of RPAC on February 28, the group voted to support advancing Industrial Motor Product Labeling/Extended Motor Products (XMP) through the Initiative Star Milestone and into NEEA's program portfolio. NEEA staff conducted a NEEA portfolio review and an emerging technologies update.

On May 14, RPAC met at the Seattle-Tacoma Airport. The RPAC was shown the 2018 RPAC Workplan and voted to move Very High Efficiency Dedicated Outside Air Systems (VHE DOAS) through the Initiative Start milestone and into NEEA's program portfolio. NEEA staff updated the group and a discussion was held concerning NEEA's 2020 to 2024 Business Planning Workshop, which addressed a complementary approach for initiatives and the right-sizing advisory committees. RPAC also reviewed the Commercial/Industrial lighting regional strategic market plan.

On August 22, RPAC began an in-depth investigation into how NEEA promotes market transformation with the goal of providing guidance to the board. The group also discussed streamlining the Initiative Life Cycle Process and decreasing the number of committees and workgroups. NEEA staff presented updates on emerging technologies and market research and evaluation.

After one funder threw the challenge flag and a subsequent board directive, RPAC+ held marketing workshops on September 26 and October 3, 11, 18, and 23 to resolve issues relating to NEEA's downstream marketing activities.

Idaho Power staff participated in RPAC+ workshops that were organized to propose guiding principles on how NEEA will conduct downstream marketing activities in Cycle 6, which runs from 2020 through 2024. Downstream marketing activities were defined as region-wide marketing activities to promote energy-efficient products, services, and practices directly to end-users including digital ads, purchased social, billboards and print, broadcast (radio/tv), point of purchase, and direct-mail where NEEA would historically use a market-facing sub-brand of a NEEA initiative.

These activities require additional coordination between NEEA and Idaho Power to limit customer confusion. Idaho Power staff spent significant time attending these weekly webinars and reviewing proposals to advocate for a process and outcome that would best serve Idaho Power customers. Ultimately, RPAC+ members agreed on the proposed downstream marketing methods except how a utility would be reimbursed if it opted out of a marketing campaign. This issue was sent back to the Board of Directors.

Throughout 2018, RPAC received updates on NEEA board discussions concerning the Strategic/ Business/Planning process for the 2020 to 2024 funding cycle and incorporating funders from natural gas utilities into NEEA.

NEEA Activities: Residential

Ductless Heat Pump Workgroup

Idaho Power continued participating in NEEA's Ductless Heat Pump Workgroup. Its members are primarily employees of electric utilities in the Northwest. The workgroup was formed several years ago to help support NEEA's regional market transformation activities around ductless heat pumps. In 2018, NEEA began creating a vetting process that will provide Northwest stakeholders an opportunity to communicate their opinions as to the readiness of the DHP initiative to transition to the last phase of the Initiative Lifecycle, called Long Term Monitoring and Tracking (LTMT).

The vetting process will extend into Q3 2019, and the Ductless Heat Pump Workgroup will provide assistance to the NEEA program manager during this time. To help inform stakeholders, the 8th MPER was initiated in December 2018 and will be published in Q3 2019. Other available information includes the 2019 DHP Operations Plan released in September and the DHP Initiative Lifecycle released in July. A stakeholder workshop is also planned for early 2019.

Heat Pump Water Heater Workgroup

Idaho Power continued participating in NEEA's Heat Pump Water Heater Workgroup. Its members are primarily employees of electric utilities in the Northwest. The workgroup was formed several years ago to help support NEEA's regional market transformation activities around HPWHs. The work in 2018 remained focused on activities to accelerate market transformation. The workgroup continued to assist the Northwest Regional Strategic Market Plan for Consumer Products group, which was also focused on HPWHs.

Northwest Regional Strategic Market Plan for Consumer Products Group

Idaho Power has been a member of the Northwest Regional Strategic Market Plan for Consumer Products group since its inception in 2016. Idaho Power continued its membership in 2018 and participated as member of its steering committee. The members are primarily employees of electric utilities in the Northwest. The group was formed based on NEEA's determination that a strong focus needed to be placed on the performance of certain consumer products to obtain their maximum contributions to Northwest energy efficiency.

In late 2017, the focus expanded from HPWH to include smart thermostats. In 2018, the steering committee assembled a Smart Thermostat Savings Task Force, asking them to create a research proposal. The RTF requested research to help the them decide if smart thermostats can be advanced to a deemed measure from their current planning measure status. The contract analyst presented the research proposal in September, which the RTF approved. The research would be performed in 2019 and 2020. In late 2018, the steering committee discussed the needed funding and how a regional request could be accomplished.

Residential Advisory Committee

Idaho Power participates in the Residential Advisory Committee (RAC), the Manufactured Homes Interest Group, the Retail Products Portfolio (RPP) Initiative, Efficient Homes Workgroup, the Super-Efficient Dryers Workgroup, and Northwest Regional Retail Collaborative. During 2016, NEEA combined the Efficient Homes Workgroup and the Manufactured Homes Interest Group and renamed it the BetterBuiltNW Workgroup.

Idaho Power participated in RAC, which met quarterly in 2018, with the exception of the Q4 meeting which was cancelled by NEEA due to lack of agenda items. The purpose of the RAC is to advise NEEA with broad-based advice, experience, and feedback in all residential program matters. This committee provides utilities with the opportunity to give meaningful input into the design and implementation of NEEA programs.

NEEA provides BetterBuiltNW builder and contractor training, manages the regional-homes database, develops regional marketing campaigns, and coordinates energy-efficient new construction activities with utilities in Idaho, Montana, Oregon, and Washington. In 2018, NEEA continued to assist utilities in launching custom single-family Residential Performance Path programs that offer utilities flexibility in program design and the opportunity to capture all above-code savings on residential new construction projects. NEEA will continue to manage the AXIS regional database. NEEA continued to work on an above-code manufactured homes specification, known as NEEM 2.0. This specification will eventually replace the current NEEM 1.1 specification.

The Super-Efficient Dryers Initiative was formed to support the acceleration of heat pump dryers into the market. The initiative focuses on influencing manufacturer product development and executing strategies to overcome the barriers of this new technology. Barriers include a high incremental cost, limited consumer awareness, and low product availability. The initiative offers incentives to reduce the retail price. In 2018, NEEA staff conducted lab tests and worked with the RTF to update the clothes dryer measure. As a result of the testing, the UES values for ENERGY STAR® clothes washers were increased.

A Multifamily Market Research Online Community group was created to help gain an understanding of the drivers, market players, and influences in multifamily building management, with the hopes of persuading multifamily developers, property managers, etc., to begin using heat pump dryers in their units.

Continued retailer pilots with Blomberg were offered, providing rebates for the purchase of qualified heat pump dryers and heat pump hybrid dryer units. One of the 2019 goals is to add promotions and rebates for clothes washers because washer performance affects the performance of heat pump dryers. The use of a high-efficiency washer leaves less moisture in the clothing, which allows the heat pump and heat pump hybrid dryer to work more efficiently. It would be ideal to market these units as a pair to ensure high satisfaction with the heat pump dryers.

The RPP Initiative was formed to provide mid-stream incentives to influence retail stocking and assortment practices that would eventually drive manufacturing and standards toward a portfolio of energy-efficient products sold through retail channels. In 2018, there were seven qualifying products and two tiers assigned to each product: basic and advanced. The incentive is not intended to buy down the purchase, but rather to influence stocking practices.

Residential Building Stock Assessment

NEEA released the results of the Residential Building Stock Assessment (RBSA) in early 2018. Results from the study were incorporated in Idaho Power's potential study to fill data gaps, as needed. The RTF will continue to update the deemed savings values and input parameters for residential energy-savings measures based on the results of the RBSA.

NEEA Activities: Commercial/Industrial

NEEA continued to provide support for commercial and industrial energy efficiency activities in Idaho in 2018, which included partial funding of the IDL for trainings and additional tasks.

Commercial Building Stock Assessment

NEEA began work on the Commercial Building Stock Assessment (CBSA) in 2018. The CBSA is conducted approximately every five years, and the information is used by utilities in the Pacific Northwest and the NWPCC to determine load forecast and electrical energy-savings potential in the region.

For commercial customers who choose to participate in the study, the third-party contractor schedules a site visit with a field technician who collects information on equipment and building characteristics that affect energy consumption. This includes HVAC equipment, lighting, building envelope, water heating, refrigeration and cooking, computers and miscellaneous equipment, and cooling towers. Participants receive a gift card and a site-specific report.

To prepare for the study, Idaho Power staff participated in the sampling and customer contact working groups. The sampling working group met to review and approve the sampling plan while the customer contact working group discussed the recruitment process and the customer contact protocols. A pre-test was conducted in Portland and Boise in fall of 2018 to test the recruitment process. The full study launched in late 2018; Idaho Power commercial customers will be contacted throughout 2019.

Commercial Code Enhancement

NEEA facilitated regional webinars for the CCE initiative for new construction to discuss how utilities can effectively align code changes and utility programs. The CCE is a NEEA initiative comprised of people with varying backgrounds and levels of association with the building construction industry. The group's goal is to enable the continual advancement of commercial construction and energy codes.

A subset of this group's work in 2018 included a Scanning Report that identified measures to be considered in future codes. This work will continue in 2019.

Strategic Energy Management

NEEA's work on SEM in the commercial and industrial sectors continued in 2018. The primary focus in 2018 was to consolidate all of the SEM templates, guidelines, and documents into the new SEM Hub website.

Commercial Lighting

Idaho Power participated in NEEA's initiatives in the commercial lighting arena. Idaho Power continued as a member of the NEEA Commercial Lighting Program Manager Work Group and the Commercial Advisory Committee.

Reduced Wattage Lamp Replacement

The Reduced Wattage Lamp Replacement (RWLR) initiative concluded December 2018. NEEA has converted this initiative to a long-term monitoring and tracking activity.

Top-Tier Trade Ally

The Top-Tier Trade Ally initiative offers lighting trade allies throughout the region multi-tiered training. One hundred seventy-nine individuals from 47 regional companies successfully completed NXT Level 1 Training and attained Top-Tier Trade Ally designation by the end of 2018. Eight individuals in Idaho Power's service area achieved the designation, for a total of 18 individuals program-to-date. To date, one company is designated as a Top-Tier Trade Ally in the Idaho Power service area.

NEEA launched a one-hour Jump Start training session in 2018 to aid in recruiting new NXT Level 1 students. The Jump Start session fulfilled one of the NXT Level training modules, which increased the interest for attendees to get involved in this valuable training. The Jump Start training was offered at four of Idaho Power's program update workshops in 2018. As a result, 36 people submitted enrollment applications for NXT Level 1 training. Five of those applicants completed the training and received designation.

NXT Level 2 training curriculum was finalized in 2018 and launched in fourth quarter. Currently, NXT Level 2 is an in-person curriculum. NEEA is rolling out this training to areas with higher NXT Level 1 designated populations. Development is underway to offer an online version of NXT Level 2 training. This version is expected to be available to the Idaho Power service area mid-2019.

Luminaire Level Lighting Controls

Idaho Power hosted two Advanced Lighting Controls classes in 2018. The classes were a follow-up to the pilot course the company hosted in 2017. The 2018 classes were held in Boise and Pocatello and both were well received. The DLC coordinated the training and curriculum, and NEEA helped sponsor the classes.

NEEA also partnered with the Seattle LDL to develop a one-day Advanced Lighting Controls curriculum targeted to electrical contractors and electrical equipment suppliers. The new course is an enhancement to the DLC class and was made available for utilities in their service area in 2019. Idaho Power plans to host a session in 2019.

By the end of 2018, 18 LLLC systems were available in the market. NEEA continues to work with manufacturers to help them achieve LLLC designation. NEEA, in partnership with the DOE's Next Generation Lighting System initiative, continues to work with manufacturers to improve product usability and ease of product installation.

NEEA Funding

In 2018, Idaho Power began the fourth year of the 2015 to 2019 *Regional Energy Efficiency Initiative Agreement* with NEEA. Per this agreement, Idaho Power is committed to fund NEEA based on a quarterly estimate of expenses up to the five-year total direct funding amount of $16.5 million in support of NEEA's implementation of market transformation programs in Idaho Power's service area. Of this amount in 2018, 100 percent was funded through the Idaho and Oregon Riders.

In 2018, Idaho Power paid $2,500,165 to NEEA; $2,375,157 from the Idaho Rider for the Idaho jurisdiction and $125,008 from the Oregon Rider for the Oregon jurisdiction. Other expenses associated with Idaho Power's participation in NEEA activities, such as administration and travel, were also paid from Idaho and Oregon Riders.

Final NEEA savings for 2018 will be released in June 2019. Preliminary estimates reported by NEEA for 2018 indicate Idaho Power's share of regional market transformation savings as 24,966 MWh. These savings are reported in two categories: codes-related and standards-related savings of 21,724 MWh and non-codes and standards-related savings of 3,241 MWh.

In the *Demand-Side Management 2017 Annual Report*, preliminary funding share estimated savings reported were 23,652 MWh. The revised estimate included in this report for 2017 final funding-share NEEA savings is 24,440 MWh. These include savings from code-related initiatives as well as non-code-related initiatives. Idaho Power relies on NEEA to report the energy savings and other benefits of NEEA's regional portfolio of initiatives. For further information about NEEA, visit their website, neea.org.

Program Planning Group

In 2014, Idaho Power convened an internal PPG to explore new opportunities to expand current DSM programs and offerings. The group consists of residential program specialists, commercial and industrial engineers, energy efficiency analysts, marketing specialists, energy efficiency program leaders, and the research and analysis leader. The PPG does not perform program execution. Instead, the group's role is to determine if a measure has energy-saving potential, has market adoption potential, and is potentially cost-effective. If a measure meets those preliminary criteria, it is given to the program teams to implement.

Throughout 2018, the group met periodically to explore new ideas to promote energy efficiency, including evaluating new potential programs and measures. Idaho Power incorporated three new ideas from the PPG into the overall portfolio of residential and commercial program offerings: HPWHs, Commercial Energy-Saving Kits, and the Residential New Construction Pilot Program. These offerings will continue to be available in 2019.

In addition to the offerings that were implemented, the company continued to pursue and investigate other new ideas, such as residential weatherization measures for direct-install and a small business direct-install program for measures such as lighting or plug strips. Based on the criteria cited above, these offerings could be launched in 2019. Idaho Power will continue to use the PPG to review, evaluate, and deliver new energy efficiency offerings in 2019 and beyond.

Regional Technical Forum

The RTF is a technical advisory committee to the NWPCC, established in 1999 to develop standards to verify and evaluate energy efficiency savings. Since 2004, Idaho Power has supported the RTF by providing annual financial support, regularly attending monthly meetings, participating in sub-committees, and sharing research and data beneficial to the forum's efforts.

The forum is made up of both voting members and corresponding members from investor-owned and public utilities, consultant firms, advocacy groups, Energy Trust of Oregon, and BPA, all with varied expertise in engineering, evaluation, statistics, and program administration. The RTF advises the NWPCC during the development and implementation of the regional power plan in regard to the following listed in the RTF charter:

- Developing and maintaining a readily accessible list of eligible conservation resources, including the estimated lifetime costs and savings associated with those resources and the estimated regional power system value associated with those savings.
- Establishing a process for updating the list of eligible conservation resources as technology and standard practices change, and an appeals process through which utilities, trade allies, and customers can demonstrate that different savings and value estimates should apply.
- Developing a set of protocols by which the savings and system value of conservation resources should be estimated, with a process for applying the protocols to existing or new measures.
- Assisting the Council in assessing: 1) the current performance, cost, and availability of new conservation technologies and measures; 2) technology development trends; and 3) the effect of these trends on the future performance, cost, and availability of new conservation resources.
- Tracking regional progress toward the achievement of the region's conservation targets by collecting and reporting on regional research findings and energy savings annually.

When appropriate, Idaho Power uses the savings estimates, measure protocols, and supporting work documents provided by the RTF, and when the work products are applicable to the climate zones and load characteristics in Idaho Power's service area. In 2018, Idaho Power staff participated in all RTF meetings as a voting member and the RTF Policy Advisory Committee. Idaho Power staff is represented at the RTF for the three-year forum member term cycle beginning in 2019.

Measure changes enacted for existing and possible new measures are reviewed throughout the year for potential impacts to programs and measures. All implementations of changes were accounted for in planning and budgeting for 2019.

Residential Energy Efficiency Education Initiative

Idaho Power recognizes the value of general energy efficiency awareness and education in creating behavioral change and customer demand for, and satisfaction with, its programs. The REEEI promotes energy efficiency to the residential sector. The company achieves this by creating and delivering educational materials and programs that result in wise and informed choices regarding energy use and increased participation in Idaho Power's energy efficiency programs.

Project Tiny House

In 2018, Idaho Power collaborated with Metro Community Services (Metro) and Canyon-Owyhee School Service Agency (COSSA) to build a tiny house. Idaho Power provided $3,500 for the purchase and installation of a DHP. Metro is an Idaho nonprofit that helps seniors, low-income people, and those with disabilities. COSSA is a trade and craft high school with students from Marsing, Homedale, Notus, Parma, and Wilder.

Metro supplied or secured the remaining supplies, and the COSSA students learned various aspects of construction through hands-on building of the tiny house. The completed tiny house was displayed at trade shows and other promotional events within Idaho Power's service area. Approximately 10 students in grades 10 through 12 worked on the home from November 2017 through June 2018, which was raffled off in September of 2018 to raise funds for senior services.

Figure 42. Tiny house

Idaho Power's promotion of Project Tiny House included custom signage to hang inside the home highlighting the energy-efficient features. Additional promotion included an article in the April issue of *Connections*. The tiny house drew customers at several events, such as March for Meals, Incredible Age Expo, Annual Information Fair, Experience Idaho Expo, Wells Fargo Sustainability Fair, HP World Environment Day, Meridian Public Works Expo, World Village Fest, Culinary Walkabout, Canyon Country Fair, and various Home Depot's throughout the Treasure Valley.

In 2018, Idaho Power partnered with Project Tiny House for the 7th annual Treefort Music Fest, held across the street from Idaho Power CHQ in downtown Boise. The annual festival brings nearly 20,000 local residents and others from around the region to the downtown area over five days of music and community-oriented programming. The partnership was a resounding success. Not only did the attraction of the Tiny House help increase the number of attendees who interacted with Idaho Power staff to learn about the company's parks and campgrounds, but the Project Tiny House team was able to sell 25 tickets for their 2018 raffle for the home.

The tiny house proved to be of great interest to curious customers at a variety of events. This gave an opportunity for customers to see what a DHP looked like installed in a wall and to feel the air conditioning it could provide. The home also provided opportunities to talk about various other energy efficiency measures, such as LED lighting and low-flow showerheads, as well as measures that are not readily visible, such as spray foam insulation.

While the tiny house proved useful for attracting and engaging customers, it was not a successful fundraiser for Metro, so they decided to discontinue the project.

Kill A Watt Meter Program

The Kill A Watt™ Meter Program remained active in 2018. Idaho Power's Customer Service Center and field staff continued to encourage customers to learn about the energy used by specific appliances and activities within their homes by visiting a local library to check out a Kill A Watt meter.

Figure 43. Kill A Watt meter

The Kill A Watt meter brochure was updated in 2018. The Kill A Watt meters were mentioned again on live television studio news programs on KTVB and KMVT in Idaho Power's monthly energy efficiency segments and highlighted in the 2018 Winter *Energy Efficiency Guide*. Late in 2017, Idaho Power contacted participating libraries to determine what, if any, replacements were needed. Those communications continued into 2018. Forty-three libraries responded with requests for additional materials, including new meters, replacement kits, brochures and/or 30 Simple Things You Can Do to Save Energy booklets.

Teacher Education

As in previous years, Idaho Power continued to strengthen the energy education relationship with secondary school educators through continued participation on the Idaho Science, Technology, Engineering, and Mathematics (iSTEM) Steering Committee. In 2018, Idaho's STEM Action Center assumed the responsibility for overseeing the state's iSTEM Institutes. This strategic change of leadership resulted in many positive outcomes; however, some challenges in the enrollment process resulted in lower enrollments. In 2018, 13 teachers completed the four-day, two-credit professional development workshop offered at the College of Western Idaho's iSTEM Institute. The workshop "Electrons—Pushing, Using, and Saving Them!" was facilitated by Idaho Power and co-sponsored by Intermountain Gas and the Idaho National Laboratory (INL). Among other things, participating teachers toured the Langley Gulch power plant and received a classroom kit containing Kill A Watt meters and other tools to facilitate student learning related to energy efficiency and wise energy use. Idaho Power took advantage of the extra space in the 2018 workshop to introduce its five community education representatives to STEM practices and concepts. These employees regularly interact with students and teachers in the schools and are increasingly used to bring relevant STEM activities into schools and classrooms in Idaho Power's service area. By participating in the 2018 workshop, teachers developed skills and relationships to help them engage middle school and high school students in activities and conversations around future energy needs, and energy efficiency options and choices.

Student Art Contest

Idaho Power held its 8th Annual Student Art Contest for grades K-9. Kindergarten through second grade completed a simple color page highlighting safety. Students in grades 3-9 were tasked with creating original artwork based on the themes "Ways to Save Energy" or "Environmental Stewardship." Many students drew pictures of their favorite ways to save energy in the home. The Student Art Contest provides a way for teachers and students to bring energy efficiency education into their classroom and inspire students and families to think more about energy. With 4,654 submissions, over 30 students were recognized with first- and second-place awards. Over the years, student artwork has been displayed in local schools, libraries and city halls, and at events such as the annual Idaho Environmental Education Conference and elementary school STEM nights. Students in both Idaho and Oregon participated in 2019 (3,827 Idaho and 827 Oregon).

Figure 44. Eighth annual Student Art Contest participants

Program Support

In 2018, 44,691 ESKs were shipped with a mini-home assessment to cross-market other energy efficiency programs, promote the use of My Account, and help families learn about other energy-saving behavior changes. Savings and expenses have been reported in the Educational Distributions residential program section of this report.

The initiative continued to coordinate LED lightbulb distributions aimed at providing the newest lighting technology to customers, along with education and answers to their common questions. At events and presentations, company staff distributed 9,450 LEDs in custom packaging that highlighted the advantages of energy-efficient lighting and encouraged participation in Idaho Power's My Account online portal. Customer representatives throughout the service area also handed out 700 Giveaway ESKs containing nine LED lightbulbs and other educational materials in conjunction with energy efficiency presentations and workshops. The energy savings resulting from these efforts and from the SEEK program for the 2017–2018 school year are also reported in the Educational Distributions residential program section of this report.

The initiative also implemented a Welcome Kit program with the goal of proactively introducing each first-time customer to sound, energy-saving practices along Idaho Power's energy efficiency programs at a moment when they may be receptive to hearing and implementing change. In the first year, approximately 30,500 brand new customers received a Welcome Kit delivered to their home about 30-45 days after they moved in. Each kit contained four LED lightbulbs, a night light, a "Welcome to the Neighborhood" greeting card, and a small, easy-to-use, tabbed flip-book filled with helpful energy-saving tips and energy efficiency program information.

The initiative continued to manage the HER pilot program. During the year, 105,626 reports were sent to over 29,000 participants across the service area. The customized reports, delivered to customers at regular intervals, showed customers how their energy use compared to other homes in their respective communities with similar characteristics (i.e., home size, type, and heating source). In addition to the comparisons, the *Home Energy Reports* provided participants with a personalized breakdown of how electricity is used in their home (disaggregated energy use), along with customized energy-saving tips and suggestions. Idaho Power determined to continue the pilot for a second year—adding 5,624 new winter-heating participants. The new group will receive bi-monthly reports. The results of both pilot years will be analyzed in late summer 2019. At that time, Idaho Power will decide whether to continue or expand the HER pilot.

Marketing

REEEI continued to produce semiannual *Energy Efficiency Guide*s in 2018. Idaho Power distributed these guides primarily via insertion in local newspapers and at events across Idaho Power's service area. The winter *Energy Efficiency Guide* was published and distributed by 17 newspapers in Idaho Power's service area the week of January 28; the *Boise Weekly* also inserted the guide. The guide focused on providing answers to a number of interesting energy efficiency questions customers had recently asked. Along with useful energy-saving tips, the guide addressed hot tubs, programmable pressure cookers, high efficiency washers, portable space heaters, and ENERGY STAR® smart thermostats. The information was applicable to all residential customers and designed to be family friendly. Idaho Power included a story from the guide in January *News Briefs*, *News Scans*, and a promo pod on the idahopower.com homepage.

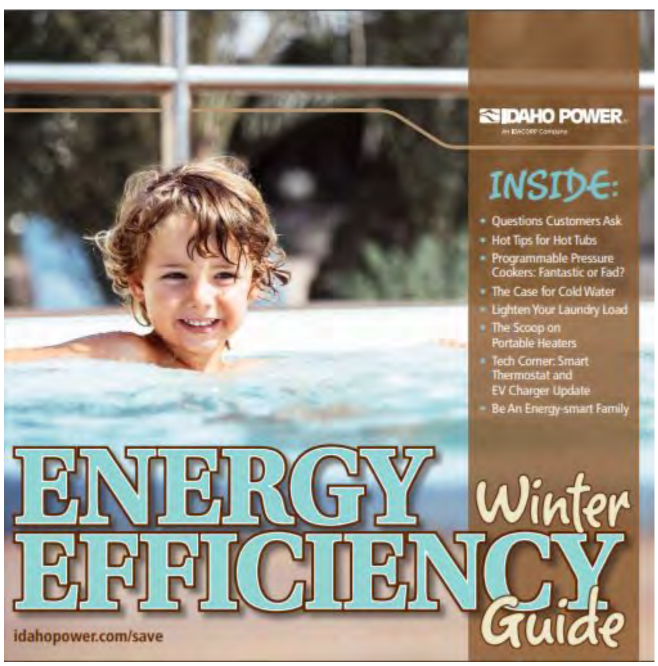

Figure 45. Winter *Energy Efficiency Guide*, 2018

The *Idaho Statesman* hosted Idaho Power's print ads, digital ads, and banner ads promoting the guide, including a one-day online homepage takeover on January 27, resulting in 173,223 impressions, 342 click throughs, and a click through rate of 20 percent. The newspaper also hosted a 30-second energy efficiency commercial as a video pre-roll from January 28 to February 28. An Idaho Power Facebook boost was used to promote the guide to Idaho Power followers.

The summer *Energy Efficiency Guide* was delivered to over 194,000 homes the week of July 29, 2018. This guide highlighted efficient ways to stay comfortable during the hot summer months and specific room-by-room tips for reducing energy use at home and while on vacation. It also discussed how to use landscaping to increase a home’s comfort and boost energy efficiency.

The release of the summer guide received public relations support through numerous communication channels, including *News Briefs, News Scans*, on Idaho Power’s social media accounts, and in digital ads on local newspaper websites, targeted to customers in the service area during the last week of July, including the *Times News, Idaho State Journal, Boise Weekly*, and *Idaho Press*. The summer guide was also mentioned during an Idaho Power interview on KBOI on July 13.

Both of the 2018 guides were translated into Spanish to help reach the larger Idaho Power customer base. In 2018, the company distributed a total of 5,500 guides, including issues from past years, at energy efficiency presentations and events. The current library of guides continues to add value. Specific issues are often requested for distribution at events and presentations based on their relevance to the particular audience. On its website, Idaho Power provides a link to the most current seasonal guide and links to past guides.

REEEI distributed energy efficiency messages through a variety of other communication methods in 2018. Idaho Power increased customer awareness of energy-saving ideas via continued distribution of the third printing of the 96-page booklet *30 Simple Things You Can Do to Save Energy*, a joint publishing project between Idaho Power and The Earthworks Group. The fourth printing of the booklet was updated to include a more colorful cover that aligns with the overall energy efficiency imagery. In 2018, the program distributed 2,560 copies directly to customers. This was accomplished via community events and local libraries; by customer representatives during in-home visits; by participating contractors in the Home Energy Audits program, Energy House Calls program, and H&CE Program through direct web requests; and in response to inquiries received by Idaho Power’s Customer Service Center. Additionally, more than 44,000 customers had an opportunity to request the booklet and/or the most recent *Energy Efficiency Guide* when they ordered their ESK online.

Idaho Power continues to recognize that educated employees are effective advocates for energy efficiency and Idaho Power’s energy efficiency programs. Idaho Power customer relations and energy efficiency staff reached out to each of Idaho Power’s geographical regions and the Customer Service Center to speak with customer representatives and other employees to discuss educational initiatives and answer questions about the company’s energy efficiency programs.

Idaho Power continued to participate in a select group of events impacting large audiences or audiences expected to have a higher receptivity to energy-efficient messaging and behavior change. Idaho Power once again participated in The Incredible Age Expo (targeting customers preparing for retirement), Boise’s Treefort Music Fest (skewing to sustainably minded younger people), St. Luke’s FitOne Expo, and numerous home and garden shows throughout the service area. Idaho Power participated in or sponsored an additional 45 outreach activities, including events, presentations, trainings, and other activities. Idaho Power customer representatives throughout the service area delivered numerous other presentations to local organizations addressing energy efficiency programs and wise energy use. In 2018, Idaho Power's community education team provided 118 presentations on *The Power to Make a Difference* to 3,063 students and 122 classroom presentations on *Saving a World Full of Energy* to 2,803 students. The community education representatives and other staff also completed 24 senior citizen presentations on energy efficiency programs and shared information about saving energy to 1,149 senior citizens in the company's service area. Additionally, Idaho Power's energy efficiency program specialists responded with detailed answers to 241 customer questions about energy efficiency and related topics received via Idaho Power's website.

Idaho Power used multiple channels to promote National Energy Awareness Month in October, including social media posts encouraging energy-efficient behaviors, as well as customer engagement in the Smart-Saver Pledge. The October *Connections*, two *News Briefs*, and the KTVB and KMVT monthly television spots also highlighted Energy Awareness Month activities.

The REEEI continued to provide energy efficiency tips in response to media inquiries and in support of Idaho Power's *#TipTuesday* posts. In addition to supplying information for various Idaho Power publications, such as *News Scans*, *Connections*, and Idaho Power's social media pages, energy efficiency tips and content were provided for weekly *News Briefs* and monthly KTVB and KMVT live news segments.

Several new videos, including customer testimonials and experiences, were made available on Idaho Power's YouTube channel. These included the following:

- Summer Learning with Idaho Power: youtube.com/watch?v=C90d72ZoPeI
- Energy Efficiency Quick Tip series (13 short clips): youtube.com/watch?v=X3JQdtNLtt4

2019 Program and Marketing Strategies

The initiative's 2019 goals are to increase customer awareness of the wise use of energy and program participation and to promote education and energy-saving ideas that result in energy-efficient, conservation-oriented behaviors. In addition to producing and distributing educational materials, the initiative will continue to manage the company's Educational Distributions program that distributes energy-savings educational measures. Examples of activities conducted under Educational Distributions include developing LED lighting education material, distributing LED lightbulbs and Giveaway ESKs to customers, and administering the SEEK program, the ESK program, Welcome Kit distribution, and the HER pilot program.

The initiative will continue to educate customers using a multi-channel approach and to work with the PPG to explore new technologies and/or program opportunities that incorporate a behavioral component.

University of Idaho Integrated Design Lab

Idaho Power is a founding supporter of the IDL. The IDL is dedicated to the development of high-performance, energy-efficient buildings in the Intermountain West. Idaho Power has worked with the IDL since its inception in 2004 to educate the public about how energy-efficient business practices benefit the business and the customer. In 2018, Idaho Power entered into an agreement with the IDL to perform the tasks and services described below.

Foundational Services

The goal of this task was to provide energy efficiency technical assistance and project-based training to building industry professionals and customers. When the IDL receives requests for their involvement in building projects, the projects are categorized into one of three types: Phase I projects are simple requests that can be addressed with minimal IDL time; Phase II projects are more complex requests that require more involvement and resources from the lab; Phase III projects are significantly more complex and must be co-funded by the customer.

In addition to 16 ongoing projects from 2017, the IDL provided technical assistance on 30 new projects in the Idaho Power service area in 2018: 16 Phase I projects, six Phase II and one proposed Phase III project. An additional seven projects are proposed for potential future work. Twelve of the projects were on new buildings, 11 on existing buildings, and the remaining were not building-specific. The number of projects increased in 2018 compared to 2017, and the total building area impacted was approximately 250,000 ft^2. The related report is located in the IDL section of *Supplement 2: Evaluation*.

Lunch & Learn

The goal of the Lunch & Learn task was to educate architects, engineers, and other design and construction professionals about energy efficiency topics through a series of educational lunch sessions.

In 2018, the IDL scheduled 20 technical training lunches in Boise. The sessions were coordinated directly with architecture and engineering firms and organizations; a total of 194 architects, engineers, designers, project managers, and others attended.

The topics of the lunches (and number of each) were: Indoor Air Quality (IAQ) and Energy Efficiency in Buildings (6); Daylight Performance Metrics for Human Health, Productivity, and Satisfaction (4); Daylight in Buildings: Getting the Details Right (3); Chilled Beams (2); Radiant Heating and Cooling Design (3); Hybrid Ground Source Heat Pump Systems (1); and Variable Refrigerant Flows (VRF) & Heat Pumps (1). The related report is located in the IDL section of *Supplement 2: Evaluation*.

Building Simulation Users Group

The goal of this task was to facilitate the Idaho BSUG, which is designed to improve the energy efficiency-related simulation skills of local design and engineering professionals.

In 2018, six monthly BSUG sessions were hosted by IDL. The sessions were attended by 72 professionals in-person and 85 professionals remotely. Evaluation forms were completed by attendees for each session. On a scale of 1 to 5, with 5 being “excellent” and 1 being “poor,” analyzing results from the first six questions, the average session rating was 4.11 for 2018. For the final question, “The content of the presentation was…” on a scale of 1 to 5, with 1 being “too basic,” 3 being “just right,” and 5 being “too advanced,” the average session rating was 3.42 for 2018.

Each presentation was archived on the BSUG 2.0 website along with general BSUG-related content. The related report is located in the IDL section of *Supplement 2: Evaluation*.

New Construction Verification

The goal of this task was to continue random installation verification of over 10 percent of the C&I Energy Efficiency Program New Construction participants who received incentives. The company conducted a review of documentation and completed on-site inspections to validate whether systems and components had been installed. The purpose of this verification was to confirm program guidelines and requirements were helping participants provide accurate information regarding measure installations. See the New Construction option in the C&I Energy Efficiency Program section for a summary of these activities. The complete verification report is located in the IDL section of *Supplement 2: Evaluation*.

This task also included the review of all daylight photo-control incentives to verify site conditions and improve the quality of design and installation.

Tool Loan Library

The TLL gives customers access to tools for measuring and monitoring energy consumption on various systems within their operations. The goal of this task was to operate and maintain the tool library, which includes a web-based loan-tracking system, and to provide technical training on the use of tools in the library.

The inventory of the TLL consists of over 900 individual pieces of equipment. In 2018, 20 new tools were added to replace old data logging models, as well as a new portable thermal camera with an external power supply for extended periods of use. The tools and manuals are available at no cost to customers, engineers, architects, and contractors in Idaho Power's service area to aid in the evaluation of energy efficiency projects and equipment they are considering.

There were 38 tool loan requests in 2018, by 22 unique users, including 11 new users from 14 different locations, including engineering firms, equipment representatives, educational institutions, industrial plants, and commercial facilities. The related report is located in the IDL section of *Supplement 2: Evaluation*.

Heat Pump Calculator/Climate Design Tools/TEST

This task was a continuation of work done in a task that began in 2013 and continued through 2018. The goal of the original task was to develop an Excel-based heat pump analysis tool to calculate energy use and savings based on site-specific variables for commercial buildings. Previously, IDL identified a lack of sophisticated heat pump energy-use calculators available with the capability of comparing the energy use of heat pumps in commercial buildings against other technologies in a quick, simple fashion.

The calculator has been updated to reflect feedback from validation testing, including an improved user interface and the ability to integrate Typical Meteorological Year, version three weather files for locations where that data is available. A few years ago, the IDL completed a set of Climate Design Tools intended to inform sustainable design and calculate the impacts of five innovative types of systems: earth tubes, passive heating, cross ventilation, stack ventilation, and night flush ventilation/thermal mass. In 2015, the IDL integrated three of the five climate design tools into the Heat Pump Calculator. This unification produced a single platform life-cycle analysis tool for several energy efficiency measures not currently well-supported with other tools in the industry. In 2016, the IDL unified two additional climate-design tools to the calculator and added seven unique weather files for sites around Idaho. The work in 2017 focused on outreach, education, and customization of the tool. In 2018, the tool was renamed to the Thermal Energy Savings Tool or TEST.

Outreach continued in 2018 but was not the main emphasis of the task. Even so, there were several new inquiries and tool downloads. The IDL included information on the TEST in many of the Lunch and Learn presentations delivered at architecture and engineering firms in Idaho. Whenever a user requested access to the tool, the IDL sent the TEST spreadsheet through the service WeTransfer because it is too large to attach in a traditional email. A disclaimer is included with each tool download that makes clear the tool does not guarantee savings, and the user is responsible for verifying his/her own calculations. Rather than sending out the tool based on individual requests, the goal for 2019 is for the IDL to host the tool online when the new IDL website is launched. Once there, the tool will be available for free download by those who create an account with IDL and agree to the disclaimer. The related report for this task is located in the IDL section of *Supplement 2: Evaluation*.

Building Energy Analytics Case Study

In 2018, IDL completed the task called "Building Energy Analytics Case Study." The purpose of this task was to identify potential savings from the implementation of a new type of energy management software focusing on building analytics. Currently, several companies promote this new type of software that monitors many control points within a building. Some examples of these analytic software packages include SkySpark, EnergyCap and BuildingIQ. These data-analysis software packages can overlay traditional Building Automation Systems (BAS) or Energy Management Systems (EMS).

The analytic software does not directly control any building equipment. Instead, its primary use is to monitor many control signals and identify potential operational problems within the building. This continuous monitoring has the potential to help maintain building commissioning and limit performance degradation through the building's life.

IDL first identified sites that were considering the addition of an analytics system in 2018. The IDL team worked with the facility owners and control teams to document any implementation issues. The last step of the project was to identify whether the installation of the analytics software led to any operational changes and to estimate potential savings resulting from those changes.

The use of energy analytics software at the two case-study sites proved key to identifying several energy efficiency measures and equipment faults. The studies showed that the software's full potential can be realized only when there is an existing direct digital control (DDC) system and a person dedicated to monitor the system and communicate issues to the facilities team.

The related report for this task is located in the IDL section of *Supplement 2: Evaluation*.

Measuring Indoor Performance at Educational Facilities

In 2018, IDL completed a task named Measuring Indoor Performance at Educational Facilities. The purpose of this task was to determine how effective HVAC systems are at cooling a typical secondary school classroom. IDL used the data to quantify energy savings that could be achieved through operational changes without adversely affecting occupant comfort. Four classrooms at two separate high schools were intensively monitored for several weeks. The temperature measurements from these classrooms were used to extrapolate cooling required in the schools during the spring and fall when the buildings are still using A/C. Department of Energy (DOE) prototype models of the schools were used to show how set point and scheduling adjustments to the HVAC operations could reduce peak loads and overall energy consumption at typical Idaho high schools while maintaining high environmental quality for the students.

Most classroom temperatures measured in this project fell below the recommended comfort parameters as specified by ASHRAE Standard 55. Enhancing thermal performance of the classrooms will save on unnecessary cooling and could increase student productivity. The classrooms could be brought into compliance by raising the cooling setpoint by 4 degrees Fahrenheit. This 4-degree adjustment is estimated to save an Idaho school $4 per student, 60 kWh, and 30 watts of electrical energy per student in annual energy use.

The related report for this task is located in the IDL section of *Supplement 2: Evaluation*.

2019 IDL Strategies

In 2019, IDL will continue work on the Foundational Services, Lunch & Learn sessions, BSUG, New Construction Verifications, TLL, and the Heat Pump Calculator. IDL will also provide work on two new tasks in 2019: A Building Energy Management System Predictive Control Case Study and a RTU Control Retrofits for Small Commercial Sites task.

Glossary of Acronyms

A/C—Air Conditioning/Air Conditioners

Ads—Advertisement

AEG—Applied Energy Group

AIA—American Institute of Architects

AMI—Advanced Metering Infrastructure

aMW—Average Megawatt

ASHRAE—American Society of Heating, Refrigeration, and Air Conditioning Engineers

B/C—Benefit/Cost

BAS—Building Automation Systems

BCASEI—Building Contractors Association of Southeast Idaho

BCASWI—Building Contractors Association of Southwestern Idaho

BOMA—Building Owners and Managers Association

BOC—Building Operator Certification

BPA—Bonneville Power Administration

BPI—Building Performance Institute

BSUG—Building Simulation Users Group

CAP—Community Action Partnership

CAPAI—Community Action Partnership Association of Idaho, Inc.

CCE—Commercial Code Enhancement

CCNO—Community Connection of Northeast Oregon, Inc.

CEI—Continuous Energy Improvement

CEL—Cost-Effective Limit

CFM—Cubic Feet per Minute

CHQ—Corporate Headquarters (Idaho Power)

CINA—Community in Action

CLEAResult—CLEAResult Consulting, Inc.

COP—Coefficient of Performance

CR&EE—Customer Relations and Energy Efficiency

DDC—Direct Digital Control

DEQ—Department of Environmental Quality

DHP—Ductless Heat Pump

DLC—DesignLights Consortium

DOE—Department of Energy

DSM—Demand Side Management

EA5—EA5 Energy Audit Program

ECM—Electronically Commutated Motor

EEAG—Energy Efficiency Advisory Group

EIA—U.S. Energy Information Administration

EICAP—Eastern Idaho Community Action Partnership

EISA—Energy Independence and Security Act

EL ADA—El Ada Community Action Partnership

EM&V—Evaluation, Measurement, and Verification

EMS—Energy Management Systems

EPA—Environmental Protection Agency

ESK—Energy-Saving Kit

ETO—Energy Trust of Oregon

EV—Electric Vehicle

ft—Feet

ft^2—Square Feet

ft^3—Cubic Feet

GMI—Green Motors Initiative

GMPG—Green Motors Practice Group

gpm—Gallons per Minute

H&CE—Heating & Cooling Efficiency Program

HEM-LLC—Home Energy Management, LLC.

hp—Horsepower

HPWH—Heat Pump Water Heater

HSPF—Heating Seasonal Performance Factor

HVAC—Heating, Ventilation, and Air Conditioning

IAQ—Indoor Air Quality

IBCA—Idaho Building Contractors Association

IBCB—Idaho Building Code Board

IBOA—International Building Operators Association

ICC—International Code Council

ID—Idaho

IDHW—Idaho Department of Health and Welfare

IDL—Integrated Design Lab

IECC—International Energy Conservation Code

INL—Idaho National Laboratory

IPMVP—International Performance Measurement and Verification Protocol

IPUC—Idaho Public Utilities Commission

IRP—Integrated Resource Plan

iSTEM—Idaho Science, Technology, Engineering, and Mathematics

kW—Kilowatt

kWh—Kilowatt hour

LDL—Lighting Design Lab

LEEF—Local Energy Efficiency Funds

LIHEAP—Low Income Home Energy Assistance Program

LLLC—Luminaire Level Lighting Controls

LTMT—Long-Term Monitoring and Tracking

M&V—Measurement and Verification

MOU—Memorandum of Understanding

MPER—Market Progress Evaluation Report

MVBA—Magic Valley Builders Association

MW—Megawatt

MWh—Megawatt hour

MWSOC—Municipal Water Supply Optimization Cohort

n/a—Not Applicable

NAMI—National Alliance on Mental Illness

NEB—Non-Energy Benefit

NEEA—Northwest Energy Efficiency Alliance

NEEM—Northwest Energy Efficient Manufactured

NEMA—National Electrical Manufacturers Association

NPR—National Public Radio

NTG—Net to Gross

NWPCC—Northwest Power and Conservation Council

O&M—Operation and Maintenance

OPUC—Public Utility Commission of Oregon

OR—Oregon

ORS—Oregon Revised Statute

OSV—On-Site Verification

PCA—Power Cost Adjustment

PCT—Participant Cost Test

PLC—Powerline Carrier

PPG—Program Planning Group

PSC—Permanent Split Capacitor

PTCS—Performance Tested Comfort System

QA—Quality Assurance

QC—Quality Control

RAC—Residential Advisory Committee

RAP—Resource Action Programs

RBSA—Residential Building Stock Assessment

RCT—Randomized Control Trial

REEEI—Residential Energy Efficiency Education Initiative

RESNET—Residential Services Network

RETAC—Regional Emerging Technologies Advisory Committee

RFP—Request for Proposal

Rider—Idaho Energy Efficiency Rider and Oregon Energy Efficiency Rider

RIM—Ratepayer Impact Measure

RPAC—Regional Portfolio Advisory Committee

RPP—Retail Products Portfolio

RTF—Regional Technical Forum

RWLR—Reduced Wattage Lamp Replacement

SCCAP—South Central Community Action Partnership

SCE—Streamlined Custom Efficiency

SEEK—Students for Energy Efficiency Kit

SEICAA—Southeastern Idaho Community Action Agency

SEM—Strategic Energy Management

SIR—Savings to Investment Ratio

SRVBCA—Snake River Valley Building Contractors Association

TLL—Tool Loan Library

TRC—Total Resource Cost

TRM—Technical Reference Manual

TSV—Thermostatic Shower Valve

UCT—Utility Cost Test

UES—Unit Energy Savings

UM—Utility Miscellaneous

US—United States

USDA—United States Department of Agriculture

USGBC—US Green Building Council

VFD—Variable Frequency Drive

VHE DOAS—Very High Efficiency Dedicated Outside Air Systems

VRF—Variable Refrigerant Flow

W—Watt

WAP—Weatherization Assistance Program

WAQC—Weatherization Assistance for Qualified Customers

WHF—Whole-House Fan

WWEEC—Wastewater Energy Efficiency Cohort

XMP—Extended Motor Products

APPENDICES

Appendix 1. Idaho Rider, Oregon Rider, and NEEA payment amounts (January–December 2018)

Idaho Energy Efficiency Rider		
2018 Beginning Balance	$	407,603
2018 Funding plus Accrued Interest as of 12-31-18		38,514,355
Total 2018 Funds		**38,921,958**
2018 Expenses as of 12-31-18		(33,663,001)
Ending Balance as of 12-31-2018	**$**	**5,258,957**
Oregon Energy Efficiency Rider		
2018 Beginning Balance	$	(6,272,529)
2018 Funds Transfer from Advice No. 18-11		5,500,000
2018 Funding plus Accrued Interest as of 12-31-18		1,132,690
Total 2018 Funds		**360,161**
2018 Expenses as of 12-31-18		(1,757,910)
Ending Balance as of 12-31-2018	**$**	**(1,397,749)**
NEEA Payments		
2018 NEEA Payments as of 12-31-2018	$	2,500,165
Total	**$**	**2,500,165**

Appendix 2. 2018 DSM expenses by funding source (dollars)

Sector/Program	Idaho Rider	Oregon Rider	Non-Rider Funds	Total
Energy Efficiency/Demand Response				
Residential				
A/C Cool Credit	$ 433,659	$ 36,425	$ 374,285	$ 844,369
Easy Savings: Low-Income Energy Efficiency Education	—	—	147,936	147,936
Educational Distributions	3,307,782	67,409	—	3,375,192
Energy Efficient Lighting	2,343,127	92,003	—	2,435,130
Energy House Calls	146,712	14,065	—	160,777
Fridge and Freezer Recycling Program	33,172	735	—	33,907
Heating & Cooling Efficiency Program	565,780	19,431	—	585,211
Home Energy Audit	264,394	—	—	264,394
Multifamily Energy Savings Program	205,131	—	—	205,131
Oregon Residential Weatherization	—	5,507	—	5,507
Rebate Advantage	105,770	41,714	—	147,483
Residential New Construction Pilot Program	400,910	2	—	400,912
Shade Tree Project	162,995	—	—	162,995
Simple Steps, Smart Savings™	86,721	3,762	—	90,484
Weatherization Assistance for Qualified Customers	—	—	1,272,973	1,272,973
Weatherization Solutions for Eligible Customers	998,233	—	24,237	1,022,471
Commercial/Industrial				
Commercial and Industrial Energy Efficiency Program...				
Custom Projects	8,400,495	395,860	12,156	8,808,512
New Construction	2,004,058	65,587	—	2,069,645
Retrofits	5,732,650	257,529	—	5,990,179
Commercial Education Initiative	144,436	1,738	—	146,174
Flex Peak Program	58,727	64,316	310,270	433,313
Irrigation				
Irrigation Efficiency Rewards	2,681,664	233,916	38,126	2,953,706
Irrigation Peak Rewards	230,953	180,865	6,479,919	6,891,737
Energy Efficiency/Demand Response Total	**$ 28,307,370**	**$ 1,480,863**	**$ 8,659,904**	**$ 38,448,137**
Market Transformation				
NEEA	2,375,157	125,008	—	2,500,165
Market Transformation Total	**$ 2,375,157**	**$ 125,008**	**$ —**	**$ 2,500,165**
Other Programs and Activities				
Commercial/Industrial Energy Efficiency Overhead	444,787	23,051	558	468,396
Energy Efficiency Direct Program Overhead	225,437	11,865	—	237,302
Home Improvement Program	2,926	—	—	2,926
Oregon Commercial Audit	—	1,473	—	1,473
Residential Energy Efficiency Education Initiative	163,255	8,961	—	172,215
Residential Energy Efficiency Overhead	1,042,132	54,125	—	1,096,257
Other Programs and Activities Total	**$ 1,878,538**	**$ 99,474**	**$ 558**	**$ 1,978,570**
Indirect Program Expenses				
Energy Efficiency Accounting & Analysis	987,281	51,254	180,706	1,219,241
Energy Efficiency Advisory Group	16,837	887	—	17,724
Special Accounting Entries	97,820	424	—	98,243
Indirect Program Expenses Total	**$ 1,101,937**	**$ 52,565**	**$ 180,706**	**$ 1,335,208**
Grand Total	**$ 33,663,001**	**$ 1,757,910**	**$ 8,841,168**	**$ 44,262,080**

Appendix 3. 2018 DSM program activity

Program	Participants		Total Costs: Utility [b]	Total Costs: Resource [c]	Savings: Annual Energy (kWh)	Savings: Peak Demand [d] (MW)	Measure Life (Years)	Nominal Levelized Costs [a]: Utility ($/kWh)	Nominal Levelized Costs [a]: Total Resource ($/kWh)
Demand Response									
A/C Cool Credit[1]	26,182	homes	$ 844,369	$ 844,369	n/a	29	n/a	n/a	n/a
Flex Peak Program[1]	140	sites	433,313	433,313	n/a	33	n/a	n/a	n/a
Irrigation Peak Rewards[1]	2,335	service points	6,891,737	6,891,737	n/a	297	n/a	n/a	n/a
Total			**$ 8,169,419**	**$ 8,169,419**		359			
Energy Efficiency									
Residential									
Easy Savings: Low-Income Energy Efficiency Education	282	HVAC tune-ups	147,936	147,936	29,610		3	1.372	1.372
Educational Distributions	94,717	kits/giveaways	3,180,380	3,180,380	16,051,888		11	0.019	0.019
Energy Efficient Lighting	1,340,842	lightbulbs	2,435,130	3,277,039	18,856,933		14	0.011	0.014
Energy House Calls	280	homes	160,777	160,777	374,484		16	0.032	0.032
Fridge and Freezer Recycling Program	304	refrigerators/freezers	33,907	33,907	73,602		7	0.061	0.061
Heating & Cooling Efficiency Program	712	projects	585,211	1,686,618	1,556,065		15	0.029	0.091
Home Energy Audit	466	audits	264,394	321,978	211,003		12	0.113	0.137
Home Energy Report Pilot Program[2]	23,914	treatment size	194,812	194,812	3,281,780		1	0.046	0.046
Multifamily Energy Savings Program	25	projects	205,131	205,131	655,953		11	0.030	0.030
Oregon Residential Weatherization	5	audits	5,507	5,507			30		
Rebate Advantage	107	homes	147,483	355,115	284,559		45	0.027	0.064
Residential New Construction Pilot	307	homes	400,912	926,958	777,369		36	0.028	0.064
Shade Tree Project	2,093	trees	162,995	162,995	35,571		20	0.307	0.307
Simple Steps, Smart Savings™	7,377	appliances/showerheads	90,484	133,101	241,215		12	0.034	0.050
Weatherization Assistance for Qualified Customers	193	homes/non-profits	1,272,973	1,819,491	649,505		30	0.111	0.159
Weatherization Solutions for Eligible Customers	141	homes	1,022,471	1,022,471	571,741		23	0.112	0.112
Sector Total			**$ 10,310,503**	**$ 13,634,216**	**43,651,278**		**13**	**$ 0.020**	**$ 0.027**
Commercial/Industrial									
Commercial Energy-Saving Kits	1,652	kits	146,174	146,174	442,170		10	0.034	0.034
Custom Projects	248	projects	8,808,512	16,112,540	46,963,690		16	0.014	0.026
Green Motors—Industrial	25	motor rewinds			64,167		7	n/a	n/a
New Construction	104	projects	2,069,645	5,054,215	13,378,315		12	0.014	0.034
Retrofits	1,358	projects	5,990,179	16,253,716	34,910,707		12	0.015	0.042
Sector Total			**$ 17,014,509**	**$ 37,566,644**	**95,759,049**		**14**	**$ 0.015**	**$ 0.032**

Program	Participants		Total Costs: Utility [b]	Total Costs: Resource [c]	Savings: Annual Energy (kWh)	Savings: Peak Demand [d] (MW)	Measure Life (Years)	Nominal Levelized Costs [a]: Utility ($/kWh)	Nominal Levelized Costs [a]: Total Resource ($/kWh)
Irrigation									
Green Motors—Irrigation	26	motor rewinds			67,676		19	n/a	n/a
Irrigation Efficiency Reward	1,022	projects	$ 2,953,706	$ 11,948,469	18,933,831		8	$ 0.019	$ 0.076
Sector Total			**$ 2,953,706**	**$ 11,948,469**	**19,001,507**		**8**	**$ 0.019**	**$ 0.075**
Energy Efficiency Portfolio Total			**$ 30,278,718**	**$ 63,149,329**	**158,411,834**		**13**	**$ 0.016**	**$ 0.034**
Market Transformation									
Northwest Energy Efficiency Alliance (codes and standards)					21,724,800				
Northwest Energy Efficiency Alliance (other initiatives)					3,241,200				
Northwest Energy Efficiency Alliance Totals[3]			**$ 2,500,165**	**$ 2,500,165**	**24,966,000**				
Other Programs and Activities									
Residential									
Home Improvement Program			2,926	2,926					
Residential Energy Efficiency Education Initiative			172,215	172,215					
Commercial									
Oregon Commercial Audits	0	audits	1,473	1,473					
Other									
Energy Efficiency Direct Program Overhead			1,801,955	1,801,955					
Total Program Direct Expense			**$ 42,926,872**	**$ 75,797,483**	**183,377,834**	**359**			
Indirect Program Expenses			1,335,208	1,335,208					
Total DSM Expense			**$ 44,262,080**	**$ 77,132,691**					

[a] Levelized Costs are based on financial inputs from Idaho Power's 2015 IRP and calculations include line-loss adjusted energy savings.

[b] The Utility Cost is the cost incurred by Idaho Power to implement and manage a DSM program.

[c] The Total Resource Cost is the total expenditures for a DSM program from the point of view of Idaho Power and its customers as a whole.

[d] Demand response program reductions are reported with 9.7-percent peak loss assumptions.

[1] Peak Demand is the peak performance of each respective program and not combined performance on the actual system peak hour.

[2] Expenses are contained in Educational Distributions expenses in Appendix 2.

[3] Savings are preliminary estimates provided by NEEA. Final savings for 2018 will be provided by NEEA May 2019.

Appendix 4. 2018 DSM program activity by state jurisdiction

	Idaho			Oregon		
Program	Participants	Utility Costs	Demand Reduction (MW)/ Annual Energy Savings (kWh)	Participants	Utility Costs	Demand Reduction (MW)/ Annual Energy Savings (kWh)
Demand Response[1]						
A/C Cool Credit	25,845 homes	$ 807,944	29	337 homes	$ 36,425	0.4
Flex Peak Program	131 sites	368,997	31	9 sites	64,316	2
Irrigation Peak Rewards	2,285 service points	6,710,235	288	50 service points	181,502	9
Total		**$ 7,887,176**	**347**		**$ $282,243**	**12**
Energy Efficiency						
Residential						
Easy Savings: Low-Income Energy Efficiency Education	282 HVAC tune-ups	147,936	29,610	n/a		
Educational Distributions	92,996 kits/giveaways	3,112,970	15,577,291	1,721 kits/giveaways	67,409	474,596
Energy Efficient Lighting	1,291,893 lightbulbs	2,343,127	18,170,017	48,949 lightbulbs	92,003	686,916
Energy House Calls	251 homes	146,712	337,715	29 homes	14,065	36,769
Fridge and Freezer Recycling Program	298 refrigerators/freezers	33,172	71,578	6 refrigerators/freezers	735	2,025
Heating & Cooling Efficiency Program	697 projects	565,780	1,521,832	15 projects	19,431	34,234
Home Energy Audit	466 audits	264,394	211,003	n/a		
Home Energy Report Pilot Program	23,914 treatment size	194,812	3,281,780	n/a		
Multifamily Energy Savings Program [3]	25 projects	205,131	655,953	0 projects		
Oregon Residential Weatherization	n/a			5 audits	5,507	
Rebate Advantage	73 homes	105,770	205,182	34 homes	41,714	79,377
Residential New Construction Pilot	307 homes	400,910	777,369	n/a	2	
Shade Tree Project	2,093 trees	162,995	35,571	n/a		
Simple Steps, Smart Savings™	7,226 appliances/showerheads	86,721	234,664	151 appliances/showerheads	3,762	6,551
Weatherization Assistance for Qualified Customers	190 homes/non-profits	1,254,630	641,619	3 homes/non-profits	18,344	7,886
Weatherization Solutions for Eligible Customers	141 homes	1,022,471	571,741	n/a		
Sector Total		**$ 10,047,532**	**42,322,925**		**$ 262,971**	**1,328,353**
Commercial						
Commercial Energy-Saving Kits	1,621 kits	144,436	433,961	31 kits	1,738	8,209
Custom Projects	238 projects	8,412,044	45,663,289	10 projects	396,468	1,300,401
Green Motors—Industrial	25 motor rewinds		64,167	0 motor rewinds		
New Construction	99 projects	2,004,058	13,092,349	5 projects	65,587	285,966
Retrofits	1,322 projects	5,732,650	33,483,180	36 projects	257,529	1,427,527
Sector Total		**$ 16,293,187**	**92,736,946**		**$ 721,322**	**3,022,103**

Program	Idaho Participants	Idaho Utility Costs	Idaho Demand Reduction (MW)/ Annual Energy Savings (kWh)	Oregon Participants	Oregon Utility Costs	Oregon Demand Reduction (MW)/ Annual Energy Savings (kWh)
Irrigation						
Green Motors—Irrigation	26 motor rewinds		67,676	0 motor rewind		
Irrigation Efficiency Rewards	971 projects	$ 2,717,884	18,000,390	51 projects	$ 235,822	933,441
Sector Total		**$ 2,717,884**	**18,068,066**		**$ 235,822**	**933,441**
Market Transformation						
Northwest Energy Efficiency Alliance (codes and standards)			20,638,560			1,086,240
Northwest Energy Efficiency Alliance (other initiatives)			3,079,140			162,060
Northwest Energy Efficiency Alliance[2]		**$ 2,375,157**	**23,717,700**		**$ 125,008**	**1,248,300**
Other Programs and Activities						
Residential						
Home Improvement Program		2,926				
Residential Energy Efficiency Education Initiative		163,255			8,961	
Commercial						
Oregon Commercial Audits					1,473	
Other						
Energy Efficiency Direct Program Overhead		1,712,887			89,069	
Total Program Direct Expense		**$ 41,200,004**			**$ 1,726,868**	
Indirect Program Expenses		1,273,608			61,600	
Total Annual Savings			**176,845,637**			**6,532,197**
Total DSM Expense		**$ 42,473,612**			**$ 1,788,468**	

[1] Peak Demand is the peak performance of each respective program and not combined performance on the actual system peak hour.
[2] Savings are preliminary estimates provided by NEEA. Final savings for 2018 will be provided by NEEA May 2019.
[3] Idaho Rider charges of $13,264 were reversed and charged to the Oregon Rider in March 2019. Oregon savings should have been 67,270 kWh.

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DEMAND-SIDE MANAGEMENT

2018 ANNUAL REPORT

MARCH 15 • 2019

SUPPLEMENT 1: COST EFFECTIVENESS

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Supplement 1: Cost-Effectiveness

Cost-Effectiveness

Idaho Power considers cost-effectiveness of primary importance in the design, implementation, and tracking of energy efficiency and demand response programs. Idaho Power's energy efficiency and demand response opportunities are preliminarily identified through the Integrated Resource Plan (IRP) process. Idaho Power uses third-party energy efficiency potential studies to identify achievable cost-effective energy efficiency potential, which is added to the resources included in the IRP. Idaho Power's Program Planning Group (PPG) explores new opportunities to expand current demand-side management (DSM) programs and offerings.

Prior to the actual implementation of energy efficiency or demand response programs, Idaho Power performs a preliminary cost-effectiveness analysis to assess whether a potential program design or measure may be cost-effective from the perspective of Idaho Power and its customers. Incorporated in these models are inputs from various sources that use the most current and reliable information available. When possible, Idaho Power leverages the experiences of other utilities in the region and/or throughout the country to help identify specific program parameters. This is accomplished through discussions with other utilities' program managers and researchers. Idaho Power also uses electric industry research organizations, such as E Source, Northwest Energy Efficiency Alliance (NEEA) Regional Emerging Technology Advisory Committee, the Consortium for Energy Efficiency (CEE), American Council for an Energy-Efficient Economy (ACEEE), Advanced Load Control Alliance (ALCA), and Association of Energy Service Professionals (AESP), to identify similar programs and their results. Additionally, Idaho Power relies on the results of program impact evaluations and recommendations from consultants.

Idaho Power's goal is for all programs to have benefit/cost (B/C) ratios greater than one for the total resource cost (TRC) test, utility cost test (UCT), and participant cost test (PCT) at the program and measure level where appropriate. Each cost-effectiveness test provides a different perspective, and Idaho Power believes each test provides value when evaluating program performance. If a measure or program is found to be not cost-effective from one or more of the three tests, Idaho Power assesses the program or measure and runs the cost-effectiveness calculations under a variety of scenarios. There are many assumptions when calculating the cost-effectiveness of a given program or measure. For some measures within the programs, savings can vary based on factors such participation levels or the participants' locations. For instance, heat pumps installed in the Boise area will have less savings than heat pumps installed in the McCall area. If program participation and savings increase, fixed costs such as labor and marketing is spread out more and the program cost-effectiveness increases.

When a program or measure is shown to be not cost-effective, Idaho Power works with Energy Efficiency Advisory Group (EEAG) to get additional input. If the measure or program is indeed offered, the company explains to stakeholders why the measure or program was implemented or continued and the steps the company plans to take to improve its cost-effectiveness. The company believes this aligns with the expectations of the Idaho Public Utilities Commission (IPUC) and Public Utility Commission of Oregon (OPUC).

In IPUC Order No. 33365, page 9, the IPUC states the following:

> We thus find it reasonable for the Company to continue screening potential programs using each test as a guideline, and to advise us on how the Company's programs fare under each test. When the Company ultimately seeks to recover its prudent investment in such programs, however, we believe the Company may (but need not exclusively) emphasize the UCT—and that test's focus on Company-controlled benefits and costs—to argue whether the programs were cost-effective.

In the OPUC Order No. 94-590, issued in Utility Miscellaneous (UM) 551, the OPUC outlines specific cost-effectiveness guidelines for energy efficiency measures and programs managed by program administrators. It is the expectation of the OPUC that measures and programs pass both the UCT and TRC tests. Measures and programs that do not pass these tests may be offered by a utility if they meet one or more of the following additional conditions specified by Section 13 of Order No. 94-590:

A. The measure produces significant non-quantifiable non-energy benefits (NEB)
B. Inclusion of the measure will increase market acceptance and is expected to lead to reduced cost of the measure
C. The measure is included for consistency with other DSM programs in the region
D. Inclusion of the measure helps increase participation in a cost-effective program
E. The package of measures cannot be changed frequently, and the measure will be cost-effective during the period the program is offered
F. The measure or package of measures is included in a pilot or research project intended to be offered to a limited number of customers
G. The measure is required by law or is consistent with OPUC policy and/or direction

If Idaho Power determines a program or measure is not cost-effective but meets one or more of the exceptions set forth by Order No. 94-590, the company files an exceptions request with the OPUC to continue offering the measure or program within it its Oregon service area.

For operational and administrative efficiency, Idaho Power endeavors to offer identical programs in both its Oregon and Idaho jurisdictions. Some customers, contractors, and trade allies operate in both states. Program consistency is important for the participants' overall satisfaction with the programs. Offering different program designs would create confusion in the marketplace and could inhibit participation. In addition, program infrastructure is designed to implement consistent programs across the service area.

Methodology

For its cost-effectiveness methodology, Idaho Power relies on the Electric Power Research Institute (EPRI) *End Use Technical Assessment Guide* (TAG); the *California Standard Practice Manual* and its subsequent addendum, the National Action Plan for Energy Efficiency's (NAPEE) *Understanding Cost Effectiveness of Energy Efficiency Programs: Best Practices, Technical Methods, and Emerging Issues for Policy-Makers*; and the National Action Plan on Demand Response. For resource planning, Idaho Power uses the TRC test. This test is used because, as defined in the TAG and *California Standard Practice Manual*, it is the most like supply-side tests and provides a useful basis to compare demand-side and supply-side resources. For program planning and evaluation, the company uses the TRC and the UCT test to develop B/C ratios to determine the cost-effectiveness of DSM programs. The PCT provides the company the opportunity to assess a program or measure from the participant perspective and to determine if it is in the best interest of the average customer.

For energy efficiency programs, each program's cost-effectiveness is reviewed annually from a one-year perspective. The annual energy-savings benefit value is summed over the life of the measure or program and is discounted to reflect 2018 dollars. The result of the one-year perspective is shown in *Supplement 1: Cost-Effectiveness*.

The goal of demand response programs is to minimize or delay the need to build new supply-side resources. Unlike energy efficiency programs or supply-side resources, demand response programs must acquire and retain participants each year to maintain a level of demand-reduction capacity for the company.

As part of the public workshops on Case No. IPC-E-13-14, Idaho Power and other stakeholders agreed on a new methodology for valuing demand response. The settlement agreement, as approved in IPUC Order No. 32923 and OPUC Order No. 13-482, defined the annual cost of operating the three demand response programs for the maximum allowable 60 hours to be no more than $16.7 million. The annual value calculation will be updated with each IRP based on changes that include, but are not limited to, need, capital cost, or financial assumptions. This amount was reevaluated in the 2015 IRP to be $18.5 million and again in the 2017 IRP to be $19.8 million.

This value is the levelized annual cost of a 170-megawatt (MW) deferred resource over a 20-year life. The demand response value calculation will include this value even in years when the IRP shows no peak-hour capacity deficits. In 2018, the cost of operating the three demand response programs was $8.2 million. Idaho Power estimates that if the three programs were dispatched for the full 60 hours, the total costs would have been approximately $11.3 million and would have remained cost-effective.

Assumptions

Idaho Power relies on research conducted by third-party sources to obtain savings and cost assumptions for various measures. These assumptions are routinely reviewed internally and with EEAG and updated as new information becomes available. For many of the measures within *Supplement 1: Cost-Effectiveness*, savings and costs were derived from the Regional Technical Forum (RTF), the technical reference manual (TRM), or the *Idaho Power Energy Efficiency Potential Study* conducted by Applied Energy Group (AEG). Idaho Power received end-use load shapes from AEG, which have been applied to each program and measure when applicable. Idaho Power used updated assumptions from the 2016 potential study for the 2018 cost-effectiveness analyses. Due to the timing of the 2018 potential study, Idaho Power will use any updated assumptions from the 2018 study in 2019.

The RTF regularly reviews, evaluates, and recommends eligible energy efficiency measures and the estimated savings and costs associated with those measures. For instance, because of the rapid changes in the lighting market, the RTF is currently evaluating lighting measures on an annual basis. As the RTF updates these assumptions, Idaho Power applies them to current program offerings and assesses the need to make any program changes. Idaho Power staff participates in the RTF by attending monthly meetings and contributing to various sub-committees. Because cost data from the RTF information is in 2012 dollars, measures with costs from the RTF are escalated to 2018 dollars. The costs are escalated by 7.8 percent. This percentage is provided by the RTF in workbook RTFStandardInformationWorkbook_v3_2.xlsx.

Idaho Power uses a TRM developed by ADM Associates, Inc. for the Commercial and Industrial Energy Efficiency Program's New Construction and Retrofit options. In 2018, the company contracted with ADM to update the TRM. Idaho Power also relies on other sources, such as the Northwest Power and Conservation Council (NWPCC), Northwest Energy Efficiency Alliance (NEEA), the Database for Energy Efficiency Resources (DEER), the Energy Trust of Oregon (ETO), the Bonneville Power Administration (BPA), third-party consultants, and other regional utilities. Occasionally, Idaho Power will also use internal engineering estimates and calculations for savings and costs based on information gathered from previous projects.

The company freezes savings assumptions when the budgets and goals are established for the next calendar year unless code and standard changes or program updates necessitate a need to use updated savings. These assumptions are discussed in more detail in the cost-effectiveness sections for each program. As a rule, the 2018 energy savings reported for most programs will use the assumption set at the beginning of the year. An exception would be the Commercial & Industrial Energy Efficiency program. Once the TRM was updated, the company launched changes to the program in August 2018. For applications initiated before the change date, the TRM version 1.7 was the source for most savings and cost assumptions for the New Construction and Retrofit options. For applications initiated after the change date, the current TRM version 2.2 is the source for most savings and cost assumptions for the program.

The remaining inputs used in the cost-effectiveness models are obtained from the IRP process. Idaho Power's 2015 IRP was acknowledged by the IPUC on December 23, 2015 and by the OPUC April 28, 2016 and is the source of all the financial assumptions for the cost-effectiveness analysis. *Appendix C—Technical Appendix* of Idaho Power's 2015 IRP contains the DSM alternative costs, discount rate, and escalation rate. These DSM alternative costs vary by season and time of day and are applied to an end-use load shape to obtain the value of that particular measure or program. The DSM alternative energy costs are based on both the projected fuel costs of a peaking unit and forward electricity prices as determined by Idaho Power's power supply model, AURORAxmp® Electric Market Model. The avoided capital cost of capacity is based on a gas-fired, simple-cycle turbine. In the 2015 IRP, the annual avoided capacity cost is $119 per kilowatt (kW).

As part of the 2015 IRP Case IPC-E-15-19 and 2014 DSM prudence Case IPC-E-15-06, parties requested Idaho Power review how transmission and distribution (T&D) costs are treated in the IRP. Idaho Power committed to reviewing the T&D benefits, and the analysis was presented to EEAG in August 2016. The estimated average value of energy efficiency on T&D deferral is $3.76/kW per year or $0.000429/kilowatt-hour (kWh). In compliance with Order No. 33365, this value is escalated and added to the 2015 DSM alternative energy costs and included in the cost-effectiveness analysis for 2018.

Idaho Power's 2017 IRP was filed on June 30, 2017 with the IPUC under case IPC-E-17-11 and with the OPUC under case LC 68. Idaho Power's 2017 IRP was acknowledged by the IPUC on February 9, 2018 in Order No. 33983 and in by the OPUC on May 23, 2018 in Order No. 18-176. Since the 2017 IRP was acknowledged after the budgets and goals were set for 2018, the 2015 IRP remained the source for all financial assumptions and cost-effectiveness analysis in 2018. The 2017 IRP is expected to be the source of all assumptions and analysis for the 2019 program year. For the demand response programs, with inputs from the 2017 IRP, the Company determined the maximum annual cost of running all three demand response programs for the maximum allowable hours of 60 hours has been calculated to be no more than $19.8 million.

As recommended by the NAPEE *Understanding Cost-Effectiveness of Energy Efficiency Programs*, Idaho Power's weighted average cost of capital (WACC) of 6.74 percent is used to discount future benefits and costs to today's dollars. Once the DSM alternative costs and load shapes are applied to the annual kWh savings of a measure or program, the WACC is used to calculate the net present value (NPV) of the annual benefit for the UCT and TRC B/C ratios. However, determining the appropriate discount rate for participant cost and benefits is difficult because of the variety of potential discount rates that can be used by the different participants as described in the TAG. Since the participant benefit is based on the anticipated bill savings of the customer, Idaho Power believes the WACC is not an appropriate discount rate to use. Because the customer bill savings is based on Idaho Power's 2018 average customer segment rate and is not escalated, the participant bill savings is discounted using a real discount rate of 4.44 percent, which is based on the 2015 IRP's WACC of 6.74 percent and an escalation rate of 2.2 percent. The real discount rate is used to calculate the NPV of any participant benefits or costs for the PCT or ratepayer impact measure (RIM) B/C ratios.

The formula to calculate the real discount rate is as follows:

$$((1 + \text{WACC}) \div (1 + \text{Escalation})) - 1 = \text{Real}$$

Line-loss percentages are applied to the metered-site energy savings to find the energy savings at the generation level. The *Demand-Side Management 2018 Annual Report* shows the estimated electrical savings at the customer meter level. Cost-effectiveness analyses are based on generation-level energy savings. The demand response program reductions are reported at the generation level with the line losses. The average system line-loss factor is 9.6 percent while the summer peak line-loss factors is 9.7 percent.

Conservation Adder

The *Pacific Northwest Electric Power Planning and Conservation Act* (Northwest Power Act) states the following:

> …any conservation or resource shall not be treated as greater than that of any non-conservation measure or resource unless the incremental system cost of such conservation or resource is in excess of 110 per centum of the incremental system cost of the nonconservation measure or resource.

As a result of the Northwest Power Act, most utilities in the Pacific Northwest add a 10-percent conservation adder in energy efficiency cost-effectiveness analyses. In OPUC Order No. 94-590, the OPUC states:

> We support the staff's position that the effect of conservation in reducing uncertainty in meeting load growth is included in the ten percent cost adder and that no separate adjustment is necessary.

Additionally, in IPUC Order No. 32788 in Case No. GNR-E-12-01, "Staff noted that Rocky Mountain Power and Avista use a 10 percent conservation adder when calculating the cost-effectiveness of all their DSM programs." Staff recommended the utilities have the option to use a 10-percent adder, and the IPUC agreed with the recommendation to allow utilities to use the 10-percent adder in the cost-effectiveness analyses for low-income programs.

After reviewing the practices of other utilities in the Pacific Northwest, as well as the OPUC Order No. 94-590 and IPUC Order 32788, Idaho Power applies the 10-percent conservation adder in all energy efficiency measure and program cost-effectiveness analyses when calculating the TRC test.

Net-to-Gross

Net-to-gross (NTG), or net-of-free-ridership (NTFR), is defined by NAPEE's *Understanding Cost Effectiveness of Energy Efficiency Programs: Best Practices, Technical Methods, and Emerging Issues for Policy-Makers* as a ratio that does as follows:

> Adjusts the impacts of the programs so that they only reflect those energy efficiency gains that are the result of the energy efficiency program. Therefore, the NTG deducts energy savings that would have been achieved without the efficiency program (e.g., 'free-riders') and increases savings for any 'spillover' effect that occurs as an indirect result of the program. Since the NTG attempts to measure what the customers would have done in the absence of the energy efficiency program, it can be difficult to determine precisely.

Capturing the effects of Idaho Power's energy efficiency efforts on free-ridership and spillover is difficult. Due to the uncertainty surrounding NTG percentages, Idaho Power used an NTG of

100 percent for all measure cost-effectiveness analyses. For the program cost-effectiveness analyses, the B/C ratios shown are based on a 100-percent NTG. A sensitivity analysis was conducted to show what the minimum NTG percentage needs to be for the program to remain (or become) cost-effective from either the TRC or UC perspective. These NTG percentages are shown in the program cost-effectiveness results in *Supplement 1: Cost-Effectiveness*.

Results

Idaho Power determines cost-effectiveness on a measure basis, where relevant, and program basis. As part of *Supplement 1: Cost-Effectiveness* and where applicable, Idaho Power publishes the cost-effectiveness by measure, calculating the PCT and RIM test at the program level, listing the assumptions associated with cost-effectiveness, and citing sources and dates of metrics used in the cost-effectiveness calculation.

The B/C ratio from the participant cost perspective is not calculated for the Commercial Energy-Saving Kits, Educational Distributions, Energy House Calls, Multifamily Energy Savings Program, Shade Tree Project, Weatherization Assistance for Qualified Customers (WAQC), and Weatherization Solutions for Eligible Customers programs. These programs have few or no customer costs. For energy efficiency programs, the cost-effectiveness models do not assume ongoing participant costs.

Supplement 1: Cost-Effectiveness contains annual cost-effectiveness metrics for each program using actual information from 2018 and includes results of the UCT, TRC, PCT, and RIM. Current average customer energy rates are used in the calculation of the B/C ratios from a PCT and RIM perspective. Rate increases are not forecasted or escalated. A summary of the cost-effectiveness by program can be found in Table 3.

In 2018, most of Idaho Power's energy efficiency programs were cost-effective, except for Heating & Cooling Efficiency (H&CE) Program, Shade Tree Project, and the weatherization programs for income-qualified customers.

The H&CE Program has a UC of 1.65, TRC of 0.83, PCT of 1.50. Idaho Power first notified EEAG in August 2016 that the program was anticipated to be not cost-effective from the TRC perspective. Idaho Power has continued to update EEAG of its efforts to improve the program's cost-effectiveness.

Throughout 2017 and into 2018, Idaho Power worked toward improving program cost-effectiveness. These tactics included: 1) reassigning non-program labor, 2) reducing marketing spend while improving other tactics, 3) reducing contractor incentives from $150 to $50, and 4) adding heat pump water heaters to the program. These efforts were successful in keeping cost-effectiveness ratios from falling in 2018 over 2017 levels. However, calibrations to end-use load shapes created for the 2016 energy efficiency potential study offset cost-effectiveness gains from cost control efforts in 2018. Had Idaho Power used the same load shape as was used for the 2017 program year, the program would have had a TRC just over 1.0.

Due to their high costs, DHPs continue to bring down the cost-effectiveness of the program. The DHP portion of the program has a UCT of 1.37 and TRC 0.69 while the rest of the program has a UCT of 1.82 and TRC of 0.96. Market transformation efforts, specifically the market transformation work provided by NEEA, in the region have failed to drive prices down along with lower net savings in colder climates are the two primary problems plaguing DHP cost-effectiveness.

When the company began the Shade Tree Project in 2013, the initial analysis showed that the project would be cost-effective from the UCT and TRC perspective based on preliminary assumptions and then-current DSM alternate costs. The company's intent was to begin claiming savings when the original planted trees were five years old. Since the Shade Tree Project began in 2013, 2018 was the first year Idaho Power claimed savings and calculating the cost-effectiveness for the Shade Tree Project. This project is shown to have a UCT of 0.71, a TRC of 0.80. The cost-effectiveness for the program is based on the modeled savings for the tree distributed in 2018 and the costs incurred during 2018. It is estimated that these trees will begin saving 35,425 kWh in 2022 and 116,197 kWh by year 2038.

DNV GL created a new savings model to adjust the savings from the enrollment calculator using the data from Idaho Power's 2015-2017 audit of the project. The audit provided information on where the trees were actually planted and the tree mortality. The new savings model calculates the average savings per tree and assumed a measure life of 20 years. This is because the enrollment software, i-Tree, used by the Arbor Day Foundation only estimates saving at 5, 10, 15, and 20 years. In 2018, the bur oak, northern red oak, Greenspire® littleleaf linden, and tulip tree were the most common species distributed in the project. According to the United States Department of Agriculture and the Urban Forest Ecosystem Institute, these trees can live up to 500 years. Idaho Power acknowledges that the potential energy savings for a tree may continue to increase beyond year 20, but the savings will be capped at some point regardless of how large the tree grows. For trees distributed in 2018, data around the survivorship of the tree beyond 2038 is also unknown.

While the energy saving in 2038 is estimated to be 116,197 kWh, the savings may continue to increase at a diminishing rate before eventually declining due to increased mortality. However, if energy savings were to stay constant beyond year 20, it can be assumed that program would be cost-effective from the UCT and TRC perspective if the program life was revised to 30 years.

WAQC had a TRC of 0.52 and a UCT ratio of 0.43, and Weatherization Solutions for Eligible Customers had a TRC of 0.51 and a UCT ratio of 0.37. The programs' cost-effectiveness ratios increased slightly over 2017's ratios. To calculate the programs' cost-effectiveness, Idaho Power adopted the following IPUC staff's recommendations from Case No. GNR E-12-01:

- Applied a 100-percent NTG.
- Claimed 100 percent of energy savings for each project.
- Included indirect administrative overhead costs. The overhead costs of 3.017 percent were calculated from the $1,335,208 of indirect program expenses divided by the total DSM expenses of $44,262,080 as shown in Appendix 3 of the *Demand-Side Management 2018 Annual Report*.

- Applied the 10 percent conservation preference adder.
- Amortized evaluation expenses over a three-year period.
- Claimed one dollar of NEBs for each dollar of utility and federal funds invested in health, safety, and repair measures.

Eighteen out of 279 individual measures in various programs are shown to not be cost-effective from either the UCT or TRC perspective. These measures will be discontinued, analyzed for additional NEBs, modified to increase potential per-unit savings, or monitored to examine their impact on the specific program's overall cost-effectiveness. Specifically, of the 18 non-cost-effective measures, and seven have ratios between 0.90-0.99 and three have ratios between 0.80-0.89. For most of these measures, Idaho Power filed cost-effectiveness exception requests with the OPUC in compliance with Order No. 94-590. Measures and programs that do not pass these tests may be offered by the utility if they meet one or more of the additional conditions specified by Section 13 of Order No. 94-590. These exception requests were approved under Order No. 15-200 on June 23, 2015, or with the specific program advice filings. The filings and exception requests are noted in Table 1.

Table 1. 2018 non-cost-effective measures

Program	Number of Measures	Notes
H&CE Program	7	Cost-effectiveness exception request for ductless heat pumps (DHP) and open-loop water source heat pumps filed with the OPUC under UM-1710. OPUC Order No. 94-590, Section 13. Approved under Order No. 15-200. Exception request for the program and smart thermostat requested and approved with OPUC Advice No. 17-09. Heat pump water heaters and duct sealing measures would be cost-effective at 1.00 and 1.16 respectively without the inclusion of administration costs. Meets OPUC Order No. 94-590, Section 10.
Rebate Advantage	1	Eco-Rated manufactured homes built in Heating Zone 1 and Cooling Zone 3 has a TRC of 0.97. Measures would be cost-effective with TRC of 1.10 without the inclusion of administration costs. Meets OPUC Order No. 94-590, Section 10.
New Construction and Retrofits	5	Measures offered in both options. Cost-effectiveness exception request filed and approved with OPUC Advice No. 18-08. OPUC Order No. 94-590, Section 13. Exceptions B, C, and D.
Retrofit	5	UCT and TRC ranges from 0.85 to 0.97. Cost-effectiveness exception request filed and approved with OPUC Advice No. 18-08. OPUC Order No. 94-590, Section 13. Exceptions B, C, and D.
Total	**18**	

Following the annual program cost-effectiveness results are tables that include measure-level cost-effectiveness. Exceptions to the measure-level tables are programs that are analyzed at the project level. These programs include Custom Projects, the custom option of Irrigation Efficiency Rewards, Shade Tree, WAQC, and Weatherization Solutions for Eligible Customers.

The measure-level cost-effectiveness includes inputs of measure life, energy savings, incremental cost, incentives, program administration cost, and net benefit. Program administration costs include all non-incentive costs: labor, marketing, training, education, purchased services, and evaluation. Energy and expense data have been rounded to the nearest whole unit.

2018 DSM Detailed Expenses by Program

Included in this supplement is a detailed breakout of program expenses as shown in Appendix 2 of the *Demand Side Management 2018 Annual Report*. These expenses are broken out by funding source major-expense type (labor/administration, materials, other expenses, purchased services, and incentives).

Table 2. 2018 DSM detailed expenses by program (dollars)

Sector/Program	Idaho Rider	Oregon Rider	Idaho Power	Total Program
Energy Efficiency/Demand Response Total	**$ 27,584,031**	**$ 1,199,257**	**$ 1,495,429**	**$ 30,278,718**
Residential Total	**$ 8,620,729**	**$ 244,628**	**$ 1,445,147**	**$ 10,310,503**
Easy Savings: Low-Income Energy Efficiency Education	–	–	**147,936**	**147,936**
Labor/Administrative Expense	–	–	22,351	**22,351**
Materials and Equipment	–	–	125,046	**125,046**
Other Expense	–	–	256	**256**
Purchased Services	–	–	283	**283**
Educational Distributions	**3,307,782**	**67,409**	–	**3,375,192**
Labor/Administrative Expense	47,054	2,475	–	**49,529**
Materials and Equipment	2,207,759	48,124	–	**2,255,883**
Purchased Services	1,052,970	16,810	–	**1,069,780**
Energy Efficient Lighting	**2,343,127**	**92,003**	–	**2,435,130**
Incentives	1,214,018	43,082	–	**1,257,100**
Labor/Administrative Expense	53,094	2,795	–	**55,889**
Other Expense	210,614	10,637	–	**221,251**
Purchased Services	865,401	35,489	–	**900,890**
Energy House Calls	**146,712**	**14,065**	–	**160,777**
Labor/Administrative Expense	11,954	628	–	**12,582**
Materials and Equipment	8,634	454	–	**9,088**
Other Expense	17,491	874	–	**18,365**
Purchased Services	108,634	12,108	–	**120,742**
Fridge and Freezer Recycling Program	**33,172**	**735**	–	**33,907**
Labor/Administrative Expense	718	37	–	**755**
Materials and Equipment	1,353	71	–	**1,424**
Other Expense	(0)	0	–	**(0)**
Purchased Services	31,102	626	–	**31,728**
Heating & Cooling Efficiency Program	**565,780**	**19,431**	–	**585,211**
Labor/Administrative Expense	110,579	5,819	–	**116,398**
Materials and Equipment	6,766	(394)	–	**6,372**
Other Expense	69,186	2,048	–	**71,235**
Purchased Services	80,408	3,432	–	**83,841**
Incentives	298,840	8,525	–	**307,365**
Home Energy Audit	**264,394**	–	–	**264,394**
Labor/Administrative Expense	57,485	–	–	**57,485**
Materials and Equipment	21,971	–	–	**21,971**
Other Expense	50,619	–	–	**50,619**
Purchased Services	134,318	–	–	**134,318**
Multifamily Energy Savings Program	**205,131**	–	–	**205,131**
Labor/Administrative Expense	64,221	–	–	**64,221**
Materials and Equipment	38,442	–	–	**38,442**
Other Expense	37,138	–	–	**37,138**
Purchased Services	65,330	–	–	**65,330**
Oregon Residential Weatherization	–	**5,507**	–	**5,507**
Labor/Administrative Expense	–	3,737	–	**3,737**
Other Expense	–	957	–	**957**
Incentives	–	812	–	**812**

Sector/Program	Idaho Rider	Oregon Rider	Idaho Power	Total Program
Rebate Advantage	**105,770**	**41,714**	–	**147,483**
Labor/Administrative Expense	13,735	723	–	**14,458**
Other Expense	4,439	182	–	**4,622**
Purchased Services	14,596	6,808	–	**21,404**
Incentives	73,000	34,000	–	**107,000**
Residential New Construction Pilot Program	**400,910**	**2**	–	**400,912**
Labor/Administrative Expense	59,151	–	–	**59,151**
Materials and Equipment	3,884	–	–	**3,884**
Other Expense	12,811	–	–	**12,811**
Purchased Services	6,065	2	–	**6,067**
Incentives	319,000	–	–	**319,000**
Shade Tree Project	**162,995**	–	–	**162,995**
Labor/Administrative Expense	36,276	–	–	**36,276**
Materials and Equipment	429	–	–	**429**
Other Expense	9,554	–	–	**9,554**
Purchased Services	116,736	–	–	**116,736**
Simple Steps, Smart Savings™	**86,721**	**3,762**	–	**90,484**
Labor/Administrative Expense	38,029	2,001	–	**40,031**
Purchased Services	10,674	422	–	**11,096**
Incentives	38,019	1,339	–	**39,357**
Weatherization Assistance for Qualified Customers	–	–	**1,272,973**	**1,272,973**
Labor/Administrative Expense	–	–	43,402	**43,402**
Other Expense	–	–	1,555	**1,555**
Purchased Services	–	–	1,228,017	**1,228,017**
Weatherization Solutions for Eligible Customers	**998,233**	–	**24,237**	**1,022,471**
Labor/Administrative Expense	6,031	–	24,237	**30,268**
Other Expense	24,403	–	–	**24,403**
Purchased Services	967,799	–	–	**967,799**
Commercial/Industrial	**$ 16,281,639**	**$ 720,714**	**$ 12,156**	**$ 17,014,509**
Custom Projects	**8,400,495**	**395,860**	**12,156**	**8,808,512**
Labor/Administrative Expense	564,640	29,713	12,067	**606,420**
Other Expense	352,090	24,887	89	**377,067**
Purchased Services	1,187,801	72,463	–	**1,260,263**
Incentives	6,295,965	268,797	–	**6,564,762**
New Construction	**2,004,058**	**65,587**	–	**2,069,645**
Labor/Administrative Expense	184,780	9,725	–	**194,504**
Other Expense	8,831	465	–	**9,296**
Purchased Services	137,927	4,692	–	**142,618**
Incentives	1,672,520	50,706	–	**1,723,226**
Retrofits	**5,732,650**	**257,529**	–	**5,990,179**
Labor/Administrative Expense	296,658	15,614	–	**312,272**
Materials and Equipment	689	36	–	**725**
Other Expense	26,392	1,389	–	**27,781**
Purchased Services	718,604	37,821	–	**756,425**
Incentives	4,690,307	202,668	–	**4,892,975**
Commercial Education Initiative	**144,436**	**1,738**	**–**	**146,174**
Labor/Administrative Expense	4,667	244	–	**4,911**
Materials and Equipment	107,780	1,144	–	**108,924**
Other Expense	(5,106)	(269)	–	**(5,375)**
Purchased Services	37,096	618	–	**37,714**

Sector/Program	Idaho Rider	Oregon Rider	Idaho Power	Total Program
Irrigation Total	**$ 2,681,664**	**$ 233,916**	**$ 38,126**	**$ 2,953,706**
Irrigation Efficiency Rewards	**2,681,664**	**233,916**	**38,126**	**2,953,706**
Labor/Administrative Expense	336,129	17,685	38,012	**391,826**
Materials and Equipment	7,917	417	–	**8,334**
Other Expense	30,133	1,979	114	**32,226**
Purchased Services	4,931	171	–	**5,103**
Incentives	2,302,554	213,663	–	**2,516,217**
Market Transformation Total	**$ 2,375,157**	**$ 125,008**	**$ –**	**$ 2,500,165**
NEAA	**2,375,157**	**125,008**	**–**	**2,500,165**
Purchased Services	2,375,157	125,008	–	**2,500,165**
Other Program and Activities Total	**$ 1,878,538**	**$ 99,474**	**$ 558**	**$ 1,978,570**
Commercial/Industrial Energy Efficiency Overhead	**444,787**	**23,051**	**558**	**468,396**
Labor/Administrative Expense	307,350	16,154	409	**323,913**
Materials and Equipment	157	8	–	**166**
Other Expense	112,461	5,583	149	**118,192**
Purchased Services	24,819	1,306	–	**26,125**
Energy Efficiency Direct Program Overhead	**225,437**	**11,865**	–	**237,302**
Labor/Administrative Expense	171,075	9,004	–	**180,079**
Other Expense	54,362	2,861	–	**57,223**
Home Improvement	**2,926**	–	–	**2,926**
Labor/Administrative Expense	101	–	–	**101**
Other Expense	300	–	–	**300**
Purchased Services	2,525	–	–	**2,525**
Oregon Commercial Audit	–	**1,473**	–	**1,473**
Labor/Administrative Expense	–	632	–	**632**
Other Expense	–	841	–	**841**
Residential Energy Efficiency Education Initiative	**163,255**	**8,961**	–	**172,215**
Labor/Administrative Expense	85,459	4,498	–	**89,957**
Materials and Equipment	1,185	62	–	**1,247**
Other Expense	74,862	4,308	–	**79,170**
Purchased Services	1,749	92	–	**1,841**
Residential Energy Efficiency Overhead	**1,042,132**	**54,125**	–	**1,096,257**
Labor/Administrative Expense	180,796	9,467	–	**190,263**
Other Expense	807,918	42,001	–	**849,920**
Purchased Services	53,418	2,657	–	**56,075**
Indirect Program Expenses Total	**$ 1,101,937**	**$ 52,565**	**$ 180,706**	**$ 1,335,208**
All Sectors Total	**$ 1,101,937**	**$ 52,565**	**$ 180,706**	**$ 1,335,208**
Energy Efficiency Accounting and Analysis	**987,281**	**51,254**	**180,706**	**1,219,241**
Labor/Administrative Expense	534,690	28,145	159,880	**722,715**
Materials and Equipment	507	27	–	**534**
Other Expense	–	–	20,826	**20,826**
Purchased Services	452,084	23,082	–	**475,166**
Energy Efficiency Advisory Group	**16,837**	**887**	–	**17,724**
Labor/Administrative Expense	6,577	347	–	**6,924**
Other Expense	10,259	540	–	**10,799**
Special Accounting Entries	**97,820**	**424**	**–**	**98,243**
Special Accounting Entry	97,820	424	–	**98,243**

Sector/Program	Idaho Rider	Oregon Rider	Idaho Power	Total Program
Demand Response Total	**$ 723,339**	**$ 281,606**	**$ 7,164,475**	**$ 8,169,419**
Residential Total	**$ 433,659**	**$ 36,425**	**$ 374,285**	**$ 844,369**
A/C Cool Credit	**433,659**	**36,425**	**374,285**	**844,369**
Labor/Administrative Expense	63,912	3,360	–	**67,271**
Materials and Equipment	(11,709)	1	–	**(11,708)**
Other Expense	15,758	829	–	**16,588**
Purchased Services	365,697	27,284	–	**392,981**
Incentives	–	4,951	374,285	**379,237**
Commercial/Industrial Total	**$ 58,727**	**$ 64,316**	**$ 310,270**	**$ 433,313**
Flex Peak Program	**58,727**	**64,316**	**310,270**	**433,313**
Labor/Administrative Expense	58,727	3,090	–	**61,816**
Incentives	–	61,227	310,270	**371,496**
Irrigation Total	**$ 230,953**	**$ 180,865**	**$ 6,479,919**	**$ 6,891,737**
Irrigation Peak Rewards	**230,953**	**180,865**	**6,479,919**	**6,891,737**
Labor/Administrative Expense	90,337	4,754	12,744	**107,836**
Materials and Equipment	65,078	2,808	–	**67,887**
Other Expense	2,352	124	–	**2,476**
Purchased Services	73,185	3,843	–	**77,028**
Incentives	–	169,335	6,467,175	**6,636,510**
Grand Total	**$ 33,663,001**	**$ 1,757,910**	**$ 8,841,168**	**$ 44,262,080**

Table 3. Cost-effectiveness of 2018 programs by B/C test

Program/Sector	UCT	TRC	RIM	PCT
Educational Distributions	2.68	4.51	0.58	N/A
Energy Efficient Lighting	4.67	6.64	0.59	13.05
Energy House Calls	1.37	1.74	0.42	N/A
Heating & Cooling Efficiency Program	1.65	0.83	0.47	1.50
Multifamily Energy Savings Program	1.60	3.00	0.47	N/A
Rebate Advantage	1.93	1.08	0.45	2.09
Residential New Construction Pilot Program	2.51	1.23	0.59	1.97
Shade Tree Project	0.71	0.80	0.57	N/A
Simple Steps, Smart Savings	1.44	4.68	0.48	8.54
Weatherization Assistance for Qualified Customers	0.43	0.52	0.25	N/A
Weatherization Solutions for Eligible Customers	0.37	0.51	0.22	N/A
Residential Energy Efficiency Sector	**2.37**	**3.16**	**0.54**	**10.03**
Commercial Energy-Saving Kits	1.56	2.50	0.65	N/A
Custom Projects	3.85	2.32	1.18	1.92
New Construction	3.97	1.79	0.89	1.88
Retrofits	3.58	1.45	0.87	1.55
Commercial/Industrial Energy Efficiency Sector*	**3.75**	**1.87**	**1.01**	**1.76**
Irrigation Efficiency Rewards	4.57	3.03	1.29	2.73
Irrigation Energy Efficiency Sector**	**4.60**	**3.04**	**1.29**	**2.73**
Energy Efficiency Portfolio	**3.04**	**2.26**	**0.83**	**2.85**

*Commercial/Industrial Energy Efficiency Sector cost-effectiveness ratios include savings and participant costs from Green Motors Rewinds.
**Irrigation Energy Efficiency Sector cost-effectiveness ratios include savings and participant costs from Green Motors Rewinds.

Cost-Effectiveness Tables by Program

Educational Distributions

Segment: Residential
2018 Program Results

Cost Inputs			Ref
Program Administration	$	3,375,192	
Program Incentives		–	I
Total UC	**$**	3,375,192	P
Measure Equipment and Installation (Incremental Participant Cost)	$	–	M

Summary of Cost-Effectiveness Results					
Test		**Benefit**		**Cost**	**Ratio**
UC Test	$	9,054,951	$	3,375,192	2.68
TRC Test		15,211,587		3,375,192	4.51
RIM Test		9,054,951		15,670,250	0.58
PCT		N/A		N/A	N/A

Net Benefit Inputs (NPV)				Ref
Resource Savings				
2018 Annual Gross Energy (kWh)	19,333,668			
NPV Cumulative Energy (kWh)	153,251,153	$	9,054,951	S
10% Credit (Northwest Power Act)			905,495	
Total Electric Savings		**$**	**9,960,446**	A
Participant Bill Savings				
NPV Cumulative Participant Bill Savings		$	12,295,058	B
Other Benefits				
Non-Utility Rebates/Incentives		$	–	NUI
NEBs		$	5,251,140	NEB

Benefits and Costs Included in Each Test		
UC Test	= S * NTG	= P
TRC Test	= (A + NUI + NEB) * NTG	= P
RIM Test	= S * NTG	= P + (B * NTG)
PCT	N/A	N/A

Assumptions for Levelized Calculations	
Discount Rate	
Nominal (WACC)	6.74%
Real ((1 + WACC) / (1 + Escalation)) – 1	4.44%
Escalation Rate	2.20%
Net-to-Gross (NTG)	100%
Minimum NTG Sensitivity	38%
Average Customer Segment Rate/kWh	$0.085
Line Losses	9.60%

Notes: Energy savings as reported by the *Resource Action Plan* for the 2017 to 2018 student kits.
NEBs for giveaway bulbs, welcome kit bulbs, and energy-saving kits include PV of periodic bulb (capital) replacement costs.
NEBs for student kit and energy-savings kit showerheads include the NPV of water and wastewater savings and, when applicable, therm savings.
No participant costs.

Year: 2018 **Program**: Educational Distributions **Market Segment**: Residential **Program Type**: Energy Efficiency

						Benefit			Cost			B/C Tests		
Measure Name	**Measure Descriptions**	**Replacing**	**Measure Unit**	**End Use**	**Measure Life (yrs)[a]**	**Gross Energy Savings (kWh/yr)[b]**	**NPV DSM Avoided Costs[c]**	**NEB**	**Incremental Participant Cost[d]**	**Incentive/ Unit**	**Admin Cost ($/kWh)[e]**	**UCT Ratio[f]**	**TRC Ratio[g]**	**Source**
General Purpose LED Give away	Efficient Technology: LED Lamp Type: General Purpose and Dimmable Lumen Category: 250 to 1049 lumens Space Type: ANY	Baseline bulb	Lamp	Residential-All-Lighting-All	13	8.20	$4.66	$3.53	–	–	$0.264	2.15	4.00	1
Student Energy Efficiency Kit (SEEK) Program	2017-2018 kit offering. Kits include: high-efficiency showerhead, shower timer, 3 LEDs, FilterTone alarm, digital thermometer, LED nightlight.	No kit	Kit	IPC_Student Kits	11	211.20	$119.46	$10.83	–	–	$0.165	3.43	4.08	2
Energy-Saving Kit—weighted average of non-electric and electric kit	9 - 250 to 1049 lumen General Purpose bulbs 1 - 1.75 gpm showerhead and thermostatic shower valve combo (electric kit only) 3 - faucet aerators (electric kit only)	No kit	Kit	IPC_Energy-savings Kits (weighted)	11	289.32	$148.37	$126.11	–	–	$0.181	2.83	5.52	3
Energy-Saving Kit (giveaway lightbulb only kit)	9 - 250 to 1049 lumen General Purpose bulbs	No kit	Kit	Residential-All-Lighting-All	13	73.80	$41.98	$31.79	–	–	$0.181	3.14	5.84	1
Welcome Kit (lightbulb only kit)	4 - 250 to 1049 lumen General Purpose bulbs	No kit	Kit	Residential-All-Lighting-All	13	32.80	$18.66	$14.13	–	–	$0.508	1.12	2.08	1
Home Energy Reports	Home energy report	No behavior change	Report	IPC_Home Energy Reports	1	124.74	$9.80	–	–	–	$0.052	1.51	1.66	4

[a] Average measure life.
[b] Estimated kWh savings measured at the customer's meter, excluding line losses.
[c] Sum of NPV of avoided cost. Based on end-use load shape, measure life, savings including line losses, and alternative costs by pricing period as provided in the 2015 IRP. TRC test benefit calculation includes 10% conservation adder from the Northwest Power Act.
[d] No participant costs.
[e] Average program administration and overhead costs to achieve each kWh of savings for each initiative. Calculated from 2018 actuals.
[f] UCT Ratio = (NPV DSM Avoided Costs) / ((Admin Cost/kWh * kWh Savings) + Incentives)
[g] TRC Ratio = ((NPV DSM Avoided Costs * 110%) + NEB / ((Admin Cost/kWh * kWh Savings) + Incentives + (Incremental Participant Cost - Incentives))
[1] RTF. ResLighting_Bulbs_v5_2.xlsm. 2017.
[2] Resource Action Programs. *2017–2018 Idaho Power Energy Wise Program Summary Report*. 2018.
[3] Lightbulbs - RTF. ResLighting_Bulbs_v5_2.xlsm. Showerhead - RTF. ResShowerheads_v3_1.xlsm. Faucet aerators - ETO. Measure Approval Document for Energy Saver Kits.
[4] Idaho Power HER Year 1 Final Program Summary. Aclara. 2018.

Energy Efficient Lighting

Segment: Residential
2018 Program Results

Cost Inputs			Ref
Program Administration	$	1,178,030	
Program Incentives		1,257,100	I
Total UC	$	**2,435,130**	P
Measure Equipment and Installation (Incremental Participant Cost)	$	2,099,009	M

Summary of Cost-Effectiveness Results					
Test		**Benefit**		**Cost**	**Ratio**
UC Test	$	11,376,534	$	2,435,130	4.67
TRC Test		21,769,861		3,277,039	6.64
RIM Test		11,376,534		19,319,949	0.59
PCT		27,397,594		2,099,009	13.05

Benefits and Costs Included in Each Test		
UC Test	= S * NTG	= P
TRC Test	= (A + NUI + NEB) * NTG	= P + ((M-I) * NTG)
RIM Test	= S * NTG	= P + (B * NTG)
PCT	= B + I + NUI + NEB	= M

Net Benefit Inputs (NPV)				Ref
Resource Savings				
2018 Annual Gross Energy (kWh)	18,856,933			
NPV Cumulative Energy (kWh)	201,790,823	$	11,376,534	S
10% Credit (Northwest Power Act)			1,137,653	
Total Electric Savings		**$**	**12,514,187**	A
Participant Bill Savings				
NPV Cumulative Participant Bill Savings		$	16,884,819	B
Other Benefits				
Non-Utility Rebates/Incentives		$	–	NUI
NEBs		$	9,255,674	NEB

Assumptions for Levelized Calculations	
Discount Rate	
Nominal (WACC)	6.74%
Real ((1 + WACC) / (1 + Escalation)) – 1	4.44%
Escalation Rate	2.20%
Net-to-Gross (NTG)	100%
Minimum NTG Sensitivity	22%
Average Customer Segment Rate/kWh	$0.085
Line Losses	9.60%

Note: NEBs include PV of periodic bulb (capital) replacement costs.

Year: 2018 **Program**: Energy Efficient Lighting **Market Segment**: Residential **Program Type**: Energy Efficiency

						Benefit			Cost			B/C Tests		
Measure Name	Measure Descriptions	Replacing	Measure Unit	End Use	Measure Life (yrs)[a]	Annual Gross Energy Savings (kWh/yr)[b]	NPV DSM Avoided Costs[c]	NEB	Gross Incremental Participant Cost[d]	Incentive/ Unit	Admin Cost ($/kWh)[e]	UCT Ratio[f]	TRC Ratio[g]	Source
Decorative and Mini-Base	Retail_LED_Decorative and Mini-Base_250 to 1049 lumens	Baseline bulb	Fixture	Residential All-Lighting	13	13.12	$7.46	$6.96	$-	$0.50	$0.062	5.68	11.55	1
General Purpose, Dimmable, and Three-Way	Retail_LED_General Purpose, Dimmable, and Three-Way_250 to 1049 lumens	Baseline bulb	Fixture	Residential All-Lighting	13	10.26	$5.84	$3.85	$1.27	$0.50	$0.062	5.14	5.39	1
General Purpose, Dimmable, and Three-Way	Retail_LED_General Purpose, Dimmable, and Three-Way_1050 to 1489 lumens	Baseline bulb	Fixture	Residential All-Lighting	13	18.08	$10.28	$6.42	$4.66	$0.50	$0.062	6.34	3.07	1
General Purpose, Dimmable, and Three-Way	Retail_LED_General Purpose, Dimmable, and Three-Way_1490 to 2600 lumens	Baseline bulb	Fixture	Residential All-Lighting	13	10.50	$5.97	$4.39	$4.01	$0.50	$0.062	5.19	2.35	1
Globe	Retail_LED_Globe_250 to 1049 lumens	Baseline bulb	Fixture	Residential All-Lighting	13	12.14	$6.91	$6.85	$2.88	$0.50	$0.062	5.51	3.98	1
Globe	Retail_LED_Globe_1050 to 1489 lumens	Baseline bulb	Fixture	Residential All-Lighting	13	14.58	$8.29	$6.32	$3.10	$0.50	$0.062	5.91	3.86	1
Globe	Retail_LED_Globe_1490 to 2600 lumens	Baseline bulb	Fixture	Residential All-Lighting	13	14.01	$7.97	$4.50	$2.94	$0.50	$0.062	5.82	3.48	1
Reflectors and Outdoor	Retail_LED_Reflectors and Outdoor_250 to 1049 lumens	Baseline bulb	Fixture	Residential All-Lighting	13	23.52	$13.38	$12.74	$1.12	$2.00	$0.062	3.87	10.65	1
Reflectors and Outdoor	Retail_LED_Reflectors and Outdoor_1050 to 1489 lumens	Baseline bulb	Fixture	Residential All-Lighting	13	21.13	$12.02	$16.70	$3.68	$2.00	$0.062	3.63	6.00	1
Reflectors and Outdoor	Retail_LED_Reflectors and Outdoor_1490 to 2600 lumens	Baseline bulb	Fixture	Residential All-Lighting	13	72.12	$41.02	$72.05	$5.65	$5.00	$0.062	4.33	11.58	1
LED Fixture Retailer	LED Indoor Fixture	Baseline bulb	Fixture	Residential All-Lighting	20	23.64	$18.70	$18.15	$2.02	$1.80	$0.062	5.73	11.11	2
LED Fixture Retailer	LED Outdoor Fixture	Baseline bulb	Fixture	IPC Outdoor Lighting	20	27.39	$16.26	$11.81	$2.22	$2.91	$0.062	3.53	7.58	2

[a] Average measure life.
[b] Estimated kWh savings measured at the customer's meter, excluding line losses.
[c] Sum of NPV of avoided cost. Based on end-use load shape, measure life, savings including line losses, and alternative costs by pricing period as provided in the 2015 IRP. TRC test benefit calculation includes 10% conservation adder from the Northwest Power Act.
[d] Incremental participant cost prior to customer incentives.
[e] Average program administration and overhead costs to achieve each kWh of savings. Calculated from 2018 actuals.
[f] UCT Ratio = (NPV DSM Avoided Costs) / ((Admin Cost/kWh * kWh Savings) + Incentives)
[g] TRC Ratio = ((NPV DSM Avoided Costs * 110%) + NEB) / ((Admin Cost/kWh * kWh Savings) + Incentives + (Incremental Participant Cost - Incentives))
[1] RTF. ResLighting_Bulbs_v5_2.xlsm. 2017.
[2] RTF. ResLighting_Bulbs_v5_2.xlsm. 2017. Weighted average of actual fixture sales.

Energy House Calls

Segment: Residential
2018 Program Results

Cost Inputs			Ref
Program Administration	$	160,777	
Program Incentives		–	I
Total UC	**$**	**160,777**	P
Measure Equipment and Installation (Incremental Participant Cost)	$	–	M

Summary of Cost-Effectiveness Results					
Test		**Benefit**		**Cost**	**Ratio**
UC Test	$	220,273	$	160,777	1.37
TRC Test		279,613		160,777	1.74
RIM Test		220,273		529,424	0.42
PCT		N/A		N/A	N/A

Net Benefit Inputs (NPV)				Ref
Resource Savings				
2018 Annual Gross Energy (kWh)	374,484			
NPV Cumulative Energy (kWh)	4,336,878	$	220,273	S
10% Credit (Northwest Power Act)			22,027	
Total Electric Savings		**$**	**242,300**	A
Participant Bill Savings				
NPV Cumulative Participant Bill Savings		$	368,647	B
Other Benefits				
Non-Utility Rebates/Incentives		$	–	NUI
NEBs		$	37,313	NEB

Benefits and Costs Included in Each Test		
UC Test	= S * NTG	= P
TRC Test	= (A + NUI + NEB) * NTG	= P
RIM Test	= S * NTG	= P + (B * NTG)
PCT	N/A	N/A

Assumptions for Levelized Calculations	
Discount Rate	
Nominal (WACC)	6.74%
Real ((1 + WACC) / (1 + Escalation)) – 1	4.44%
Escalation Rate	2.20%
Net-to-Gross (NTG)	100%
Minimum NTG Sensitivity	73%
Average Customer Segment Rate/kWh	$0.085
Line Losses	9.60%

Notes: NEBs include PV of periodic bulb (capital) replacement costs for direct-install LED bulbs.
NEBs for showerheads include the NPV of water and wastewater savings.
No participant costs.

Year: 2018 **Program**: Energy House Calls **Market Segment**: Residential **Program Type**: Energy Efficiency

						Benefit			Cost			B/C Tests		
Measure Name	Measure Descriptions	Replacing	Measure Unit	End Use	Measure Life (yrs)[a]	Annual Gross Energy Savings (kWh/yr)[b]	NPV DSM Avoided Costs[c]	NEB	Gross Incremental Participant Cost[d]	Incentive/ Unit	Admin Cost ($/kWh)[e]	UCT Ratio[f]	TRC Ratio[g]	Source
PTCS Duct Sealing	Manufactured Home Prescriptive Duct Sealing - Electric FAF - Heating Zone 1	Pre-existing duct leakage	Home	Residential-Manufactured Home Idaho -Heating-All	18	973.00	$577.05	–	–	–	$0.429	1.38	1.52	1
PTCS Duct Sealing	Manufactured Home Prescriptive Duct Sealing - Electric FAF - Heating Zone 2 or 3	Pre-existing duct leakage	Home	Residential-Manufactured Home Idaho -Heating-All	18	1,248.00	$740.14	–	–	–	$0.429	1.38	1.52	1
PTCS Duct Sealing	Manufactured Home Prescriptive Duct Sealing - Heat Pump - Heating Zone 1	Pre-existing duct leakage	Home	Residential-Manufactured Home Idaho -Heating-All	18	615.00	$364.73	–	–	–	$0.429	1.38	1.52	1
PTCS Duct Sealing	Manufactured Home Prescriptive Duct Sealing - Heat Pump - Heating Zone 2 or 3	Pre-existing duct leakage	Home	Residential-Manufactured Home Idaho -Heating-All	18	876.00	$519.52	–	–	–	$0.429	1.38	1.52	1
General Purpose LED Direct Install	Direct install - LED_General Purpose, Dimmable, and Three-Way_250 to 1049 lumens (Average High Use and Moderate Use)	baseline bulb	Lamp	Residential-All-Lighting-All	12	25.30	$13.49	$14.25	–	–	$0.429	1.24	2.68	2
Low-flow faucet aerator	1.0-1.5 gpm kitchen or bathroom faucet aerator	non- low flow faucet aerator	Aerator	Residential-All-Water Heating-Water Heater	10	105.83	$50.78	–	–	–	$0.429	1.12	1.23	3
Low-flow showerheads	Residential Showerhead Replacement_2_00gpm_Any Shower_ Electric Water Heating_Direct Install	any showerhead 2.2 gpm or higher	Showerhead	Residential-All-Water Heating-Water Heater	10	176.44	$84.65	$83.22	–	–	$0.429	1.12	2.33	4
Low-flow showerheads	Residential Showerhead Replacement_1_75gpm_Any Shower_ Electric Water Heating_Direct Install	any showerhead 2.2 gpm or higher	Showerhead	Residential-All-Water Heating-Water Heater	10	232.42	$111.51	$141.27	–	–	$0.429	1.12	2.65	4
Water heater pipe covers	Up to 6 ft	No existing coverage	Pipe wrap	Residential-All-Water Heating-Water Heater	10	127.14	$61.00	–	–	–	$0.429	1.12	1.23	3

[a] Average measure life.
[b] Estimated kWh savings measured at the customer's meter, excluding line losses.
[c] Sum of NPV of avoided cost. Based on end-use load shape, measure life, savings including line losses, and alternative costs by pricing period as provided in the 2015 IRP. TRC test benefit calculation includes 10% conservation adder from the Northwest Power Act.
[d] No participant costs.
[e] Average program administration and overhead costs to achieve each kWh of savings. Calculated from 2018 actuals.
[f] UCT Ratio = (NPV DSM Avoided Costs) / ((Admin Cost/kWh * kWh Savings) + Incentives)
[g] TRC Ratio = ((NPV DSM Avoided Costs * 110%) + NEB) / ((Admin Cost/kWh * kWh Savings) + Incentives + (Incremental Participant Cost - Incentives))
[1] RTF. ResMHHeatingCoolingPrescriptiveDuctSeal_v2_0.xlsm. 2015.
[2] RTF. ResLighting_Bulbs_v5_2.xlsm. 2017.
[3] AEG. Potential Study. 2016.
[4] RTF. Showerheads_v3_1.xlsm. 2016.

Heating & Cooling Efficiency Program

Segment: Residential
2018 Program Results

Cost Inputs			Ref
Program Administration	$	277,846	
Program Incentives		307,365	I
Total UC	**$**	**585,211**	P
Measure Equipment and Installation (Incremental Participant Cost)	$	1,408,772	M

Summary of Cost-Effectiveness Results					
Test		**Benefit**		**Cost**	**Ratio**
UC Test	$	965,305	$	585,211	1.65
TRC Test		1,406,893		1,686,618	0.83
RIM Test		965,305		2,049,285	0.47
PCT		2,116,497		1,408,772	1.50

Net Benefit Inputs (NPV)				Ref
Resource Savings				
2018 Annual Gross Energy (kWh)	1,556,065			
NPV Cumulative Energy (kWh)	17,358,692	$	965,305	S
10% Credit (Northwest Power Act)			96,531	
Total Electric Savings		**$**	**1,061,836**	A
Participant Bill Savings				
NPV Cumulative Participant Bill Savings		$	1,464,074	B
Other Benefits				
Non-Utility Rebates/Incentives		$	–	NUI
NEBs		$	345,057	NEB

Benefits and Costs Included in Each Test		
UC Test	= S * NTG	= P
TRC Test	= (A + NUI + NEB) * NTG	= P + ((M-I) * NTG)
RIM Test	= S * NTG	= P + (B * NTG)
PCT	= B + I + NUI + NEB	= M

Assumptions for Levelized Calculations	
Discount Rate	
Nominal (WACC)	6.74%
Real ((1 + WACC) / (1 + Escalation)) – 1	4.44%
Escalation Rate	2.20%
Net-to-Gross (NTG)	100%
Minimum NTG Sensitivity	188%
Average Customer Segment Rate/kWh	$0.085
Line Losses	9.60%

Note: NEBs include NPV of RTF values for annual operation and maintenance (O&M) savings and monetized comfort savings.

Year: 2018 **Program**: Heating & Cooling Efficiency Program **Market Segment**: Residential **Program Type**: Energy Efficiency

						Benefit			Cost			B/C Tests		
Measure Name	Measure Descriptions	Replacing	Measure Unit	End Use	Measure Life (yrs)[a]	Annual Gross Energy Savings (kWh/yr)[b]	NPV DSM Avoided Costs[c]	NEB	Gross Incremental Participant Cost[d]	Incentive/ Unit	Admin Cost ($/kWh)[e]	UCT Ratio[f]	TRC Ratio[g]	Source
Heat Pump Conversion	Existing Single Family and Manufactured Home HVAC Conversion to Heat Pump with Commissioning and Sizing (Heating & Cooling Zone Weighted Average)	Conversion to high efficiency heat pump	Unit	Residential-All-Heating-Air-Source Heat Pump	15	5,657.51	$3,457.56	$1,156.00	$3,798.18	$800.00	$0.179	1.91	1.03	1, 2, 3, 4
Heat Pump Upgrade	Existing Single Family and Manufactured Home HVAC Heat Pump Upgrade (Heating & Cooling Zone Weighted Average)	Heat pump to heat pump upgrade	Unit	Residential-All-Heating-Air-Source Heat Pump	15	883.56	$539.98	$17.00	$256.12	$250.00	$0.179	1.32	1.47	1, 2, 3, 4
Heat Pump Upgrade	New Construction Single Family and Manufactured Home HVAC Heat Pump Upgrade (Heating & Cooling Zone Weighted Average)	Heat pump to heat pump upgrade	Unit	Residential-All-Heating-Air-Source Heat Pump	15	936.33	$572.23	$14.87	$256.12	$250.00	$0.179	1.37	1.52	1, 2, 3, 4
Open Loop Heat Pump	Open loop water source heat pump for existing homes - 14.00 EER 3.5 COP (Heating & Cooling Zone Weighted Average)	Electric resistance/Oil Propane	Unit	Residential-All-Heating-Air-Source Heat Pump	20	8,730.00	$6,642.13	–	$9,086.46	$1,000.00	$0.179	2.59	0.69	5, 6
Open Loop Heat Pump	Open loop water source heat pump for new construction - 14.00 EER 3.5 COP (Heating & Cooling Zone Weighted Average)	Electric resistance/Oil Propane	Unit	Residential-All-Heating-Air-Source Heat Pump	20	9,538.17	$7,257.02	–	$9,655.65	$1,000.00	$0.179	2.68	0.70	5, 6
Open Loop Heat Pump	Open loop water source heat pump - heat pump to open loop (Heating & Cooling Zone Weighted Average)	Electric resistance/Oil Propane	Unit	Residential-All-Heating-Air-Source Heat Pump	20	9,095.00	$6,919.84	–	$9,095.00	$1,000.00	$0.179	2.63	0.71	5, 6
Ductless Heat Pump	Zonal to DHP. (Heating & Cooling Zone Weighted Average)	Zonal Electric	Unit	Residential-All-Heating-Air-Source Heat Pump	15	2,333.40	$1,426.05	$1,105.30	$3,557.20	$750.00	$0.179	1.22	0.67	1, 5
Heat Pump Water Heater	Weighted average of tier 2 and tier 3, heating and cooling zone, and indoor, basement, garage install location.	Electric water heater	Unit	Residential-All-Water Heating-Heat Pump Water Heater	13	1,649.11	$908.72	$(59.43)	$940.74	$300.00	$0.179	1.53	0.76	7
Evaporative Cooler	Evaporative Cooler	Central Air Conditioning	Unit	Residential-Single Family Idaho-Cooling-All	12	406.62	$575.08	–	$237.91	$150.00	$0.179	2.58	2.04	8
Prescriptive Duct Sealing	Duct Tightness - PTCS Duct Sealing - Average Heating System. Weighted average of Heating Zones 1-3.	Pre-existing duct leakage	Unit	Residential-Single Family Idaho -Heating-All	20	1,037.47	$689.27	–	$656.05	$350.00	$0.179	1.29	0.90	9

						Benefit			Cost			B/C Tests		
Measure Name	Measure Descriptions	Replacing	Measure Unit	End Use	Measure Life (yrs)[a]	Annual Gross Energy Savings (kWh/yr)[b]	NPV DSM Avoided Costs[c]	NEB	Gross Incremental Participant Cost[d]	Incentive/ Unit	Admin Cost ($/kWh)[e]	UCT Ratio[f]	TRC Ratio[g]	Source
Electronically Commutated Motor (ECM) Blower Motor	ECM Blower Motor	permanent split capacitor (PSC) motor	Unit	IPC_Whole House Fan	18	2,098.55	$1,441.61	–	$300.00	$50.00	$0.179	3.39	2.35	10
Whole-House Fan	Whole-House Fan	Displaced forced air dx cooling	Unit	Residential-Single Family Idaho-Cooling-All	18	445.60	$832.11	–	$700.00	$200.00	$0.179	2.97	1.17	10
Smart Thermostat	Smart Thermostat	non wi-fi enabled thermostat/no thermostat	Unit	Residential-Single Family Idaho -Heating-All	5	680.54	$137.74	–	$341.94	$75.00	$0.179	0.70	0.33	11, 12

[a] Average measure life.
[b] Estimated kWh savings measured at the customer's meter, excluding line losses.
[c] Sum of NPV of avoided cost. Based on end-use load shape, measure life, savings including line losses, and alternative costs by pricing period as provided in the 2015 IRP. TRC test benefit calculation includes 10% conservation adder from the Northwest Power Act.
[d] Incremental participant cost prior to customer incentives.
[e] Average program administration and overhead costs to achieve each kWh of savings. Calculated from 2018 actuals.
[f] UCT Ratio = (NPV DSM Avoided Costs) / ((Admin Cost/kWh * kWh Savings) + Incentives)
[g] TRC Ratio = ((NPV DSM Avoided Costs * 110%) + NEB) / ((Admin Cost/kWh * kWh Savings) + Incentives + (Incremental Participant Cost - Incentives))
[1] RTF. ResSFExistingHVAC_v4_1.xlsx. Weighted average of 2018 participants in heating and cooling zones 1-3.
[2] RTF. ResHeatingCoolingCommissioningControlsSizingSF_v3_6.xlsm. Weighted average of 2018 participants in heating and cooling zones 1-3.
[3] RTF. ResMHExistingHVAC_v3_4.xlsx. Weighted average of 2018 participants in heating and cooling zones 1-3.
[4] RTF. ResMHHeatingCoolingCommissioningControlsSizing_v3_4.xlsx. Weighted average of 2018 participants in heating and cooling zones 1-3.
[5] Measure not cost-effective.
[6] RTF. ResGSHP_v2_6. 2016. Weighted average of 2018 participants in heating and cooling zones 1-3.
[7] RTF. ResHPWH_v3_v.xlsm.2017. Measure cost-effective without inclusion of admin costs.
[8] AEG. Potential Study. 2016.
[9] RTF. ResSFDuctSealing_v5_1.xlsm. 2018. Measure would be cost-effective without inclusion of admin costs.
[10] Idaho Power engineering calculations based on Integrated Design Lab inputs. 2015.
[11] RTF. ResConnectedTstats_v1.1.xlsm.
[12] Measure not cost-effective. Measure is being piloted and will be monitored in 2019.

Multifamily Energy Savings Program

Segment: Residential
2018 Program Results

Cost Inputs				Ref
Program Administration		$	205,131	
Program Incentives			–	I
Total UC		**$**	**205,131**	P
Measure Equipment and Installation (Incremental Participant Cost)		$	–	M

Net Benefit Inputs (NPV)				Ref
Resource Savings				
2018 Annual Gross Energy (kWh)	655,953			
NPV Cumulative Energy (kWh)	5,999,280	$	328,520	S
10% Credit (Northwest Power Act)			32,852	
Total Electric Savings		**$**	361,372	A
Participant Bill Savings				
NPV Cumulative Participant Bill Savings		$	489,695	B
Other Benefits				
Non-Utility Rebates/Incentives		$	–	NUI
NEBs		$	253,989	NEB

Summary of Cost-Effectiveness Results					
Test		**Benefit**		**Cost**	**Ratio**
UC Test	$	328,520	$	205,131	1.60
TRC Test		615,361		205,131	3.00
RIM Test		328,520		694,827	0.47
PCT		N/A		N/A	N/A

Benefits and Costs Included in Each Test		
UC Test	= S * NTG	= P
TRC Test	= (A + NUI + NEB) * NTG	= P
RIM Test	= S * NTG	= P + (B * NTG)
PCT	N/A	N/A

Assumptions for Levelized Calculations	
Discount Rate	
Nominal (WACC)	6.74%
Real ((1 + WACC) / (1 + Escalation)) – 1	4.44%
Escalation Rate	2.20%
Net-to-Gross (NTG)	100%
Minimum NTG Sensitivity	63%
Average Customer Segment Rate/kWh	$0.085
Line Losses	9.60%

Notes: NEBs include PV of periodic bulb (capital) replacement costs for direct-install LED lightbulbs.
NEBS for showerheads include the NPV of water and waste water savings.
No participant costs.

Year: 2018 **Program**: Multifamily Energy Savings Program **Market Segment**: Residential **Program Type**: Energy Efficiency

						Benefit			Cost			B/C Tests		
Measure Name	**Measure Descriptions**	**Replacing**	**Measure Unit**	**End Use**	**Measure Life (yrs)[a]**	**Annual Gross Energy Savings (kWh/yr)[b]**	**NPV DSM Avoided Costs[c]**	**NEB**	**Gross Incremental Participant Cost[d]**	**Incentive/ Unit**	**Admin Cost ($/kWh)[e]**	**UCT Ratio[f]**	**TRC Ratio[g]**	**Source**
General Purpose LED Direct Install	Efficient Technology: LED Lamp Type: General Purpose and Dimmable Lumen Category: 250 to 1049 lumens Space Type: Average of Moderate and High-Use Interior	Baseline bulb	Lamp	Residential-All-Lighting-All	12	25.30	$13.49	$6.75	–	–	$0.313	1.70	2.73	1
General Purpose LED Direct Install	Efficient Technology: LED Lamp Type: General Purpose and Dimmable Lumen Category: 250 to 1049 lumens Space Type: Exterior	Baseline bulb	Lamp	IPC_ Outdoor Lighting	12	43.40	$16.76	$9.07	–	–	$0.313	1.23	2.02	1
General Purpose LED Direct Install	Efficient Technology: LED Lamp Type: General Purpose and Dimmable Lumen Category: 1490 to 2600 lumens Space Type: Exterior	Baseline bulb	Lamp	IPC_ Outdoor Lighting	12	60.50	$23.36	$12.80	–	–	$0.313	1.23	2.03	1
Reflector LED Direct Install	Efficient Technology: LED Lamp Type: Reflectors and Outdoor Lumen Category: 250 to 1049 lumens Space Type: High-use Interior	Baseline bulb	Lamp	Residential-All-Lighting-All	12	60.60	$32.30	$24.19	–	–	$0.313	1.70	3.15	1
Reflector LED Direct Install	Efficient Technology: LED Lamp Type: Reflectors and Outdoor Lumen Category: 250 to 1049 lumens Space Type: Exterior	Baseline bulb	Lamp	IPC_ Outdoor Lighting	12	76.00	$29.35	$24.19	–	–	$0.313	1.23	2.37	1
Globe LED Direct Install	Efficient Technology: LED Lamp Type: Globe Lumen Category: 250 to 1049 lumens Space Type: Moderate Use Interior	Baseline bulb	Lamp	Residential-All-Lighting-All	12	15.90	$8.48	$6.65	–	–	$0.313	1.70	3.21	1
Decorative LED Direct Install	Efficient Technology: LED Lamp Type: Decorative or Minibase Lumen Category: 250 to 1049 lumens Space Type: Average of Moderate and High Use Interior	Baseline bulb	Lamp	Residential-All-Lighting-All	12	22.35	$11.91	$8.77	–	–	$0.313	1.70	3.13	1
Low-flow faucet aerator	1.0-1.5 gpm kitchen or bathroom faucet aerator	Non-low-flow faucet aerator	Aerator	Residential-All-Water Heating-Water Heater	10	56.20	$26.96	–	–	–	$0.313	1.53	1.69	2

						Benefit			Cost			B/C Tests		
Measure Name	Measure Descriptions	Replacing	Measure Unit	End Use	Measure Life (yrs)[a]	Annual Gross Energy Savings (kWh/yr)[b]	NPV DSM Avoided Costs[c]	NEB	Gross Incremental Participant Cost[d]	Incentive/ Unit	Admin Cost ($/kWh)[e]	UCT Ratio[f]	TRC Ratio[g]	Source
Low-flow showerheads and thermostatic shower valve combination unit	Residential_Direct install_Valve and 1.75 gpm showerhead_Electric resistance DHW	Any showerhead 2.2 gpm or higher	Showerhead	Residential-All-Water Heating-Water Heater	10	266.64	$127.93	$245.74			$0.313	1.53	4.63	3
Low-flow showerheads	Residential Showerhead Replacement_2_00gpm_ Any Shower_ Electric Water Heating_Direct Install	Any showerhead 2.2 gpm or higher	Showerhead	Residential-All-Water Heating-Water Heater	10	102.15	$49.01	$57.26	–	–	$0.313	1.53	3.48	4
Water heater pipe covers	up to 6 feet	No existing coverage	Pipe wrap	Residential-All-Water Heating-Water Heater	10	80.69	$38.71	–	–	–	$0.313	1.53	1.69	2

[a] Average measure life.
[b] Estimated kWh savings measured at the customer's meter, excluding line losses.
[c] Sum of NPV of avoided cost. Based on end-use load shape, measure life, savings including line losses, and alternative costs by pricing period as provided in the 2015 IRP. TRC test benefit calculation includes 10% conservation adder from the Northwest Power Act.
[d] No participant costs.
[e] Average program administration and overhead costs to achieve each kWh of savings. Calculated from 2018 actuals.
[f] UCT Ratio = (NPV DSM Avoided Costs) / ((Admin Cost/kWh * kWh Savings) + Incentives)
[g] TRC Ratio = ((NPV DSM Avoided Costs * 110%) + NEB) / ((Admin Cost/kWh * kWh Savings) + Incentives + (Incremental Participant Cost - Incentives))
[1] RTF. ResLighting_Bulbs_v5_2.xlsm. 2017.
[2] AEG. Potential Study. 2016.
[3] RTF. Showerheads_v3.1.xlsm. 2016.
[4] RTF. ResThermostaicShowerRestrictionValve_v1_3.xlsm. 2016.

Rebate Advantage

Segment: Residential
2018 Program Results

Cost Inputs			Ref
Program Administration	$	40,483	
Program Incentives		107,000	I
Total UC	**$**	**147,483**	P
Measure Equipment and Installation (Incremental Participant Cost)	$	314,631	M

Summary of Cost-Effectiveness Results					
Test		**Benefit**		**Cost**	**Ratio**
UC Test	$	284,973	$	147,483	1.93
TRC Test		383,338		355,115	1.08
RIM Test		284,973		627,397	0.45
PCT		656,782		314,631	2.09

Net Benefit Inputs (NPV)				Ref
Resource Savings				
2018 Annual Gross Energy (kWh)	284,559			
NPV Cumulative Energy (kWh)	4,821,480	$	284,973	S
10% Credit (Northwest Power Act)			28,497	
Total Electric Savings		**$**	**313,470**	A
Participant Bill Savings				
NPV Cumulative Participant Bill Savings		$	479,914	B
Other Benefits				
Non-Utility Rebates/Incentives		$	–	NUI
NEBs		$	69,869	NEB

Benefits and Costs Included in Each Test		
UC Test	= S * NTG	= P
TRC Test	= (A + NUI + NEB) * NTG	= P + ((M-I) * NTG)
RIM Test	= S * NTG	= P + (B * NTG)
PCT	= B + I + NUI + NEB	= M

Assumptions for Levelized Calculations	
Discount Rate	
Nominal (WACC)	6.74%
Real ((1 + WACC) / (1 + Escalation)) – 1	4.44%
Escalation Rate	2.20%
Net-to-Gross (NTG)	100%
Minimum NTG Sensitivity	84%
Average Customer Segment Rate/kWh	$0.085
Line Losses	9.60%

Year: 2018 **Program**: Rebate Advantage **Market Segment**: Residential **Program Type**: Energy Efficiency

						Benefit			Cost			B/C Tests		
Measure Name	Measure Descriptions	Replacing	Measure Unit	End Use	Measure Life (yrs)[a]	Annual Gross Energy Savings (kWh/yr)[b]	NPV DSM Avoided Costs[c]	NEB	Gross Incremental Participant Cost[d]	Incentive/ Unit	Admin Cost ($/kWh)[e]	UCT Ratio[f]	TRC Ratio[g]	Source
ENERGY STAR® manufactured home	Estar_electric_HZ1_CZ3	Manufactured home built to Housing and Urban Development (HUD) code.	Home	Residential-Manufactured Home Idaho -Heating-All	44	2,305.00	$2,289.73	$411.53	$2,588.21	$1,000.00	$0.142	1.73	1.01	1
ENERGY STAR manufactured home	Estar_electric_HZ2_CZ1	Manufactured home built to HUD code.	Home	Residential-Manufactured Home Idaho -Heating-All	45	3,312.00	$3,316.82	$1,232.83	$2,588.21	$1,000.00	$0.142	2.26	1.60	1
ENERGY STAR manufactured home	Estar_electric_HZ2_CZ2	Manufactured home built to HUD code.	Home	Residential-Manufactured Home Idaho -Heating-All	45	3,313.00	$3,317.82	$1,199.40	$2,588.21	$1,000.00	$0.142	2.26	1.59	1
ENERGY STAR manufactured home	Estar_electric_HZ2_CZ3	Manufactured home built to HUD code.	Home	Residential-Manufactured Home Idaho -Heating-All	45	3,315.00	$3,319.82	$1,232.83	$2,588.21	$1,000.00	$0.142	2.26	1.60	1
ENERGY STAR manufactured home	Estar_electric_HZ3_CZ1	Manufactured home built to HUD code.	Home	Residential-Manufactured Home Idaho -Heating-All	45	4,142.00	$4,148.02	$1,333.11	$2,588.21	$1,000.00	$0.142	2.61	1.86	1
EcoRated manufactured home	EcoRated_electric_HZ1_CZ3	Manufactured home built to HUD code.	Home	Residential-Manufactured Home Idaho -Heating-All	42	2,521.00	$2,460.80	$417.32	$2,848.07	$1,000.00	$0.142	1.81	0.97	1, 2

[a] Average measure life.
[b] Estimated kWh savings measured at the customer's meter, excluding line losses.
[c] Sum of NPV of avoided cost. Based on end-use load shape, measure life, savings including line losses, and alternative costs by pricing period as provided in the 2015 IRP. TRC test benefit includes 10% conservation adder from the Northwest Power Act.
[d] Incremental participant cost prior to customer incentives.
[e] Average program administration and overhead costs to achieve each kWh of savings. Calculated from 2018 actuals.
[f] UCT Ratio = (NPV DSM Avoided Costs) / ((Admin Cost/kWh * kWh Savings) + Incentives)
[g] TRC Ratio = ((NPV DSM Avoided Costs * 110%) + NEB) / ((Admin Cost/kWh * kWh Savings) + Incentives + (Incremental Participant Cost - Incentives))
[1] RTF. NewMHNewHomesandHVAC_v3_4.xlsm. 2017.
[2] Measure not cost-effective. Measure cost-effective without inclusion of admin costs.

Residential New Construction Pilot Program

Segment: Residential
2018 Program Results

Cost Inputs			Ref
Program Administration	$	81,912	
Program Incentives		319,000	I
Total UC	**$**	**400,912**	P
Measure Equipment and Installation (Incremental Participant Cost)	$	845,046	M

Summary of Cost-Effectiveness Results					
Test		**Benefit**		**Cost**	**Ratio**
UC Test	$	1,005,043	$	400,912	2.51
TRC Test		1,139,556		926,958	1.23
RIM Test		1,005,043		1,711,958	0.59
PCT		1,664,055		845,046	1.97

Net Benefit Inputs (NPV)				Ref
Resource Savings				
2018 Annual Gross Energy (kWh)	777,369			
NPV Cumulative Energy (kWh)	13,172,205	$	1,005,043	S
10% Credit (Northwest Power Act)			100,504	
Total Electric Savings		**$**	**1,105,547**	A
Participant Bill Savings				
NPV Cumulative Participant Savings		$	1,311,046	B
Other Benefits				
Non-Utility Rebates/Incentives		$	–	NUI
NEBs		$	34,009	NEB

Benefits and Costs Included in Each Test		
UC Test	= S * NTG	= P
TRC Test	= (A + NUI + NEB) * NTG	= P + ((M-I) * NTG)
RIM Test	= S * NTG	= P + (B * NTG)
PCT	= B + I + NUI + NEB	= M

Assumptions for Levelized Calculations	
Discount Rate	
Nominal (WACC)	6.74%
Real ((1 + WACC) / (1 + Escalation)) – 1	4.44%
Escalation Rate	2.20%
Net-to-Gross (NTG)	100%
Minimum NTG Sensitivity	65%
Average Customer Segment Rate/kWh	$0.085
Line Losses	9.60%

Notes: 2012 International Energy Conservation Code (IECC) with amendments adopted in Idaho in 2014.

Year: 2018 **Program**: Residential New Construction Pilot Program **Market Segment**: Residential **Program Type**: Energy Efficiency

						Benefit			Cost			B/C Tests		
Measure Name	Measure Descriptions	Replacing	Measure Unit	End Use	Measure Life (yrs)[a]	Annual Gross Energy Savings (kWh/yr)[b]	NPV DSM Avoided Costs[c]	NEB	Gross Incremental Participant Cost[d]	Incentive/ Unit	Admin Cost ($/kWh)[e]	UCT Ratio[f]	TRC Ratio[g]	Source
ENERGY STAR home	Multifamily Central Electric Heating Zone 1 Cooling Zone 3	Multi-family home built to IECC 2012 Code. Adopted 2014.	Home	Prog_Energy Star Homes NW	45	2,440.00	$3,154.62	$155.86	$2,010.64	$1,000.00	$0.105	2.51	1.60	1
Next Step Home	Next Step Home	Single family home built to International Energy Conservation Code 2009 Code. Adopted 2011.	Home	Residential-All-Heating-Air-Source Heat Pump	36	4,326.00	$4,606.63	–	$2,152.00	$1,500.00	$0.105	2.36	1.94	2

[a] Average measure life.
[b] Estimated kWh savings measured at the customer's meter, excluding line losses.
[c] Sum of NPV of avoided cost. Based on end-use load shape, measure life, savings including line losses, and alternative costs by pricing period as provided in the 2015 IRP. TRC test benefit calculation includes 10% conservation adder from the Northwest Power Act.
[d] Incremental participant cost prior to customer incentives.
[e] Average program administration and overhead costs to achieve each kWh of savings. Calculated from 2018 actuals.
[f] UCT Ratio = (NPV DSM Avoided Costs) / ((Admin Cost/kWh * kWh Savings) + Incentives)
[g] TRC Ratio = ((NPV DSM Avoided Costs * 110%) + NEB) / ((Admin Cost/kWh * kWh Savings) + Incentives + (Incremental Participant Cost - Incentives))
[1] RTF. ResNewConstructionNEEAMFHomesIDMTv1.3.xlsm. 2016.
[2] NEEA circuit rider code enforcement initiative, 2017 cost data.

Shade Tree Project

Segment: Residential
2018 Program Results

Cost Inputs			Ref
Program Administration	$	162,995	
Program Incentives		–	I
Total UC	**$**	**162,995**	P
Measure Equipment and Installation (Incremental Participant Cost)	$	–	M

Summary of Cost-Effectiveness Results					
Test		**Benefit**		**Cost**	**Ratio**
UC Test	$	115,028	$	162,995	0.71
TRC Test		130,233		162,995	0.80
RIM Test		115,028		203,574	0.57
PCT		N/A		N/A	N/A

Net Benefit Inputs (NPV)				Ref
Resource Savings				
2018 Annual Gross Energy (kWh) from 2013 and 2014 plantings	35,571			
Cumulative Energy (kWh) from 2018 plantings	1,560,005			
NPV Cumulative Energy (kWh)	702,067	$	115,028	S
10% Credit (Northwest Power Act)			11,503	
Total Electric Savings		**$**	**126,530**	A
Participant Bill Savings				
NPV Cumulative Participant Savings		$	40,579	B
Other Benefits				
Non-Utility Rebates/Incentives		$	–	NUI
NEBs		$	3,703	NEB

Benefits and Costs Included in Each Test		
UC Test	= S * NTG	= P
TRC Test	= (A + NUI + NEB) * NTG	= P
RIM Test	= S * NTG	= P + (B * NTG)
PCT	N/A	N/A

Assumptions for Levelized Calculations	
Discount Rate	
Nominal (WACC)	6.74%
Real ((1 + WACC) / (1 + Escalation)) – 1	4.44%
Escalation Rate	2.20%
Net-to-Gross (NTG)	100%
Minimum NTG Sensitivity	141%
Average Customer Segment Rate/kWh	$0.085
Line Losses	9.60%

Notes: Annual Report shows savings from the 2013 and 2014 planting years. Cost-effectiveness based on trees distributed in 2018.
NEBs include costs associated with increased home heating energy and benefits associated with air quality, storm water runoff, and carbon dioxide.

Simple Steps, Smart Savings™

Segment: Residential
2018 Program Results

Cost Inputs			Ref
Program Administration	$	51,127	
Program Incentives		39,357	I
Total UC	**$**	**90,484**	P
Measure Equipment and Installation (Incremental Participant Cost)	$	81,976	M

Summary of Cost-Effectiveness Results					
Test		**Benefit**		**Cost**	**Ratio**
UC Test	$	129,872	$	90,484	1.44
TRC Test		623,290		133,102	4.68
RIM Test		129,872		270,560	0.48
PCT		699,865		81,976	8.54

Net Benefit Inputs (NPV)				Ref
Resource Savings				
2018 Annual Gross Energy (kWh)	241,215			
NPV Cumulative Energy (kWh)	2,206,155	$	129,872	S
10% Credit (Northwest Power Act)			12,987	
Total Electric Savings		**$**	**142,859**	A
Participant Bill Savings				
NPV Cumulative Participant Bill Savings		$	180,077	B
Other Benefits				
Non-Utility Rebates/Incentives		$	2,970	NUI
NEBs		$	477,461	NEB

Benefits and Costs Included in Each Test		
UC Test	= S * NTG	= P
TRC Test	= (A + NUI + NEB) * NTG	= P + ((M-I) * NTG)
RIM Test	= S * NTG	= P + (B * NTG)
PCT	= B + I + NUI + NEB	= M

Assumptions for Levelized Calculations	
Discount Rate	
Nominal (WACC)	6.74%
Real ((1 + WACC) / (1 + Escalation)) – 1	4.44%
Escalation Rate	2.20%
Net-to-Gross (NTG)	100%
Minimum NTG Sensitivity	70%
Average Customer Segment Rate/kWh	$0.085
Line Losses	9.60%

Note: Non-utility incentives includes additional incentive customer received from retailers for clothes washer purchase.
NEBs include the NPV of water savings from low-flow showerheads and clothes washers.

Year: 2018 **Program**: Simple Steps, Smart Savings **Market Segment**: Residential **Program Type**: Energy Efficiency

						Benefit			Cost			B/C Tests		
Measure Name	Measure Descriptions	Replacing	Measure Unit	End Use	Measure Life (yrs)[a]	Annual Gross Energy Savings (kWh/yr)[b]	NPV Avoided Costs[c]	NEB	Gross Incremental Participant Cost[d]	Incentive/ Unit	Admin Cost ($/kWh)[e]	UCT Ratio[f]	TRC Ratio[g]	Source
Clothes Washer	ENERGY STAR® clothes washer—Any	Baseline clothes washers	Clothes washer	Residential-All-Appliances-Clothes Washer	14	101.12	$70.49	$199.26	$98.41	$25.00	$0.212	1.52	2.31	1, 2
Low-Flow Showerhead	Low-flow showerhead 2.0 gpm Any shower any water Heating Retail	Showerhead 2.2 gpm or higher	Showerhead	Residential-All-Water Heating-Water Heater	10	15.11	$7.25	$29.94	–	$2.00	$0.212	1.39	7.29	3
Low-Flow Showerhead	Low-flow showerhead 1.75 gpm Any shower any water Heating Retail	Showerhead 2.2 gpm or higher	Showerhead	Residential-All-Water Heating-Water Heater	10	41.27	$19.80	$84.62	–	$6.00	$0.212	1.34	7.21	3
Low-Flow Showerhead	Low-flow showerhead 1.5 gpm Any shower any water Heating Retail	Showerhead 2.2 gpm or higher	Showerhead	Residential-All-Water Heating-Water Heater	10	63.46	$30.45	$130.26	–	$6.00	$0.212	1.57	8.42	3

[a] Average measure life.
[b] Estimated kWh savings measured at the customer's meter, excluding line losses.
[c] Sum of NPV of avoided cost. Based on end-use load shape, measure life, savings including line losses, and alternative costs by pricing period as provided in the 2015 IRP. TRC test benefit calculation includes 10% conservation adder from the Northwest Power Act.
[d] Incremental participant cost prior to customer incentives.
[e] Average program administration and overhead costs to achieve each kWh of savings. Calculated from 2018 actuals.
[f] UCT Ratio = (NPV DSM Avoided Costs) / ((Admin Cost/kWh * kWh Savings) + Incentives)
[g] TRC Ratio = ((NPV DSM Avoided Costs * 110%) + NEB) / ((Admin Cost/kWh * kWh Savings) + Incentives + (Incremental Participant Cost - Incentives))
[1] BPA. UES_Measures_List.xlsx. 2017.
[2] NEBs from RTF. ResClothesWashers_v6_1.xlsm. 2016. Adjusted savings by changing Electric Water Heating saturation from 61% to 49% to match Idaho Power mix.
[3] RTF. Showerheads_v3.1.xlsm. 2016. Adjusted savings by changing Electric Water Heating saturation from 60% to 49% to match Idaho Power mix.

Weatherization Assistance for Qualified Customers

Segment: Residential
2018 Program Results

Cost Inputs			Ref
Program Administration	$	$183,907	
Community Action Partnership (CAP) Agency Payments		1,089,066	
Total Program Expenses/Total UC	**$**	**1,272,973**	P
Idaho Power Indirect Overhead Expense Allocation—3.017%	$	38,406	OH
Additional State Funding		546,518	M

Net Benefit Inputs (NPV)				Ref
Resource Savings				
2018 Annual Gross Energy (kWh)	649,505			
NPV Cumulative Energy (kWh)	9,977,880	$	558,685	S
10% Credit (Northwest Power Act)			55,869	
Total Electric Savings		**$**	**614,554**	A
Participant Bill Savings				
NPV Cumulative Participant Bill Savings		$	929,508	B
Other Benefits				
Non-Utility Rebates/Incentives		$	–	NUI
NEBs				
Health and Safety		$	150,364	
Repair			16,262	
Other			180,250	
NEBs Total		**$**	**346,876**	NEB

Summary of Cost-Effectiveness Results					
Test		**Benefit**		**Cost**	**Ratio**
UC Test	$	558,685	$	1,311,379	0.43
TRC Test		961,430		1,857,897	0.52
RIM Test		558,685		2,240,887	0.25
PCT		N/A		N/A	N/A

Benefits and Costs Included in Each Test		
UC Test	= S * NTG	= P + OH
TRC Test	= (A + NUI + NEB) * NTG	= P + OH + M
RIM Test	= S * NTG	= P + OH + (B * NTG)
PCT	N/A	N/A

Assumptions for Levelized Calculations	
Discount Rate	
Nominal (WACC)	6.74%
Real ((1 + WACC) / (1 + Escalation)) – 1	4.44%
Escalation Rate	2.20%
Net-to-Gross (NTG)	100%
Minimum NTG Sensitivity	234%
Average Customer Segment Rate/kWh	$0.085
Line Losses	9.60%

Notes: Savings from the billing analysis of the 2013–2014 weatherization projects.
Program cost-effectiveness incorporated IPUC staff recommendations from case GNR-E-12-01. Recommendations include: Claimed 100% of savings; increased NTG to 100%; added a 10% conservation preference adder; health, safety, and repair NEBs; and allocation of indirect overhead expenses.
No customer participant costs. Costs shown are from the DOE state weatherization assistance program.

Weatherization Solutions for Eligible Customers

Segment: Residential
2018 Program Results

Cost Inputs			Ref
Program Administration	$	154,724	
Weatherization LLC Payments		867,747	
Total Program Expenses/Total UC	**$**	**1,022,471**	P
Idaho Power Indirect Overhead Expense Allocation—3.017%	$	30,848	OH
Additional State Funding		–	M

Net Benefit Inputs (NPV)				Ref
Resource Savings				
2018 Annual Gross Energy (kWh)	571,741			
NPV Cumulative Energy (kWh)	7,944,760	$	394,661	S
10% Credit (Northwest Power Act)			39,466	
Total Electric Savings		**$**	**434,127**	A
Participant Bill Savings				
NPV Cumulative Participant Bill Savings		$	709,802	B
Other Benefits				
Non-Utility Rebates/Incentives		$	–	NUI
NEBs				
Health and Safety			49,287	
Repair			6,513	
Other			45,973	
NEBs Total		**$**	**101,773**	NEB

Summary of Cost-Effectiveness Results					
Test		**Benefit**		**Cost**	**Ratio**
UC Test	$	394,661	$	1,053,319	0.37
TRC Test		535,900		1,053,319	0.51
RIM Test		394,661		1,763,120	0.22
PCT		N/A		N/A	N/A

Benefits and Costs Included in Each Test		
UC Test	= S * NTG	= P +OH
TRC Test	= (A + NUI + NEB) * NTG	= P + OH + M
RIM Test	= S * NTG	= P + OH + (B * NTG)
PCT	N/A	N/A

Assumptions for Levelized Calculations	
Discount Rate	
Nominal (WACC)	6.74%
Real ((1 + WACC) / (1 + Escalation)) – 1	4.44%
Escalation Rate	2.20%
Net-to-Gross (NTG)	100%
Minimum NTG Sensitivity	266%
Average Customer Segment Rate/kWh	$0.085
Line Losses	9.60%

Notes: Savings from the billing analysis of the 2013–2014 weatherization projects.
Program cost-effectiveness incorporated IPUC staff recommendations from case GNR-E-12-01. Recommendations include: Claimed 100% of savings; increased NTG to 100%; added a 10% conservation preference adder; health, safety, and repair NEBs; and allocation of indirect overhead expenses.
No customer participant costs.

Commercial Energy-Saving Kits

Segment: Commercial
2018 Program Results

Cost Inputs			Ref
Program Administration	$	146,174	
Program Incentives		–	I
Total UC	**$**	**146,174**	P
Measure Equipment and Installation (Incremental Participant Cost)	$	–	M

Summary of Cost-Effectiveness Results					
Test		**Benefit**		**Cost**	**Ratio**
UC Test	$	227,826	$	146,174	1.56
TRC Test		365,660		146,174	2.50
RIM Test		227,826		350,566	0.65
PCT		N/A		N/A	N/A

Net Benefit Inputs (NPV)				Ref
Resource Savings				
2018 Annual Gross Energy (kWh)	442,170			
NPV Cumulative Energy (kWh)	3,783,321	$	227,826	S
10% Credit (Northwest Power Act)			22,783	
Total Electric Savings		**$**	**250,608**	A
Participant Bill Savings				
NPV Cumulative Participant Bill Savings		$	204,393	B
Other Benefits				
Non-Utility Rebates/Incentives		$	–	NUI
NEBs		$	115,052	NEB

Benefits and Costs Included in Each Test		
UC Test	= S * NTG	= P
TRC Test	= (A + NUI + NEB) * NTG	= P
RIM Test	= S * NTG	= P + (B * NTG)
PCT	N/A	N/A

Assumptions for Levelized Calculations	
Discount Rate	
Nominal (WACC)	6.74%
Real ((1 + WACC) / (1 + Escalation)) – 1	4.44%
Escalation Rate	2.20%
Net-to-Gross (NTG)	100%
Minimum NTG Sensitivity	64%
Average Customer Segment Rate/kWh	$0.057
Line Losses	9.60%

Notes: NEBs include PV of periodic bulb (capital) replacement costs for direct-install LED bulbs and water, waste water, and therm savings from water-saving devices.

Year: 2018 **Program**: Commercial Energy-Saving Kits **Market Segment**: Commercial **Program Type**: Energy Efficiency

						Benefit			Cost			B/C Tests		
Measure Name	Measure Descriptions	Replacing	Measure Unit	End Use	Measure Life (yrs)[a]	Annual Gross Energy Savings (kWh/yr)[b]	NPV Avoided Costs[c]	NEB	Gross Incremental Participant Cost[d]	Incentive/ Unit	Admin Cost ($/kWh)[e]	UCT Ratio[f]	TRC Ratio[g]	Source
Restaurant Commercial Kit	3-9W LEDs, 2-bathroom aerators, 2-kitchen aerators, 2-exit sign retrofit, 1-pre-rinse spray valve.		kit	IPC_Commercial Kit Restaurant	8	710.15	$284.86	$321.93	–	–	$0.331	1.21	2.70	1
Retail Commercial Kit	2-9W LEDs, 2-8W LED BR30s, 1-bathroom aerator, 2-exit sign retrofit		kit	IPC_Commercial Kit Retail	11	240.56	$125.51	$6.90	–	–	$0.331	1.58	1.82	1
Office Commercial Kit	2-9W LEDs, 2-bathroom aerators, 1-kitchen aerator, 2-exit sign retrofit, 1-advance power strip		kit	IPC_Commercial Kit Office	11	174.04	$96.81	$8.89	–	–	$0.331	1.68	2.00	1

[a] Average measure life.
[b] Estimated kWh savings measured at the customer's meter, excluding line losses.
[c] Sum of NPV of avoided cost. Based on end-use load shape, measure life, savings including line losses, and alternative costs by pricing period as provided in the 2015 IRP. TRC test benefit calculation includes 10% conservation adder from the Northwest Power Act.
[d] Incremental participant cost prior to customer incentives.
[e] Average program administration and overhead costs to achieve each kWh of savings. Calculated from 2018 actuals.
[f] UCT Ratio = (NPV DSM Avoided Costs) / ((Admin Cost/kWh * kWh Savings) + Incentives)
[g] TRC Ratio = ((NPV DSM Avoided Costs * 110%) + NEB) / ((Admin Cost/kWh * kWh Savings) + Incentives + (Incremental Participant Cost - Incentives))
[1] Idaho Power analysis based on average hours of use by building type. Assume 40 percent of kits distributed to businesses with electric water heat.

Custom Projects

Segment: Industrial
2018 Program Results

Cost Inputs			Ref
Program Administration	$	2,243,750	
Program Incentives		6,564,762	I
Total UC	**$**	**8,808,512**	P
Measure Equipment and Installation (Incremental Participant Cost)	$	13,868,790	M

Summary of Cost-Effectiveness Results					
Test		**Benefit**		**Cost**	**Ratio**
UC Test	$	33,943,416	$	8,808,512	3.85
TRC Test		37,337,758		16,112,540	2.32
RIM Test		33,943,416		28,851,329	1.18
PCT		26,607,579		13,868,790	1.92

Net Benefit Inputs (NPV)				Ref
Resource Savings				
2018 Annual Gross Energy (kWh)	46,963,690			
NPV Cumulative Energy (kWh)	543,904,881	$	33,943,416	S
10% Credit (Northwest Power Act)			3,394,342	
Total Electric Savings		**$**	**37,337,758**	A
Participant Bill Savings				
NPV Cumulative Participant Savings		$	20,042,817	B
Other Benefits				
Non-Utility Rebates/Incentives		$	–	NUI
NEBs		$	–	NEB

Benefits and Costs Included in Each Test		
UC Test	= S * NTG	= P
TRC Test	= (A + NUI + NEB) * NTG	= P + ((M-I) * NTG)
RIM Test	= S * NTG	= P + (B * NTG)
PCT	= B + I + NUI + NEB	= M

Assumptions for Levelized Calculations	
Discount Rate	
Nominal (WACC)	6.74%
Real ((1 + WACC) / (1 + Escalation)) – 1	4.44%
Escalation Rate	2.20%
Net-to-Gross (NTG)	100%
Minimum NTG Sensitivity	30%
Average Customer Segment Rate/kWh	$0.037
Line Losses	9.60%

Notes: Energy savings are unique by project and are reviewed by Idaho Power engineering staff or third-party consultants. Each project must complete a certification inspection.
Green Rewind initiative is available to agricultural, commercial, and industrial customers. Commercial and industrial motor rewinds are paid under Custom Projects, but the savings are not included in the program cost-effectiveness.
Green Rewind savings are included in the sector cost-effectiveness.

Year: 2018 **Program**: Custom Projects—Green Motors **Market Segment**: Industrial **Program Type**: Energy Efficiency

						Benefit			Cost			B/C Tests		
Measure Name	**Measure Descriptions**	**Replacing**	**Measure Unit**	**End Use**	**Measure Life (yrs)[a]**	**Annual Gross Energy Savings (kWh/yr)[b]**	**NPV DSM Avoided Costs[c]**	**NEB**	**Gross Incremental Participant Cost[d]**	**Incentive/ Unit**	**Admin Cost ($/kWh)[e]**	**UCT Ratio[f]**	**TRC Ratio[g]**	**Source**
Green Motors Program Rewind: Motor size 15 HP	Green Motors Program Rewind: Motor size 15 HP	Standard rewind practice	Motor	MF_Motors	8	601.00	$258.58	–	$160.18	$30.00	$0.050	4.31	1.50	1
Green Motors Program Rewind: Motor size 20 HP	Green Motors Program Rewind: Motor size 20 HP	Standard rewind practice	Motor	MF_Motors	8	804.00	$345.93	–	$178.70	$40.00	$0.050	4.31	1.74	1
Green Motors Program Rewind: Motor size 25 HP	Green Motors Program Rewind: Motor size 25 HP	Standard rewind practice	Motor	MF_Motors	8	1,052.00	$452.63	–	$204.18	$50.00	$0.050	4.41	1.94	1
Green Motors Program Rewind: Motor size 30 HP	Green Motors Program Rewind: Motor size 30 HP	Standard rewind practice	Motor	MF_Motors	8	1,133.00	$487.48	–	$224.25	$60.00	$0.050	4.18	1.91	1
Green Motors Program Rewind: Motor size 40 HP	Green Motors Program Rewind: Motor size 40 HP	Standard rewind practice	Motor	MF_Motors	8	1,319.00	$567.51	–	$274.04	$80.00	$0.050	3.89	1.84	1
Green Motors Program Rewind: Motor size 50 HP	Green Motors Program Rewind: Motor size 50 HP	Standard rewind practice	Motor	MF_Motors	8	1,418.00	$610.10	–	$303.37	$100.00	$0.050	3.57	1.79	1
Green Motors Program Rewind: Motor size 60 HP	Green Motors Program Rewind: Motor size 60 HP	Standard rewind practice	Motor	MF_Motors	9	1,476.00	$700.73	–	$357.80	$120.00	$0.050	3.62	1.79	1
Green Motors Program Rewind: Motor size 75 HP	Green Motors Program Rewind: Motor size 75 HP	Standard rewind practice	Motor	MF_Motors	9	1,519.00	$721.15	–	$386.74	$150.00	$0.050	3.19	1.71	1
Green Motors Program Rewind: Motor size 100 HP	Green Motors Program Rewind: Motor size 100 HP	Standard rewind practice	Motor	MF_Motors	9	2,005.00	$951.88	–	$479.76	$200.00	$0.050	3.17	1.81	1
Green Motors Program Rewind: Motor size 125 HP	Green Motors Program Rewind: Motor size 125 HP	Standard rewind practice	Motor	MF_Motors	8	2,598.00	$1,117.80	–	$538.82	$250.00	$0.050	2.94	1.84	1
Green Motors Program Rewind: Motor size 150 HP	Green Motors Program Rewind: Motor size 150 HP	Standard rewind practice	Motor	MF_Motors	8	3,089.00	$1,329.06	–	$600.19	$300.00	$0.050	2.92	1.94	1
Green Motors Program Rewind: Motor size 200 HP	Green Motors Program Rewind: Motor size 200 HP	Standard rewind practice	Motor	MF_Motors	8	4,088.00	$1,758.88	–	$722.54	$400.00	$0.050	2.91	2.09	1
Green Motors Program Rewind: Motor size 250 HP	Green Motors Program Rewind: Motor size 250 HP	Standard rewind practice	Motor	MF_Motors	9	4,972.00	$2,360.46	–	$928.64	$500.00	$0.050	3.15	2.21	1
Green Motors Program Rewind: Motor size 300 HP	Green Motors Program Rewind: Motor size 300 HP	Standard rewind practice	Motor	MF_Motors	9	5,935.00	$2,817.65	–	$938.68	$600.00	$0.050	3.14	2.51	1
Green Motors Program Rewind: Motor size 350 HP	Green Motors Program Rewind: Motor size 350 HP	Standard rewind practice	Motor	MF_Motors	9	6,919.00	$3,284.80	–	$983.84	$700.00	$0.050	3.14	2.72	1

Measure Name	Measure Descriptions	Replacing	Measure Unit	End Use	Measure Life (yrs)[a]	Benefit: Annual Gross Energy Savings (kWh/yr)[b]	Benefit: NPV DSM Avoided Costs[c]	Benefit: NEB	Cost: Gross Incremental Participant Cost[d]	Cost: Incentive/ Unit	Cost: Admin Cost ($/kWh)[e]	B/C Tests: UCT Ratio[f]	B/C Tests: TRC Ratio[g]	Source
Green Motors Program Rewind: Motor size 400 HP	Green Motors Program Rewind: Motor size 400 HP	Standard rewind practice	Motor	MF_Motors	9	7,848.00	$3,725.84	–	$1,098.86	$800.00	$0.050	3.12	2.75	1
Green Motors Program Rewind: Motor size 450 HP	Green Motors Program Rewind: Motor size 450 HP	Standard rewind practice	Motor	MF_Motors	9	8,811.00	$4,183.03	–	$1,201.14	$900.00	$0.050	3.12	2.80	1
Green Motors Program Rewind: Motor size 500 HP	Green Motors Program Rewind: Motor size 500 HP	Standard rewind practice	Motor	MF_Motors	9	9,804.00	$4,654.46	–	$1,297.63	$1,000.00	$0.050	3.12	2.86	1
Green Motors Program Rewind: Motor size 600 HP	Green Motors Program Rewind: Motor size 600 HP	Standard rewind practice	Motor	MF_Motors	7	14,689.00	$5,633.99	–	$1,912.23	$1,200.00	$0.050	2.91	2.34	1
Green Motors Program Rewind: Motor size 700 HP	Green Motors Program Rewind: Motor size 700 HP	Standard rewind practice	Motor	MF_Motors	7	17,065.00	$6,545.31	–	$2,086.24	$1,400.00	$0.050	2.90	2.45	1
Green Motors Program Rewind: Motor size 800 HP	Green Motors Program Rewind: Motor size 800 HP	Standard rewind practice	Motor	MF_Motors	7	19,461.00	$7,464.30	–	$2,314.75	$1,600.00	$0.050	2.90	2.50	1
Green Motors Program Rewind: Motor size 900 HP	Green Motors Program Rewind: Motor size 900 HP	Standard rewind practice	Motor	MF_Motors	7	21,847.00	$8,379.46	–	$2,551.91	$1,800.00	$0.050	2.90	2.53	1
Green Motors Program Rewind: Motor size 1,500 HP	Green Motors Program Rewind: Motor size 1,500 HP	Standard rewind practice	Motor	MF_Motors	7	35,891.00	$13,766.06	–	$3,763.37	$3,000.00	$0.050	1.98	1.96	1

[a] Average measure life.
[b] Estimated kWh savings measured at the customer's meter, excluding line losses.
[c] Sum of NPV of avoided cost. Based on end-use load shape, measure life, savings including line losses, and alternative costs by pricing period as provided in the 2015 IRP. TRC test benefit calculation includes 10% conservation adder from the Northwest Power Act.
[d] Incremental participant cost prior to customer incentives.
[e] Average program administration and overhead costs to achieve each kWh of savings. Calculated from 2018 actuals.
[f] UCT Ratio = (NPV DSM Avoided Costs) / ((Admin Cost/kWh * kWh Savings) + Incentives)
[g] TRC Ratio = ((NPV DSM Avoided Costs * 110%) + NEB) / ((Admin Cost/kWh * kWh Savings) + Incentives + (Incremental Participant Cost - Incentives))
[1] RTF. IndGreenMotorsRewind_v2_3.xlsm. 2016.

New Construction

Segment: Commercial
2018 Program Results

Cost Inputs			Ref
Program Administration	$	346,419	
Program Incentives		1,723,226	I
Total UC	**$**	**2,069,645**	P
Measure Equipment and Installation (Incremental Participant Cost)	$	4,707,796	M

Summary of Cost-Effectiveness Results					
Test		**Benefit**		**Cost**	**Ratio**
UC Test	$	8,209,254	$	2,069,645	3.97
TRC Test		9,030,179		5,054,215	1.79
RIM Test		8,209,254		9,199,493	0.89
PCT		8,853,075		4,707,796	1.88

Net Benefit Inputs (NPV)				Ref
Resource Savings				
2018 Annual Gross Energy (kWh)	13,378,315			
NPV Cumulative Energy (kWh)	129,752,600	$	8,209,254	S
10% Credit (Northwest Power Act)			820,925	
Total Electric Savings		**$**	**9,030,179**	A
Participant Bill Savings				
NPV Cumulative Participant Bill Savings		$	7,129,849	B
Other Benefits				
Non-Utility Rebates/Incentives		$	–	NUI
NEBs		$	–	NEB

Benefits and Costs Included in Each Test		
UC Test	= S * NTG	= P
TRC Test	= (A + NUI + NEB) * NTG	= P + ((M-I) * NTG)
RIM Test	= S * NTG	= P + (B * NTG)
PCT	= B + I + NUI + NEB	= M

Assumptions for Levelized Calculations	
Discount Rate	
Nominal (WACC)	6.74%
Real ((1 + WACC) / (1 + Escalation)) – 1	4.44%
Escalation Rate	2.20%
Net-to-Gross (NTG)	100%
Minimum NTG Sensitivity	34%
Average Customer Segment Rate/kWh	$0.057
Line Losses	9.60%

Year: 2018 **Program**: New Construction **Market Segment**: Commercial **Program Type**: Energy Efficiency

						Benefit			Cost			B/C Tests		
Measure Name	Measure Descriptions	Replacing	Measure Unit	End Use	Measure Life (yrs)[a]	Annual Gross Energy Savings (kWh/yr)[b]	NPV DSM Avoided Costs[c]	NEB	Gross Incremental Participant Cost[d]	Incentive/ Unit	Admin Cost ($/kWh)[e]	UCT Ratio[f]	TRC Ratio[g]	Source
Lighting	Interior Light Load Reduction. Part A: 10-19.9% below code.	Code standards	ft²	Commercial-Miscellaneous-Interior Lighting-All	14	0.44	$0.31	–	$0.14	$0.10	$0.039	2.62	2.15	1
Lighting	Interior Light Load Reduction. Part B: 20-29.9% below code.	Code standards	ft²	Commercial-Miscellaneous-Interior Lighting-All	14	0.88	$0.61	–	$0.28	$0.20	$0.039	2.62	2.15	1
Lighting	Interior Light Load Reduction. Part C: Equal to or greater than 30% below code.	Code standards	ft²	Commercial-Miscellaneous-Interior Lighting-All	14	2.00	$1.39	–	$0.65	$0.30	$0.039	3.69	2.11	1
Lighting	Exterior Light Load Reduction. Minimum of 15% below code.	Code standards	kW	IPC_Outdoor Lighting	15	4,059.00	$1,900.12	–	$287.00	$200.00	$0.039	5.32	4.71	1
Lighting	Daylight Photo Controls	Code standards	ft²	Commercial-Miscellaneous-Interior Lighting-All	14	1.97	$1.37	–	$0.46	$0.25	$0.039	4.20	2.81	1
Lighting	Occupancy Sensors	Code standards	Sensor	Commercial-Miscellaneous-Interior Lighting-All	8	387.00	$172.00	–	$134.22	$25.00	$0.039	4.30	1.27	1
Lighting	High-Efficiency Exit Signs	Code standards	Sign	IPC_8760	16	28.00	$19.65	–	$10.83	$7.50	$0.039	2.29	1.81	1
A/C	Unitary Commercial A/C, Air Cooled (Cooling Mode). <= 5 tons. Split system & single package. Part A: Base to CEE Tier 1	Code standards	Tons	Commercial-Miscellaneous-Cooling-All	15	69.00	$74.97	–	$33.68	$30.00	$0.039	2.29	2.27	1
A/C	Unitary Commercial A/C, Air Cooled (Cooling Mode). <= 5 tons. Split system & single package. Part B: Base to CEE Tier 2	Code standards	Tons	Commercial-Miscellaneous-Cooling-All	15	108.00	$117.34	–	$60.30	$75.00	$0.039	1.48	2.00	1
Heat Pump	Heat Pumps, Air Cooled (Cooling Mode). <= 5 tons. Split system & single package. Part A: Base to CEE Tier 1	Code standards	Tons	Commercial-Miscellaneous-Cooling-All	15	69.00	$74.97	–	$153.00	$30.00	$0.039	2.29	0.53	1, 2
Heat Pump	Heat Pumps, Air Cooled (Cooling Mode). <= 5 tons. Split system & single package. Part B: Base to CEE Tier 2	Code standards	Tons	Commercial-Miscellaneous-Cooling-All	15	108.00	$117.34	–	$168.27	$75.00	$0.039	1.48	0.75	1, 2
VRF AC	Variable Refrigerant Flow Units. <= 64 tons. A/C. Part B: Base to CEE Tier 1	Code standards	Tons	Commercial-Miscellaneous-Cooling-All	15	82.50	$89.63	–	$69.24	$75.00	$0.039	1.15	1.36	1
VRF AC	Variable Refrigerant Flow Units. <= 5 tons. A/C. Part C: Base to CEE Tier 2	Code standards	Tons	Commercial-Miscellaneous-Cooling-All	15	118.00	$128.20	–	$181.50	$100.00	$0.039	1.23	0.76	1, 2

						Benefit			Cost			B/C Tests		
Measure Name	Measure Descriptions	Replacing	Measure Unit	End Use	Measure Life (yrs)[a]	Annual Gross Energy Savings (kWh/yr)[b]	NPV DSM Avoided Costs[c]	NEB	Gross Incremental Participant Cost[d]	Incentive/ Unit	Admin Cost ($/kWh)[e]	UCT Ratio[f]	TRC Ratio[g]	Source
VRF Heat Pump	Variable Refrigerant Flow Units. <= 64 tons. Heat Pump. Part B: Base to CEE Tier 1	Code standards	Tons	Commercial-Miscellaneous-Cooling-All	15	124.00	$134.72	–	$141.75	$75.00	$0.039	1.69	1.01	1
VRF Heat Pump	Variable Refrigerant Flow Units. <= 5 tons. Heat Pump. Part C: Base to CEE Tier 2	Code standards	Tons	Commercial-Miscellaneous-Cooling-All	15	160.00	$173.83	–	$165.50	$100.00	$0.039	1.64	1.11	1
A/C	Air-cooled chiller condenser, IPLV 14.0 EER or higher	Code standards	Tons	Commercial-Miscellaneous-Cooling-All	20	200.00	$264.26	–	$56.50	$80.00	$0.039	3.01	4.52	3
A/C	Water-cooled chiller electronically operated, reciprocating and positive displacement	Code standards	Tons	Commercial-Miscellaneous-Cooling-All	20	118.30	$156.31	–	$33.40	$40.00	$0.039	3.51	4.53	4
A/C	Airside economizer	Code standards	Ton of cooling	Commercial-Miscellaneous-Cooling-All	15	186.00	$202.08	–	$81.36	$75.00	$0.039	2.46	2.51	1
A/C	Direct evaporative cooler	Code standards	Tons	IPC_Evap Cooler	15	315.00	$453.69	–	$364.00	$200.00	$0.039	2.14	1.33	1
Building Shell	Reflective roof treatment	Code standards	ft$_2$ roof area	Commercial-Miscellaneous-Cooling-All	15	0.12	$0.13	–	$0.05	$0.05	$0.039	2.31	2.54	1
Controls	Energy Management System (EMS) controls. Part A: 1 strategy	Code standards	Tons of cooling	Commercial-Miscellaneous-Ventilation-All	15	226.00	$171.17	$15.02	$162.49	$60.00	$0.039	2.49	1.19	1
Controls	Energy Management System (EMS) controls. Part B: 2 strategies	Code standards	Tons of cooling	Commercial-Miscellaneous-Ventilation-All	15	408.00	$309.01	$20.03	$162.49	$70.00	$0.039	3.60	2.02	1
Controls	EMS controls. Part C: 3 strategies	Code standards	Tons of cooling	Commercial-Miscellaneous-Ventilation-All	15	511.00	$387.02	$32.55	$162.49	$80.00	$0.039	3.88	2.51	1
Controls	EMS controls. Part D: 4 strategies	Code standards	Tons of cooling	Commercial-Miscellaneous-Ventilation-All	15	568.00	$430.20	$52.58	$162.49	$90.00	$0.039	3.84	2.85	1
Controls	EMS controls. Part E: 5 strategies	Code standards	Tons of cooling	Commercial-Miscellaneous-Ventilation-All	15	618.00	$468.06	$52.58	$162.49	$100.00	$0.039	3.78	3.04	1
Controls	Guest room energy management system	Code standards	Ton	Commercial-Lodging-Ventilation-All	11	571.00	$309.68	–	$57.50	$50.00	$0.039	4.29	4.28	1
Controls	Part A. Variable speed drive on HVAC system applications: -chilled water pumps -condenser water pumps -cooling tower fans	Code standards	HP	Commercial-Miscellaneous-Ventilation-All	15	268.00	$202.98	–	$165.33	$60.00	$0.039	2.88	1.27	1

						Benefit			Cost			B/C Tests		
Measure Name	Measure Descriptions	Replacing	Measure Unit	End Use	Measure Life (yrs)[a]	Annual Gross Energy Savings (kWh/yr)[b]	NPV DSM Avoided Costs[c]	NEB	Gross Incremental Participant Cost[d]	Incentive/ Unit	Admin Cost ($/kWh)[e]	UCT Ratio[f]	TRC Ratio[g]	Source
Controls	Part B. Variable speed drive on HVAC system applications: -supply -return -outside air -make-up air -hot water pumps	Code standards	HP	Commercial-Miscellaneous-Ventilation-All	15	996.00	$754.36	–	$142.05	$100.00	$0.039	5.44	4.59	1
Variable Speed Controls	Part C: Variable speed drive on Potato/Onion Storage Shed Ventilation	No VFD	HP	IPC_Onion Potato VSD	10	1,993.00	$793.50	–	$264.00	$200.00	$0.039	2.86	2.56	1
Demand Controlled Kitchen Ventilation Exhaust Hood	Demand Controlled Kitchen Ventilation Exhaust Hood	Kitchen hood with constant speed ventilation motor	HP	Commercial-Restaurant-Ventilation-All	15	4,423.00	$3,334.31	–	$1,991.00	$200.00	$0.039	8.98	1.70	1
Appliances with Electric Water Heating	Efficient Laundry Machines (electric)	Code standards	Unit	Commercial-Lodging-Water Heating-All	10	994.00	$492.92	$1,267.61	$393.00	$125.00	$0.039	3.02	4.19	5
Appliances with Electric Water Heating	ENERGY STAR® undercounter (residential style) dishwasher	Code standards	Machine	Commercial-Restaurant-Water Heating-All	12	2,210.00	$1,368.33	$221.74	$232.00	$200.00	$0.039	4.79	5.44	6
Appliances with Electric Water Heating	ENERGY STAR commercial dishwasher	Code standards	Machine	Commercial-Restaurant-Water Heating-All	12	5,561.00	$3,443.11	$598.02	$3,978.00	$500.00	$0.039	4.81	1.05	6
Refrigeration	Refrigeration head pressure controls	Code standards	HP	Commercial-Miscellaneous-Refrigeration-All	16	225.00	$163.22	–	$166.60	$40.00	$0.039	3.35	1.02	1
Refrigeration	Refrigeration floating suction controls	Code standards	HP	Commercial-Miscellaneous-Refrigeration-All	16	77.00	$55.86	–	$53.75	$10.00	$0.039	4.30	1.08	1
Refrigeration	Efficient refrigeration condensers	Code standards	Tons of refrigeration	Commercial-Miscellaneous-Refrigeration-All	15	114.00	$78.69	–	$35.00	$20.00	$0.039	3.22	2.20	1
Strip Curtains	For walk-in freezers	No protective barrier	Curtain/Door	Commercial-Warehouse-Refrigeration-All	4	4,865.00	$1,055.28	–	$213.00	$150.00	$0.039	3.12	2.89	1
Strip Curtains	For walk-in refrigerators	No protective barrier	Curtain/Door	Commercial-Warehouse-Refrigeration-All	4	3,024.00	$655.94	–	$213.00	$150.00	$0.039	2.46	2.19	1
Automatic High-Speed Doors	Freezer to Refrigerator	manual or electric warehouse door	Door	Commercial-Warehouse-Refrigeration-All	8	101,222.00	$41,200.48	–	$11,650.00	$4,000.00	$0.039	5.20	2.91	1
Automatic High-Speed Doors	Freezer to Dock	manual or electric warehouse door	Door	Commercial-Warehouse-Refrigeration-All	8	140,093.00	$57,022.17	–	$11,650.00	$8,000.00	$0.039	4.25	3.67	1

						Benefit			Cost			B/C Tests		
Measure Name	Measure Descriptions	Replacing	Measure Unit	End Use	Measure Life (yrs)[a]	Annual Gross Energy Savings (kWh/yr)[b]	NPV DSM Avoided Costs[c]	NEB	Gross Incremental Participant Cost[d]	Incentive/ Unit	Admin Cost ($/kWh)[e]	UCT Ratio[f]	TRC Ratio[g]	Source
Smart Power Strips	Load-sensing, motion-sensing, or timer-controlled power strip	No existing load or motion-sensing, or timer-controlled power strip	Power strip	Commercial-Small Office-Office Equipment-All	4	118.00	$27.17	–	$33.00	$10.00	$0.039	1.86	0.80	1, 7
High-Volume, Low-Speed Fan	High-Volume, Low-Speed Fan	Standard high-speed fan	Fan	Commercial-Warehouse-Ventilation-All	15	16,733.00	$12,154.54	–	$3,185.00	$2,000.00	$0.039	4.59	3.49	1
Compressed Air	Air compressor VFD	No existing VFD	HP	Commercial-Miscellaneous-Miscellaneous-All	15	949.00	$692.49	–	$223.00	$150.00	$0.039	3.71	2.93	1
Compressed Air	No-Loss Condensate Drain	Open tube with ball valve	HP	Commercial-Miscellaneous-Miscellaneous-All	10	1,830.00	$971.37	–	$700.00	$300.00	$0.039	2.62	1.39	1
Compressed Air	Low Pressure Drop Filter	Standard filter	HP	Commercial-Miscellaneous-Miscellaneous-All	5	44.00	$12.80	–	$10.00	$7.50	$0.039	1.39	1.20	1
Compressed Air	Refrigerated Compressed Air Dryer	Standard air dryer	CFM	Commercial-Miscellaneous-Miscellaneous-All	10	10.62	$5.64	–	$6.00	$2.00	$0.039	2.34	0.97	1, 8
Compressed Air	Efficient Compressed Air Nozzle <= ¼ inch	Standard air nozzle	Unit	Commercial-Miscellaneous-Miscellaneous-All	15	602.50	$439.65	–	$49.50	$30.00	$0.039	8.24	6.64	1
Compressed Air	Efficient Compress Air Nozzle > ¼ inch	Standard air nozzle	Unit	Commercial-Miscellaneous-Miscellaneous-All	15	2,997.50	$2,187.29	–	$104.00	$60.00	$0.039	12.43	10.93	1
Engine Block Heater Controls	Wall-mounted engine block heater	Standard engine block heater without controls	Unit	IPC_Engine Block	15	2,733.00	$1,312.28	–	$70.00	$50.00	$0.039	8.42	8.21	1
Engine Block Heater Controls	Engine-mounted engine block heater	Standard engine block heater without controls	Unit	IPC_Engine Block	15	2,335.00	$1,121.17	–	$120.00	$100.00	$0.039	5.89	5.86	1
Dairy VFD	VFD on milking vacuum pump	No existing VFD	HP	Commercial-Miscellaneous-Miscellaneous-All	15	3,084.00	$2,250.41	–	$356.00	$250.00	$0.039	6.09	5.21	1

[a] Average measure life.
[b] Estimated kWh savings measured at the customer's meter, excluding line losses.
[c] Sum of NPV of avoided cost. Based on end-use load shape, measure life, savings including line losses, and alternative costs by pricing period as provided in the 2015 IRP. TRC test benefit calculation includes 10% conservation adder from the Northwest Power Act.
[d] Incremental participant cost prior to customer incentives.
[e] Average program administration and overhead costs to achieve each kWh of savings. Calculated from 2018 actuals.
[f] UCT Ratio = (NPV DSM Avoided Costs) / ((Admin Cost/kWh * kWh Savings) + Incentives)
[g] TRC Ratio = ((NPV DSM Avoided Costs * 110%) + NEB) / ((Admin Cost/kWh * kWh Savings) + Incentives + (Incremental Participant Cost - Incentives))
[1] Idaho Power TRM prepared by ADM Associates, Inc. 2018.
[2] Measure not cost-effective. Measure to be monitored in 2019. Measure included in the program to increase participation in a cost-effective program and to encourage adoption of higher-efficiency equipment.
[3] Idaho Power TRM prepared by ADM Associates, Inc. 2018. Averaged air cooled chillers.
[4] Idaho Power TRM prepared by ADM Associates, Inc. 2018. Averaged water cooled chillers.
[5] Idaho Power TRM prepared by ADM Associates, Inc. 2018. NEBs from water savings from RTF. ComClothesWashers_v5_1.xlsm. Simple average. 2018.
[6] Idaho Power TRM prepared by ADM Associates, Inc. 2018. NEBs from water savings from RTF. ComDishwasher_v1_2.xlsm. 2012.
[7] Measure not cost-effective. Measure to be monitored in 2019. Measure included in the program to increase participation in a cost-effective program.
[8] Measure not cost-effective. Measure cost-effective without inclusion of admin costs.

Retrofits

Segment: Commercial
2018 Program Results

Cost Inputs			Ref
Program Administration	$	1,097,204	
Program Incentives		4,892,975	I
Total UC	**$**	**5,990,179**	P
Measure Equipment and Installation (Incremental Participant Cost)	$	15,156,512	M

Summary of Cost-Effectiveness Results					
Test		**Benefit**		**Cost**	**Ratio**
UC Test	$	21,422,044	$	5,990,179	3.58
TRC Test		23,564,248		16,253,716	1.45
RIM Test		21,422,044		24,595,515	0.87
PCT		23,498,311		15,156,512	1.55

Net Benefit Inputs (NPV)				Ref
Resource Savings				
2018 Annual Gross Energy (kWh)	34,910,707			
NPV Cumulative Energy (kWh)	338,589,351	$	21,422,044	S
10% Credit (Northwest Power Act)			2,142,204	
Total Electric Savings		**$**	**23,564,248**	A
Participant Bill Savings				
NPV Cumulative Participant Savings		$	18,605,336	B
Other Benefits				
Non-Utility Rebates/Incentives		$	–	NUI
NEBs		$	–	NEB

Benefits and Costs Included in Each Test		
UC Test	= S * NTG	= P
TRC Test	= (A + NUI + NEB) * NTG	= P + ((M-I) * NTG)
RIM Test	= S * NTG	= P + (B * NTG)
PCT	= B + I + NUI + NEB	= M

Assumptions for Levelized Calculations	
Discount Rate	
Nominal (WACC)	6.74%
Real ((1 + WACC) / (1 + Escalation)) – 1	4.44%
Escalation Rate	2.20%
Net-to-Gross (NTG)	100%
Minimum NTG Sensitivity	45%
Average Customer Segment Rate/kWh	$0.057
Line Losses	9.60%

Note: Measure inputs from Evergreen Consulting Group or the TRM prepared by ADM Associates, Inc., unless otherwise noted.

Year: 2018 **Program**: Retrofits **Market Segment**: Commercial **Program Type**: Energy Efficiency

						Benefit			Cost			B/C Tests		
Measure Name	Measure Descriptions	Replacing	Measure unit	End Use	Measure Life (yrs)[a]	Annual Gross Energy Savings (kWh/yr)[b]	NPV DSM Avoided Costs[c]	NEB	Gross Incremental Participant Cost[d]	Incentive/ Unit	Admin Cost ($/kWh)[e]	UCT Ratio[f]	TRC Ratio[g]	Source
Standard/High Performance T8 Fluorescents	4-foot T8	4-foot T12	fixture	Commercial-Miscellaneous-Interior Lighting-All	6	182.49	$63.01	–	$53.17	$30.01	$0.039	1.70	1.15	1
Standard T8 Fluorescents	6-foot T8	6-foot T12	fixture	Commercial-Miscellaneous-Interior Lighting-All	6	332.20	$114.70	–	$76.03	$16.00	$0.039	3.97	1.42	1
Standard T8 Fluorescents	4-foot T8	8-foot T12	fixture	Commercial-Miscellaneous-Interior Lighting-All	6	445.52	$153.82	–	$66.50	$50.58	$0.039	2.27	2.02	1
T5/T8 High Bay - New Fixture	4-foot T8/T5	Fixture using > 200 input watts	fixture	Commercial-Miscellaneous-Interior Lighting-All	9	1,195.77	$586.16	–	$206.92	$135.44	$0.039	3.23	2.55	1
Relamp T8/ T5HO to Reduced Wattage T8/ T5HO	Reduced wattage T8/T5 re-lamp	4' T8/T5 HO	fixture	Commercial-Miscellaneous-Interior Lighting-All	12	124.99	$77.12	–	$21.65	$1.00	$0.039	13.21	3.20	1
Permanent Fixture Removal	Permanent Fixture Removal		fixture	Commercial-Miscellaneous-Interior Lighting-All	6	876.59	$302.66	–	$29.48	$22.73	$0.039	5.34	5.25	1
Light emitting diodes (LEDs)	Screw-in or pin-based LED	Existing lamp using > input watts	fixture	Commercial-Miscellaneous-Interior Lighting-All	12	502.97	$310.35	–	$56.37	$30.96	$0.039	6.15	4.50	1
Light emitting diodes (LEDs)	LED tubes (type A, B & DM)	lamp using > 17 watts	fixture	Commercial-Miscellaneous-Interior Lighting-All	12	279.42	$172.41	–	$65.25	$6.02	$0.039	10.24	2.49	1
Light emitting diodes (LEDs)	LED Tubes (type C) or hardwired conversion	fixture using higher wattage	fixture	Commercial-Miscellaneous-Interior Lighting-All	12	312.08	$192.57	–	$99.52	$15.60	$0.039	6.96	1.90	1
LED Exit Sign	LED fixture or sign lighting retrofit kit	fixture using higher wattage	fixture	Commercial-Miscellaneous-Interior Lighting-All	12	429.23	$264.85	–	$180.93	$61.64	$0.039	3.38	1.47	1
Lighting Controls	New LED fixture or LED fixture kit with lighting control strategies	fixture using higher wattage	fixture	Commercial-Miscellaneous-Interior Lighting-All	12	545.54	$336.62	–	$239.55	$103.76	$0.039	2.70	1.42	1

						Benefit			Cost			B/C Tests		
Measure Name	Measure Descriptions	Replacing	Measure unit	End Use	Measure Life (yrs)[a]	Annual Gross Energy Savings (kWh/yr)[b]	NPV DSM Avoided Costs[c]	NEB	Gross Incremental Participant Cost[d]	Incentive/ Unit	Admin Cost ($/kWh)[e]	UCT Ratio[f]	TRC Ratio[g]	Source
Lighting Controls	New LED fixture with Networked Controls	fixture using higher wattage	fixture	Commercial-Miscellaneous-Interior Lighting-All	12	599.03	$369.63	–	$339.77	$131.79	$0.039	2.39	1.12	1
LED Exit Sign	LED Exit sign	fixture using higher wattage	fixture	IPC_8760	12	230.68	$129.06	–	$68.69	$40.00	$0.039	2.64	1.83	1
Lighting Controls	Lighting Controls	Manual controls	fixture	Commercial-Miscellaneous-Interior Lighting-All	10	179.65	$95.90	–	$90.10	$27.59	$0.039	2.78	1.09	1
Standard T8 Fluorescents	6-foot T8	6-foot T12	fixture	IPC_Outdoor Lighting	6	386.42	$80.26	–	$76.03	$14.00	$0.039	2.77	0.97	1, 2
Standard T8 Fluorescents	4-foot T8	8-foot T12	fixture	IPC_Outdoor Lighting	6	496.54	$103.13	–	$83.27	$41.88	$0.039	1.69	1.11	1
T5/T8 High Bay - New Fixture	4-foot T8/T5	Fixture using > 200 input watts	fixture	IPC_Outdoor Lighting	11	1,643.61	$588.91	–	$195.03	$102.71	$0.039	3.54	2.50	1
Permanent Fixture Removal	Permanent Fixture Removal		fixture	IPC_Outdoor Lighting	6	1,016.60	$211.15	–	$35.78	$17.73	$0.039	3.70	3.09	1
LEDs	Screw-in or pin-based LED	Existing lamp using > input watts	fixture	IPC_Outdoor Lighting	12	583.30	$225.26	–	$87.93	$27.96	$0.039	4.46	2.24	1
LEDs	LED tubes (type A, B & DM)	lamp using > 17 watts	fixture	IPC_Outdoor Lighting	12	324.04	$125.14	–	$66.98	$6.02	$0.039	6.74	1.73	1
LEDs	LED Tubes (type C) or hardwired conversion	fixture using higher wattage	fixture	IPC_Outdoor Lighting	12	342.71	$132.35	–	$113.60	$6.85	$0.039	6.58	1.15	1
LED Exit Sign	LED fixture or sign lighting retrofit kit	fixture using higher wattage	fixture	IPC_Outdoor Lighting	12	804.15	$310.55	–	$275.95	$91.09	$0.039	2.54	1.11	1
Lighting Controls	New LED fixture or LED fixture kit with lighting control strategies	fixture using higher wattage	fixture	IPC_Outdoor Lighting	12	1,324.18	$511.38	–	$427.62	$198.89	$0.039	2.04	1.17	1
Lighting Controls	New LED fixture with Networked Controls	fixture using higher wattage	fixture	IPC_Outdoor Lighting	12	1,454.01	$561.52	–	$456.12	$261.72	$0.039	1.77	1.21	1
Lighting Controls	Lighting Controls	Manual controls	fixture	IPC_Outdoor Lighting	10	364.55	$120.30	–	$109.12	$27.59	$0.039	2.51	1.02	1
Refrigeration Case Lighting	Refrigeration Case Lighting		lamp	Commercial-Miscellaneous-Refrigeration-All	6	347.86	$112.21	–	$97.91	$42.36	$0.039	2.01	1.11	1
Air Conditioning Units	<= 5 ton AC Unit. Base to CEE Tier 1	Code standards	tons	Commercial-Miscellaneous-Cooling-All	15	69.00	$74.97	–	$33.68	$30.00	$0.039	2.29	2.27	3
Air Conditioning Units	<= 5 ton AC Unit. Base to CEE Tier 2	Code standards	tons	Commercial-Miscellaneous-Cooling-All	15	108.00	$117.34	–	$60.30	$75.00	$0.039	1.48	2.00	3

						Benefit			Cost			B/C Tests		
Measure Name	Measure Descriptions	Replacing	Measure unit	End Use	Measure Life (yrs)[a]	Annual Gross Energy Savings (kWh/yr)[b]	NPV DSM Avoided Costs[c]	NEB	Gross Incremental Participant Cost[d]	Incentive/ Unit	Admin Cost ($/kWh)[e]	UCT Ratio[f]	TRC Ratio[g]	Source
Air Conditioning Units	<= 5 ton VRF. Base to CEE Tier 2	Code standards	tons	Commercial-Miscellaneous-Cooling-All	15	118.00	$128.20	–	$181.50	$100.00	$0.039	1.23	0.76	2, 3
Air Conditioning Units	<= 64 ton VRF. Base to CEE Tier 1	Code standards	tons	Commercial-Miscellaneous-Cooling-All	15	82.50	$89.63	–	$69.24	$75.00	$0.039	1.15	1.36	3
Heat Pump (HP) units	<= 5 ton HP Unit. Base to CEE Tier 1	Code standards	tons	Commercial-Miscellaneous-Cooling-All	15	69.00	$74.97	–	$153.00	$30.00	$0.039	2.29	0.53	2, 3
Heat Pump (HP) units	<= 5 ton HP Unit. Base to CEE Tier 2	Code standards	tons	Commercial-Miscellaneous-Cooling-All	15	108.00	$117.34	–	$168.27	$75.00	$0.039	1.48	0.75	2, 3
Heat Pump (HP) units	<= 5 ton Variable Refrigerant Flow (VRF). Base to CEE Tier 2	Code standards	tons	Commercial-Miscellaneous-Cooling-All	15	160.00	$173.83	–	$165.50	$100.00	$0.039	1.64	1.11	3
Heat Pump (HP) units	<= 64 ton VRF. Base to CEE Tier 1	Code standards	tons	Commercial-Miscellaneous-Cooling-All	15	124.00	$134.72	–	$141.75	$75.00	$0.039	1.69	1.01	3
Chillers	Air-cooled chiller condenser, IPLV 14.0 EER or higher	Standard air-cooled chiller	tons	Commercial-Miscellaneous-Cooling-All	20	200.00	$264.26	–	$56.50	$80.00	$0.039	3.01	4.52	4
Chillers	Water-cooled chiller electronically operated, reciprocating and positive displacement	Standard water-cooled chiller	tons	Commercial-Miscellaneous-Cooling-All	20	118.30	$156.31	–	$33.40	$40.00	$0.039	3.51	4.53	5
Economizers	Airside economizer control addition	No prior control	ton of cooling	Commercial-Miscellaneous-Cooling-All	15	278.00	$302.03	–	$155.01	$100.00	$0.039	2.73	2.00	3
Economizers	Airside economizer control repair	Non-functional economizer	ton of cooling	Commercial-Miscellaneous-Cooling-All	15	278.00	$302.03	–	$73.65	$50.00	$0.039	4.97	3.94	3
Evaporative Cooler	Direct evaporative cooler	Replacing standard AC unit	tons	Commercial-Miscellaneous-Cooling-All	15	315.00	$342.23	–	$364.00	$200.00	$0.039	1.61	1.00	3
Automated Controls	EMS controls with 1 strategy	Proposed strategy not existing (retrofit system)	tons of cooling	Commercial-Miscellaneous-Ventilation-All	15	371.00	$280.99	$20.03	$197.98	$100.00	$0.039	2.46	1.55	3
Automated Controls	EMS controls with 2 strategies	Proposed strategy not existing (retrofit system)	tons of cooling	Commercial-Miscellaneous-Ventilation-All	15	621.00	$470.34	$20.03	$197.98	$125.00	$0.039	3.16	2.42	3
Automated Controls	EMS controls with 3 strategies	Proposed strategy not existing (retrofit system)	tons of cooling	Commercial-Miscellaneous-Ventilation-All	15	870.00	$658.93	$70.11	$197.98	$150.00	$0.039	3.59	3.43	3
Automated Controls	EMS controls with 4 strategies	Proposed strategy not existing (retrofit system)	tons of cooling	Commercial-Miscellaneous-Ventilation-All	15	1,730.00	$1,310.28	$240.38	$197.98	$175.00	$0.039	5.42	6.35	3

						Benefit			Cost			B/C Tests		
Measure Name	Measure Descriptions	Replacing	Measure unit	End Use	Measure Life (yrs)[a]	Annual Gross Energy Savings (kWh/yr)[b]	NPV DSM Avoided Costs[c]	NEB	Gross Incremental Participant Cost[d]	Incentive/ Unit	Admin Cost ($/kWh)[e]	UCT Ratio[f]	TRC Ratio[g]	Source
Automated Controls	EMS controls with 5 strategies	Proposed strategy not existing (retrofit system)	tons of cooling	Commercial-Miscellaneous-Ventilation-All	15	1,798.00	$1,361.78	$242.89	$197.98	$200.00	$0.039	5.05	6.51	3
Automated Controls	EMS controls with 1 strategy	Proposed strategy not existing (new system)	tons of cooling	Commercial-Miscellaneous-Ventilation-All	15	226.00	$171.17	$15.02	$162.49	$60.00	$0.039	2.49	1.19	3
Automated Controls	EMS controls with 2 strategies	Proposed strategy not existing (new system)	tons of cooling	Commercial-Miscellaneous-Ventilation-All	15	408.00	$309.01	$20.03	$162.49	$70.00	$0.039	3.60	2.02	3
Automated Controls	EMS controls with 3 strategies	Proposed strategy not existing (new system)	tons of cooling	Commercial-Miscellaneous-Ventilation-All	15	511.00	$387.02	$32.55	$162.49	$80.00	$0.039	3.88	2.51	3
Automated Controls	EMS controls with 4 strategies	Proposed strategy not existing (new system)	tons of cooling	Commercial-Miscellaneous-Ventilation-All	15	568.00	$430.20	$52.58	$162.49	$90.00	$0.039	3.84	2.85	3
Automated Controls	EMS controls with 5 strategies	Proposed strategy not existing (new system)	tons of cooling	Commercial-Miscellaneous-Ventilation-All	15	618.00	$468.06	$52.58	$162.49	$100.00	$0.039	3.78	3.04	3
Automated Controls	Lodging room occupancy controls	Manual controls	ton	Commercial-Lodging-Ventilation-All	11	665.00	$360.66	–	$150.61	$75.00	$0.039	3.58	2.25	3
Electronically Commutated Motor (ECM)	ECM motor in HVAC application	Shaded pole or permanent split capacitor motor	motor	Commercial-Miscellaneous-Ventilation-All	15	1,354.00	$1,025.50	–	$305.00	$100.00	$0.039	6.73	3.16	3
Premium Windows	Low U-value, U-factor of .30 or less	Standard windows	ft2 window area	Commercial-Miscellaneous-Heating-Electric Furnace	25	6.87	$5.28	–	$5.92	$2.50	$0.039	1.91	0.94	2, 3
Reflective Roofing	Adding reflective roof treatment	Non-reflective low pitch roof	ft2 roof area	Commercial-Miscellaneous-Cooling-All	15	0.12	$0.13	–	$0.05	$0.05	$0.039	2.31	2.54	3
Ceiling Insulation	Increase to R38 min. insulation	Insulation level, R11 or less	ft2 wall area	Commercial-Miscellaneous-Heating-Electric Furnace	25	2.00	$1.54	–	$1.38	$0.35	$0.039	3.59	1.16	3
Wall Insulation	Increase to R11 min. insulation	Insulation level, R2.5 or less	ft2 wall area	Commercial-Miscellaneous-Heating-Electric Furnace	25	9.15	$7.03	–	$0.66	$0.40	$0.039	9.32	7.62	3
Wall Insulation	Increase to R19 min. insulation	Insulation level, R2.5 or less	ft2 wall area	Commercial-Miscellaneous-Heating-Electric Furnace	25	10.29	$7.90	–	$0.66	$0.55	$0.039	8.33	8.22	3
Computers	PC network power management	No central control software in place	unit	Commercial-Small Office-Office Equipment-All	4	148.00	$34.07	–	$12.00	$10.00	$0.039	2.17	2.11	3

						Benefit			Cost			B/C Tests		
Measure Name	Measure Descriptions	Replacing	Measure unit	End Use	Measure Life (yrs)[a]	Annual Gross Energy Savings (kWh/yr)[b]	NPV DSM Avoided Costs[c]	NEB	Gross Incremental Participant Cost[d]	Incentive/ Unit	Admin Cost ($/kWh)[e]	UCT Ratio[f]	TRC Ratio[g]	Source
Laundry Machines	High efficiency washer	Standard washer, electric HW	unit	Commercial-Lodging-Water Heating-All	8	994.00	$409.71	$1,056.14	$393.00	$125.00	$0.039	2.51	3.49	3, 6
Stock Tank	Thermostatically controlled Stock Tank De-Icer	Non thermostatically controlled de-icer	unit	Commercial-Miscellaneous-Heating-Electric Furnace	10	3,030.00	$1,134.03	–	$51.60	$50.00	$0.039	6.78	7.39	3, 7
HVAC Fan Motor Belt	Type AX notched V-belt Type BX notched V-belt	Type A solid V-belt Type B solid V-belt	hp	Commercial-Miscellaneous-Ventilation-All	5	78.00	$23.62	–	$1.90	$5.00	$0.039	2.94	5.28	3
HVAC Fan Motor Belt	Synchronous belt	Standard fan belt	hp	Commercial-Miscellaneous-Ventilation-All	5	199.00	$60.25	–	$67.00	$35.00	$0.039	1.41	0.89	2, 3
Commercial showerhead, electric water heat	2.0 gpm or less installed in health club/fitness business	Showerhead using 2.2 gpm or greater	unit	Commercial-Small Office-Water Heating-All	10	2,159.00	$1,066.94	$2,579.17	$3.66	$15.00	$0.039	10.82	43.02	8
Commercial showerhead, electric water heat	2.0 gpm or less installed in commercial business (non health club/fitness business)	Showerhead using 2.2 gpm or greater	unit	Commercial-Small Office-Water Heating-All	10	115.00	$56.83	$137.34	$3.66	$9.00	$0.039	4.22	24.64	8
Smart Power Strips	Load-sensing, motion-sensing, or timer-controlled power strip	No existing load-sensing, motion-sensing, or timer-controlled power strip	power strip	Commercial-Small Office-Office Equipment-All	4	118.00	$27.17	–	$37.00	$10.00	$0.039	1.86	0.72	2, 3
Engine block heater	Stationary pump-driven circulating block heater	Thermosiphon electric resistance circulating block heater < 3 kW	unit	IPC_Engine Block	15	7,469.00	$3,586.31	–	$1,400.00	$200.00	$0.039	7.33	2.34	3
Engine block heater	Stationary pump-driven circulating block heater	Thermosiphon electric resistance circulating block heater 3 kW or greater	unit	IPC_Engine Block	15	17,633.00	$8,466.65	–	$1,950.00	$1,500.00	$0.039	3.88	3.54	3
Engine block heater	Wall mounted engine block heater	Thermosiphon electric resistance circulating block heater 3 kW or greater	unit	IPC_Engine Block	15	2,733.00	$1,312.28	–	$120.00	$50.00	$0.039	8.42	6.39	3
Engine block heater	Engine-mounted engine block heater	Thermosiphon electric resistance circulating block heater 3 kW or greater	unit	IPC_Engine Block	15	2,335.00	$1,121.17	–	$170.00	$100.00	$0.039	5.89	4.74	3
High Volume Low Speed Fan	High Volume Low Speed Fan	Standard high speed fan	Fan	Commercial-Warehouse-Ventilation-All	15	16,733.00	$12,154.54	–	$4,185.00	$2,000.00	$0.039	4.59	2.77	3
Compressed Air	Air compressor VFD	No existing VFD	HP	Commercial-Miscellaneous-Miscellaneous-All	15	949.00	$692.49	–	$223.00	$150.00	$0.039	3.71	2.93	3
Compressed Air	Low Pressure Drop Filter	Open tube with ball valve	HP	Commercial-Miscellaneous-Miscellaneous-All	5	44.00	$12.80	–	$10.00	$7.50	$0.039	1.39	1.20	3

						Benefit			Cost			B/C Tests		
Measure Name	Measure Descriptions	Replacing	Measure unit	End Use	Measure Life (yrs)[a]	Annual Gross Energy Savings (kWh/yr)[b]	NPV DSM Avoided Costs[c]	NEB	Gross Incremental Participant Cost[d]	Incentive/ Unit	Admin Cost ($/kWh)[e]	UCT Ratio[f]	TRC Ratio[g]	Source
Compressed Air	No-Loss Condensate Drain	Standard filter	HP	Commercial-Miscellaneous-Miscellaneous-All	10	1,830.00	$971.37	–	$700.00	$300.00	$0.039	2.62	1.39	3
Compressed Air	Efficient Compressed Air Nozzle <= ¼ inch	Standard air nozzle	unit	Commercial-Miscellaneous-Miscellaneous-All	15	602.50	$439.65	–	$49.50	$30.00	$0.039	8.24	6.64	3
Compressed Air	Efficient Compress Air Nozzle > ¼ inch	Standard air nozzle	unit	Commercial-Miscellaneous-Miscellaneous-All	15	2,997.50	$2,187.29	–	$104.00	$60.00	$0.039	12.43	10.93	3
Compressed Air	Refrigerated Compressed Air Dryer	Standard air dryer	CFM	Commercial-Miscellaneous-Miscellaneous-All	10	10.62	$5.64	–	$6.00	$2.00	$0.039	2.34	0.97	3, 9
Refrigeration	Install auto-closer - walk-in	no/damaged auto-closer, low temp	door	Commercial-Miscellaneous-Refrigeration-All	8	2,509.00	$1,043.52	–	$157.00	$125.00	$0.039	4.70	4.52	3
Refrigeration	Install auto-closer - reach-in	Damaged auto-closer, low temp	door	Commercial-Miscellaneous-Refrigeration-All	8	326.00	$135.59	–	$122.00	$100.00	$0.039	1.20	1.11	3
Refrigeration	Install auto-closer - walk-in	No/damaged auto-closer, med. Temp	door	Commercial-Miscellaneous-Refrigeration-All	8	562.00	$233.74	–	$157.00	$100.00	$0.039	1.92	1.44	3
Refrigeration	Install auto-closer - reach-in	Damaged auto-closer, med. Temp	door	Commercial-Miscellaneous-Refrigeration-All	8	243.00	$101.07	–	$122.00	$70.00	$0.039	1.27	0.85	2, 3
Refrigeration	Add anti-sweat heat controls	Low/med. Temp case w/ out controls	linear ft	Commercial-Miscellaneous-Refrigeration-All	8	266.00	$110.63	–	$47.90	$40.00	$0.039	2.20	2.09	3
Automatic high speed doors	Freezer to Dock	manual or electric warehouse door	Door	Commercial-Warehouse-Refrigeration-All	8	155,659.00	$63,358.01	–	$12,650.00	$8,000.00	$0.039	4.52	3.73	3
Automatic high speed doors	Freezer to Refrigerator	manual or electric warehouse door	Door	Commercial-Warehouse-Refrigeration-All	8	112,469.00	$45,778.35	–	$12,650.00	$4,000.00	$0.039	5.48	2.96	3
Strip Curtain	For walk-in freezers	no protective barrier	Curtain/ Door	Commercial-Warehouse-Refrigeration-All	4	4,865.00	$1,055.28	–	$274.00	$150.00	$0.039	3.12	2.51	3
Strip Curtain	For walk-in refrigerators	no protective barrier	Curtain/ Door	Commercial-Warehouse-Refrigeration-All	4	3,024.00	$655.94	–	$274.00	$150.00	$0.039	2.46	1.85	3
Evaporative Fans	Add evaporative fan controls	low or med. temp. walk-in or reach-in with no controls	fan	Commercial-Miscellaneous-Refrigeration-All	15	696.00	$480.42	–	$161.74	$75.00	$0.039	4.71	2.80	3
Evaporative Fans	Install ECM/PSC evap fan motor	Med. or low temp. walk-in	motor	Commercial-Miscellaneous-Refrigeration-All	15	1,075.00	$742.03	–	$296.78	$100.00	$0.039	5.24	2.41	3

Measure Name	Measure Descriptions	Replacing	Measure unit	End Use	Measure Life (yrs)[a]	Benefit: Annual Gross Energy Savings (kWh/yr)[b]	Benefit: NPV DSM Avoided Costs[c]	Benefit: NEB	Cost: Gross Incremental Participant Cost[d]	Cost: Incentive/ Unit	Cost: Admin Cost ($/kWh)[e]	B/C Tests: UCT Ratio[f]	B/C Tests: TRC Ratio[g]	Source
Evaporative Fans	Install ECM/PSC evap fan motor	Med. or low temp. reach-in	motor	Commercial-Miscellaneous-Refrigeration-All	15	429.00	$296.12	–	$84.45	$60.00	$0.039	3.87	3.22	3
Floating Head/Suction Pressures	Head pressure controller	Standard head pressure control	HP	Commercial-Miscellaneous-Refrigeration-All	16	440.00	$319.19	–	$272.60	$80.00	$0.039	3.29	1.21	3
Floating Head/Suction Pressures	Suction pressure controller	Standard suction pressure control	HP	Commercial-Miscellaneous-Refrigeration-All	16	104.00	$75.44	–	$86.91	$20.00	$0.039	3.14	0.91	2, 3
Demand Controlled Kitchen Ventilation Exhaust Hood	VFD installed on kitchen exhaust and/or makeup air fan	Kitchen hood with constant speed ventilation	HP	Commercial-Restaurant-Ventilation-All	15	4,423.00	$3,334.31	–	$1,991.00	$200.00	$0.039	8.98	1.70	3
Vending Machines	Non-cooled snack control	Vending machine with no sensor	sensor	Commercial-Miscellaneous-Miscellaneous-All	5	387.00	$112.54	–	$75.00	$50.00	$0.039	1.73	1.38	3
Commercial kitchen equipment	ENERGY STAR® undercounter (residential style) dishwasher	Code standards	machine	Commercial-Restaurant-Water Heating-All	12	2,210.00	$1,368.33	$221.74	$232.00	$200.00	$0.039	4.79	5.44	3, 10
Commercial kitchen equipment	ENERGY STAR commercial dishwasher	Code standards	machine	Commercial-Restaurant-Water Heating-All	12	5,561.00	$3,443.11	$598.02	$3,978.00	$500.00	$0.039	4.81	1.05	3, 10
Commercial kitchen equipment	ENERGY STAR listed electric combination oven (6-15 pans)	Standard electric oven	oven	Commercial-Restaurant-Food Preparation-All	10	12,999.00	$7,428.28	–	$1,700.83	$1,100.00	$0.039	4.63	3.71	11
Commercial kitchen equipment	ENERGY STAR listed electric combination oven (16-20 pans)	Standard electric oven	oven	Commercial-Restaurant-Food Preparation-All	10	17,877.00	$10,215.82	–	$464.69	$300.00	$0.039	10.30	9.71	11
Commercial kitchen equipment	ENERGY STAR listed electric convection oven	Standard electric oven	oven	Commercial-Restaurant-Food Preparation-All	10	1,672.00	$955.47	–	$961.48	$300.00	$0.039	2.62	1.02	12
Commercial kitchen equipment	ENERGY STAR listed electric fryer	Standard fryer	fryer	Commercial-Restaurant-Food Preparation-All	8	2,449.00	$1,166.65	–	$821.11	$400.00	$0.039	2.36	1.40	13
Commercial kitchen equipment	ENERGY STAR listed electric steamer - 3 pan	Standard steamer	steamer	Commercial-Restaurant-Food Preparation-All	9	21,470.00	$11,273.13	–	$376.22	$80.00	$0.039	12.37	10.27	14
Commercial kitchen equipment	ENERGY STAR listed electric steamer - 4 pan	Standard steamer	steamer	Commercial-Restaurant-Food Preparation-All	9	28,564.00	$14,997.94	–	$143.60	$100.00	$0.039	12.44	13.21	14
Commercial kitchen equipment	ENERGY STAR listed electric steamer - 5 pan	Standard steamer	steamer	Commercial-Restaurant-Food Preparation-All	9	35,659.00	$18,723.27	–	$-	$150.00	$0.039	12.23	13.46	14

						Benefit			Cost			B/C Tests		
Measure Name	Measure Descriptions	Replacing	Measure unit	End Use	Measure Life (yrs)[a]	Annual Gross Energy Savings (kWh/yr)[b]	NPV DSM Avoided Costs[c]	NEB	Gross Incremental Participant Cost[d]	Incentive/ Unit	Admin Cost ($/kWh)[e]	UCT Ratio[f]	TRC Ratio[g]	Source
Commercial kitchen equipment	ENERGY STAR listed electric steamer - 6 pan	Standard steamer	steamer	Commercial-Restaurant-Food Preparation-All	9	42,754.00	$22,448.61	–	$62.29	$175.00	$0.039	12.27	14.38	14
Commercial kitchen equipment	ENERGY STAR listed electric steamer -10 pan or larger	Standard steamer	steamer	Commercial-Restaurant-Food Preparation-All	9	71,133.00	$37,349.41	–	$4,264.74	$200.00	$0.039	12.65	5.85	14
Variable speed controls	Variable speed drive on HVAC system applications: -chilled water pumps -condenser water pumps -cooling tower fans	Single speed HVAC system fan/pump	HP	Commercial-Miscellaneous-Ventilation-All	15	268.00	$202.98	–	$194.28	$60.00	$0.039	2.88	1.09	3
Variable speed controls	Variable speed drive on HVAC system applications: -supply -return -outside air -make-up air -hot water pumps	Single speed HVAC system fan/pump	HP	Commercial-Miscellaneous-Ventilation-All	15	996.00	$754.36	–	$174.82	$100.00	$0.039	5.44	3.89	3
Dairy VFD	VFD on milking vacuum pump	No existing VSD	HP	Commercial-Miscellaneous-Miscellaneous-All	15	3,084.00	$2,250.41	–	$356.00	$250.00	$0.039	6.09	5.21	3

[a] Average measure life.
[b] Estimated kWh savings measured at the customer's meter, excluding line losses.
[c] Sum of NPV of avoided cost. Based on end-use load shape, measure life, savings including line losses, and alternative costs by pricing period as provided in the 2015 IRP. TRC test benefit calculation includes 10% conservation adder from the Northwest Power Act.
[d] Incremental participant cost prior to customer incentives.
[e] Average program administration and overhead costs to achieve each kWh of savings. Calculated from 2018 actuals.
[f] UCT Ratio = (NPV DSM Avoided Costs) / ((Admin Cost/kWh * kWh Savings) + Incentives)
[g] TRC Ratio = ((NPV DSM Avoided Costs * 110%) + NEB) / ((Admin Cost/kWh * kWh Savings) + Incentives + (Incremental Participant Cost - Incentives))
[1] Evergreen Consulting Group, LLC. Idaho Power Lighting Tool. 2018.
[2] Measure not cost-effective. Measure to be monitored in 2019. Measure included in the program to increase participation in a cost-effective program and to encourage adoption of higher efficiency equipment.
[3] Idaho Power TRM prepared by ADM Associates, Inc. 2018.
[4] Idaho Power TRM prepared by ADM Associates, Inc. 2018. Averaged air cooled chillers.
[5] Idaho Power TRM prepared by ADM Associates, Inc. 2018. Averaged water cooled chillers.
[6] Idaho Power TRM prepared by ADM Associates, Inc. 2018. NEBs from water savings from RTF. ComClothesWashers_v5_1.xlsm. Simple average. 2018.
[7] RTF. AgStockTankDe-Icer_v1_0.xlsm. 2018.
[8] RTF. Showerheads_v3.1.xlsm.
[9] Measure not cost-effective. Measure cost-effective without inclusion of admin costs.
[10] Idaho Power TRM prepared by ADM Associates, Inc. 2018. NEBs from water savings from RTF. ComDishwasher_v1_2.xlsm. 2012.
[11] RTF. ComCookingCombinationOven_v2_3.xlsm. 2018.
[12] RTF. ComCookingConvectionOven_v2_3.xlsm. Simple average of half and full size ovens. 2018.
[13] RTF. ComCookingFryer_v2_3.xlsm. 2018.
[14] RTF. ComCookingSteamer_v2_4.xlsm. 2018.

Irrigation Efficiency Rewards

Segment: Irrigation
2018 Program Results

Cost Inputs			Ref
Program Administration	$	437,489	
Program Incentives		2,516,217	I
Total UC	**$**	**2,953,706**	P
Measure Equipment and Installation (Incremental Participant Cost)	$	11,510,980	M

Summary of Cost-Effectiveness Results					
Test		**Benefit**		**Cost**	**Ratio**
UC Test	$	13,490,357	$	2,953,706	4.57
TRC Test		36,233,955		11,948,469	3.03
RIM Test		13,490,357		10,443,888	1.29
PCT		31,400,961		11,510,980	2.73

Net Benefit Inputs (NPV)				Ref
Resource Savings				
2018 Annual Gross Energy (kWh)	18,933,831			
NPV Cumulative Energy (kWh)	137,375,687	$	13,490,357	S
10% Credit (Northwest Power Act)			1,349,036	
Total Electric Savings		**$**	**14,839,393**	A
Participant Bill Savings				
NPV Cumulative Participant Bill Savings		$	7,490,182	B
Other Benefits				
Non-Utility Rebates/Incentives		$	–	NUI
NEBs		$	21,394,562	NEB

Benefits and Costs Included in Each Test		
UC Test	= S * NTG	= P
TRC Test	= (A + NUI + NEB) * NTG	= P + ((M-I) * NTG)
RIM Test	= S * NTG	= P + (B * NTG)
PCT	= B + I + NUI + NEB	= M

Assumptions for Levelized Calculations	
Discount Rate	
Nominal (WACC)	6.74%
Real ((1 + WACC) / (1 + Escalation)) – 1	4.44%
Escalation Rate	2.20%
Net-to-Gross (NTG)	100%
Minimum NTG Sensitivity	22%
Average Customer Segment Rate/kWh	$0.059
Line Losses	9.60%

Notes: Energy savings are combined for projects under the Custom and Menu program. Savings under each Custom project is unique and individually calculated and assessed.
NEBs including yield, labor, and other benefits reported by the customer.
Green Rewind initiative is available to agricultural, commercial, and industrial customers. Agricultural motor rewinds are paid under Irrigation Efficiency Rewards, but the savings are not included in the program cost-effectiveness.
Green Rewind savings are included in the sector cost-effectiveness.

Year: 2018 **Program**: Irrigation Efficiency Rewards **Market Segment**: Irrigation **Program Type**: Energy Efficiency

						Benefit			Cost			B/C Tests		
Measure Name[a]	Measure Descriptions	Replacing	Measure Unit	End Use	Measure Life (yrs)[b]	Annual Gross Energy Savings (kWh/yr)[c]	NPV DSM Avoided Costs[d]	NEB	Gross Incremental Participant Cost[e]	Incentive/ Unit	Admin Cost ($/kWh)[f]	UCT Ratio[g]	TRC Ratio[h]	Sources
Nozzle Replacement	New flow-control-type nozzles replacing existing brass nozzles or worn out flow control nozzles of same flow rate or less	Brass nozzles or worn out flow control nozzles of same flow rate or less	Unit	IPC_Irrigation	4	40.60	$15.66	–	$6.35	$1.50	$0.023	6.43	2.36	1
Nozzle Replacement	New nozzles replacing existing worn nozzles of same flow rate or less	Worn nozzle of same flow rate or less	Unit	IPC_Irrigation	4	40.60	$15.66	–	$0.91	$0.25	$0.023	13.23	9.34	1
Sprinklers	Rebuilt or new brass impact sprinklers	Worn sprinkler	Unit	IPC_Irrigation	5	28.26	$13.37	–	$12.31	$2.75	$0.023	3.93	1.13	1
Levelers	Rebuilt or new wheel line levelers	Worn wheel line leveler	Unit	IPC_Irrigation	5	41.76	$19.76	–	$6.23	$0.75	$0.023	11.55	3.02	1
Sprinklers	Center pivot/linear move: Install new sprinkler package on an existing system	Worn sprinkler system	Unit	IPC_Irrigation	5	100.19	$47.40	–	$25.15	$8.00	$0.023	4.60	1.90	1
Gasket Replacement	New gaskets for hand lines, wheel lines, or portable mainline	Worn gasket	Unit	IPC_Irrigation	5	170.00	$80.43	–	$1.99	$1.00	$0.023	16.38	15.00	1
Drain Replacement	New drains, hand lines, wheel lines, or portable mainline	Worn drain	Unit	IPC_Irrigation	5	176.25	$83.39	–	$4.36	$3.00	$0.023	11.82	10.90	1
Hub Replacement	New wheel line hubs	Worn hubs	Unit	IPC_Irrigation	10	73.06	$61.97	–	$41.49	$12.00	$0.023	4.53	1.58	1
New Goose Necks	New goose neck with drop tube or boomback	Worn gooseneck	Outlet	IPC_Irrigation	15	14.50	$16.62	–	$6.99	$1.00	$0.023	12.46	2.50	1
Pipe Repair	Cut and pipe press or weld repair of leaking hand lines, wheel lines, and portable mainline	Leaking pipe	Joint	IPC_Irrigation	8	84.48	$60.19	–	$12.08	$8.00	$0.023	6.05	4.72	1
Gasket Replacement	New center pivot base boot gasket	Worn gasket	Unit	IPC_Irrigation	8	1,456.40	$1,037.74	–	$391.29	$125.00	$0.023	6.55	2.69	1

[a] Available measures in the Irrigation Efficiency Rewards Menu Incentive Option. For the Custom Incentive Option, projects are thoroughly reviewed by Idaho Power staff.
[b] Average measure life.
[c] Estimated peak demand reduction measured at the customer's meter, excluding line losses.
[d] Sum of NPV of avoided cost. Based on end-use load shape, measure life, savings including line losses, and alternative costs by pricing period as provided in the 2015 IRP. TRC test benefit calculation includes 10% conservation adder from the Northwest Power Act.
[e] Incremental participant cost prior to customer incentives.
[f] Average program administration and overhead costs to achieve each kWh of savings. Calculated from 2018 actuals.
[g] UCT Ratio = (NPV DSM Avoided Costs) / ((Admin Cost/kWh * kWh Savings) + Incentives)
[h] TRC Ratio = ((NPV DSM Avoided Costs * 110%) + NEB) / ((Admin Cost/kWh * kWh Savings) + Incentives + (Incremental Participant Cost - Incentives))
[1] RTF. AgIrrigationHardware_v3_3.xlsm. 2016. Weighted average of Western Idaho (13%), Eastern Washington & Oregon (4%), and Eastern & Southern Idaho (83%).

Year: 2018 **Program**: Irrigation Efficiency Rewards—Green Motors **Market Segment**: Irrigation **Program Type**: Energy Efficiency

						Benefit			Cost			B/C Tests		
Measure Name	Measure Descriptions	Replacing	Measure Unit	End Use	Measure Life (yrs)[a]	Annual Gross Energy Savings (kWh/yr)[b]	NPV DSM Avoided Costs[c]	NEB	Gross Incremental Participant Cost[d]	Incentive/ Unit	Admin Cost ($/kWh)[e]	UCT Ratio[f]	TRC Ratio[g]	Source
Green Motors Program Rewind: Motor size 15 HP	Green Motors Program Rewind: Motor size 15 HP	Standard rewind practice	Motor	IPC_Irrigation	18	317.00	$412.56	–	$160.18	$30.00	$0.050	9.00	2.58	1
Green Motors Program Rewind: Motor size 20 HP	Green Motors Program Rewind: Motor size 20 HP	Standard rewind practice	Motor	IPC_Irrigation	18	425.00	$553.12	–	$178.70	$40.00	$0.050	9.03	3.04	1
Green Motors Program Rewind: Motor size 25 HP	Green Motors Program Rewind: Motor size 25 HP	Standard rewind practice	Motor	IPC_Irrigation	17	595.00	$744.73	–	$204.18	$50.00	$0.050	9.34	3.50	1
Green Motors Program Rewind: Motor size 30 HP	Green Motors Program Rewind: Motor size 30 HP	Standard rewind practice	Motor	IPC_Irrigation	17	640.00	$801.05	–	$224.25	$60.00	$0.050	8.71	3.44	1
Green Motors Program Rewind: Motor size 40 HP	Green Motors Program Rewind: Motor size 40 HP	Standard rewind practice	Motor	IPC_Irrigation	17	746.00	$933.73	–	$274.04	$80.00	$0.050	7.96	3.30	1
Green Motors Program Rewind: Motor size 50 HP	Green Motors Program Rewind: Motor size 50 HP	Standard rewind practice	Motor	IPC_Irrigation	17	802.00	$1,003.82	–	$303.37	$100.00	$0.050	7.17	3.21	1
Green Motors Program Rewind: Motor size 60 HP	Green Motors Program Rewind: Motor size 60 HP	Standard rewind practice	Motor	IPC_Irrigation	20	765.00	$1,066.23	–	$357.80	$120.00	$0.050	6.74	2.96	1
Green Motors Program Rewind: Motor size 75 HP	Green Motors Program Rewind: Motor size 75 HP	Standard rewind practice	Motor	IPC_Irrigation	20	788.00	$1,098.29	–	$386.74	$150.00	$0.050	5.80	2.84	1
Green Motors Program Rewind: Motor size 100 HP	Green Motors Program Rewind: Motor size 100 HP	Standard rewind practice	Motor	IPC_Irrigation	20	1,040.00	$1,449.52	–	$479.76	$200.00	$0.050	5.75	3.00	1
Green Motors Program Rewind: Motor size 125 HP	Green Motors Program Rewind: Motor size 125 HP	Standard rewind practice	Motor	IPC_Irrigation	20	1,157.00	$1,612.59	–	$538.82	$250.00	$0.050	5.24	2.97	1
Green Motors Program Rewind: Motor size 150 HP	Green Motors Program Rewind: Motor size 150 HP	Standard rewind practice	Motor	IPC_Irrigation	20	1,376.00	$1,917.82	–	$600.19	$300.00	$0.050	5.20	3.15	1
Green Motors Program Rewind: Motor size 200 HP	Green Motors Program Rewind: Motor size 200 HP	Standard rewind practice	Motor	IPC_Irrigation	20	1,821.00	$2,538.05	–	$722.54	$400.00	$0.050	5.17	3.43	1
Green Motors Program Rewind: Motor size 250 HP	Green Motors Program Rewind: Motor size 250 HP	Standard rewind practice	Motor	IPC_Irrigation	20	2,823.00	$3,934.60	–	$928.64	$500.00	$0.050	6.14	4.05	1
Green Motors Program Rewind: Motor size 300 HP	Green Motors Program Rewind: Motor size 300 HP	Standard rewind practice	Motor	IPC_Irrigation	20	3,370.00	$4,696.99	–	$938.68	$600.00	$0.050	6.11	4.67	1
Green Motors Program Rewind: Motor size 350 HP	Green Motors Program Rewind: Motor size 350 HP	Standard rewind practice	Motor	IPC_Irrigation	20	3,929.00	$5,476.11	–	$983.84	$700.00	$0.050	6.11	5.10	1

						Benefit			Cost			B/C Tests		
Measure Name	Measure Descriptions	Replacing	Measure Unit	End Use	Measure Life (yrs)[a]	Annual Gross Energy Savings (kWh/yr)[b]	NPV DSM Avoided Costs[c]	NEB	Gross Incremental Participant Cost[d]	Incentive/ Unit	Admin Cost ($/kWh)[e]	UCT Ratio[f]	TRC Ratio[g]	Source
Green Motors Program Rewind: Motor size 400 HP	Green Motors Program Rewind: Motor size 400 HP	Standard rewind practice	Motor	IPC_Irrigation	20	4,456.00	$6,210.62	–	$1,098.86	$800.00	$0.050	6.07	5.17	1
Green Motors Program Rewind: Motor size 450 HP	Green Motors Program Rewind: Motor size 450 HP	Standard rewind practice	Motor	IPC_Irrigation	20	5,003.00	$6,973.01	–	$1,201.14	$900.00	$0.050	6.06	5.29	1
Green Motors Program Rewind: Motor size 500 HP	Green Motors Program Rewind: Motor size 500 HP	Standard rewind practice	Motor	IPC_Irrigation	20	5,567.00	$7,759.10	–	$1,297.63	$1,000.00	$0.050	6.07	5.42	1
Green Motors Program Rewind: Motor size 600 HP	Green Motors Program Rewind: Motor size 600 HP	Standard rewind practice	Motor	IPC_Irrigation	20	6,193.00	$8,631.60	–	$1,912.23	$1,200.00	$0.050	5.72	4.27	1
Green Motors Program Rewind: Motor size 700 HP	Green Motors Program Rewind: Motor size 700 HP	Standard rewind practice	Motor	IPC_Irrigation	20	7,195.00	$10,028.15	–	$2,086.24	$1,400.00	$0.050	5.70	4.51	1
Green Motors Program Rewind: Motor size 800 HP	Green Motors Program Rewind: Motor size 800 HP	Standard rewind practice	Motor	IPC_Irrigation	20	8,205.00	$11,435.85	–	$2,314.75	$1,600.00	$0.050	5.69	4.62	1
Green Motors Program Rewind: Motor size 900 HP	Green Motors Program Rewind: Motor size 900 HP	Standard rewind practice	Motor	IPC_Irrigation	20	9,211.00	$12,837.98	–	$2,551.91	$1,800.00	$0.050	5.68	4.69	1
Green Motors Program Rewind: Motor size 1,500 HP	Green Motors Program Rewind: Motor size 1,500 HP	Standard rewind practice	Motor	IPC_Irrigation	20	12,681.00	$17,674.35	–	$3,763.37	$3,000.00	$0.050	3.89	3.66	1

[a] Average measure life.
[b] Estimated kWh savings measured at the customer's meter, excluding line losses.
[c] Sum of NPV of avoided cost. Based on end-use load shape, measure life, savings including line losses, and alternative costs by pricing period as provided in the 2015 IRP. TRC test benefit calculation includes 10% conservation adder from the Northwest Power Act.
[d] Incremental participant cost prior to customer incentives.
[e] Average program administration and overhead costs to achieve each kWh of savings. Calculated from 2018 actuals.
[f] UCT Ratio = (NPV DSM Avoided Costs) / ((Admin Cost/kWh * kWh Savings) + Incentives)
[g] TRC Ratio = ((NPV DSM Avoided Costs * 110%) + NEB) / ((Admin Cost/kWh * kWh Savings) + Incentives + (Incremental Participant Cost - Incentives))
[1] RTF.AgMotorsRewind_v2_3.xlsm. 2016.

IDAHO POWER®
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DEMAND-SIDE MANAGEMENT

2018 ANNUAL REPORT

MARCH 15 • 2019

SUPPLEMENT 2: EVALUATION

LIST OF CONTENTS

Evaluation and Research Summary

Idaho Power considers program evaluation an essential component of its demand-side management (DSM) operational activities. The company contracts with third-party contractors to conduct impact, process, and other evaluations on a scheduled and as-required basis.

Third-party contracts are generally awarded using a competitive bid process managed by Idaho Power's Corporate Services. In some cases, research and analysis is conducted internally and managed by Idaho Power's Research and Analysis team within the Customer Relations and Energy Efficiency (CR&EE) department. Third-party evaluations are specifically managed by the company's energy efficiency evaluator.

Idaho Power uses industry-standard protocols for its internal and external evaluation efforts, including the *National Action Plan for Energy Efficiency—Model Energy Efficiency Program Impact Evaluation Guide*, the *California Evaluation Framework, the International Performance Measurement and Verification Protocol* (IPMVP), the *Database for Energy Efficiency Resources*, and the Regional Technical Forum's (RTF) evaluation protocols.

The company also supports regional and national studies to promote the ongoing cost-effectiveness of programs, the validation of energy savings and demand reduction, and the efficient management of its programs. Idaho Power considers primary and secondary research, cost-effectiveness analyses, potential assessments, impact and process evaluations, industry best-practice analyses, and customer surveys as important resources in providing accurate and transparent program savings estimates. Recommendations and findings from evaluations and research are used to continuously refine Idaho Power's DSM programs.

In 2018, Idaho Power contracted with Tetra Tech MA to conduct three program impact evaluations and one program process evaluation, DNV GL to conduct a program savings determination analysis, Resource Action Programs to conduct two program summary analyses, and Aclara to conduct one program summary analysis. Impact evaluations were performed for Energy Efficient Lighting, Multifamily Energy Savings Program, and the Custom option of the Commercial and Industrial Energy Efficiency Program. A process evaluation was performed for the Multifamily Energy Savings Program and a savings determination analysis was conducted for the Shade Tree Project. Program summary analyses were performed for the Energy-Savings Kit Program, the Energy Wise Program, and the Home Energy Reports pilot project. Idaho Power conducted internal analyses of the 2018 demand response events for A/C Cool Credit, Irrigation Peak Rewards, and Flex Peak Program.

Throughout 2018, Idaho Power administered several surveys regarding energy efficiency programs to measure customer satisfaction. Some surveys were administered by a third-party contractor; other surveys were administered by Idaho Power either through traditional paper and electronic surveys or through the company's Empowered Community online survey.

An evaluation schedule and final reports from all evaluations, research, and surveys completed in 2018 are provided in *Supplement 2: Evaluation*.

EVALUATION PLAN

Energy Efficiency 2010–2020 Program Evaluation Plans

Program Evaluation Schedule[1]	2010			2011			2012			2013			2014			2015[3]			2016			2017			2018			2019			2020		
	Impact	Process	Other	Impact	Process	Other	Impact	Process	Other	Impact	Process	Other	Impact	Process	Other	Impact	Process	Other	Impact	Process	Other	Impact	Process	Other	Impact	Process	Other	Impact	Process	Other	Impact	Process	Other
Residential Programs																																	
Energy House Calls		✓		✓																								✓	✓				
ENERGY STAR® Homes Northwest											✓		✓																				
Heating & Cooling Efficiency Program		✓					✓				✓											✓	✓										
Rebate Advantage				✓															✓	✓											✓		
Weatherization Solutions for Eligible Customers							✓				✓				✓												✓						
Weatherization Assistance for Qualified Customers							✓				✓				✓												✓						
Residential Energy Efficiency Education Initiative		✓																			✓												
Shade Tree Project	N/A[2]													✓													✓						
Home Energy Audit	N/A													✓								✓											
Educational Distributions	N/A																														✓	✓	
Simple Steps, Smart Savings™	N/A																														✓		
Multifamily Energy Savings Program	N/A																								✓	✓							
Home Energy Reports	N/A																										✓					✓	
Residential New Construction Pilot Program	N/A																											✓	✓				
Commercial/Industrial Programs																																	
New Construction		✓					✓												✓				✓					✓					
Custom Projects		✓		✓									✓	✓									✓		✓								
Retrofits		✓					✓				✓								✓				✓					✓					
Irrigation Programs																																	
Irrigation Efficiency Rewards		✓									✓			✓					✓	✓											✓		
Demand Response Programs																																	
A/C Cool Credit						✓		✓				✓			✓			✓			✓			✓			✓			✓			✓
Flex Peak Program						✓					✓							✓			✓			✓			✓			✓			✓
Irrigation Peak Rewards						✓						✓			✓			✓			✓			✓			✓			✓			✓

[1] Does not include Green Motors or Oregon Residential Weatherization.
[2] N/A indicates program not yet in existence.
[3] Energy efficiency programs evaluated in 2015 have since been eliminated or combined into another program.

ENERGY EFFICIENCY ADVISORY GROUP NOTES

The following pages include notes from EEAG meetings held on February 8, May 1, August 9, and October 20, 2018.

Energy Efficiency Advisory Group (EEAG)
Notes dated 2/8/2018

Present:

Pete Pengilly*-Idaho Power
Tina Jayaweera-Northwest Power & Conservation Council
Stacey Donohue–Idaho Public Utilities Commission
Jim Hall-Bodybuilding.com
Diego Rivas–Northwest Energy Coalition
Don Strickler–Simplot
Ben Otto-Idaho Conservation League
Connie Aschenbrenner-Idaho Power
John Chatburn–Office of Energy & Mineral Resources
Sid Erwin–Idaho Irrigation Pumpers Association

Not Present:

Kent Hanway-CSHQA
Ken Robinette–South Central Comm. Action Partnership
Nadine Hanhan–Public Utility Commission of Oregon

Guests and Presenters*:

Quentin Nesbitt*-Idaho Power
Tracey Burtch*–Idaho Power
Shelley Martin–Idaho Power
Billie McWinn*–Idaho Power
Gary Grayson–Idaho Power
Todd Greenwell–Idaho Power
Chellie Jensen–Idaho Power
Rachelle Farnsworth-Idaho Public Utilities Commission
Dan Johnson (on phone)-Avista
Becky Arte-Howell-Idaho Power
Denise Humphreys-Idaho Power
Dave Angel*-Idaho Power
Becky Andersohn-Idaho Power
Roger Lawless*-Idaho Power
Gina Powell-Idaho Power
Sheree Willhite-Idaho Power
Mindi Shodeen-Idaho Power
Phil DeVol-Idaho Power
Brandon Capps-Idaho Public Utilities Commission
Annie Meyer*–Idaho Power
Theresa Drake–Idaho Power
Andrea Simmonsen–Idaho Power
Debra Leithauser*-Idaho Power
Cheryl Paoli–Idaho Power
Zeke VanHooser-Idaho Power
Chris Pollow–Idaho Power
Rob Ord-Idaho Power
Brittany Nixon-Idaho Power
Kevin Keyt-Idaho Public Utilities Commission
Donn English-Idaho Public Utilities Commission
Jared Hansen-Idaho Power
Adam Richins-Idaho Power
Brad Iverson-Long-Idaho Public Utilities Commission
Dylan Martin-Idaho Power
Tasha Tolley-Idaho Power
Johan Kalala-Kassanda-Idaho Public Utilities Commission
Tonja Dyke-Idaho Power
Katie Pegan-Office of Energy and Mineral Resources

Note Takers:

Shawn Lovewell (Idaho Power) with Kathy Yi (Idaho Power)

Meeting Facilitator: Rosemary Curtin

Meeting Convened at 9:30am

Rosemary started the meeting with introductions of members and guests. Pete expressed appreciation for members of EEAG and their time. All the savings shown in the presentations is preliminary. The upcoming dates for EEAG meetings are: May 1st, August 9th, and October 30th. There were no comments on the November 1st, 2017 meeting notes.

9:35 am Transmission & Distribution Deferral Benefits—Dave Angell

Dave addressed the group regarding the ongoing analysis of transmission & distribution deferral benefits. He initially presented to EEAG on this topic in August of 2016. The following points were presented by Tina Jayaweera and Dave Angell:

- An action item that came from The Northwest Power and Conservation Council's (NWPCC) Seventh Power Plan was to improve the methodology of valuing energy efficiency's ability to defer transmission and distribution. In August of 2017 regional utilities were asked to share with the NWPCC how they were estimating this value. There were ten utilities present and they all had different methodologies. The goal of that meeting was to find a method that would work on a regional level.

- Idaho Power's deferral calculation is based on the present value of capital expenses that are approved by officers and board members. The approvals are for the current year but can span three years. A larger percentage of projects are infrastructure replacement. Originally Idaho Power analyzed energy efficiency benefits out seven years. The feedback was that benefits should have longer than a seven-year life, so calculations will be done for twenty years.

- Tina discussed Idaho Power's involvement in working with the NWPCC. Capital growth varies depending on what is happening in the economy. The NWPCC is looking at broader periods that take in to account the boom and bust cycles. All utility methodologies will be slightly different but the NWPCC will have a regional value to work with.
- The purpose is to apply a fair value of transmission and distribution deferral to determine the cost effectiveness of energy efficiency. Idaho Power will update their methodology and continue to support development of a regional approach with understanding that the company's own methodology will be used in the future. Idaho Power will present at the IRP and will come back to EEAG again.

There were questions and comments around the average age of Idaho Power's infrastructure, average growth rates and average prices, the value of looking at past and future data regarding the assessment of capital spending.

10:05 am -Residential Programs—Billie McWinn

Billie's presentation of the residential programs gave an overview of each program, the differences, and what category they fall in to: direct install, incentives, giveaways, buy-downs, and behavioral. Preliminary participation and year-end savings for each program was provided.

- Overall 2017 savings for residential programs is up 56% from 2016

- In the last three years, there have been seven new residential programs and six new offerings within existing residential programs.

- Twelve Multifamily projects were completed in 2017. Costs are lower when all units in a complex are done in one day rather than scheduling one at a time. Idaho Power personnel, the contractor, and a representative from the site first walk-through the complex and determine what needs to be done. They then order product and schedule a time to come back and install the items in each unit. One member commented that maybe there could be some efficiencies by combining the walk-through and installation into one visit rather than two.

- There is a finite number of manufactured homes in Idaho Power's service area that can participate in the Energy House Calls program. The company is regularly sending out direct mail. Marketing this program will continue for as long as it is cost-effective. One member suggested having the targeted marketing piece mention "your neighbors have participated in this program, now's the time to take advantage of it." Billie pointed out that contractors are commenting that direct installs are decreasing because customers have received and installed items from the Energy Savings Kit.

- In 2018, a smart strip will be an available measure added to the Home Energy Audit program. One member asked about follow up with customers after an audit is performed. A report is sent to the customer and the auditor calls them.

- At the last meeting, Idaho Power presented the new HVAC tune-up coupon offering in the Easy Savings program. This launched in November of 2017.

- The Residential New Custom Home pilot is expected to launch March 2018 in Idaho and April 2018 in Oregon. This offering will replace the Energy Star® program.

- The Shade Tree Project will expand into Twin Falls for 2018. This year the company is expecting to start realizing energy savings from this project.

- Billie passed around the new residential customer kits. These kits will be sent to customers who have a brand-new account with Idaho Power.

- Billie spoke to the group about Energy Savings Kits used for giveaways at high bill calls or events. These are the same as the non-electric mail by request kits and asked if EEAG is in favor of continuing to support the savings from these giveaway kits? Being that the interactions are targeted to a more engaged customer, the consensus of the group was favorable for continuing as is.

10:15 am-Break

10:25 am- Resume Residential presentation

- Kathy presented updated numbers regarding future lighting savings from those discussed at the November 2017 EEAG meeting. Jennifer Light of the Regional Technical Forum (RTF) will provide an update on lighting savings at the next meeting.

- Billie presented new findings related to showerheads offered in the Simple Steps, Smart Savings program. This was in response to a request at the November meeting where EEAG suggested the Company should consider market indicators before deciding on whether to continue offering the measure in the program. Based on the findings, the group felt that the company should continue offering the showerheads in the program.

There were questions and comments about looking at incentives on items for smart homes, including the RTF on analysis findings of Smart Thermostats, and make sure to check in with NEEA before removing Smart Sense showerheads from Simple Steps, Smart Savings program.

11:40 am C/I & Irrigation Programs—Quentin Nesbitt

Quentin provided preliminary savings and participation for the Commercial, Industrial, and Irrigation programs. Generally, all the programs in the commercial & industrial sector can be categorized under incentive and the cohorts fall under behavioral savings.

- The driver for measure updates in 2018 are based on the update of building codes and standards.

- The Technical Reference Manual update will be completed in the spring of 2018.

- Idaho Power took suggestions and feedback from EEAG and developed the Commercial Energy Saving Kits. There will be three kits that are targeted to three small business customer types; restaurants, offices, and retail.

- The amount of capital projects generated from the Wastewater and Water Cohorts has increased. Quentin thanked EEAG for their input on expanding this offering to the eastern region. He passed around informational collateral for the cohorts.

- Idaho Power is now sending out a welcome packet to new irrigation customers. This packet informs customers about the agriculture representatives and the current programs. At the last meeting, Quentin asked for feedback on an idea for a dealer incentive. The feedback from EEAG was that it wasn't a good idea. One member has since reached out and provided input and ideas on how to achieve better installation rates.

There was a question about whether Idaho Power is looking at a whole building approach in the New Construction Program. Idaho Power offers a whole building approach through energy modeling and the custom portion of its program. There was also a question about Dedicated Outdoor Air Systems (DOAS). Idaho Power is currently evaluating DOAS as an incentive measure for the New Construction program. Idaho Power currently offers technical Lunch & Learn training on DOAS systems through the Integrated Design Lab, however the Company does not claim savings for trainings. One member thanked Idaho Power for the continuation and expansion of the Wastewater & Water Cohort offering. Due to new regulations on the horizon, this will be very helpful for these customers.

Quentin and Billie presented information on the types of communication devices each demand response program uses. Billie provided preliminary information regarding a limited number of non-communicating devices identified in the residential DR program. Billie discussed that a new testing device was available that would help determine the cause of some communication issues. She asked for input on how the Company should proceed with non-communicating devices and the consensus was to continue with testing of the devices before any changes to participation were made. Billie will bring a testing process plan to the group in May.

12:30 Lunch

1:15 Meeting Reconvened

1:15 pm-Customer Solutions Advisor Activities—Roger Lawless

Roger presented the Customer Solutions Advisor (CSA) activities and how they support energy efficiency efforts. The CSA's make outbound calls to commercial customers and irrigation customers, and as a part of those calls they discuss Idaho Power's energy efficiency programs. They also respond to Home Energy Report inquiries, actively working with customers to update their My Account information to improve the accuracy of the reports or addressing other concerns or questions.

1:32 pm-My Account/Customer Touchpoints—Todd Schultz

Todd updated EEAG on Customer Care Initiatives, My Account registration redesign and energy efficiency promotion within My Account. One member suggested targeting those customers who have viewed energy efficiency pages with specific information. EEAG appreciates the work Idaho Power has done on text alerts and the improvements made to My Account.

1:57 pm-2017 Preliminary Energy Savings Results/Financials—Pete Pengilly

Pete briefly highlighted Appendix 1, the 2017 DSM Expenses and Preliminary Energy Savings by program. He presented the 2017 Preliminary Energy Savings Portfolio results.

- The company will receive preliminary savings numbers from NEEA at the end of February.
- Energy efficiency savings for 2017 was the highest it's been since 2010.

There were comments that the company does a good job exploring future program offerings.

2:20 pm-Marketing—Debra Leithauser, Tracey Burtch, Annie Meyer

Debra Leithauser introduced herself as the new Director of Corporate Communications and gave a brief history of how marketing has changed over time. Annie and Tracey presented an update on marketing activities since the last EEAG meeting. The following points were presented:

- The company's marketing tactics were shown in how they fall within the marketing funnel.
- At the last EEAG meeting, the group requested more information on how marketing tactics drive participation in programs. Information from a survey was provided to show the percentage of residential customers are familiar with energy efficiency programs and the overall improvement of customers who feel that their energy efficiency needs are met.
- Idaho Power is now participating in a new earned media opportunity in Twin Falls. A new energy saving habits video was played.

There were questions and comments regarding direct mailings, using My Account as a platform to engage customers rather than using direct mail, and ideas on what is done in other organizations to track people that have engaged with them; databases, social media, direct mailings, and events.

2:56-Break

3:12 pm-Wrap Up/Open Discussion

- The morning agenda was very full. Didn't find the My Account or CSA information relevant to the meeting.
- It was a very interesting meeting. We learned a lot about the programs today which helps new members.

- Appreciate the topics presented this morning as it was very helpful for new members and attendees. The afternoon session was good. All the broad-based stuff; text alerts, My Account, and marketing is the information that the group has been asking for. It's nice to see good program results under difficult market conditions.

- Enjoyed the entire meeting including; marketing and social media. It is interesting to see how the company is driving people to My Account and how it will translate into energy savings.

- The morning session was content heavy. Appreciated how the residential presentation was categorized. I enjoy the evaluation presentations and look forward to seeing M&V results.

- The customer topics fit with today's topics and tied in nicely. It would be nice to see a deeper dive into how it connects. Appreciated being able to go over the programs in more detail. There has been a marketing presentation at every meeting so maybe that can be cut back to every other time.

- The EEAG meetings have changed for the better and the presentations have become more meaningful.

Rosemary opened the discussion to the group. There were comments and questions about building codes and that there will be more opportunity for people to stay engaged, discussion around the Energy Imbalance Market and what that means for energy efficiency, what Idaho Power plans to regarding the lowered energy savings numbers for lighting and how the group can focus their efforts to find new and interesting ways to drive people to programs, allowing more space on the agenda for brainstorming ideas, and a suggestion to have someone from NEEA speak at a future EEAG meeting.

Theresa addressed the group and expressed appreciation for everyone's contributions and feedback. She thanked the group for their recognition of 2017 results. The company took recommendations that EEAG made throughout the year and has incorporated them. The company is committed to pursuing all cost-effective energy efficiency and is looking to EEAG to assist it in those endeavors.

3:51 Meeting Adjourned

Energy Efficiency Advisory Group (EEAG)
Notes May 1, 2018

Present:

Kent Hanway-CSHQA
Ken Robinette–South Central Comm. Action Partnership
Stacey Donohue*–Idaho Public Utilities Commission
John Chatburn–Office of Energy & Mineral Resources
Connie Aschenbrenner–Idaho Power
Haley Falconer-City of Boise Public Works Department
Diego Rivas-Northwest Energy Coalition-on phone
Don Strickler–Simplot
Tina Jayaweera-Northwest Power & Conservation Council-on phone
Selena O'Neal-Ada County Operations
Sid Erwin–Idaho Irrigation Pumpers Association
Pete Pengilly*-Idaho Power

Not Present:

Jim Hall-Bodybuilding.com
Ben Otto-Idaho Conservation League
Nadine Hanhan–Public Utility Commission of Oregon

Guests and Presenters*:

Quentin Nesbitt*-Idaho Power
Tracey Burtch*–Idaho Power
Shelley Martin–Idaho Power
Billie McWinn*–Idaho Power
Gary Grayson–Idaho Power
Todd Greenwell–Idaho Power
Chellie Jensen–Idaho Power
Jerry Peterson-Division of Building Safety
Denise Humphreys-Idaho Power
Randy Thorn-Idaho Power
Phil DeVol-Idaho Power
Tonja Dyke-Idaho Power
Sheree Willhite-Idaho Power
Cassie Koerner-Idaho Public Utilities Commission
Mark Rehley*-Northwest Energy Efficiency Alliance
Craig Williamson*-DNV-GL
Mike Alvarado-Bonocore
Cory Read–Idaho Power
Ariel Minter–Idaho Power
Andrea Simmonsen–Idaho Power
Annie Meyer*-Idaho Power
AJ Freeman–Idaho Power
Dan Axness-Idaho Power
Chris Pollow–Idaho Power
Kevin Keyt-Idaho Public Utilities Commission
Brittany Nixon-Idaho Power
Bryan Wewers-Idaho Power
Lynn Tominaga-Idaho Irrigation Pumpers Association
Mindi Shodeen-Idaho Power
Katie Pegan-Office of Energy and Mineral Resources
Yao Yin-Idaho Public Utilities Commission
Jennifer Light*-Northwest Power and Conservation Council
Shawn Bodmann*-DNV-GL
Sonexay Sengmany-City of Boise

Note Takers:

Shawn Lovewell (Idaho Power) with Kathy Yi (Idaho Power)

Meeting Facilitator: Rosemary Curtin-RBCI

Meeting Convened at 9:38 am

Pete started the meeting with housekeeping and emergency items, introduction of two new members; Hayley Falconer and Selena O'Neal, EEAG members and guests. There were no comments or questions on the February notes. Pete stated that due to the timing of the earnings release, the financial information will not be presented at this meeting. Those documents will be emailed to members later in the week. Tracey Burtch provided two updates regarding account and outage alerts.

9:44 am-2017 Evaluations—Craig Williamson & Shawn Bodmann-DNV GL

Craig introduced himself and Shawn. Several programs were evaluated during 2017, based on program year 2016. The three Commercial and Industrial programs had process evaluations. An impact and process evaluation were done for Residential Heating & Cooling Efficiency (H&CE) and the Residential Home Energy Audits (HEA) had an impact evaluation. Craig and Shawn covered the evaluation objectives, method highlights, and detailed findings for each program.

There were questions and comments regarding the benchmarking of program incentives, the evaluation schedule for programs, tracking or testing of the effectiveness of marketing, and how and when the evaluation findings get incorporated into programs.

11:20 am-Idaho Public Utilities Commission—Stacey Donohue-Idaho Public Utilities Commission

Stacey provided an overview of the Idaho Public Utilities Commission (IPUC). Her presentation covered the history of the IPUC, who it regulates, what the regulatory compact is, what the role of the commission is, how regulatory cases are processed (including the roles of interveners and the Commission staff, and how the IPUC makes its decisions). Stacey also discussed the IPUC's role regarding demand side management (DSM).

Connie briefly explained the differences between energy efficiency program management in the Company's Oregon and Idaho jurisdictions. In Oregon, Idaho Power must file tariff schedules and receive approval from the Public Utility Commission of Oregon on program changes. In Idaho, the Company is not limited by tariff schedules; however, it files an annual prudence determination with the IPUC for authority to recover program costs from customers. The Company appreciates the valuable input received from members of EEAG.

12:00 Lunch

1:00 Meeting Reconvened

1:00 pm-Regional Technical Forum Overview—Jennifer Light-Regional Technical Forum

Jennifer provided an overview of the Regional Technical Forum (RTF). It included the origins of the RTF, the role of the RTF and its organization, what functions the RTF performs, the structure of the Subcommittees, and the processes of measurement development.

Jennifer also focused on residential lighting and the key parameters that are used to establish savings. The presentation included the current practices and market data for establishing baseline savings, estimating savings over time, and the inclusion of federal standards.

Idaho Power helps fund the RTF and has a representative on the RTF.

2:01 pm NEEA, Emerging Technology, and RETAC—Mark Rehley-NEEA

Mark provided information on the Northwest Energy Efficiency Alliance (NEEA), the vision and mission of NEEA and their role on behalf of the numerous companies in the northwest region that they work with. Their work is mostly done with manufactures and supply chains and not with end users. Their goal is to look for products that deliver the same value while also using less energy and eventual market transformation.

Mark explained the Regional Emerging Technology Advisory Committee (RETAC) was established in 2010 and provides a regional view, a consistent approach to research and development, and provides product readiness assessment.

Idaho Power has representation on the RETAC and has since its inception.

3:17 pm Programs Update—Quentin Nesbitt & Billie McWinn

Commercial/Industrial Programs:

Energy Saving Kits for Businesses:

All Idaho EEAG members received a small office energy saving kit for use at their respective office buildings. These kits were developed with input from EEAG to target Idaho Power's small business customer, and in addition to the small office kit, a kit for restaurants and small retail were created (the contents of the kit vary by type). The program will be launching in a week, and generally small business customers are contacted by the company's Customer Solutions Advisors and Customer Representatives. Kits include surveys and flyers providing information on Idaho Power's energy efficiency programs. Information gathered from the surveys along with savings numbers from the RTF will be used for cost effectiveness.

School Cohort:

EEAG was asked for input if Idaho Power should continue with year two of the School Cohort. EEAG expressed appreciation that the company is looking at ways to improve and continue this program. A comment was made that the Boise School District was happy to participate in this cohort and are looking forward to year two. The consensus of EEAG was that Idaho Power should continue the School Cohort for year two.

C&I Energy Efficiency Program:

Quentin presented some changes for prescriptive measures that will be made to the commercial & industrial programs that are based on code changes, savings, measure costs, market acceptance, and cost effectiveness.

Residential Programs:

Billie led a discussion on the A/C Cool Credit program non-communicating switches and provided an update on the Home Energy Reports.

At the EEAG meeting in February the group discussed a limited number of non-communicating devices that were identified in the A/C Cool Credit program, and Billie committed to bring back a plan for testing the non-communicating devices. She provided detailed information of the testing protocol, which would result in participant removal as a last resort, and asked for feedback from EEAG on the new protocol.

There were questions and comments regarding the current process to work with customers on non-communicating devices and the process the company goes through to determine unknown causes. EEAG was in favor of Idaho Power moving forward with the new protocol.

4:22 pm-Wrap Up/Open Discussion

- It was a long day filled with great presentations. The educational presentations were great. These presentations would be great for new members.
- There was a lot of great information which helps the group to help Idaho Power work on finding cost effective savings.
- The variety of educational topics were appreciated.
- It was a great day for new members to start because of the updates and educational material.
- Great educational presentations. Thanks to all the out of town presenters for speaking to the group, it's great to have the experts explain what their organizations do.
- The program content was informational and helped the group understand what the organizations do. These topics would be a great "boot camp" to help get new members up to speed.
- Appreciated the educational topics and getting updates on what has happened since the last meeting.

4:40 pm Meeting Adjourned

Energy Efficiency Advisory Group (EEAG)
Notes dated 8/9/2018

Present:

Kent Hanway-CSHQA
Ken Robinette–South Central Comm. Action Partnership
Stacey Donohue–Idaho Public Utilities Commission
Diego Rivas–Northwest Energy Coalition (on phone)
Lynn Tominaga–Idaho Irrigation Pumpers Association
Nadine Hanhan–Public Utility Commission of Oregon (on phone)
Jim Hall-Bodybuilding.com
Selena O'Neal-Ada County Operations
Don Strickler–Simplot
Ben Otto-Idaho Conservation League
Scott Pugrud–Office of Energy & Mineral Resources
Connie Aschenbrenner–Idaho Power
Pete Pengilly*-Idaho Power
Tina Jayaweera-Northwest Power & Conservation Council
Haley Falconer-City of Boise Public Works Department

Not Present:

Sid Erwin–Idaho Irrigation Pumpers Association

Guests and Presenters*:

Quentin Nesbitt*-Idaho Power
Annie Meyer*–Idaho Power
Shelley Martin–Idaho Power
Billie McWinn*–Idaho Power
Gary Grayson–Idaho Power
Todd Greenwell–Idaho Power
Chellie Jensen–Idaho Power
Sheree Willhite-Idaho Power
Royce Davis*-City of Boise
Don Reading-Industrial Customers of Idaho Power
Rachelle Farnsworth-Idaho Public Utilities Commission
Paul Goralski-Idaho Power
Mindi Shodeen-Idaho Power
Katie Pegan-Office of Energy & Mineral Resources
Kevin Keyt-Idaho Public Utilities Commission
Krista West-Idaho Power
Grant Black-Idaho Power Student Intern
Cassie Koerner-Idaho Public Utilities Commission
Anna Kim-Public Utility Commission of Oregon (on phone)
Cory Read–Idaho Power
Theresa Drake–Idaho Power
Andrea Simmonsen–Idaho Power
Randy Thorn-Idaho Power
Cheryl Paoli–Idaho Power
Zeke VanHooser-Idaho Power
Chris Pollow–Idaho Power
Bill Carr*-Suez Water Company
Rito Reynoso-Metro Community Services
Peter Richardson-Industrial Customers of Idaho Power
Jerry Peterson-Division of Building Safety
Brittany Nixon-Idaho Power
Zach Waterman-Sierra Club
Adam Richins-Idaho Power
Mary Hacking-Idaho Power
Tonja Dyke-Idaho Power
Denise Humphreys-Idaho Power
Bentley Erdwurm-Idaho Public Utilities Commission

Note Takers:

Shawn Lovewell (Idaho Power) with Kathy Yi* (Idaho Power)

Meeting Facilitator: Rosemary Curtin-RBCI

Meeting Convened at 9:34am

Pete started the meeting with introduction of members and guests, safety, and housekeeping He informed the group that Ken Robinette will no longer be a member of EEAG. Ken was recently appointed to the Department of Energy's State Advisory Board by the Secretary of Energy, Rick Perry. Pete presented Ken with an appreciation gift for his 16 years of service to the EEAG.

9:46 Am-Preliminary Cost Effectiveness—Kathy Yi

Kathy presented a high-level view of program cost-effectiveness and will provide a more in-depth presentation at the October meeting. She provided a brief explanation of the different cost-effectiveness tests, a DSM alternate cost comparison, and the anticipated changes that may impact programs in 2019.

There were questions and discussion about alternative costs, and whether the company includes capacity benefits in its calculations. Kathy answered that in addition to alternative costs, the company applies a load shape and anything that has savings during peak hours is given a capacity value.

10:42-Programs—Billie McWinn and Quentin Nesbitt

Residential Programs:

Billie provided an update on year-to-date savings for each program and led a discussion on the Home Energy Reports and Multifamily Direct Install program. She provided an update on the Home Energy Reports which included first year savings and the objectives for year two. The attrition rates for year one were due to move-in's and move-outs, and overall the program had high customer satisfaction. The Multifamily Direct Install program timeline was discussed. A process and impact evaluation are being done on this program in 2018.

There were questions and comments asking if Idaho Power has received feedback from customers on the Thermostatic Showerheads and how to use them. A suggestion was made to have the evaluators ask customers if they like the showerheads and if they are still installed.

Commercial/Industrial/Irrigation programs:

Quentin provided preliminary year-to-date savings and participation for the Commercial, Industrial, and Irrigation programs.

- **New Construction**

  Program changes have been filed in Oregon and the company anticipates a Commission order by August 15th. There was discussion around using signage for Idaho Power programs at job sites and some of the barriers associated with that.

- **Retrofits**

  This portion of the program also will change with the Oregon filing. Some incentives are being lowered so there is a push by some contractors to get projects in before program changes are implemented. The program has seen quite a few large non-lighting projects, especially among a few large industrial customers, but lighting continues to comprise most of the savings for retrofits.

- **Energy Saving Kits**

  The Customer Solutions Advisors are completing outbound calls to all new business customers to introduce them to Idaho Power, the company's energy efficiency programs, and the Energy Saving Kits. A specific list of Idaho Powers smallest office, retail, and restaurant customers are also specifically being called to promote the Commercial Energy Savings Kits. There was some discussion on how long the company thought it would take to call these customers. Quentin estimated that it would be done by the end of the year.

- **Custom Projects**

  There was a question about how often the same customer participates with a different facility vs. a customer participating for the first time. Quentin answered that the majority of participation is the same customer with a different location or facility. An example was given of a project that was in the planning stage for 10 years prior to being completed. There are a lot of people and decisions that go into completing upgrade projects.

- **Demand Response**

  Quentin provided an overview of the season and preliminary savings estimates for the Flex Peak, AC Cool Credit, and Irrigation Peak Rewards programs and explained how the nomination process works for Flex Peak in response to an EEAG member question. There was some discussion around an online dashboard for real time data. Idaho Power is working on a system to provide interval data for all large customers but not real time data. Customers can get real time data through KYZ output from the Idaho Power meter and put it into their own software systems.

- **Irrigation Efficiency**

  There are some reduced savings assumptions from the Regional Technical Forum (RTF) for the menu portion of this program. The company may have more information to present at the next meeting.

12:00 Lunch

1:00 pm-Municipal Water Supply Optimization Cohort —Bill Carr-Suez Water Co and Royce-City of Boise

Quentin introduced Bill Carr of Suez and Royce Davis of the City of Boise. They spoke about their participation in the water supply cohort with Idaho Power. They gave a background of their systems, spoke to the barriers and challenges they encountered, the successful projects they accomplished, and lessons learned.

There were comments and questions about reduction in water usage, how they overcame the barriers within their companies, and how capital projects were processed through Idaho Power's incentive programs. EEAG members thanked Idaho Power for running these cohorts and thanked Bill and Royce for sharing their experiences and how it impacts operations.

2:00 pm-Marketing Update—Annie Meyer

Annie updated the group on the latest marketing efforts since the last EEAG meeting. She highlighted the marketing funnel and how it relates to the company's Spring Awareness Campaign. She also provided definitions for the terms: Reach, Frequency, and Impressions which provided context for the company's ads on network TV, radio, and digital. She also highlighted the changes to marketing collateral based on feedback that EEAG provided.

There were comments and questions about how many customers read the company's newsletter, Connections, having a pop-up on the company's website encouraging people to read Connections, creating a pop-up ad to target a customer who is looking to compare their current months' usage to last year, and a request to get the click thru rate for programs and unique number of users to that site.

Annie then spoke to the group about the upcoming fall pledge. She asked EEAG members to form small groups to brainstorm ideas for simple low-cost or no-cost actions customers can pledge to save energy and money. Rosemary explained the expectations of the breakout session and split the members into two groups. She asked for one person from each group to report out once the exercise was complete.

Stacey Donohue reported for her group, their ideas were: line dry clothes, install timers on outdoor lights, use an Insta-pot (old pledge listed crockpot), close blinds on hot days, open on cold days, replace your 5 most used light bulbs w/LED, use a robot vacuum, program thermostat.

Scott Pugrud reported for his group, their ideas were: increase a/c by 2 degrees, use outdoor light sensors, take a seven minute or less shower, install low flow showerhead, change air filter, sign up for energy saving kit, hang dry clothes, check temperature on hot water heater, unplug cell phone charger when not in use.

3:15 pm-Wrap-up/Open discussion

- This was the right sized agenda, liked diving deeper on just a couple topics

- Enjoyed the cohort presentation and encourage Idaho Power to consider other areas to continue that model. A presentation on the Integrated Resource Plan (IRP) that has been adopted.

- Thank you for the cohort presentation. It was very useful to hear customer perspectives. An IRP presentation would be helpful.

- Appreciated the cohort presentations.

- Would like to see more examples like the successes of the cohorts.

- Thank you for the newspaper insert. Idaho Power does a great job with marketing.

- It was interesting to hear about the decision makers and those on the ground trying to get projects done. It was good to hear about the example of it taking 10 years to get a project done. Similar examples like those would be good to hear about.

- The cohort presentation was good and hearing about the people on the ground that were able to get things done.

- It is intriguing to see Idaho Power and Suez working together, are there plans for Idaho Power, Intermountain Gas and Suez to work more together?

- The multi-family project is interesting. From a city perspective, it can be a challenge to provide service. It will be interesting to see how the city can leverage this program.

- Looking forward to the cost-effectiveness discussion and to discuss the end goal of programs once the market has been transformed.

3:45 pm-Meeting Adjourned

Energy Efficiency Advisory Group (EEAG)
Notes dated October 30th, 2018

Present:

Kent Hanway-CSHQA
Jim Hall-Bodybuilding.com
Stacey Donohue–Idaho Public Utilities Commission
Diego Rivas–Northwest Energy Coalition (on phone)
Connie Aschenbrenner–Idaho Power
Anna Kim–Public Utility Commission of Oregon
Haley Falconer-City of Boise
Selena O'Neal-Ada County Operations
Don Strickler–Simplot
Ben Otto-Idaho Conservation League
Scott Pugrud–Office of Energy & Mineral Resources
Sid Erwin–Idaho Irrigation Pumpers Association
Pete Pengilly*-Idaho Power
Tina Jayaweera-Northwest Power & Conservation Council

Guests and Presenters*:

Quentin Nesbitt*-Idaho Power
Tracey Burtch*–Idaho Power
Shelley Martin–Idaho Power
Billie McWinn*–Idaho Power
Gary Grayson*–Idaho Power
Todd Greenwell–Idaho Power
Chellie Jensen–Idaho Power
Lisa Grow-Idaho Power
Adam Richins-Idaho Power
Donn English-Idaho Public Utilities Commission
Phil DeVol-Idaho Power
Kevin Keyt-Idaho Public Utilities Commission
Katie Pegan-Office of Energy & Mineral Resources
John Chatburn-Office of Energy & Mineral Resources
Braden Jensen-Idaho Farm Bureau Federation
Cory Read–Idaho Power
Theresa Drake–Idaho Power
Andrea Simmonsen*–Idaho Power
Becky Andersohn*-Idaho Power
Cheryl Paoli–Idaho Power
Zeke VanHooser-Idaho Power
Chris Pollow–Idaho Power
Darrel Anderson*-Idaho Power
Brian Buckham-Idaho Power
Tonja Dyke-Idaho Power
Dan Axness-Idaho Power
Cassie Koerner-Idaho Public Utilities Commission
John Anderson-Idaho Power
Krista West-Idaho Power
Butch Otter-Governor of Idaho

Note Takers:

Shawn Lovewell (Idaho Power) with Kathy Yi (Idaho Power)

Meeting Facilitator: Rosemary Curtin

Meeting Convened at 9:30am

Rosemary started the meeting with introduction of members and guests. There were no questions or comments on the August 8th notes.

9:35 am-Report out on Smart Saver Pledge—Andrea Simmonsen

Andrea updated the group on the status of the Smart Saver Pledge. It runs from October 1st thru November 20th. At the August meeting EEAG members worked in groups to help Idaho Power come up with new low or no-cost items to use in the pledge. Andrea informed the group that four out of the five items came from that break out session. She also explained the different avenues Idaho Power has communicated the pledge with customers. As of today, October 30th, there have been over 4,000 entrants. In prior pledge campaigns, the average has been about 1,000.

<u>Follow-up Items</u>

Quentin and Billie provided information on follow-up items from the August 9th meeting.

1. **When the Customer Solutions Advisors (CSA) are making outbound calls, what do customers see on their caller id?** Quentin stated that If they have subscribed to caller ID they will see "Idaho Power Company" on their phone. If they don't have that feature they will just see the phone number and not the name.

2. **A comment was made about sending out a postcard to our list of customers that are being contacted by the CSA**. Quentin stated that rather than a postcard, the Company is sending out a letter.

3. **A question was asked if Idaho Power has seen increased sign-ups for My Account from customers that receive a Home Energy Report.** Billie stated that there is no significant difference between the sign-up rates for the treatment group versus the control group.

9:48 am 2019 Preliminary Cost Effectiveness Results—Kathy Yi

Kathy provided an overview of the different tests that Idaho Power uses to determine cost-effectiveness and shared updated preliminary cost-effectiveness results for 2018 and 2019. She also highlighted the changes in the numbers that were presented during the August EEAG meeting. (Kathy's presentation will continue after Governor Butch Otters Award Presentation)

10:00 am-Award for Excellence in Energy Efficiency—Governor Butch Otter

The Governor presented Darrel Anderson and Idaho Power with the Governor's Award for Excellence in Energy Efficiency, recognizing the Company's efforts and leadership in energy efficiency. Darrel Anderson thanked the Governor and stated that Idaho Power is very proud and honored to accept this award. Darrel recognized how Idaho Power benefits from a group like EEAG who assists the Company in its pursuit of energy efficiency. In 2017, enough energy was saved to power 17,000 homes for one year. Darrel thanked the Governor again and accepted the award on behalf of Idaho Power customers and employees.

Preliminary Cost-Effectiveness presentation continued

Kathy highlighted some of the issues facing the Heating & Cooling Efficiency program and the Residential New Construction Pilot. Idaho Power is not making any major changes to the programs and if there are any changes it will be to improve the cost-effectiveness.

There were questions and comments regarding avoided costs and if energy efficiency is part of those calculations. A question about whether ductless heat pumps pass the Utility Cost Test (UCT) and the Participant Cost Test (PCT) by themselves, the assumptions for baseline savings for ductless heat pumps, and percentage of new residential construction that would be eligible for the new construction pilot incentive. Idaho Power will provide the answers and information at the next EEAG meeting.

Break-10:47am

10:59 am-Irrigation Efficiency Savings—Quentin Nesbitt

Quentin explained the Irrigation Efficiency Rewards program and the two types of incentives available to customers: the custom option and the menu option. Earlier this year, the Regional Technical Forum (RTF) voted to accept the reduced savings on the irrigation hardware /menu measures. Quentin provided examples of past measure savings methodology, Idaho Power's understanding of the RTF new methodology, and the modified methodology that Idaho Power is purposing to use for 2019. Quentin asked EEAG for input on using the modified methodology.

There were questions and discussion of several topics, including: how and when the original savings methodology was established, the frequency of sprinkler package replacement, if Idaho Power is mandated to use the RTF savings numbers, crop values and savings assumptions, and evaluation strategy.

Quentin explained Idaho Power is not mandated to use RTF savings, but because they are available they are highly valued. If the Company doesn't use those savings numbers, Idaho Power's regulators may expect it to provide rationale for why they were not used.

The majority of EEAG members were supportive of Idaho Power using the modified savings methodology for 2019 and reporting back to EEAG on any further research that is done. One member did not support Idaho Power using the modified savings. It was stated that the RTF savings assumptions may have been misapplied by Idaho Power.

12:05 Lunch

12:48 Meeting Reconvened

12:48 pm-2017 Idaho Prudence Order Overview—Connie Aschenbrenner

Connie provided an overview of how Idaho Power manages its programs in Idaho vs. Oregon. In Oregon, programs and incentives are approved by the OPUC and included in schedules contained within the Company's tariff. An annual cost-effectiveness review is performed. In Idaho, there are no energy efficiency program tariff schedules that are approved by IPUC. Rather, the Company applies for a prudence determination on what was spent the previous year. She highlighted the 2017 prudence filing timeline and the comments that were filed. The Company felt that today's meeting and a future meeting would be the best opportunity to address the Idaho Commission order directing the Company address each of the topics raised by parties during the case with the EEAG.

Topic #1- "Not over-emphasize the results of its empowered community surveys when designing programs for all of its customers."

Becky Andersohn provided the background and function of the empowered community. It is an online panel made up of residential customers. Idaho Power established this community because it is a low-cost opportunity to receive feedback from customers fast. It is not intended to replace Idaho Power's regular surveys but used as an overall Company resource. It is not the sole source of customer feedback. Some surveys are used for energy efficiency topics and some are used for other Company issues.

Once a year the community is reviewed and members that aren't active participants are given one last chance to participate. If they don't, they are removed from the pool of participants. Community members also have the option to opt out of a survey when they receive it.

Billie provided examples of the types of questions asked in a survey for energy efficiency.

Rosemary asked the group if Idaho Power is using the empowered community appropriately, and if not, how it should be used going forward.

There was discussion and questions regarding other resources that the Company uses to make program decisions, the reason this topic was part of the comments in the Commission's order, and that moving forward the Company needs to be clearer on the multiple sources of information and how it uses the empowered community surveys.

Topic #2- "Include attic insulation in the multifamily housing program."

Billie briefly discussed the current offerings and qualifications for the Multifamily Energy Savings program. The Company explored adding windows, wall insulation, attic insulation, and floor insulation into this program. There were two combinations that passed cost effectiveness with conditions: attic insulation and floor insulation. Idaho Power stated that from a Company perspective it is a good idea to add attic insulation to the program, but not floor insulation because it requires a more invasive test (drilling holes in floors) and chances of a building meeting the criteria are slim.

Rosemary asked the group if Idaho Power should include attic insulation as an option into the multifamily housing program.

There was discussion and questions regarding cost sharing between Idaho Power and a building owner, if the incentive would cover the insulation, if the Company looked at low e window attachments, and cost effectiveness. In general, EEAG was in favor of the Company including attic insulation into this program.

Topic #3- "Expand cohort group partnerships with municipalities and school districts."

Quentin explained the different cohorts that Idaho Power has offered in its service territory and the timelines of each and the status on how Idaho Power has continued or expanded each of the cohorts. Quentin also explained there is no real industry standard in determining cost effectiveness for the cohorts. Idaho Power is engaged with other utilities and the RTF to establish protocol around how to determine cost-effectiveness.

Rosemary asked EEAG for their thoughts on the cohorts.

There was discussion and questions regarding the cost of cohorts to the Company, how to determine cost effectiveness, the success of the cohort model and how to continue it in other industries such as data centers or correctional facilities. In general, EEAG encouraged Idaho Power to continue with the cohort model, providing they are cost effective.

Topic #4- "Explore small business design options"

Quentin presented that Idaho Power currently has programs that small business customers can and do participate in: Commercial & Industrial Efficiency program which has measures for New Construction, Retrofits, and Custom projects for all sizes of business customers. Idaho Power also recently launched the energy savings kits for its smallest customers. Quentin explained basic details of the current Commercial & Industrial program and showed current program participation by customer size.

Quentin also stated that Idaho Power is initiating a request for proposal (RFP) for a small business direct install program. This will enable the Company to determine cost effectiveness and potential structure and overlap of an offering.

Rosemary asked the group for their thoughts on a small business option.

There was discussion and questions regarding the RFP and when the responses would come in, a pay for performance model, the challenges of a building owner vs. building tenant and how to market to each type of customer. There was support from EEAG in looking into additional options for small businesses.

Topic #5- "Consider a more frequent evaluation schedule and follow industry norm of two to three years for both impact and process evaluations for each program."

Gary Grayson discussed Idaho Power's current evaluation strategy and goals. He explained the several types of evaluations, the timing, and schedule of those evaluations. He explained that a variety of vendors are used year after year for evaluations for transparency

Rosemary asked for the groups thoughts.

There was discussion and questions regarding economies of scale, amortizing evaluation expenses, showing the cost effectiveness of a program with and without the cost of the evaluation included, industry standards for evaluation frequency, and Idaho Power providing a forward-looking schedule for program evaluations.

Topic #6- "Explore opportunities to engage customers in energy efficiency when they sign up for MyAccount."

Tracey walked the group through the steps a customer would take when registering for My Account. Step four was recently added to the registration process, asking if the customer wanted to receive information about Company news and energy efficiency. Currently, pop-ups are related to alerts but next month they will be related to energy efficiency

There was discussion and questions regarding the frequency of pop-ups, how the Company interacts with customers who are engaged thru My Account and push them toward program participation and saving energy, the use of how-to videos. In general, EEAG agreed that this topic will be an ongoing discussion at future EEAG meetings.

4:30 pm-Meeting Adjourned.

NEEA Market Effects Evaluations

Report Title	Sector	Analysis Performed By	Study Manager	Study/Evaluation Type
Building Commissioning Long-Term Monitoring and Tracking: 2017 Square Footage and Market Penetration Update	Commercial	The Cadmus Group	NEEA	Market Assessment
Commercial Windows Attachment (SGS) Initiative	Commercial	Navigant	NEEA	Market Assessment
Drive Power Initiative Long Term Monitoring and Tracking (LTMT) Report and ACE Model Assumption Update	Industrial	The Cadmus Group	NEEA	Market Assessment
Emerging Technology Quarterly Report	All	NEEA	NEEA	Quarterly Report
Emerging Technology Quarterly Report	All	NEEA	NEEA	Quarterly Report
Emerging Technology Quarterly Report	All	NEEA	NEEA	Quarterly Report
Energy Efficiency Through Windows	Residential	Arrow G Consulting	NEEA	Qualitative Research
Heat Pump Clothes Dryers in the Pacific Northwest – Abridged Field & Lab Study Report	Residential	NEEA	NEEA	Analysis
NEEA CRE Standard Evaluation: Final Report	Commercial	TRC Energy Services	NEEA	NEEA Assessment
NEEA Residential Furnace Fan Standard Evaluation: Final Report	Residential	TRC Energy Services	NEEA	NEEA Assessment
Northwest Ductless Heat Pump Initiative Market Progress Evaluation Report 6	Residential	The Cadmus Group	NEEA	Market Assessment
Northwest Ductless Heat Pump Initiative: Market Progress Evaluation #7	Residential	The Cadmus Group	NEEA	Market Assessment
Northwest Heat Pump Water Heater Initiative Market Progress Evaluation Report #4	Residential	Cadeo Group	NEEA	Market Assessment
Reduced Wattage Lamp Replacement: Market Intervention Strategies, Market Size and Next Steps	Commercial	Cadeo Group	NEEA	Market Assessment
Residential Building Stock Assessment II, Manufactured Homes Report 2016 2017	Residential	The Cadmus Group	NEEA	NEEA Assessment
Residential Building Stock Assessment II, Multifamily Buildings Report 2016 2017	Residential	The Cadmus Group	NEEA	NEEA Assessment
Residential Building Stock Assessment II, Single-Family Homes Report 2016 2017	Residential	The Cadmus Group	NEEA	NEEA Assessment
Secondary Glazing System (SGS) Moisture Analysis and Validation	Residential/ Commercial	Berkeley National Lab	NEEA	Analysis
Water Heater Market Characterization Report	Residential	Russell Research	NEEA	Market Assessment

Report titles appearing in blue are links to the online versions of the reports. A PDF of this supplement can be found at idahopower.com/ways-to-save/energy-efficiency-program-reports/.

INTEGRATED DESIGN LAB

Report Title	Sector	Analysis Performed By	Study Manager	Study/Evaluation Type
2018 Task 1: Foundational Services	Commercial	IDL	Idaho Power	EE Assistance & Education
2018 Task 2: Lunch and Learn	Commercial	IDL	Idaho Power	EE Training & Education
2018 Task 3: BSUG	Commercial	IDL	Idaho Power	EE Training & Education
2018 Task 4: New Construction Verifications	Commercial	IDL	Idaho Power	EE Verifications
2018 Task 5: Tool Loan Library	Commercial	IDL	Idaho Power	EE Assistance & Education
2018 Task 6 (1.6): Thermal Energy Savings Tool*	Commercial	IDL	Idaho Power	EE Assistance & Education
2018 Task 7: Building Energy Analytics Case	Commercial	IDL	Idaho Power	EE Research
2018 Task 8: Measuring Indoor Performance at Educational Facilities	Commercial	IDL	Idaho Power	EE Research

*Task 6 was numbered 1.6 in 2018.

2018 TASK 1: FOUNDATIONAL SERVICES

SUMMARY OF PROJECTS

IDAHO POWER COMPANY EXTERNAL YEAR-END REPORT

December 31, 2018

Prepared for:
Idaho Power Company

Author:
Elizabeth Cooper

Report Number: 1801_001-01

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Prepared for:
Idaho Power Company

Contract Number:
5277

Please cite this report as follows: Cooper, E. (2018). *2018 TASK 1: Foundational Services – Summary of Projects* (1801_001-01). University of Idaho Integrated Design Lab, Boise, ID.

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Acronyms and Abbreviations

AIA	American Institute of Architects
ASHRAE	American Society of Heating, Refrigeration, and Air-conditioning Engineers
BEQ	Building Energy Quotient
BOMA	Building Owners and Managers Association
EMS	Energy Management System
HID	High Intensity Discharge
IDL	Integrated Design Lab
IPC	Idaho Power Company
LED	Light Emitting Diode
LEED	Leadership in Energy and Environmental Design
Op-Ed	Opinion Editorial
TI	Tenant Improvement
UI	University of Idaho

1. Introduction

The University of Idaho Integrated Design Lab (UI-IDL) provided technical assistance in 2018 for energy efficiency building projects through the Foundational Services task. This program, supported by Idaho Power Company (IPC), offered three phases of assistance from which customers could choose. A marketing flyer, developed in prior years, outlining the three phases is shown below. Phase I includes projects with budgets less than $2,000, Phase II is limited to projects from $2,000 to $4,000, and Phase III is any project with a budget greater than $4,000.

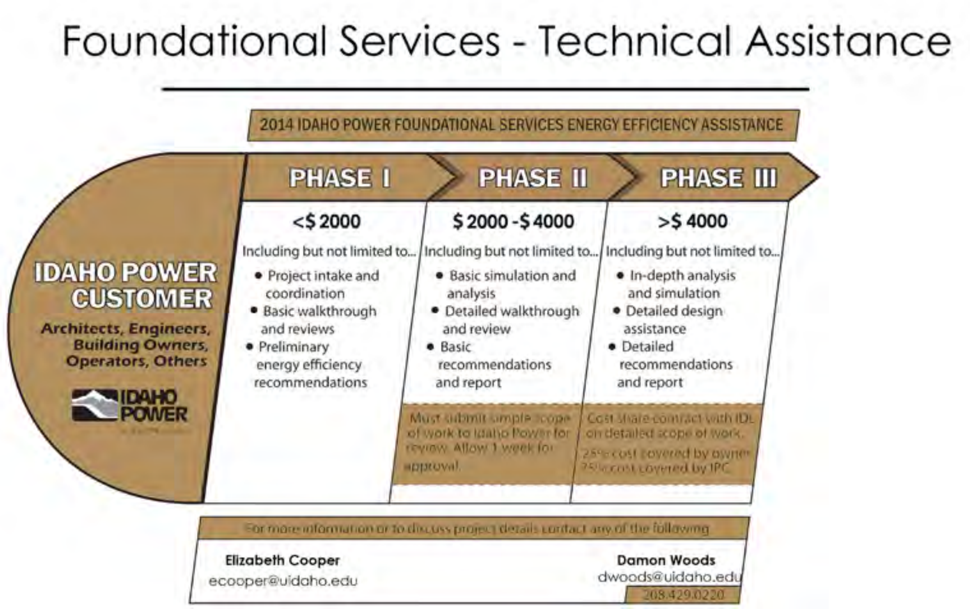

Figure 1: Foundational Services Flyer Outlining Phases

The Foundational Services program was marketed at numerous events and to multiple organizations in 2018, which included all IDL Lunch and Learn series presentations and BSUG presentations to local architecture and engineering firms, ASHRAE, AIA, and local government.

2. Project Summary

In addition to sixteen on-going projects from 2017, thirty new projects were submitted for technical assistance through the Foundational Services program in 2018. Projects ranged from short phone call consultations to detailed building simulations and Level 2 Energy Analyses. Building owners, property managers, building operators, architects, design engineers, utility customer representatives, government staff, energy management staff, program administrators, and contractors contacted the IDL. In total, there were sixteen Phase I projects, six Phase II projects, and one Phase III project (proposed), and seven projects that were proposed for potential future work. The full list of projects is shown in the appendix below. Details on Phase II projects are included in the individual project reports submitted to IPC and are included as Appendix B. Eleven of the projects were for work to be completed in existing buildings, and twelve were for new construction projects. The remaining projects were not building specific. There was an increase in the number of projects identified from 2017 to 2018. In 2018, the IDL assisted with approximately 250,000 square feet of buildings.

Table 1: 2018 Foundational Services Project Summary

Project Type	Size	NEW/EXISTING	Location
Planning	-	-	-
Office	30,000	New	Meridian
Educational	-	New	Boise
Mixed-use	-	New	Boise
Mixed-use	-	New	Boise
Civic/government	3,600	New	Homedale
Civic/government	9,000	New	Boise
Church	2,400	Existing	Boise

Review	-	-	-
Civic/government	24,145	New	Boise
Civic/government	10,000	Existing	Boise
Educational	-	New	Boise/Nampa
Civic/government	15,000	Existing	Boise
Civic/government	-	-	Boise
Educational	15,000	Existing	Boise
Hotel	12,500	Existing	Riggins
Planning	-	-	-
Educational	-	New	Boise
Medical	-	new/existing	Boise/McCall
Mixed-use	-	New	Boise
Industrial	100	Existing	Salmon
Educational	-	-	-
Office	14,215	Existing	Meridian
Office	4,000	New	Meridian
Office	1,344	Existing	Payette
Civic/government	10,000	Existing	Boise
Civic/government	15,000	Existing	Boise
Office	30,000	Existing	Boise
Civic/government	1,500	Existing	Boise
Industrial	-	-	-

INTEGRATED DESIGN LAB
University of Idaho

2018 Task 2: Lunch and Learn

Summary of Effort and Outcomes

Idaho Power Company External Year-End Report

December 31, 2018

Prepared for:
Idaho Power Company

Authors:
Elizabeth Cooper
Dylan Agnes

Report Number: 1801_002-01

IDAHO POWER
An IDACORP Company

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Contract Number:
#

Please cite this report as follows: Agnes, D., (2018). *2018 TASK 2: Lunch and Learn – Summary of Effort and Outcomes* (1801_002-01). University of Idaho Integrated Design Lab, Boise, ID.

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Acronyms and Abbreviations

AIA	American Institute of Architects
Arch	Architect(ure)
ASHRAE	American Society of Heating, Refrigeration, and Air-Conditioning Engineers
BCGCC	Boise Green Building Code
BESF	Building Energy Simulation Forum (Energy Trust of Oregon)
Bldg.	Building
BOMA	Building Owners and Managers Association
CSI	Construction Specifications Institute
Cx	Customer Experience
DOE	Department of Energy
Elec.	Electrical
EUI	Energy Use Intensity
GSHP	Ground Source Heat Pump
HVAC	Heating, Ventilation, and Air Conditioning
IBOA	Intermountain Building Operators Association
IBPSA	International Building Performance Simulation Association
IDL	Integrated Design Lab
IECC	International Energy Conservation Code
IES	Illuminating Engineering Society
IPC	Idaho Power Company
LEED	Leadership in Energy & Environmental Design
LED	Light Emitting Diode
M&V	Measurement and Verification
Mech.	Mechanical
Mgmt.	Management
NCARB	National Council of Architectural Registration Boards
TBD	To Be Determined
UI	University of Idaho
USGBC	U.S. Green Building Council
WBS	WELL Building Standard

1. 2018 Summary and Cumulative Analysis

Table 1: 2018 Lunch and Learn Summary

	Date	Title	Presenter	Group / Location	Attendees
1	03/23	Indoor Air Quality (IAQ) and Energy Efficiency in Buildings	Elizabeth	Engineering Firm 1	4
2	04/13	Daylight Performance Metrics for Human Health, Productivity, and Satisfaction	Elizabeth	Architectural Organization 1	10
3	04/13	Daylight in Buildings: Getting the Details Right	Elizabeth	Architectural Organization 1	8
4	04/27	Indoor Air Quality (IAQ) and Energy Efficiency in Buildings	Elizabeth	Architectural Firm 1	14
5	06/05	Daylight Performance Metrics for Human Health, Productivity, and Satisfaction	Elizabeth	Architectural Firm 2	7
6	06/14	Radiant Heating and Cooling Design	Damon	Engineering Firm 2	13
7	06/20	Indoor Air Quality (IAQ) and Energy Efficiency in Buildings	Elizabeth	Architectural Firm 2	8
8	06/21	Daylight in Buildings: Getting the Details Right	Elizabeth	Architectural Firm 1	6
9	07/12	Indoor Air Quality (IAQ) and Energy Efficiency in Buildings	Elizabeth	Engineering Firm 2	6
10	08/02	Daylight in Buildings: Getting the Details Right	Elizabeth	Architectural Firm 3	10
11	08/07	Radiant Heating and Cooling Design	Damon	Architectural Firm 4	9
12	08/08	Hybrid Ground Source Heat Pump System	Damon	Architectural Firm 5	3
13	08/21	Chilled Beams	Damon	Architectural Firm 4	6
14	08/23	Daylight Performance Metrics for Human Health, Productivity, and Satisfaction	Elizabeth	Engineering Firm 3	18
15	08/30	Daylight Performance Metrics for Human Health, Productivity, and Satisfaction	Elizabeth	Architectural Firm 6	9
16	09/05	Radiant Heating and Cooling Design	Damon	Architectural Firm 5	2
17	09/06	Indoor Air Quality (IAQ) and Energy Efficiency in Buildings	Elizabeth	Architectural Firm 3	3
18	09/17	VRFs & Heat Pumps	Elizabeth	Engineering Firm 3	5
19	10/09	Chilled Beams	Damon	Architectural Organization 1	48
20	10/30	Indoor Air Quality (IAQ) and Energy Efficiency in Buildings	Elizabeth	Architectural Firm 6	5
					194

Table 1 above summarizes all Lunch and Learn presentations given in 2018. The statistics in this section are cumulative for the 20 presentations. At each presentation participants were asked to sign in and fill out an evaluation form. Presentations were judged on a scale of 1 to 5, please see table 2. Participants were also given the opportunity to provide hand written responses.

Table 2: Evaluation Form Scale

Evaluation	1	2	3	4	5
In general, today's presentation was:	Not Useful		Somewhat Useful		Very Useful
The content of the presentation was:	Too Basic		About Right		Too Advanced
Please rate the following parts of the presentation: Organization, Clarity, Opportunity for Questions, Instructor's Knowledge of Subject Matter, and Delivery of Presentation	Needs Improvement		Good		Excellent

Table 3: Overall Attendance Breakdown

Architect:	136	Electrician:	
Engineer:	10	Contractor:	
Mech. Engineer:	12	Other:	6
Elec. Engineer:	7	None Specified:	23
Total (In-Person):	**194**		

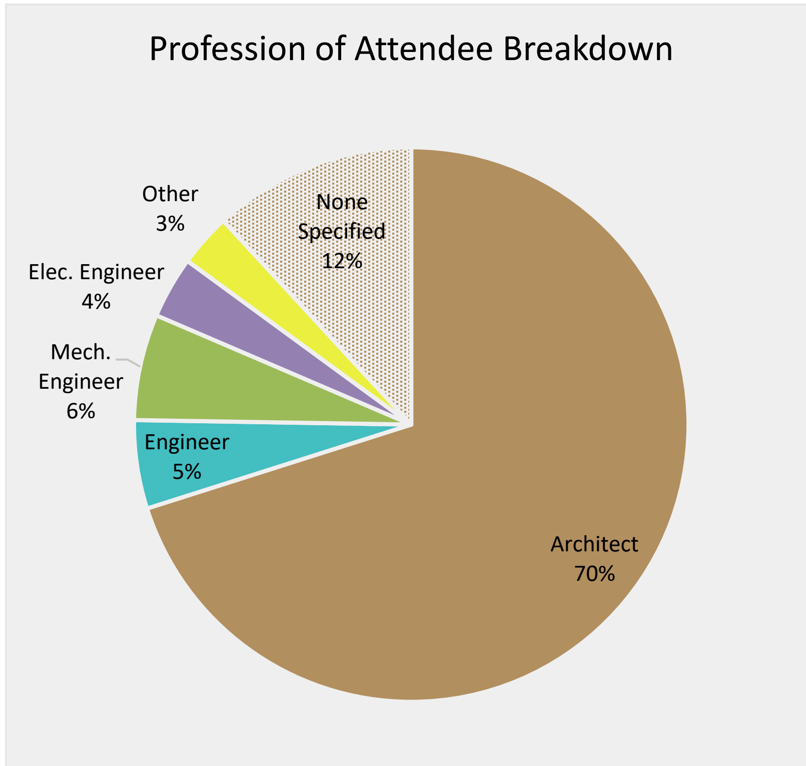

Figure 1: Attendee Profession

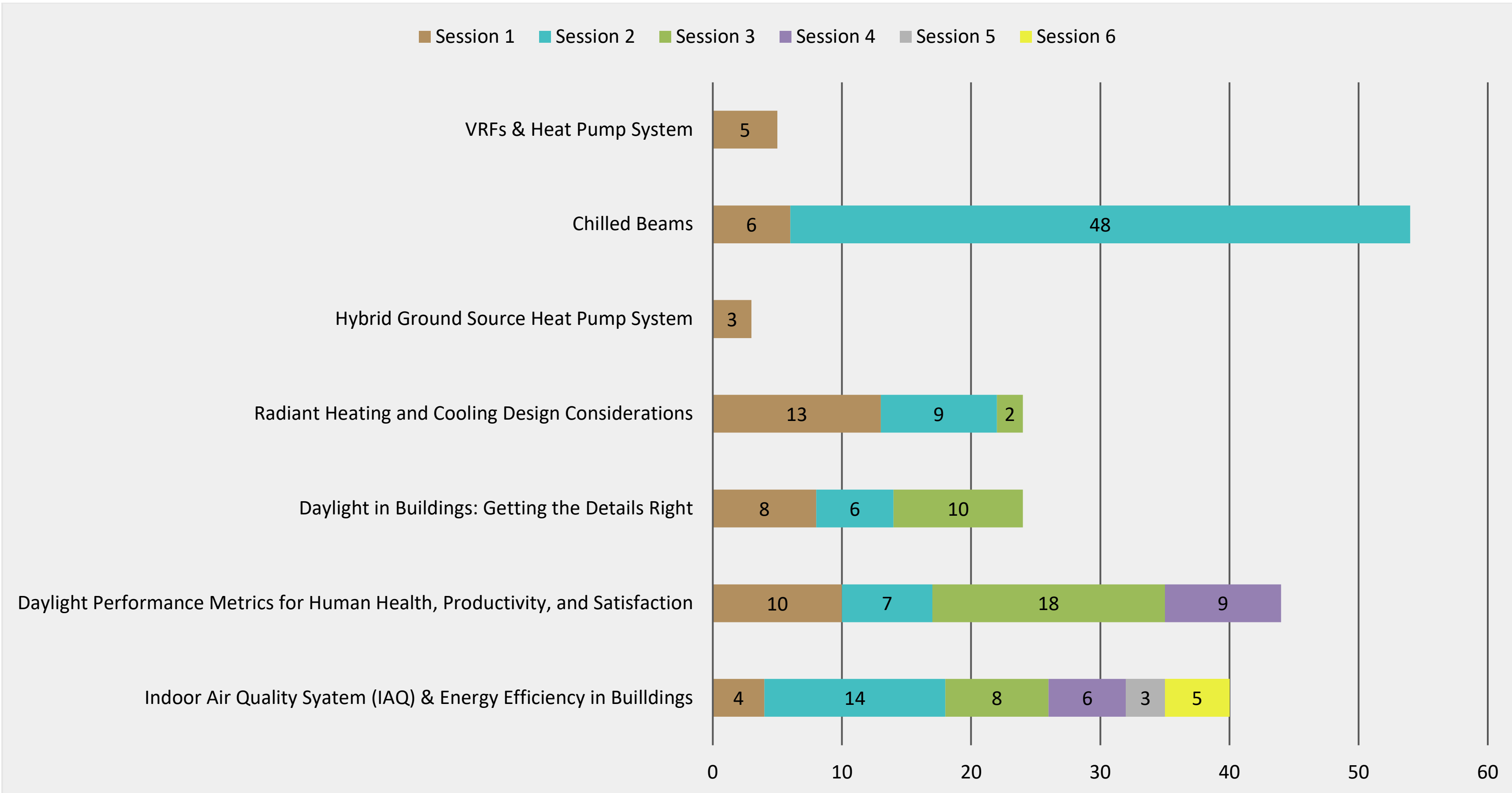

Figure 2: Attendee Count by Title and Number of Session

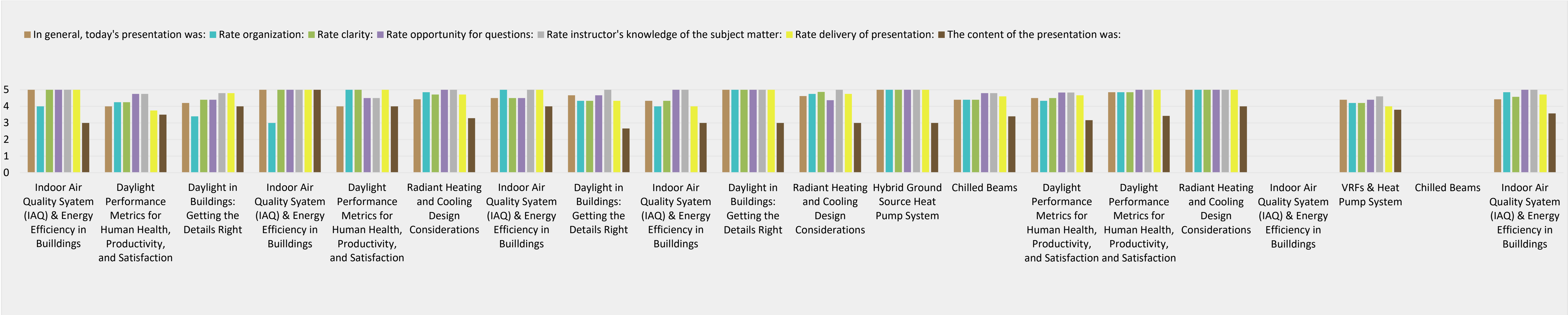

Figure 3: Average Evaluations by Session Title

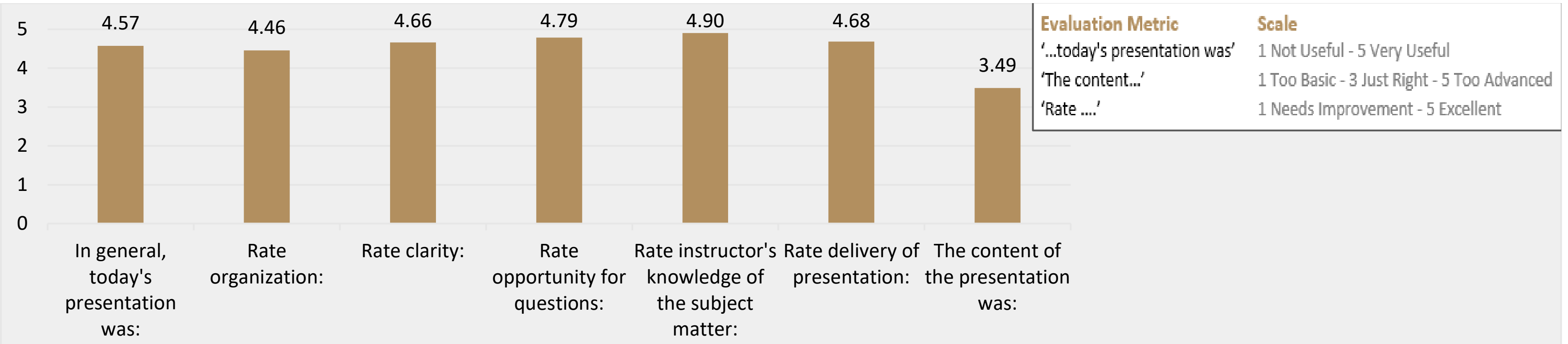

Figure 4: Overall Averages of Evaluations for all Sessions

2. Session Summaries

After each lunch and learn session, an evaluation form was requested from each participant. The feedback was used to improve future sessions. The feedback received from participants is generally constructive criticism used to keep sessions updated but also to propose other potential topics and questions to the Integrated Design Lab.

2.1 Session 1: Indoor Air Quality (IAQ) and Energy Efficiency in Buildings (03/23/2018)

Title: Indoor Air Quality (IAQ) and Energy Efficiency in Buildings.

Description: In an effort to make buildings operate in the most energy efficient manner, we are designing building envelopes to be as airtight as possible with as little outside air as allowable. In this presentation the following issues are addressed: significance of IAQ to human health and productivity, the link between IAQ and building energy demands, and efficient technologies for optimizing IAQ.

Presentation Info:

Date:	03/23/18
Location:	Engineering Firm 1 – Boise, ID
Presenter:	Elizabeth Cooper

Attendance:

Architect:		Electrician:	
Engineer:		Contractor:	
Mech. Engineer:	4	Other:	
Elec. Engineer:		None Specified:	
Total (In-Person):	**4**		

2.2 Session 2: Daylight Performance Metrics for Human Health, Productivity, and Satisfaction (04/13/2018)

Title: Daylight Performance Metrics for Human Health, Productivity, and Satisfaction.

Description: Daylight can breathe light and life into our buildings. Daylight can also make our buildings healthier and more energy efficient. However, designing effective, comfortable, and daylit buildings remains outside the capabilities of most designers. This session will discuss the impacts of daylight on humans in the built environment, the metrics associated with effective daylighting, and the tools available for designing daylight spaces with these metrics. It will highlight both the physical and psychological effects of daylight on the human visual and biological system and what can be feasibly achieved in terms of positive impacts upon worker productivity and improved user satisfaction through high quality daylighting design. It will explain the basis for daylighting metrics and how to utilize them in daylight and lighting design as well as capabilities of simulation tools to generate them, the effect of assumptions about blinds operation, implications for daylight performance and visual comfort, and the limitations of the metrics. Examples from real spaces present us with actionable knowledge about synthesizing the light of place with the specific needs of human activity as well as inform an intuitive understanding of the metrics and corresponding criteria**.**

Presentation Info:

Date:	04/13/18
Location:	Architectural Organization 1 – Boise, ID
Presenter:	Elizabeth Cooper

Attendance:

Architect:	10	Electrician:	
Engineer:		Contractor:	
Mech. Engineer:		Other*:	
Elec. Engineer:		None Specified:	
Total (In-Person):	**10**		

2.3 Session 3: Daylight in Buildings: Getting the Details Right (04/13/2018)

Title: Daylight in Buildings: Getting the Details Right.

Description: This session is intended to instruct on the process of creating high quality and comfortable day-lit spaces focuses on getting the details right. After the schematic design is formed to appropriately deliver daylight to the important surfaces within a space, there are several details that can make or break the overall success of the project. This presentation discussed several details, ranging from interior surface colors and reflectance, to interior space layouts, furniture design, window details (including glazing specifications), and shading strategies. The presentation introduces concepts of lighting control systems to ensure that energy is saved from the inclusion of daylight.

Presentation Info:

Date:	04/13/18
Location:	Architectural Organization 1 – Boise, ID
Presenter:	Elizabeth Cooper

Attendance:

Architect:	8	Electrician:	
Engineer:		Contractor:	
Mech. Engineer:		Other*:	
Elec. Engineer:		None Specified:	
Total (In-Person):	**8**		

2.4 Session 4: Indoor Air Quality (IAQ) and Energy Efficiency in Buildings (04/27/2018)

Title: Indoor Air Quality (IAQ) and Energy Efficiency in Buildings**.**

Description: In an effort to make buildings operate in the most energy efficient manner, we are designing building envelopes to be as airtight as possible with as little outside air as allowable. In this presentation the following issues are addressed: significance of IAQ to human health and productivity, the link between IAQ and building energy demands, and efficient technologies for optimizing IAQ.

Presentation Info:

Date:	04/27/2018
Location:	Architectural Firm 1 – Boise, ID
Presenter:	Elizabeth Cooper

Attendance:

Architect:		Electrician:	
Engineer:	14	Contractor:	
Mech. Engineer:		Other*:	
Elec. Engineer:		None Specified:	
Total (In-Person):	**14**		

2.5 Session 5: Daylight Performance Metrics for Human Health, Productivity, and Satisfaction (06/05/18)

Title: Daylight Performance Metrics for Human Health, Productivity, and Satisfaction.

Description: Daylight can breathe light and life into our buildings. Daylight can also make our buildings healthier and more energy efficient. However, designing effective, comfortable, and daylit buildings remains outside the capabilities of most designers. This session will discuss the impacts of daylight on humans in the built environment, the metrics associated with effective daylighting, and the tools available for designing daylight spaces with these metrics. It will highlight both the physical and psychological effects of daylight on the human visual and biological system and what can be feasibly achieved in terms of positive impacts upon worker productivity and improved user satisfaction through high quality daylighting design. It will explain the basis for daylighting metrics and how to utilize them in daylight and lighting design as well as capabilities of simulation tools to generate them, the effect of assumptions about blinds operation, implications for daylight performance and visual comfort, and the limitations of the metrics. Examples from real spaces present us with actionable knowledge about synthesizing the light of place with the specific needs of human activity as well as inform an intuitive understanding of the metrics and corresponding criteria**.**

Presentation Info:

Date:	06/05/2018
Location:	Architectural Firm 2 – Boise, ID
Presenter:	Elizabeth Cooper

Attendance:

Architect:	6	Electrician:	
Engineer:		Contractor:	
Mech. Engineer:		Other*:	1
Elec. Engineer:		None Specified:	
Total (In-Person):	**7**		

2.6 Session 6: Radiant Heating and Cooling Design (06/14/18)

Title: Radiant Heating and Cooling Design.

Description: Designing for radiant systems and thermally active surfaces represents a key opportunity for integrated design and high performance buildings. While radiant systems can be inherently more energy efficient than air-based systems, their success requires close collaboration between architects and engineers to ensure that the building facade reduces loads to levels achievable by radiant systems. This integration between the disciplines has a direct relationship to the performance of the system and comfort of the building, which is not always so closely related in more typical forced-air systems. Key design decisions must be made early in the design process to ensure the feasibility and performance of radiant systems down the road. A wide spectrum of configurations and types of radiant systems are available for designers, with each having different strengths, capacities, and complexities according to their setup. This presentation will cover some general rules of thumb to consider for radiant systems, as well as provide an overview of the key architectural and engineering design decisions associated with each system configuration.

Presentation Info:

Date:	06/14/2018
Location:	Engineering Firm 2- Boise, ID
Presenter:	Damon Woods

Attendance:

Architect:		Electrician:	
Engineer:	4	Contractor:	
Mech. Engineer:		Other:	
Elec. Engineer:		None Specified:	9
Total (In-Person):	**13**		

2.7 Session 7: Indoor Air Quality (IAQ) and Energy Efficiency in Buildings (06/20/18)

Title: Indoor Air Quality (IAQ) and Energy Efficiency in Buildings.

Description: In an effort to make buildings operate in the most energy efficient manner, we are designing building envelopes to be as airtight as possible with as little outside air as allowable. In this presentation the following issues are addressed: significance of IAQ to human health and productivity, the link between IAQ and building energy demands, and efficient technologies for optimizing IAQ.

Presentation Info:

Date:	06/20/2018
Location:	Architecture Firm 2 - Boise, ID
Presenter:	Elizabeth Cooper

Attendance:

Architect:	8	Electrician:	
Engineer:		Contractor:	
Mech. Engineer:		Other:	
Elec. Engineer:		None Specified:	
Total (In-Person):	**8**		

2.8 Session 8: Daylight in Buildings: Getting the Details Right(06/21/18)

Title: Daylight in Buildings: Getting the Details Right

Description: This session is intended to instruct on the process of creating high quality and comfortable day-lit spaces focuses on getting the details right. After the schematic design is formed to appropriately deliver daylight to the important surfaces within a space, there are several details that can make or break the overall success of the project. This presentation discussed several details, ranging from interior surface colors and reflectance, to interior space layouts, furniture design, window details (including glazing specifications), and shading strategies. The presentation introduces concepts of lighting control systems to ensure that energy is saved from the inclusion of daylight.

Presentation Info:

Date:	06/21/2018		
Location:	Architectural Firm 1 – Boise, ID		
Presenter:	Elizabeth Cooper		

Attendance:

Architect:	6	Electrician:	
Engineer:		Contractor:	
Mech. Engineer:		Other:	
Elec. Engineer:		None Specified:	
Total (In-Person):	**6**		

2.9 Session 9: Indoor Air Quality (IAQ) and Energy Efficiency in Buildings (07/12/18)

Title: Indoor Air Quality (IAQ) and Energy Efficiency in Buildings.

Description: In an effort to make buildings operate in the most energy efficient manner, we are designing building envelopes to be as airtight as possible with as little outside air as allowable. In this presentation the following issues are addressed: significance of IAQ to human health and productivity, the link between IAQ and building energy demands, and efficient technologies for optimizing IAQ.

Presentation Info:

Date:	07/12/2018
Location:	Engineering Firm 2 – Meridian, ID
Presenter:	Elizabeth Cooper

Attendance:

Architect:		Electrician:	
Engineer:	4	Contractor:	
Mech. Engineer:		Other:	1
Elec. Engineer:		None Specified:	1
Total (In-Person):	**6**		

2.10 Session 10: Daylight in Buildings: Getting the Details Right (08/02/18)

Title: Daylight in Buildings: Getting the Details Right.

Description: This session is intended to instruct on the process of creating high quality and comfortable day-lit spaces focuses on getting the details right. After the schematic design is formed to appropriately deliver daylight to the important surfaces within a space, there are several details that can make or break the overall success of the project. This presentation discussed several details, ranging from interior surface colors and reflectance, to interior space layouts, furniture design, window details (including glazing specifications), and shading strategies. The presentation introduces concepts of lighting control systems to ensure that energy is saved from the inclusion of daylight.

Presentation Info:

Date:	08/02/2018
Location:	Architectural Firm 3 –Boise, ID
Presenter:	Elizabeth Cooper

Attendance:

Architect:	10	Electrician:	
Engineer:		Contractor:	
Mech. Engineer:		Other:	
Elec. Engineer:		None Specified:	
Total (In-Person):	**10**		

2.11 Session 11: Radiant Heating and Cooling Design (08/07/18)

Title: Radiant Heating and Cooling Design.

Description: Designing for radiant systems and thermally active surfaces represents a key opportunity for integrated design and high-performance buildings. While radiant systems can be inherently more energy efficient than air-based systems, their success requires close collaboration between architects and engineers to ensure that the building facade reduces loads to levels achievable by radiant systems. This integration between the disciplines has a direct relationship to the performance of the system and comfort of the building, which is not always so closely related in more typical forced-air systems. Key design decisions must be made early in the design process to ensure the feasibility and performance of radiant systems down the road. A wide spectrum of configurations and types of radiant systems are available for designers, with each having different strengths, capacities, and complexities according to their setup. This presentation will cover some general rules of thumb to consider for radiant systems, as well as provide an overview of the key architectural and engineering design decisions associated with each system configuration.

Presentation Info:

Date:	08/07/2018
Location:	Architectural Firm 4 – Boise, ID
Presenter:	Damon Woods

Attendance:

Architect:	7	Electrician:	
Engineer:		Contractor:	
Mech. Engineer:		Other:	
Elec. Engineer:		None Specified:	2
Total (In-Person):	**9**		

2.12 Session 12: Hybrid Ground Source Heat Pump System (08/08/2018)

Title: Hybrid Ground Source Heat Pump System.

Description: The initial cost of ground-source heat pump systems can be substantially higher than conventional systems, limiting it as a design option. This presentation will highlight how, with a hybrid GSHP system it is possible to optimize the overall system life-cycle cost by reducing the initial cost, while still maintaining the low operating cost of a GSHP system. It will discuss how, to reduce initial costs, peak loads should be carefully calculated and minimized during the design phase, the GSHP system should be sized based on coincidental building loads with the use of simulation software, and the system components, including the ground heat exchanger and additional central plant equipment, should be sized to optimize life-cycle costs using appropriate economic assumptions.

Presentation Info:

Date:	08/08/2018
Location:	Architectural Firm 5 – Boise, ID
Presenter:	Damon Woods

Attendance:

Architect:	3	Electrician:	
Engineer:		Contractor:	
Mech. Engineer:		Other*:	
Elec. Engineer:		None Specified:	
Total (In-Person):	**3**		

2.13 Session 13: Chilled Beams (08/21/18)

Title: Chilled Beams.

Description: How to incorporate chilled beams into building design: the costs, the energy savings, and the impacts on the architectural program and HVAC system.

Presentation Info:

Date:	08/21/2018
Location:	Architectural Firm 4 – Boise, ID
Presenter:	Damon Woods

Attendance:

Architect:	3	Electrician:	

Engineer:		Contractor:	
Mech. Engineer:		Other:	2
Elec. Engineer:		None Specified:	1
Total (In-Person):	**6**		

2.14 Session 14: Daylight Performance Metrics for Human Health, Productivity, and Satisfaction (08/23/18)

Title: Daylight Performance Metrics for Human Health, Productivity, and Satisfaction.

Description: Daylight can breathe light and life into our buildings. Daylight can also make our buildings healthier and more energy efficient. However, designing effective, comfortable, and daylit buildings remains outside the capabilities of most designers. This session will discuss the impacts of daylight on humans in the built environment, the metrics associated with effective daylighting, and the tools available for designing daylight spaces with these metrics. It will highlight both the physical and psychological effects of daylight on the human visual and biological system and what can be feasibly achieved in terms of positive impacts upon worker productivity and improved user satisfaction through high quality daylighting design. It will explain the basis for daylighting metrics and how to utilize them in daylight and lighting design as well as capabilities of simulation tools to generate them, the effect of assumptions about blinds operation, implications for daylight performance and visual comfort, and the limitations of the metrics. Examples from real spaces present us with actionable knowledge about synthesizing the light of place with the specific needs of human activity as well as inform an intuitive understanding of the metrics and corresponding criteria**.**

Presentation Info:

Date:	08/23/2018
Location:	Engineering Firm 3 – Meridian, ID
Presenter:	Elizabeth Cooper

Attendance:

Architect:		Electrician:	
Engineer:	1	Contractor:	
Mech. Engineer:	7	Other:	
Elec. Engineer:	7	None Specified:	1
Total (In-Person):	**18**		

2.15 Sessions 15: Daylight Performance Metrics for Human Health, Productivity, and Satisfaction (08/30/18)

Title: Daylight Performance Metrics for Human Health, Productivity, and Satisfaction.

Description: Daylight can breathe light and life into our buildings. Daylight can also make our buildings healthier and more energy efficient. However, designing effective, comfortable, and daylit buildings remains outside the capabilities of most designers. This session will discuss the impacts of daylight on humans in the built environment, the metrics associated with effective daylighting, and the tools available for designing daylight spaces with these metrics. It will highlight both the physical and psychological effects of daylight on the human visual and biological system and what can be feasibly achieved in terms of positive impacts upon worker productivity and improved user satisfaction through high quality daylighting design. It will explain the basis for daylighting metrics and how to utilize them in daylight and lighting design as well as capabilities of simulation tools to generate them, the effect of assumptions about blinds operation, implications for daylight performance and visual comfort, and the limitations of the metrics. Examples from real spaces present us with actionable knowledge about synthesizing the light of place with the specific needs of human activity as well as inform an intuitive understanding of the metrics and corresponding criteria**.**

Presentation Info:

Date:	08/30/2018
Location:	Architectural Firm 6 – Boise, ID
Presenter:	Elizabeth Cooper

Attendance:

Architect:	6	Electrician:	
Engineer:		Contractor:	
Mech. Engineer:		Other:	
Elec. Engineer:		None Specified:	3
Total (In-Person):	**9**		

2.16 Session 16: Radiant Heating and Cooling Design (09/05/2018)

Title: Radiant Heating and Cooling Design.

Description: Designing for radiant systems and thermally active surfaces represents a key opportunity for integrated design and high-performance buildings. While radiant systems can be inherently more energy efficient than air-based systems, their success requires close collaboration between architects and engineers to ensure that the building facade reduces loads to levels achievable by radiant systems. This integration between the disciplines has a direct relationship to the performance of the system and comfort of the building, which is not always so closely related in more typical forced-air systems. Key design decisions must be made early in the design process to ensure the feasibility and performance of radiant systems down the road. A wide spectrum of configurations and types of radiant systems are available for designers, with each having different strengths, capacities, and complexities according to their setup. This presentation will cover some general rules of thumb to consider for radiant systems, as well as provide an overview of the key architectural and engineering design decisions associated with each system configuration.

Presentation Info:

Date:	09/05/2018
Location:	Architecture Firm 5 – Boise, ID
Presenter:	Damon Woods

Attendance:

Architect:	2	Electrician:	
Engineer:		Contractor:	
Mech. Engineer:		Other*:	
Elec. Engineer:		None Specified:	
Total (In-Person):	**2**		

2.17 Session 17: Indoor Air Quality (IAQ) and Energy Efficiency in Buildings (09/06/2018)

Title: Indoor Air Quality (IAQ) and Energy Efficiency in Buildings.

Description: In an effort to make buildings operate in the most energy efficient manner, we are designing building envelopes to be as airtight as possible with as little outside air as allowable. In this presentation the following issues are addressed: significance of IAQ to human health and productivity, the link between IAQ and building energy demands, and efficient technologies for optimizing IAQ.

Presentation Info:

Date:	09/06/2018
Location:	Architecture Firm 3 – Boise, ID
Presenter:	Elizabeth Cooper

Attendance:

Architect:	3	Electrician:	
Engineer:		Contractor:	
Mech. Engineer:		Other*:	
Elec. Engineer:		None Specified:	
Total (In-Person):	**3**		

2.18 Session 18: VRFs & Heat Pumps (09/17/18)

Title: VRFs & Heat Pumps.

Description: Designing features of decoupled buildings. Sizing VRF and heat pump systems for Idaho’s climates. Including ERVs with DOAS.

Presentation Info:

Date:	09/17/2018
Location:	Engineering Firm 3 – Boise, ID
Presenter:	Damon Woods

Attendance:

Architect:	3	Electrician:	
Engineer:	1	Contractor:	
Mech. Engineer:	1	Other*:	
Elec. Engineer:		None Specified:	
Total (In-Person):	**5**		

2.19 Session 19: Chilled Beams (10/09/2018)

Title: Chilled Beams

Description: How to incorporate chilled beams into building design: the costs, the energy savings, and the impacts on the architectural program and HVAC system.

Presentation Info:

Date:	10/09/2018
Location:	Architecture Organization 1 –Boise, ID
Presenter:	Damon Woods

Attendance:

Architect:	43	Electrician:	
Engineer:		Contractor:	
Mech. Engineer:		Other*:	
Elec. Engineer:		None Specified:	5
Total (In-Person):	**48**		

2.20 Session 20: Indoor Air Quality (IAQ) and Energy Efficiency in Buildings (10/30/2018)

Title: Indoor Air Quality (IAQ) and Energy Efficiency in Buildings.

Description: In an effort to make buildings operate in the most energy efficient manner, we are designing building envelopes to be as airtight as possible with as little outside air as allowable. In this presentation the following issues are addressed: significance of IAQ to human health and productivity, the link between IAQ and building energy demands, and efficient technologies for optimizing IAQ.

Presentation Info:

Date:	10/30/2018

Location:	Architecture Firm 6 – Boise, ID		
Presenter:	Elizabeth Cooper		

Attendance:

Architect:	4	Electrician:	
Engineer:		Contractor:	
Mech. Engineer:		Other*:	
Elec. Engineer:		None Specified:	1
Total (In-Person):	**5**		

3. Future Work

Feedback was gathered from the 79 Lunch and Learn evaluations received throughout 2018. The comments from these were valuable in defining possible future Lunch and Learn topics and informed the list of suggestions below.

<u>Potential Future Topics:</u>

- Envelope Design to meet energy code
- Natural Ventilation, Passive Heating & Cooling
- Update on LEED
- Photocontrols Basic & Advanced
- Absorption Cooling Technologies and Applications
- Thermal Comfort and its Implications in Building Design
- Drain Recovery Technologies

With the Lunch and Learn task, attendance at each session is determined mainly by the size of the firm or organization that is hosting. However, there may still be opportunities for increasing attendance. One suggestion would be to encourage the hosting entity to invite others who would find the information relevant such as, consultants or owners they work with.

2018 TASK 3: BSUG

SUMMARY OF EFFORT AND OUTCOMES

IDAHO POWER COMPANY EXTERNAL YEAR-END REPORT

December 31, 2018

Prepared for:

Idaho Power Company

Author:

Dylan Agnes

Elizabeth Cooper

Report Number: 1801_003-01

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Prepared by:
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IDL Director:
Elizabeth Cooper

Author:
Dylan Agnes
Elizabeth Cooper

Prepared for:
Idaho Power Company

Contract Number:
JKB168

Please cite this report as follows: Agnes, D. (2018). *2018 TASK 3: BSUG – Summary of Effort and Outcomes* (1801_003-01). University of Idaho Integrated Design Lab, Boise, ID.

DISCLAIMER

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Table of Contents

1. Acronyms and Abbreviations

AIA	American Institute of Architects
App	Application
ARUP	London based multi-discipline firm
ASHRAE	American Society of Heating, Refrigeration, and Air-Conditioning Engineers
BCVTP	Building Controls Virtual Test-Bed
BEMP	Building Energy Modeling Professional
BESF	Building Energy Simulation Forum (Energy Trust of Oregon)
BIM	Building Information Modeling
BOMA	Building Owners and Managers Association
BSME	Bachelor of Science in Mechanical Engineering
BSUG	Building Simulation Users' Group
CBECS	Commercial Building Energy Consumption Survey
Comm	Commercial
Elec.	Electrical
HePESC	Heat Pump Energy Savings Calculator
HVAC	Heating, Ventilation, and Air Conditioning
IBPSA	International Building Performance Simulation Association
IDL	Integrated Design Lab
IPC	Idaho Power Company
LBNL	Lawrence Berkeley National Laboratory
LEED	Leadership in Energy & Environmental Design
M. Arch	Masters of Architecture
ME	Mechanical Engineer(ing)
Mech.	Mechanical
MEP	Mechanical, Electrical, and Plumbing
MS Arch	Masters of Science Architecture
NCARB	National Council of Architectural Registration Boards
RDA	Revit Daylighting Analysis
TMSF	Twenty-Mile-South-Farm
TMY	Typical Meteorological Year
UDC	Urban Design Center
UI	University of Idaho
USGBC	U.S. Green Building Council

2. Introduction

The 2018 Idaho Power scope of work for the Building Simulation Users' Group (BSUG) task included planning, organization and hosting of six meetings, recording attendance and evaluations, archiving video of the presentations, and maintaining the BSUG 2.0 website.

3. 2018 Summary and Cumulative Analysis

In 2018, six sessions were coordinated and hosted. Sessions are summarized below with details in the following sections.

Table 1: Overall Summary of Sessions

Date	Title	Presenter	Presenter Company	RSVPs		Attendees	
				In-person	Online	In-person	Online
2/22	Sensor Suitcase	Michael Brambley & Sammuel Graham	PNNL & Green Path	13	41	12	17
3/22	Code Compliance through Energy Modeling	Rebecca Reel	Noresco	9	38	10	13
4/26	Energy Modeling Workflow – Creating Energy and Daylight Simulations from CAD	Damon Woods & Dylan Agnes	IDL	15	58	10	21
5/24	Energy Modeling for LEED v4 in Open Studio	Taylor Roberts	Group 14	10	52	11	19
10/25	Modeling Tools to Inform Early Design	Justin Shultz	EYP	6	26	5	15
12/12	ASHRAE Co-Meeting	Drury Crawley	BID	4	-	24	-
			Total:	**57**	**215**	**72**	**85**
				272		**157**	

3.1 2018 Attendance

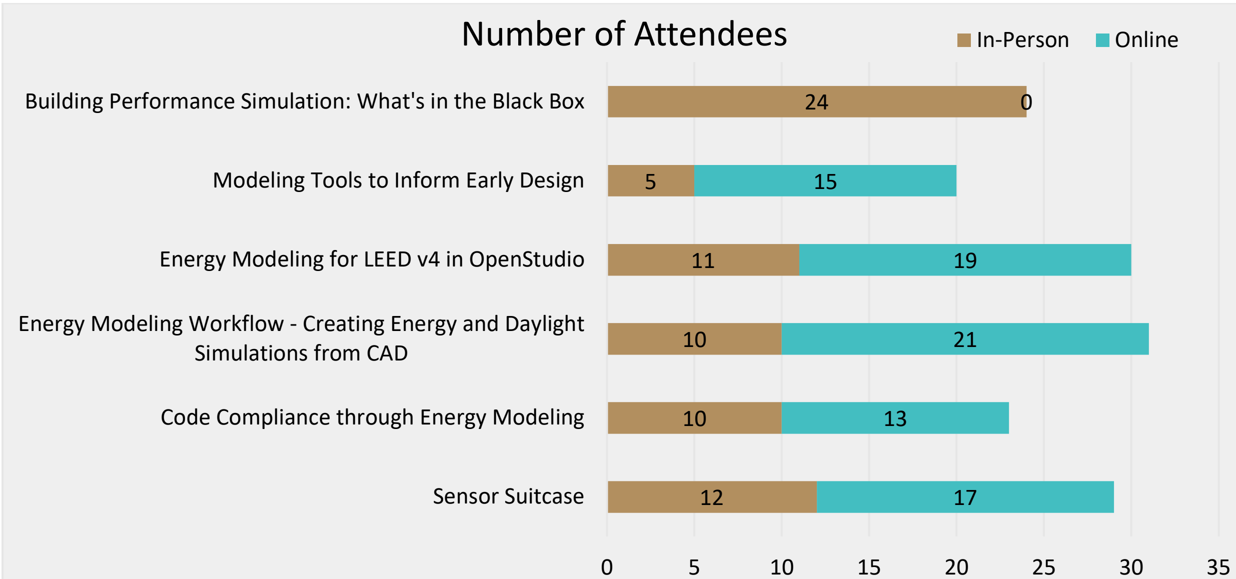


Figure 1: Attendee Count by Session and Type

Table 2: Overall Attendance Breakdown

Architect:	20	Electrician:	
Engineer:	62	Contractor:	
Mech. Engineer:	9	Other:	3
Elec. Engineer:		None Specified:	70
Total (In-Person):	**72**		
Total (Online):	**85**		
Total (Combined):	**157**		

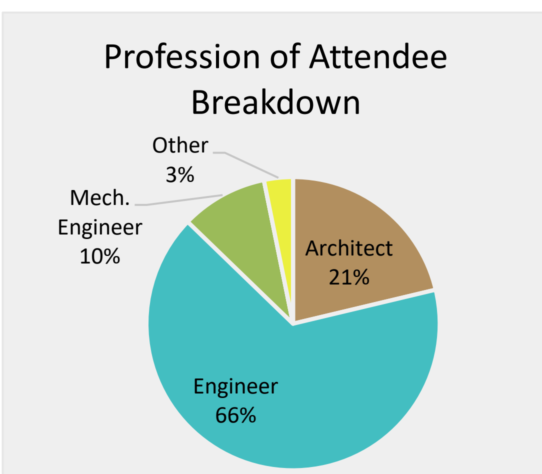


Figure 2: Attendee Profession Breakdown

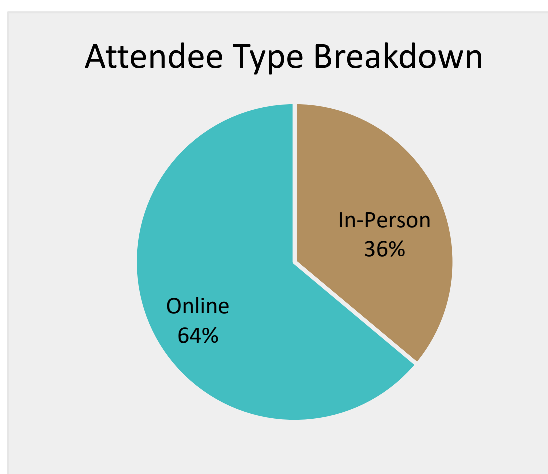


Figure 3: Attendee Type Breakdown

3.2 2018 Evaluations

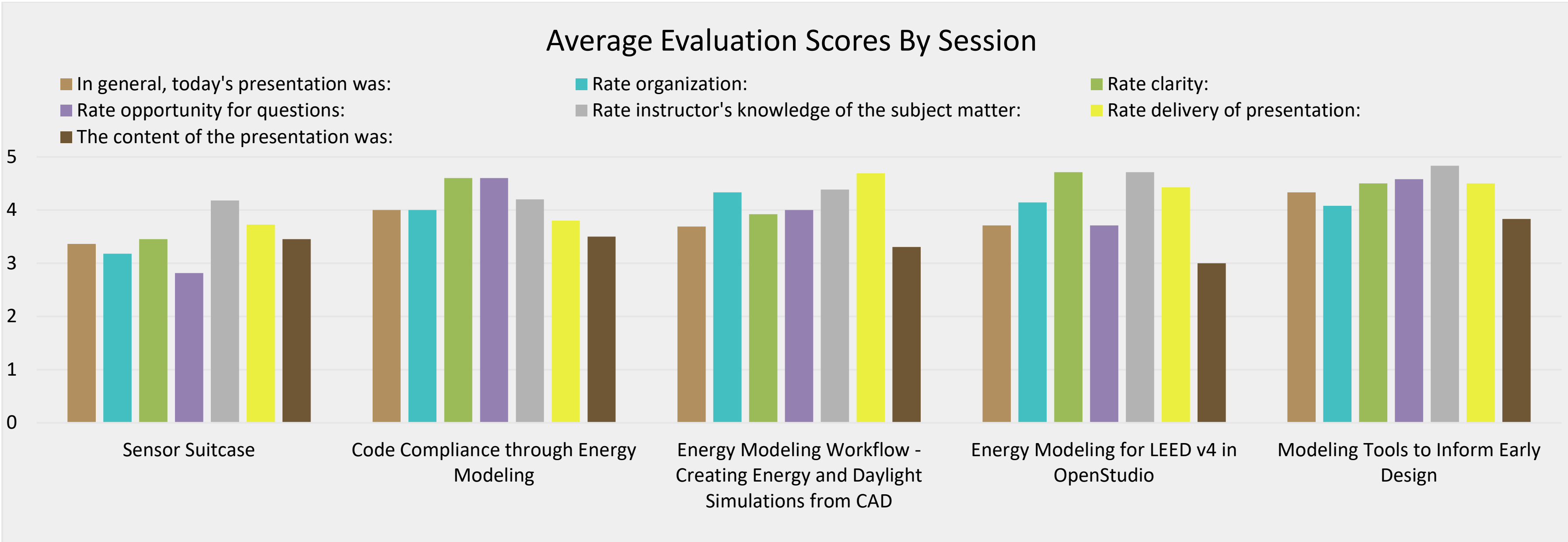
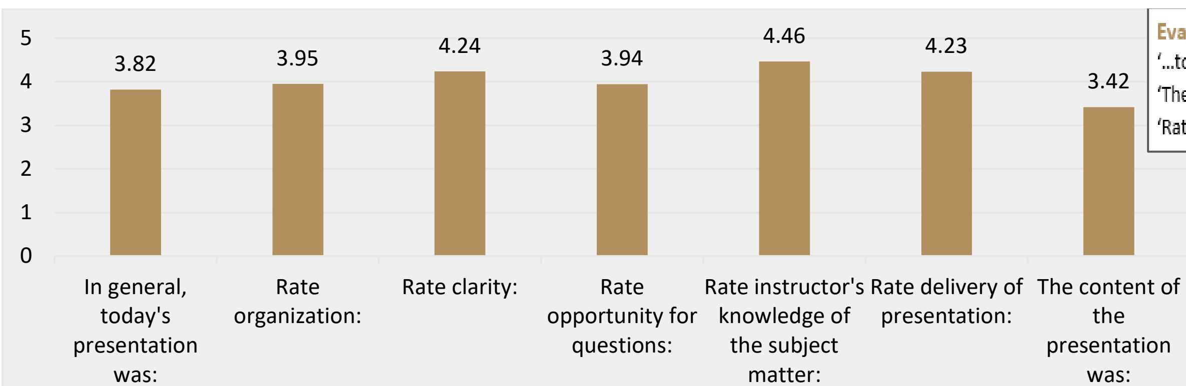


Figure 4: Average Evaluations by Session



Evaluation Metric	Scale
'...today's presentation was'	1 Not Useful - 5 Very Useful
'The content...'	1 Too Basic - 3 Just Right - 5 Too Advanced
'Rate ....'	1 Needs Improvement - 5 Excellent

Figure 5: Average Evaluation Scores for All Sessions

4. Session Summaries

4.1 Session 1: Sensor Suitcase (02/28/18)

Title: Sensor Suitcase

Date: 02/28/18

Description: The Sensor Suitcase is a portable diagnostic toolkit with sensors that gather information about how a building operates. The result of a collaborative effort by PNNL, Lawrence Berkeley National Laboratory (LBNL), and Oak Ridge National Laboratory (ORNL), it serves as a tool to simplify and streamline the retro-commissioning process by enabling non-experts to identify energy-saving operational changes, while keeping the costs of this service low. Total energy cost savings for retro-commissioning are estimated to be 15 percent. The service provider enters a commercial building with the sensor suitcase and a tablet computer. The tablet, on which the suitcase software application is installed, wirelessly communicates with the suitcase to guide the service provider/user through sensor installation. Sensors are placed in designated locations, some on lighting fixtures, others near thermostats, and still others on rooftop HVAC systems. Once installation is complete, the user exits the building site, leaving the sensors in place for 4-6 weeks. When the sensors are configured during the installation process, data that identifies the building, the location at which the sensor is installed (e.g., the room name or number), and the type of measurement being taken – such as temperature of air coming out of a register, or when lights are on or off – are stored on the sensor. Throughout the measurement period, the sensor collects sensed data. At the end of the measurement period, the user simply collects the sensors and places them back into slots in the suitcase, from where the data are transferred to a computer for analysis. The user-friendly software then provides an output of recommended actions for reducing energy use, including expected costs savings.

Presenter: Michael Brambley & Samuel Graham

Attendance:

Architect:	2	Electrician:	
Engineer:	6	Contractor:	
Mech. Engineer:		Other*:	
Elec. Engineer:		None Specified:	21
Total (In-Person):	**12**		
Total (Online):	**17**		
*If 'Other' was noted:			

Evaluation Highlights (What attendees found most valuable):

- Explanation of the use of the product.
- Having the presenter live feed to the webinar and the slides up simultaneously was really nice.
- Learning about the suitcase, and the possibilities to use it for POE studies.

4.2 Session 2: Code Compliance through Energy Modeling (03/22/18)

Title: Code Compliance through Energy Modeling

Date: 03/22/18

Description: Have you submitted an energy model to a building department to demonstrate code compliance? Now you can. In their goal to increase energy conservation the City of Boulder, CO is requiring new commercial construction projects to exceed ASHRAE 90.1-2010 by 30%, and 14% for residential projects. Explore the progression of the energy code in the City of Boulder, examine the current code, and dive into three examples from a single site exploring the range of project aspects from multi-family residential, new construction, renovation, and addition. The presentation will cover specific code language, the challenges of energy modeling for a new code requirement, modeling guidelines utilized to create a model for code compliance, results from three different project examples, and a summary of thoughts on code compliance energy simulation.

Presenters: Rebecca Reel

Attendance:

Architect:	2	Contractor:	
Mech. Engineer:	10	Other*:	2
Elec. Engineer:		None Specified:	9
Total (In-Person):	**10**		
Total (Online):	**13**		
*If 'Other' was noted:	Accounting, Performance Design		

Evaluation Highlights (What attendees found most valuable):

- The presenter card about, and you could tell loved energy modeling. That energy and excitement makes a good presentation
- Design Work Flow and Methodology
- Great examples and important to hear what is happening on the leading edge.
- Progressiveness of Boulder

4.3 Session 3: Energy Modeling Workflow – Creating Energy and Daylight Simulations from CAD Drawings (04/26/18)

Title: Energy Modeling Workflow – Creating Energy and Daylight Simulations from CAD Drawings

Date: 04/26/18

Description: This presentation is for anyone who wants to know how to take an Autodesk (Revit & AutoCAD) based project and turn it into a preliminary study to inform early design, or for more detailed analysis through OpenStudio or Radiance software. Dylan Agnes and Damon Woods from IDL will cover what information is needed for an energy and/or daylighting model. We will share lessons we've learned and recommendations for anyone who is looking to gain LEED credits for their project or just a better sense of the energy or lighting impacts of different design iterations. This talk is intended for anyone who is just beginning energy modeling, as well as experienced users. For experienced modelers, we will share tips and tricks that we use at the lab to make the process as simple and robust as possible. The need for energy modeling, and controls/standards for daylighting and electric lighting, is growing due to the requirements of standards such as LEED, and is now required in some jurisdictions. The IDL aims to encourage more architects and engineers in Boise to provide energy and daylighting modeling in house. This presentation aims to answer your questions, prevent headaches for new users, and remove the mystery of getting from plans to energy and daylight findings.

Presenter: Damon Woods & Dylan Agnes

Attendance:

Architect:	5	Electrician:	
Engineer:	8	Contractor:	
Mech. Engineer:		Other*:	
Elec. Engineer:		None Specified:	18
Total (In-Person):	**10**		
Total (Online):	**21**		
*If 'Other' was noted:			

Evaluation Highlights (What attendees found most valuable):

- Good resource for getting into Radiance later
- How the daylight simulations could be linked to, and integrated with, the CAD drawings output.

4.4 Session 4: Energy Modeling for LEED v4 in OpenStudio (05/24/18)

Title: Climate Design Tools

Date: 06/28/17

Description: USGBC's Leadership in Energy and Environmental Design (LEED) helped push energy efficiency in commercial buildings far beyond minimum code requirements. The latest version, LEED v4, is continuing to advance energy efficiency with the adoption of ASHRAE 90.1-2010 Appendix G for baseline modeling. In order for whole building simulations to accurately inform design teams, the code must be correctly reflected in the energy model. This presentation will address several potential issues with using OpenStudio for LEED v4 energy modeling and provides solutions and best practices for practitioners. These issues include; several of the defaults in OpenStudio do not comply with ASHRAE, some requirements in ASHRAE are not explicitly identified leaving modelling these parameters up to interpretation, and there are program-specific issues in meeting the ASHRAE requirements.

Presenter: Taylor Roberts

Attendance:

Architect:	4	Electrician:	
Engineer:	9	Contractor:	
Mech. Engineer:		Other*:	2
Elec. Engineer:		None Specified:	15
Total (In-Person):	**11**		
Total (Online):	**19**		
*If 'Other' was noted:	Energy Modeler, Energy Consultant		

Evaluation Highlights (What attendees found most valuable):

- Info about New LEED standard

4.5 Session 5: Modeling Tools to Inform Early Design (10/25/18)

Title: Modeling Tools to Inform Early Design

Date: 10/25/18

Description: Designing high performance buildings requires an integrated design process. Design teams are looking for building performance analysis to inform the ever evolving design and time is critical in this process. This session will highlight analysis tools that work seamlessly with design tools allowing for timely analysis results. Case studies will also be shared to demonstrate how these tools were applied in the design process.

Presenter: Justin Shultz

Attendance:

Architect:	5	Electrician:	
Engineer:	7	Contractor:	
Mech. Engineer:		Other*:	1
Elec. Engineer:		None Specified:	7
Total (In-Person):	**5**		
Total (Online):	**15**		
*If 'Other' was noted:	Sustainability consultant		

Evaluation Highlights (What attendees found most valuable):

- Examples that the presenter gave - real case studies.
- References to the software tools for each early design analysis performed
- The number of energy modeling tools available
- the variety of case studies and informative results

4.6 Session 6: Building Performance Simulation – What's in the Black Box (12/12/18)

Title: Building Performance Simulation – What's in the Black Box

Date: 12/12/18

Description: Over the last 50 years, building simulation has evolved into a powerful tool for evaluating the energy performance of potential or existing buildings. Building simulation allows easy comparison of the energy and environmental performance of many hundreds of design or retrofit options. This presentation provides an overview of building performance simulation fundamentals and history, Building Information Modeling, what's in the black box of key simulation programs, as well as comparing underlying simulation methods.

Presenters: Drury B. Crawley

Attendance:

Architect:	2	Electrician:	
Engineer:	22	Contractor:	
Mech. Engineer:		Other*:	
Elec. Engineer:		None Specified:	
Total (In-Person):	**24**		
Total (Online):			
*If 'Other' was noted:			

Evaluation Highlights (What attendees found most valuable):

- No Evaluations were collected – Joint session with ASHRAE.

5. Website Maintenance and Statistics

The Google site "BSUG 2.0" was maintained and updated monthly. Each month, details about the upcoming presentation were posted to the 'UPCOMING EVENTS' page. These pages also included links to both webinar and in-person registration. Monthly emails linked to these pages as well as directly to the registration sites. If the monthly session included a webinar recording, the video was edited and posted to the YouTube channel with a link from the BSUG 2.0 website.

Between January 1, 2018 and December 18, 2018, total page views summed to 709 with unique page views at 586 for 323 total sessions at the site. Of the 323 sessions, 14 (4.33%) of the sessions were by users in Idaho. Below are charts showing a summary of website activity for the most popular pages, as well as for the site as a whole.

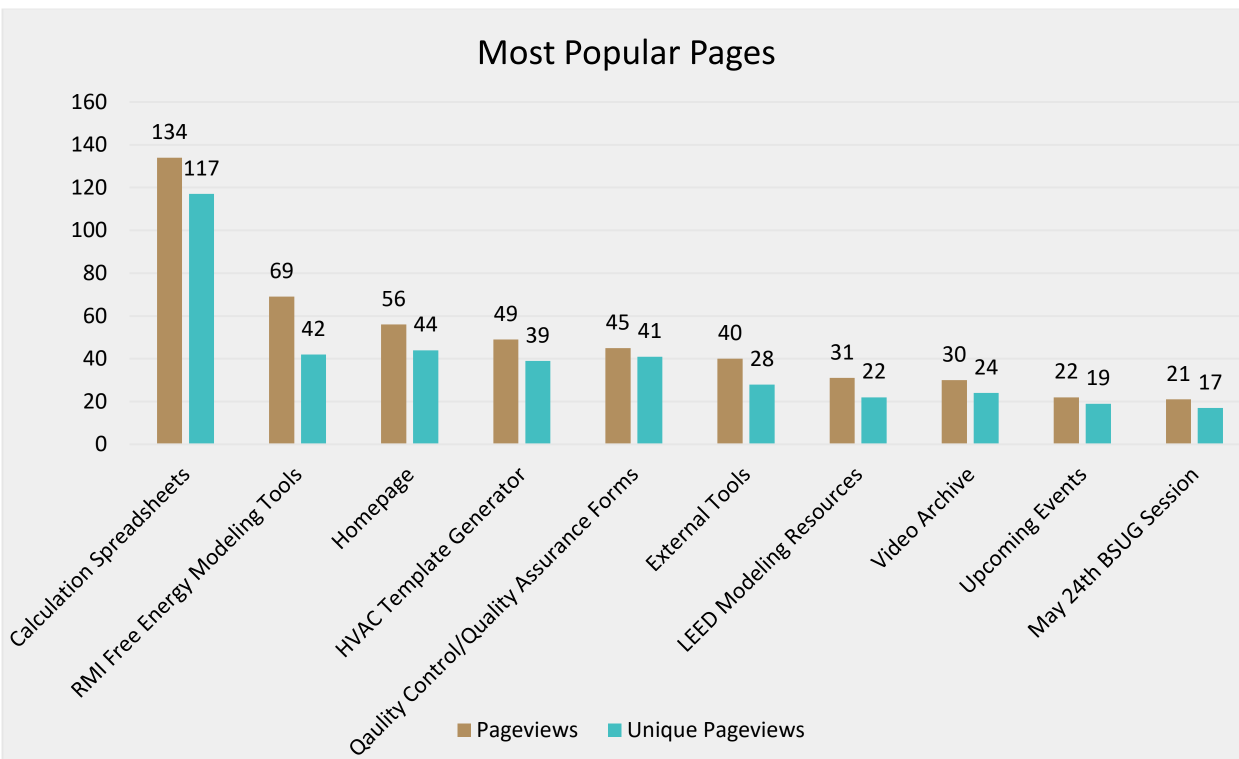


Figure 6: Number of Page Views for the Ten Most Popular Pages in 2018

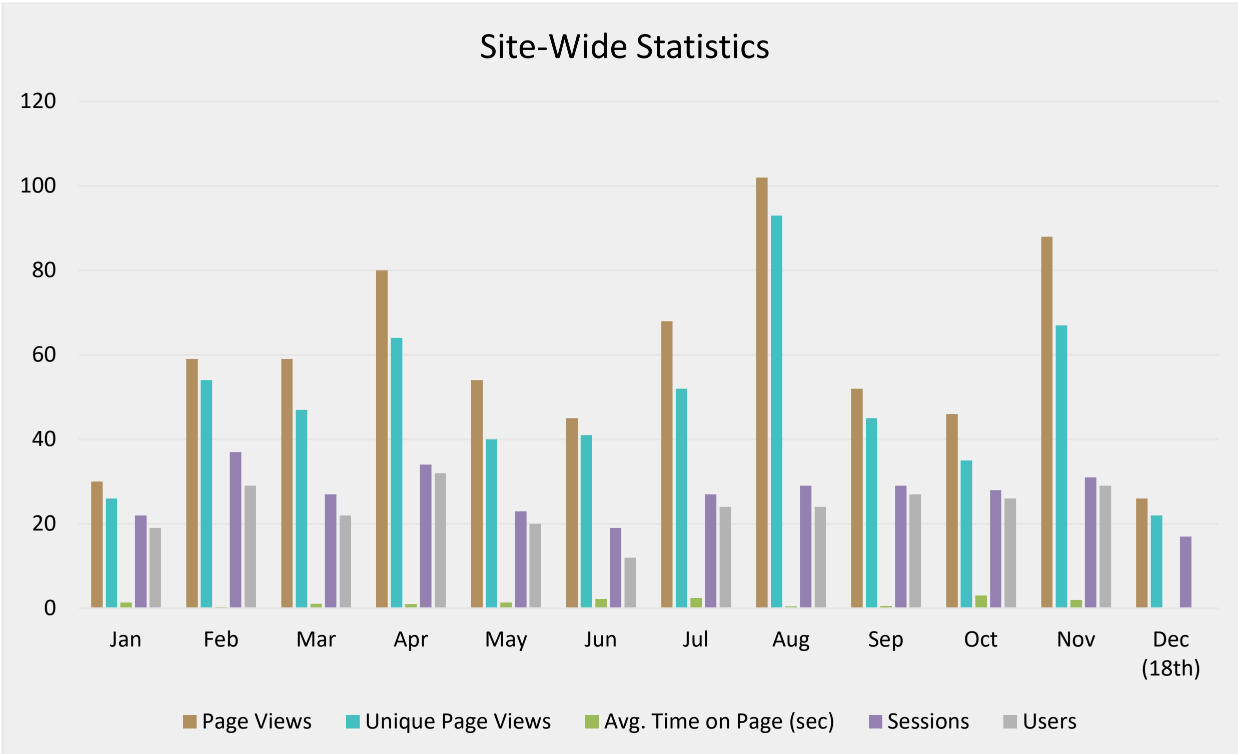


Figure 7: Monthly Site-Wide Statistics

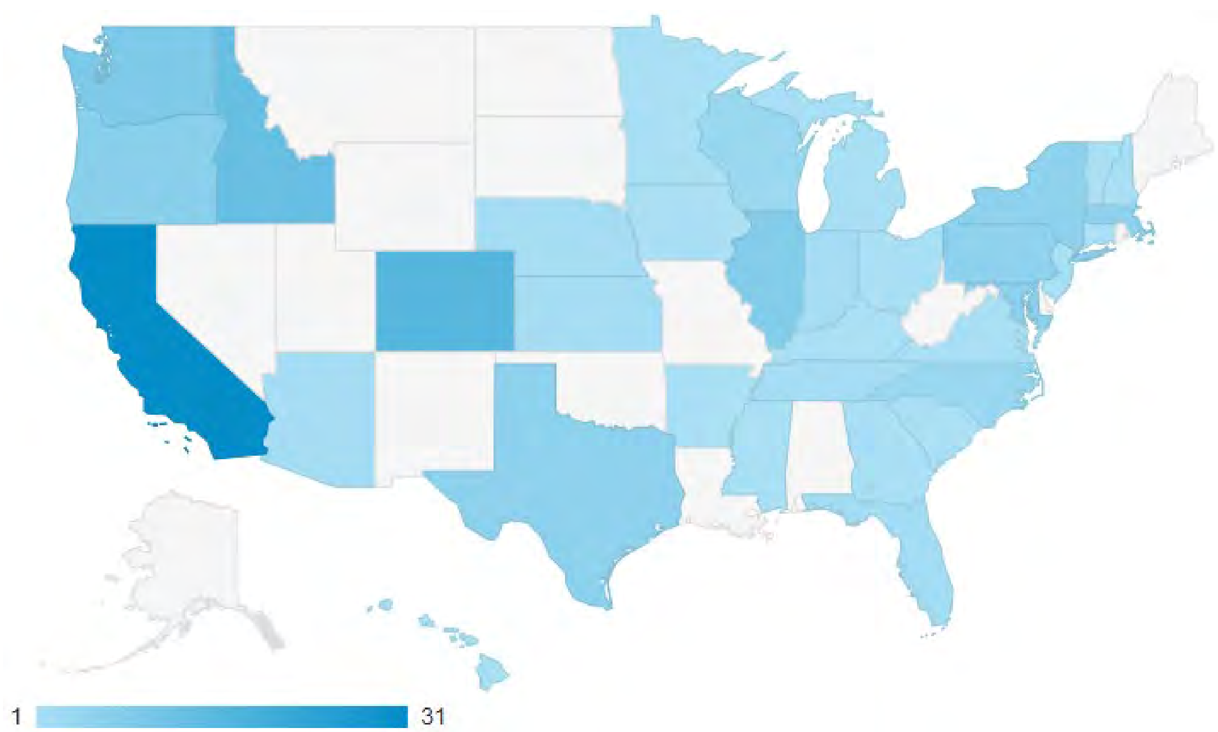


Figure 8: Heat Map of All U.S. Sessions in 2018

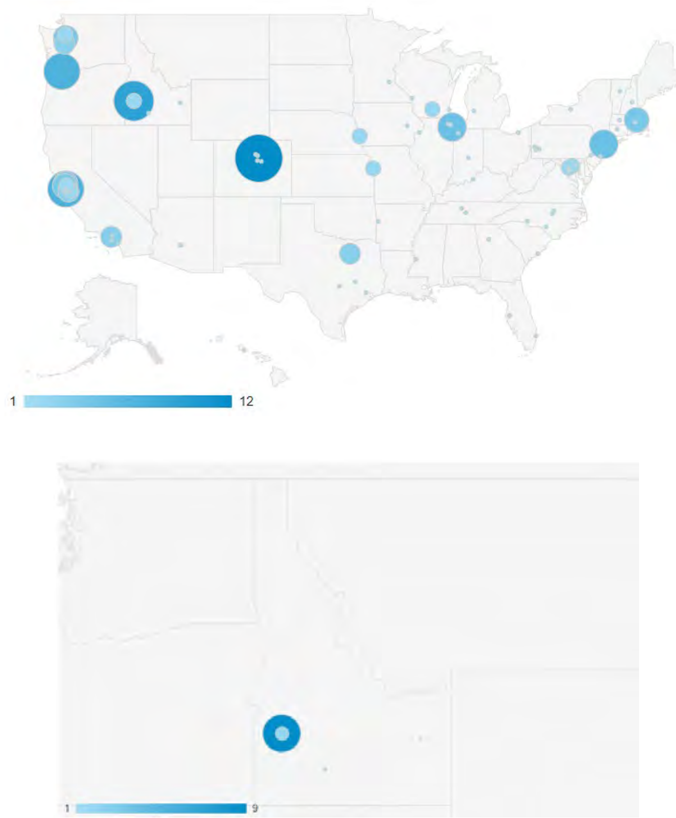


Figure 9: Bubble Maps of All Sessions and Idaho in 2018

6. Other Activities and Suggestions for Future Improvements

We saw an increase in average attendance for each session this year gaining 39 in-person (54%) for overall attendance from 2017. Additionally, we saw an increase in online attendance by 44 online-attendees (51%) from last year even though we offered one less webinar. This year was successful for the BSUG task with 6 sessions completed and 157 total attendees – 72 in-person and 85 online. Feedback was provided by attendees via the evaluation forms, 53 of which were collected. These offered a starting point for determining future improvements to the program. Such as, reviewing and revising the mailing list, advertise with ASHRAE and AIA, host joint session with ASHRAE or AIA, and lastly creating physical flyers to hand out at lunch and learns.

2018 Task 4: New Construction Verifications

Summary of Projects

Idaho Power Company External Year-End Report

December 31, 2018

Prepared for:
Idaho Power Company

Author:
Elizabeth Cooper

Report Number: 1801_004-01

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Prepared for:
Idaho Power Company

Contract Number:
5277

Please cite this report as follows: Cooper, E. (2018). *2018 TASK 4: New Construction Verifications – Summary of Projects* (1801_004-01). University of Idaho Integrated Design Lab, Boise, ID.

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Table of Contents

Acronyms and Abbreviations

AC	Air Conditioning
NCV	New Construction Verification
HVAC	Heating, Ventilation, and Air Conditioning
IDL	Integrated Design Lab
IPC	Idaho Power Company
UI	University of Idaho
VRF	Variable Refrigerant Flow

1. Introduction

The University of Idaho Integrated Design Lab (UI-IDL) had two roles for the New Construction Verification (NCV) task in 2018. The primary role was to conduct on-site verification reports for approximately 10%, typically twelve to fifteen, of projects that participated in Idaho Power Company's (IPC) New Construction Program. The verified projects were randomly selected from the entire pool of projects, and at least four projects were required to be outside the Boise/Meridian/Eagle/Kuna area. The secondary role was to review the photo controls design and function for every project whose application included incentive L3: Daylight Photo Controls within the New Construction Program. Once each review was concluded, a letter of support for the incentive was submitted to Idaho Power. This review and letter are intended to increase energy savings and quality of design through the inclusion of additional design and commissioning recommendations.

2. 2018 New Construction Verification Projects

The UI-IDL completed twelve New Construction Verification projects in 2018. A detailed report for each project was submitted to IPC, including claimed and actual installation for each specific incentive the project applied for. All of the projects reviewed in 2018 were finalized and paid in 2018 but resided under the 2016 program format. The specific incentives for this program are outlined in Table 1.

Table 2 summarizes the twelve projects and respective qualified incentive measures which were verified by UI-IDL. For the projects listed, more than 41% were conducted outside the Boise area.

Table 1: 2016 New Construction Program Specific Incentives

Lighting	L1	Interior Light Load Reduction
	L2	Exterior Light Load Reduction
	L3	Daylight Photo Controls
	L4	Occupancy Sensors
	L5	High Efficiency Exit Signs
Air Conditioning	A1	Efficient Air-Cooled AC & Heat Pump Units
	A2	Efficient VRF Units
	A3	Efficient Chillers
	A4	Air Side Economizers
	A5	Direct Evaporative Coolers
	A6	Evaporative Pre-coolers on Air-cooled Condensers
Building Shell	B1	Reflective Roof Treatment
Controls	C1	Energy Management Control System
	C2	Guest Room Energy Management System
	C3	HVAC Variable Speed Drives
	C4	Kitchen Hood Variable Speed Drives
	C5	Onion/Potato Shed Ventilation Variable Speed Drives
Appliances with Electric Water Heating	W1	Efficient Laundry Machines
	D1	EnergyStar Undercounter Dishwashers
	D2	EnergyStar Commercial Dishwasher
Refrigeration	R1	Head Pressure Controls
	R2	Floating Suction Controls
	R3	Efficient Condensers
Other	P1	Smart Strip Power Strips

Table 2: Project Summary

IPC Project #	Facility Description	Location	Incentive Measures	UI-IDL Site-Visit Date
16-033	Industrial	Caldwell, ID	L1, L2	11/05/18
16-064	Educational	Star, ID	L1, L2, L3, L4, L5, A1, A5, B1, C1, C3, W1, D1, D2	11/02/18
16-068	Industrial	Meridian, ID	L1, L4	07/12/18
16-107	Warehouse	Gooding, ID	L1, L4, L5	07/31/18
16-234	Industrial	Eagle, ID	L1, L5, A1	10/26/18
16-245	Manufacturing	Emmett, ID	L1, L5	12/13/18
16-303	Other – Dairy	Twin falls, ID	L1	07/31/18
16-306	Other – Misc.	Boise, ID	L1	08/03/18
16-344	Retail	Boise, ID	L1	07/30/18
16-380	Office Building	Boise, ID	L1, L5	12/11/18
16-391	Retail	Garden City, ID	L1, L5	12/10/18
16-392	Warehouse	Caldwell, ID	L1, L2, L5	11/05/18

3. 2018 Photo Controls Review Projects

In 2018, the UI-IDL received at least eight inquiries regarding the New Construction photo controls incentive review. Documentation was received and final letters of support were submitted to IPC for photo controls incentive applications for five of these projects including offices, schools, mixed-use, industrial, and civic buildings.

2018 Task 5: Tool Loan Library

Summary of Effort and Outcomes

Idaho Power Company External Year-End Report

December 31, 2018

Prepared for:
Idaho Power Company

Authors:
Dylan Agnes
Elizabeth Cooper

Report Number: 1801_005-05

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Prepared for:
Idaho Power Company

Contract Number:
####

Please cite this report as follows: *Agnes, D.* (2018). *2018 TASK 5: Tool Loan Library – Summary of Effort and Outcomes* (1801_005-05). University of Idaho Integrated Design Lab, Boise, ID.

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ACRONYMS AND ABBREVIATIONS

AC	Air Conditioning
AIA	American Institute of Architects
AHU	Air Handling Unit
Amp	Ampere
ASHRAE	American Society of Heating, Refrigeration, and Air-Conditioning Engineers
BOMA	Building Owners and Managers Association
BSU	Boise State University
CO2	Carbon Dioxide
CT	Current Transducer
Cx	Commissioning
DCV	Demand Control Ventilation
EE	Energy Efficiency
EEM(s)	Energy Efficiency Measure(s)
fc	Foot-Candle
HVAC	Heating, Ventilation, and Air Conditioning
IAC	Industrial Assessment Center
IBOA	Intermountain Building Operators Association
IDL	Integrated Design Lab
Int.	International
IPC	Idaho Power Company
kW	Kilowatt
kWh	Kilowatt-Hour
M&V	Measurement and Verification
OSA	Outside Air

PG&E	Pacific Gas and Electric Company
PPM	Parts Per Million
RPM	Rotations Per Minute
RTU	Rooftop Unit
TLL	Tool Loan Library
TPS	Third Party Service
UI	University of Idaho
USGBC	U.S. Green Building Council
Verif.	Verification
VOC	Volatile Organic Compound
3P	Third Party

1. Introduction

The Tool Loan Library (TLL) is a resource supported by Idaho Power Company (IPC) and managed by the University of Idaho Integrated Design Lab (UI-IDL). The TLL at the UI-IDL is modeled after the Lending Library at the Pacific Energy Center, which is supported by Pacific Gas and Electric (PG&E). In the past years interest in these types of libraries has grown. Recently, the Smart Building Center which is a project of the Northwest Energy Efficiency Council has started a lending library and they cite other lending libraries spanning a large range of tools, including non-energy efficiency related tools. Equipment in the library is tracked via excel, website databases, and in the Energy Resource Catalog that is being redesigned and reviewed by the Idaho Power marketing team.

The primary goal of the TLL is to help customers with energy efficiency (EE) needs, through the use of sensors and loggers deployed in buildings of various types. Loans are provided to individuals or businesses at no charge to the customer. Over 900 individual pieces of equipment are available for loan through the TLL. The equipment is focused on measuring parameters to quantify key factors related to building and equipment energy use, and factors which can affect worker productivity.

The loan process is started when a customer creates a user account at idlboise.com. The customer the has access to the tool loan portal where they fill out a tool loan proposal form. This form is found on the TLL webpage (http://www.idlboise.com/tool-loan-library). When completing a tool loan proposal, the customer includes basic background information, project and data measurement requirements, and goals. When a proposal is submitted, UI-IDL staff members are alerted of a pending proposal via email. The customer and a staff member communicate to verify and finalize equipment needs. An approval email is sent and tools are picked up at the UI-IDL or shipped at the customer's expense.

2. Marketing

Marketing for the TLL was done at various UI-IDL and IPC activities throughout 2018, as well as on the UI-IDL website. The flyer layout was unchanged from 2013: it is in Figure 1 and Figure 2 below. After submitting several drafts for approval it is now being redesigned and reviewed by Idaho Power marketing team. The Energy Resource Catalog is intended to be a complete listing of all tools available to Idaho Power customers, but also, as an in-house reference to assist Architects and Engineering in deciding if a tool would be beneficial to the project. The TLL was promoted in presentations given by the UI-IDL staff, including the Lunch and Learn series and lectures to professional organizations.

The TLL flyer and program slides direct potential users to the TLL website for more information about the library. The main UI-IDL website hosts the TLL portal where customers can submit proposals to request tools, all online. In 2018, the TLL home page had 2,045 visitors.

INTEGRATED idl DESIGN LAB
University of Idaho

TOOL LOAN LIBRARY

The Tool Loan Library is a free resource managed by the University of Idaho-Integrated Design Lab (UI IDL) available to Idaho Power Company customers to support energy efficiency, demand response, or demand reduction projects. Loans are free of charge for people working on projects in the Idaho Power Company service territory.

The Library has a large variety of tools to capture many parameters for both data logging and on-site spot readings.

TOOL TYPES / PARAMETERS

Power (kW)	Temperature
Energy (kWh)	Relative Humidity
Power Factor	State Logging-Light
Voltage	State Logging-Magnetic
Solar flux (W/m^2)	Air Velocity
Plug loads (120V)	Air Pressure
RPM	Sound Level
Current	Gas-VOC
Flow-liquids	Light Level (lux,fc,ca)
Gas-(CO_2 ppm)	Thermal Imaging Camera
Flow-Natural Gas	Air Balance Equipment
Ultrasonic Leak Detection	

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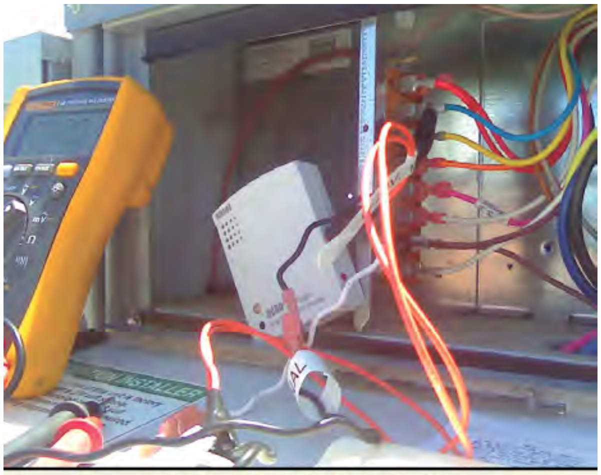
fx: 208.343.0001
www.idlboise.com
www.idahopower.com

IDAHO POWER.
An IDACORP Company

Figure 1: TLL Flyer Front



TOOL LOAN PROCESS

You will need to have a registered user account to access the tool request form. Creating an account is easy and free. An available tool inventory can be viewed online with information on how specific tools are used.

STEP 1: Access the UI-IDL website at (idlboise.com)
STEP 2: Select the Tool Loan Library tab
STEP 3: Log in, if you don't have an account click the register button on the top right of the IDL website, or follow the prompts to register from the Tool Request Form link.
STEP 4: Select the Tool Request Form link and complete the form.
STEP 5: The form will be sent to staff at the UI-IDL who will determine which tools are best for your application, and will contact you and provide the best equipment available to fulfill your request.

www.idlboise.com/tool-loan-library

Figure 2: TLL Flyer Back

3. New Tools & Tool Calibration Plan

In 2018, twenty new tools were added to the TLL to replace old data logging models as well as a new FLIR thermal camera that is portable with an external power supply for extended periods of use. In addition, the FLIR E50bx thermal imaging camera was calibrated during the third quarter.

Equipment items included in the tool loan program are typically distributed with a manufacturer guaranteed calibration period between 1 and 3 years. While many items may remain within recommended tolerances for years after the guaranteed calibration period ends, verifying the item is properly calibrated after initial and subsequent periods is recommended. Calibration services are available on most tools, sometimes from the manufacturer, and from various certified calibration services nationwide.

Third party (3P), certified tool calibration is ideal, but an extensive 3P calibration program would be expensive. Based on research and pricing from quotes, formal calibration would be cost prohibitive for much of the library tools. In several cases, cost of calibration can well exceed 30% of the item cost. As a certified calibration is typically only valid for 1-2 years, an alternative measurement and verification plan for most sensors and loggers is recommended. This will be possible with most of the tool loan inventory. A few exceptions to this must be made on a case by case basis to allow for factory calibration of items that cannot be compared or tested in any other way. An example of one item in this category would be the Shortridge Digital Manometer and Air-Data Multimeter which would have to be recalibrated by the manufacturer.

The IDL will perform the following to ensure items are within specified calibration tolerances:

1. Equipment will be cross-checked against new equipment of the same type for accuracy in a test situation where data is logged. The IDL plan would cross-check older items against multiple newer items at the end of each calibration period (i.e. every two years) to ensure readings are within specified tolerances.
2. Those items found to be out of tolerance will be assessed for factory re-calibration or replacement.

Calibration tracking columns have been added to an inventory spreadsheet which will allow the IDL to determine which items are due for calibration testing. Updates to calibration and references to testing data will be maintained in the inventory spreadsheet and has been expanded to include tool use, quotes, and budget estimates.

4. 2018 Summary Of Loans

In 2018, loan requests totaled 38 with 34 loans completed, 4 loans are on-going. The third quarter had the highest volume of loans at 12 total. Loans were made to 14 different locations and 22 unique users and 11 new TLL users. A wide range of tools were borrowed, as listed in Figure 8. The majority of tools were borrowed for principle investigations or audits, although loans were also made for determining baselines before EEMs were implemented. Tools were borrowed to verify these EEMs as well.

Table 1 and the following figures outline the usage analysis for TLL in 2018.

Table 1: Project and Loan Summary

	Request Date	Location		Project	Type of Loan	# of Tools Loaned
1	1/11/2018	Boise	ID	EWDC	Audit	7
2	1/11/2018	Burley	ID	AOTP	Audit	34
3	2/5/2018	Emmett	ID	IGCLNGP	Audit	1
4	2/9/2018	Lewiston	ID	TCMS	Verification of EEMs	1
5	2/15/2018	Nampa	ID	DTBA	Audit	3
6	2/23/2018	Canyon County	ID	CSFS	Audit	4
7	2/26/2018	Boise	ID	NRCS	Baseline measurement of EEMs	1
8	4/1/2018	Boise	ID	IPDM	Audit	1
9	3/20/2018	Nampa	ID	SFTH	Audit	1
10	3/21/2018	Meridian	ID	SLLDD	Baseline measurement of EEMs	3
11	4/24/2018	Boise	ID	PCJD	Audit	24
12	5/9/2018	Garden City	ID	ESS	Audit	2
13	5/16/2018	Boise	ID	SDAS	Audit	1
14	6/12/2018	Boise	ID	HHSSU	Verification of EEMs	1
15	6/21/2018	Boise	ID	AOTP2	Audit	20

16	8/10/2018	McCall	ID	CADW	Baseline measurement of EEMs	8
17	7/13/2018	Boise	ID	OTYDW	Baseline measurement of EEMs	34
18	7/24/2018	Salmon	ID	GCA	Verification of EEMs	1
19	7/30/2018	Boise	ID	CCS	Audit	1
20	7/31/2018	Boise	ID	OTP	Audit	34
21	8/17/2018	Boise	ID	HWP	Audit	8
22	8/28/2018	Lewiston	ID	IRCBC	Audit	1
23	9/6/2018	Idaho City	ID	EAAC	Audit	3
24	9/11/2018	Boise	ID	BCCC	Audit	2
25	9/18/2018	Meridian	ID	RTSA	Audit	44
26	9/19/2018	Boise	ID	MCPBAP	Baseline measurement of EEMs	17
27	9/19/2018	Boise	ID	KCEA	Audit	2
28	10/19/2018	Burley	ID	IEP	Audit	45
29	11/1/2018	Ketchum	ID	JCS	Audit	4
30	11/6/2018	Boise	ID	UICBC	Verification of EEMs	20
31	11/7/2018	Boise	ID	MFPB	Baseline measurement of EEMs	29
32	11/19/2018	Boise	ID	IPAR	Audit	1
33	11/21/2018	Burley	ID	INTI	Verification of EEMs	1
34	11/19/2018	Boise	ID	FPPEA	Audit	2
35	12/6/2018	Boise	ID	CPL	Audit	1
36	12/7/2018	Twin Falls	ID	IURH	Audit	10
37	12/10/2018	Caldwell	ID	CLA	Verification of EEMs	7
38	12/17/2018	Twin Falls	ID	CWLDC	Audit	8

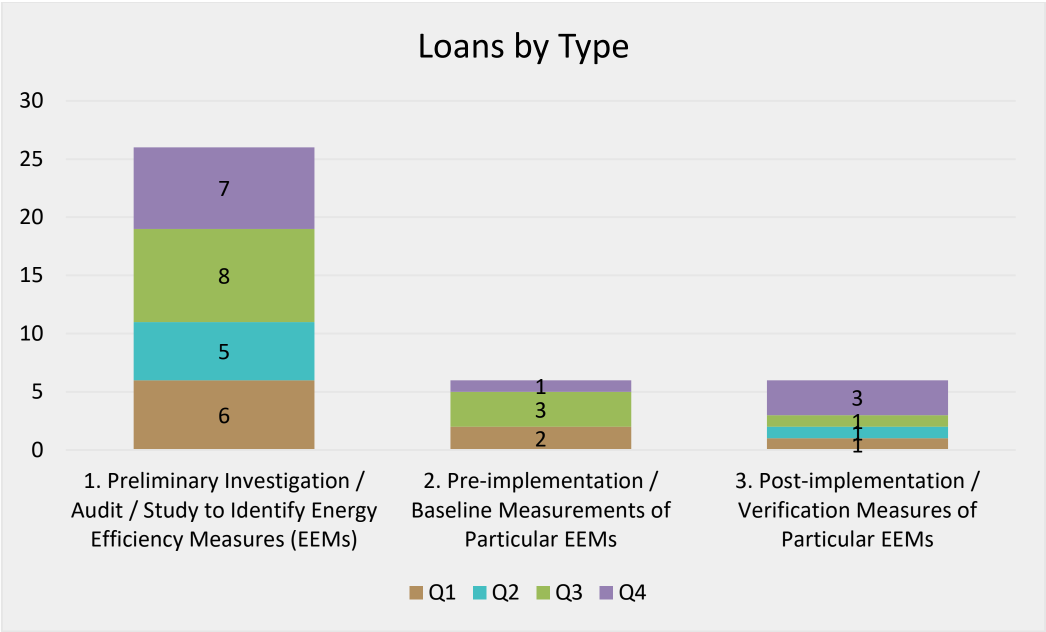


Figure 3: Loans by Type

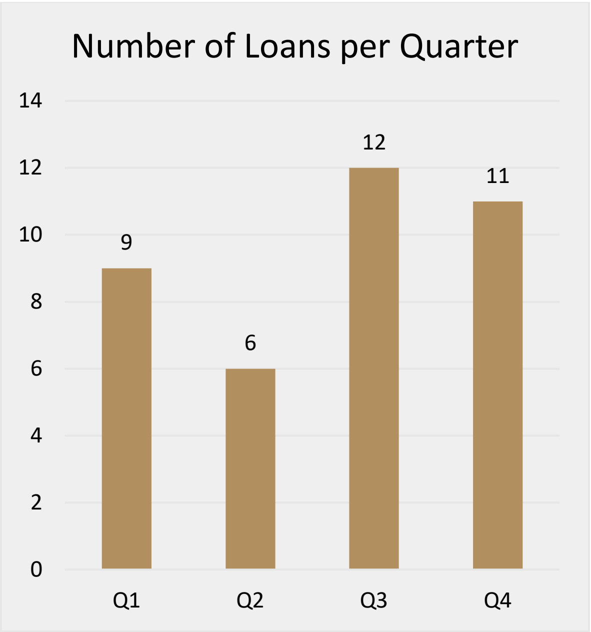


Figure 4: Number of Loans per Quarter

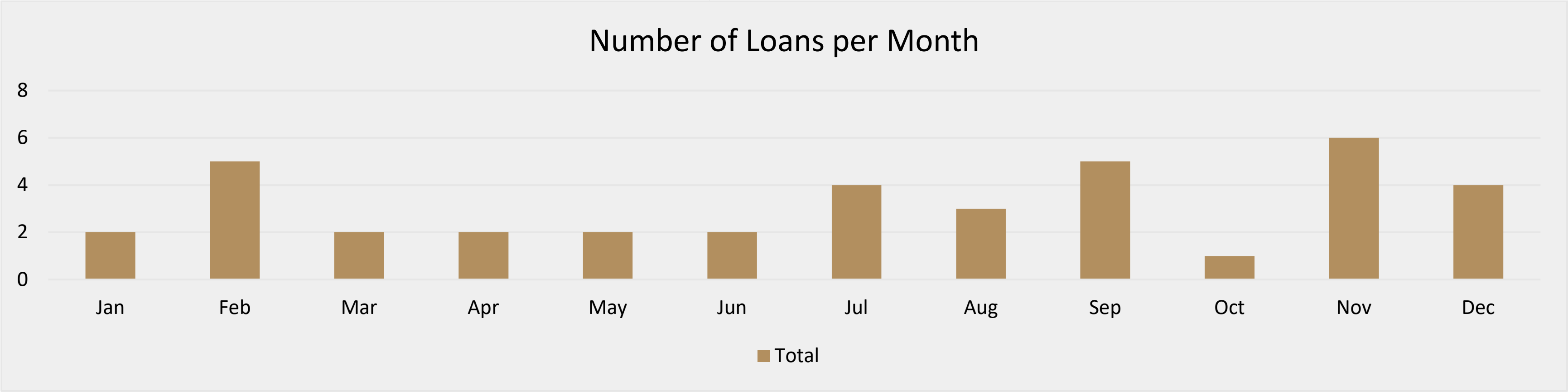


Figure 5: Number of Loans per Month

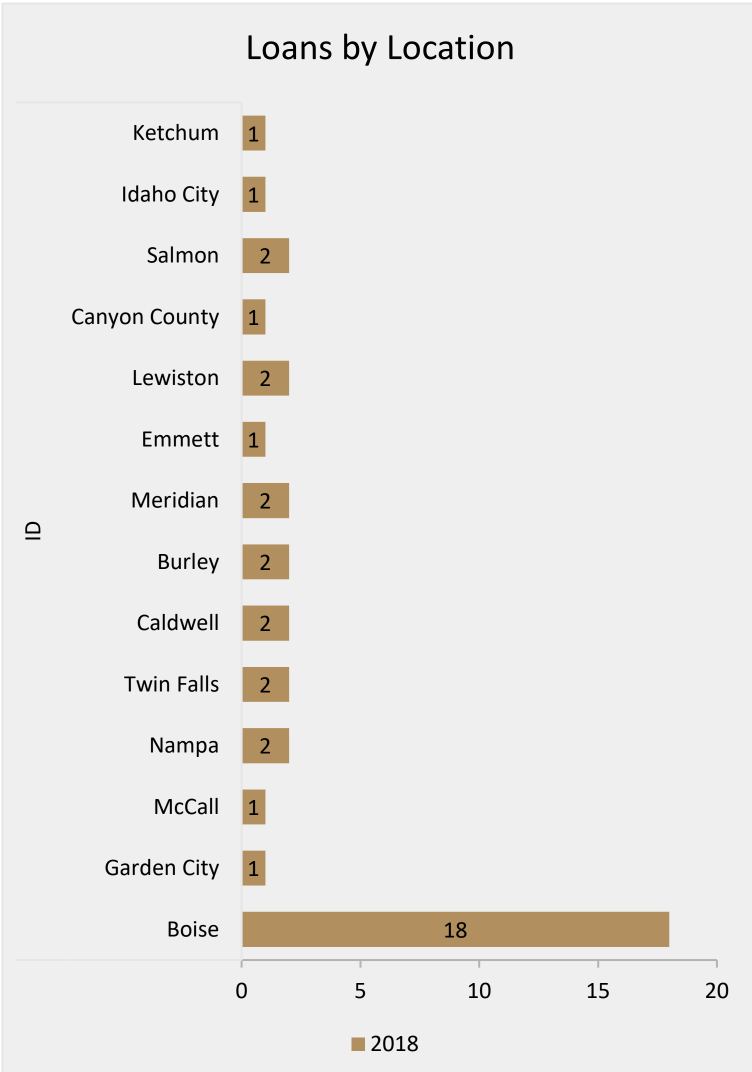


Figure 6: Number of Loans by Location

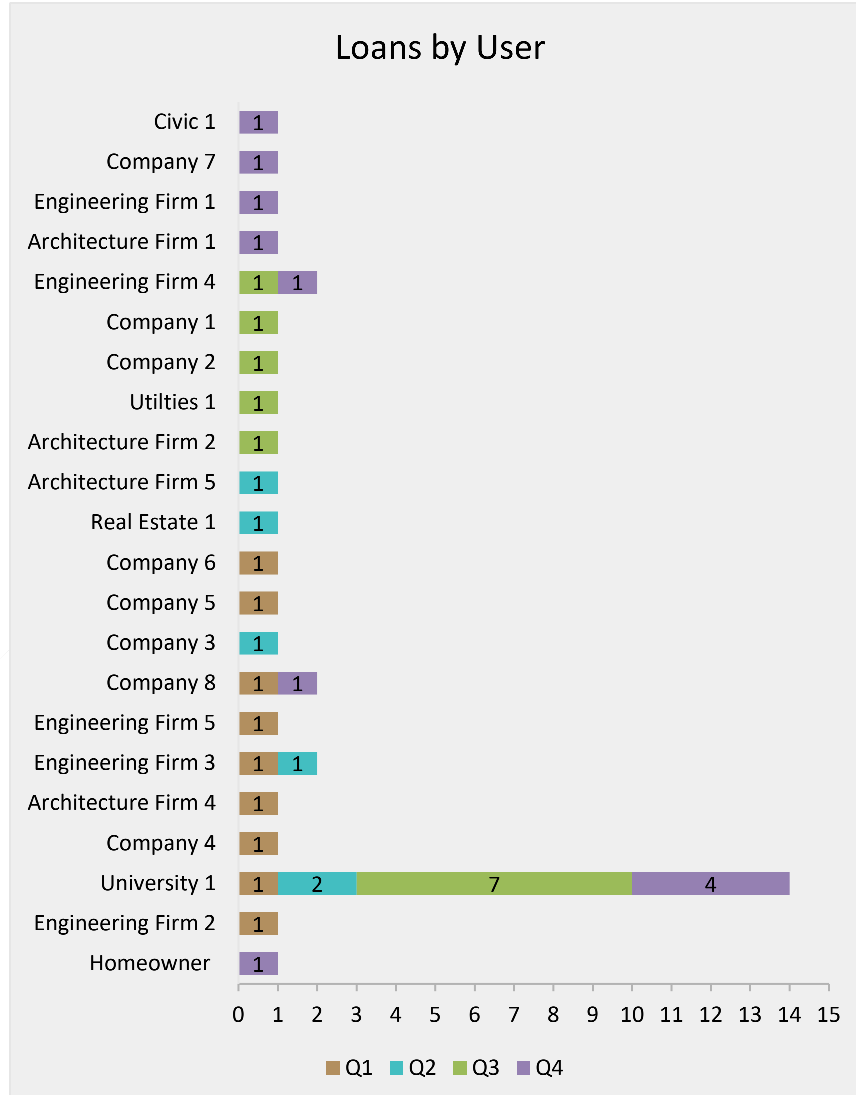


Figure 7: Number of Loans by User

TOTAL TOOLS LOANED: **390**	Q1=55	Q2=49	Q3=155	Q4=131

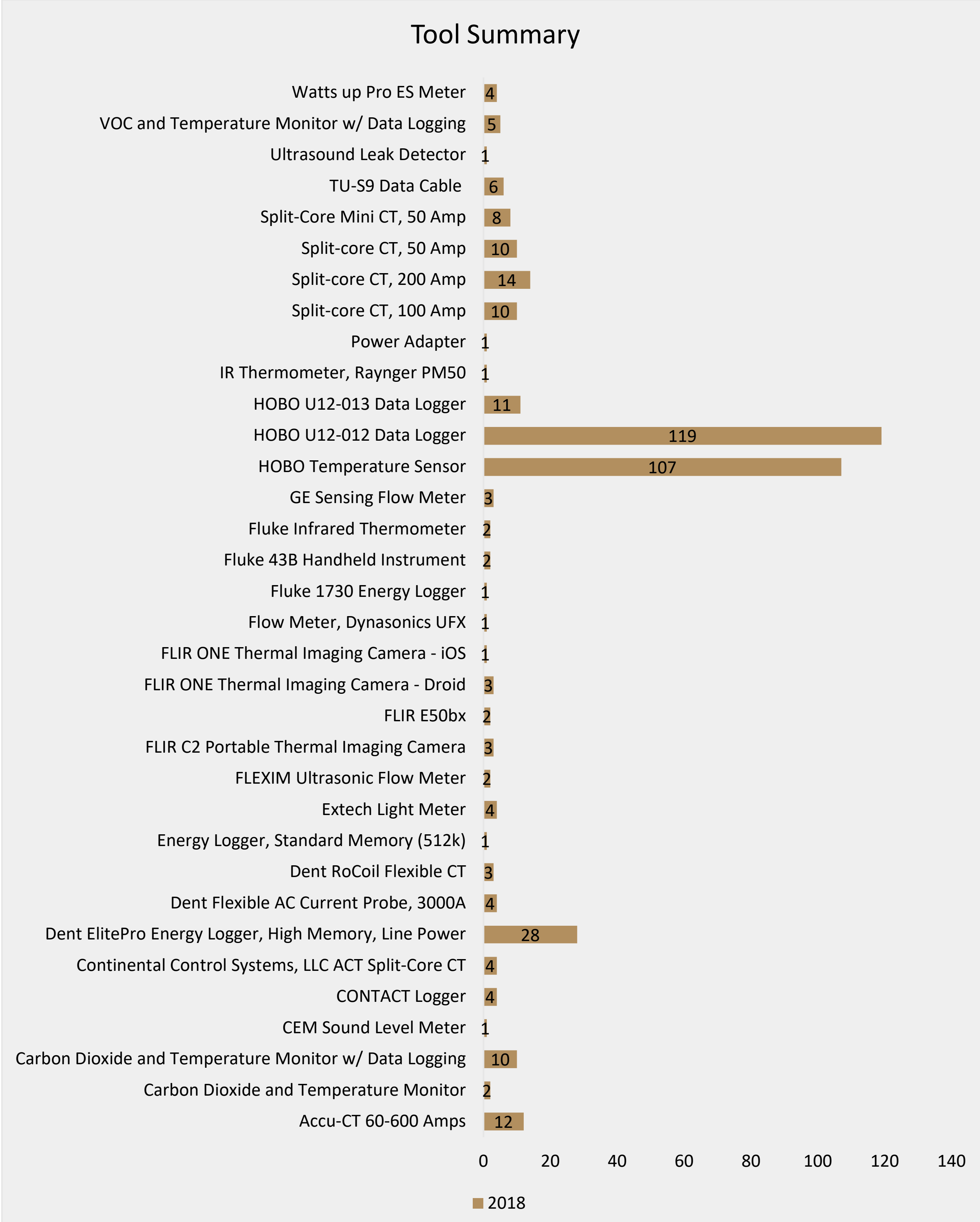


Figure 8: Summary of Tools Loaned

5. Appendices

APPENDIX A: Equipment List

The equipment in the library is tracked via excel, website, and in the soon completed ERL Catalog.

INTEGRATED DESIGN LAB
University of Idaho

2018 Task 1.6: Thermal Energy Savings Tool

Summary of Progress

Idaho Power Company External Year-End Report

December 31, 2018

Prepared for:
Idaho Power Company

Authors:
Damon Woods

Report Number: 1801_010-06

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Contract Number:
5277

Please cite this report as follows: Woods, D. (2018). *TASK 6: Thermal Energy Savings Tool - Summary of Progress* (1801_010-06). University of Idaho Integrated Design Lab, Boise, ID.

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Table of Contents

Acronyms and Abbreviations

GSHP	Ground-Source Heat Pump
HP	Heat Pump
IDL	Integrated Design Lab
IPC	Idaho Power Company
TEST	Thermal Energy Savings Tool
UI	University of Idaho
VRF	Variable Refrigerant Flow
WSHP	Water-Source Heat Pump

1. Introduction

The 2018 Thermal Energy Savings Tool (TEST) development task was a continuation of work done by the University of Idaho Integrated Design Lab (UI-IDL) for Idaho Power Company (IPC). The original tool development began in 2013 and continued through 2016. Over the years, the tool has grown in its capabilities. Initially, a Heat Pump Energy Savings Calculator (HePESC) spreadsheet was developed in 2013, which was capable of hourly load calculations, energy consumption estimates using regression curves from simulation, and simple cost calculations. Details on 2013 effort, progress, and methods can be found in the IDL technical report number 1301_010-01, "*2013 Heat Pump Calculator – Development and Methodology*." The tool now incorporates several climate design tools and has been improved over time. Tool improvements have included the following:

2014 – Methods verified and user feedback incorporated

2015 – Residential space-type added

2016 – Climate design tools and new weather files included

2017 – Outreach, education, and customization provided for users

2018 – Code defaults updated and continued maintenance and outreach

Details of the 2018 outreach and improvements are outlined in this report.

2. Outreach and Education

Outreach was the main focus of the 2017 task. Outreach continued in 2018, but was not the main emphasis of the task. Even so, there were several new inquiries and tool downloads. The IDL included information on the TEST in many of the Lunch and Learn presentations delivered at architecture and engineering firms in Idaho. Whenever a user requested access to the tool, the IDL sent the TEST spreadsheet through the service WeTransfer as it is too large to attach in a traditional email. A disclaimer is included with each tool download that makes clear that the tool does not guarantee savings and that the user is responsible for verifying their own calculations. Rather than sending out the tool based on individual requests, the goal for next year is for the IDL to host the tool online when the new IDL website is launched. Once there, the tool will be available for free download by those who create an account with IDL and agree to the disclaimer. Tool requests were received from the following organizations in 2018:

- A municipality
- A university
- An engineering consulting firm
- A utility research organization

3. Code Updates

One of the requests the lab received last year was to update the code defaults in the TEST spreadsheet. While a user may manually edit any of the numbers within the tool, there are default numbers provided for insulation, glazing properties, and lighting levels. These defaults had been referenced to ASHRAE 90.1-2007. These defaults have now been updated to the IECC 2015 code cycle to make it current with Idaho's commercial energy code requirements for new construction. Since the tool is primarily designed for iterating potential new construction designs, this reduces the user's time in updating the default values used. These included U-Values, F-Factors, Glazing SHGCs, power densities, and lighting requirements.

In 2017, IDL provided users the ability to define custom curves for heating and cooling equipment. The functionality of this feature has been improved. There are still ways that the tool could be customized and improved. For example, for heat-pump selections, there could be a cut-off for low temperature operation so that the equipment is not over-sized. Some of the tool's features could also be streamlined depending on the desired function. No major adjustments are planned for 2019, but the lab will continue to fix any errors users may identify and maintain its functionality. In its current form, the TEST spreadsheet remains effective at demonstrating the energy impacts of early-design decisions and presents these implications with clear and engaging graphics.

4. References

A. Nezamdoost, E. Cooper and D. Woods, *Using a passive design toolset to evaluate low-cost cooling strategies for an industrial facility in a hot and dry climate*, Energy and Buildings, Vol. 159, pp. 319-331, Jan 2018. https://doi.org/10.1016/j.enbuild.2017.11.011

ASHRAE. (2013). Chapter 18: Nonresidential cooling and heating load calculations. In Ashrae handbook: Fundamentals. Atlanta, GA: ASHRAE.

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Masy, G. (2008). *Definition and Validation of a Simplified Multizone Dynamic Building Model Connected to a Heating System and HVAC Unit* (Doctoral Thesis). Retrieved from website: http://bictel.ulg.ac.be/ETD-db/collection/available/ULgetd-11052008-145605/ (ULgetd-11052008-145605).

Mendon, V., & Taylor, T. (2014). Development of Residential Prototype Building Models and Analysis System for Large-Scale Energy Efficiency Studies Using EnergyPlus. *Building Simulation Conference* (pp. 457-464). Atlanta: ASHRAE/IBPSA-USA

Wilson, E., Metzger, D., Hrowitz, S., and Hendron, R. (2014). 2014 Building America House Simulation Protocols. National Renewable Energy Laboratory, Technical Reprot NREL/TP-5500-60988

5. Appendices

Appendix A: Code Updates

Project :

Climate: Boise Air Terminal

Code Cycle: IECC 2015/90.1-2013

GENERAL BUILDING INFO

Building Location:	Boise, ID
Building Use:	Office
Total Building Area (ft^2):	23500
Floor-to-Floor Height (ft):	10
Exposed Bldg Perimeter (linear ft)	314
Cooling Design Day Temp. (°F):	95
Heating Design Day Temp. (°F):	8
Number of Bedrooms:	3

Key Setpoints

Occupied Heating Setpoint (°F):	70
Unoccupied Heating Setback (°F):	64
Occupied Cooling Setpoint (°F):	76
Unoccupied Cooling Setback (°F):	82

Hours of Operation

Default Office Schedule Summary:

8a-5p, M-F. Low use Sat, vacant Sun.

View Other Schedules for Reference

Custom Schedule?: No

*Please click the hyperlink above to input a Custom Schedule.

**Custom schedule is required for Health, Assembly, or Other building use types.

ENVELOPE INPUTS

Code U-values of assemblies/glazing.

Construction Class: Heavy no carpet

Representative constructions

Floor Type: slab on grade

F-Factor: 0.52

Roof slope (degrees): 0

Roof azimuth (degrees

	Total Area (ft^2)	U-Value (Btu/hr-ft^2-°F)	Envelope Heat Rate (Btu/hr-°F)	Glazing Area (ft^2)	Glazing U-Value (Btu/hr-ft^2-°F)	Glazing SHGC	Percent Shaded
(All vert. walls)		0.055			0.42	0.32	0%
North	3800	0.055	162.8	840	0.42	0.32	0%
South	3800	0.055	162.8	840	0.42	0.32	0%
East	2480	0.055	96.3	730	0.42	0.32	0%
West	2480	0.055	96.3	730	0.42	0.32	0%
NW	0	-	0.0	0	-	-	0%
NE	0	-	0.0	0	-	-	0%
SW	0	-	0.0	0	-	-	0%
SE	0	-	0.0	0	-	-	0%
Roof	5890	0.032	188.5	0	-	-	0%
Floor	5890	0.033	163.3		(Btu/hr-°F)	**(Btu/hr)**	
Totals	24340		870	3,140	1,319	101,997	

Figure 1: Code cycle and default values updated and changes underlined in red

HePESC - Loads Results

PEAK LOAD RESULTS

Normalized Loads Table:

Component	Htg Load (Btu/hr-°F)	Cooling Load (Btu/hr-°F)
Envelope	356	356
Glazing (Cond)	60	60
Ventilation	151	151
Infiltration	43	43

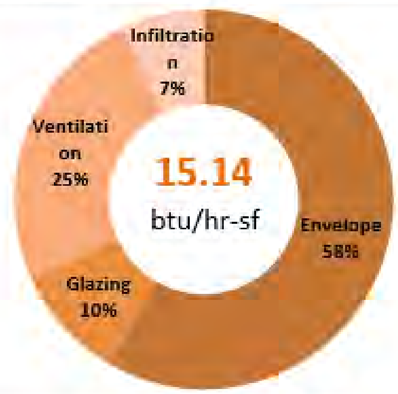
Internal Gains Summary Table:

Component	Htg Load (Btu/hr)	Cooling Load (Btu/hr)
Glazing (Solar)	n/a	13,577
People	n/a	1,200
Lights	n/a	7,592
Plug Loads	n/a	6,398

Peak Loads Summary (at Design Day Temps):

Component	Htg Load (Btu/hr)	Cooling Load (Btu/hr)
Envelope	22,078	6,766
Glazing	3,720	14,717
Ventilation	9,387	2,877
Infiltration	2,663	816
People	n/a	1,200
Lights	n/a	7,592
Plug Loads	n/a	6,398

Peak Heating Load:



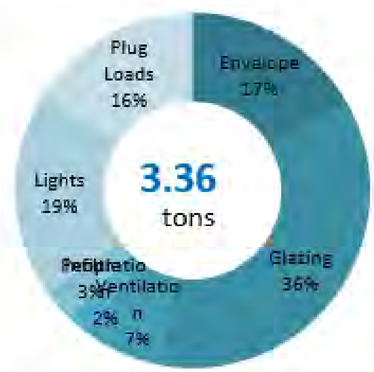
Non-Coincident Peak Heating Breakdown:

37,848	btu/hr
15.14	btu/hr-sf
11.09	kw

Coincident Peak Heating:

45,855	btu/hr
18.34	btu/hr-sf
13.44	kw

Peak Cooling Load:



Non-Coincident Peak Cooling Breakdown:

40,365	btu/hr
16.15	btu/hr-sf
3.36	tons
743.22	sf/ton

Coincident Peak Cooling:

28,203	btu/hr
11.28	btu/hr-sf
2.35	tons
1063.71	sf/ton

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HePESC - Loads Results

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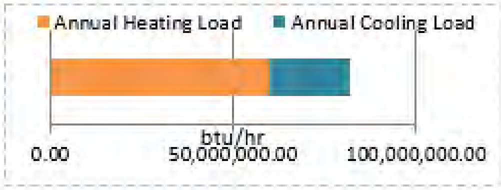
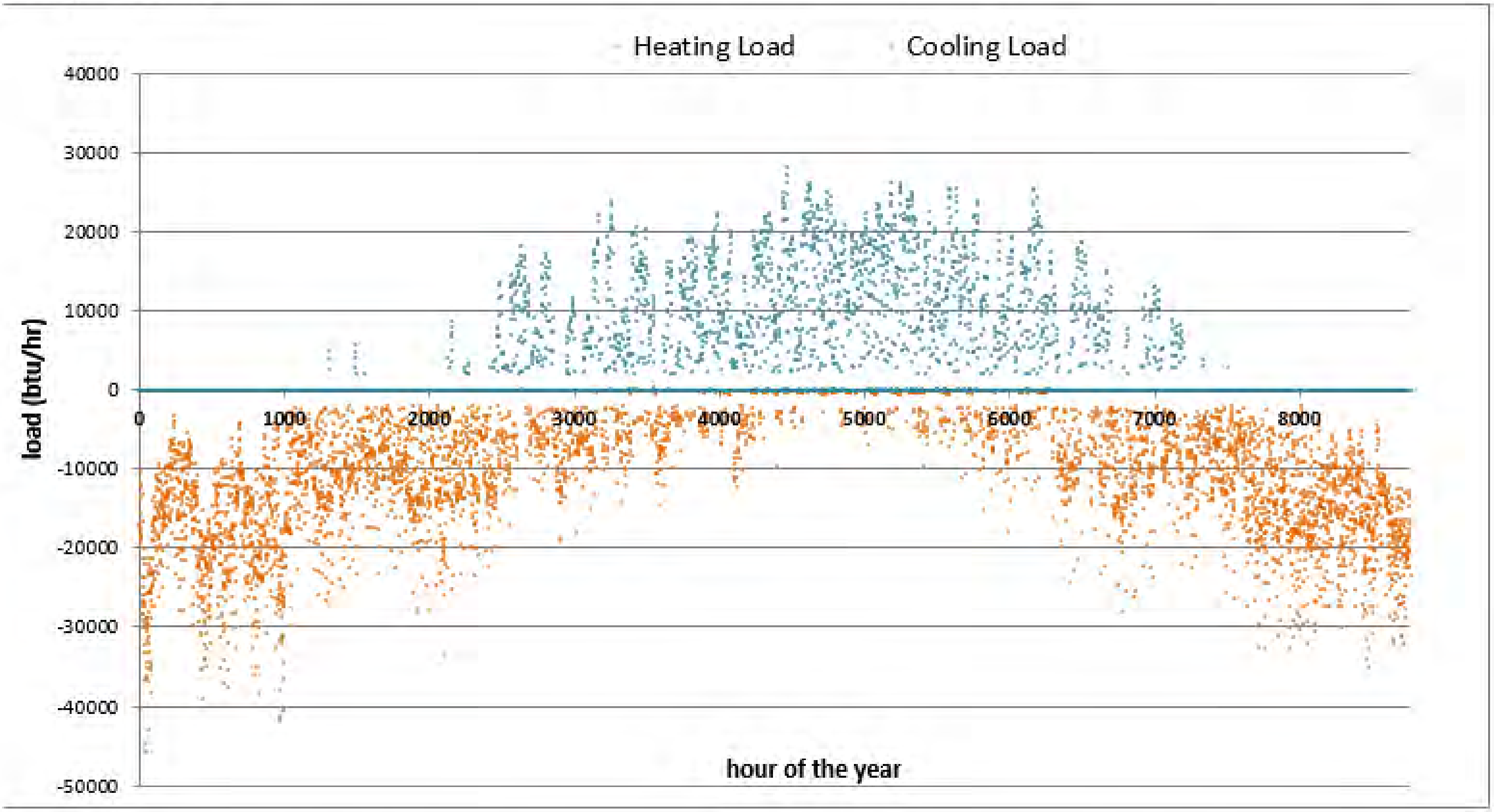
HOURLY LOADS:

	btus	kBtu	kWh	Therms	%of total
Annual Heating Load	59,987,783	59,988	204,687	600	73%
Annual Cooling Load	21,787,747	21,788	74,343	218	27%
Total Annual Load	81,775,530	81,776	279,030	818	100%



Hourly Load Profile



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HePESC - Loads Results

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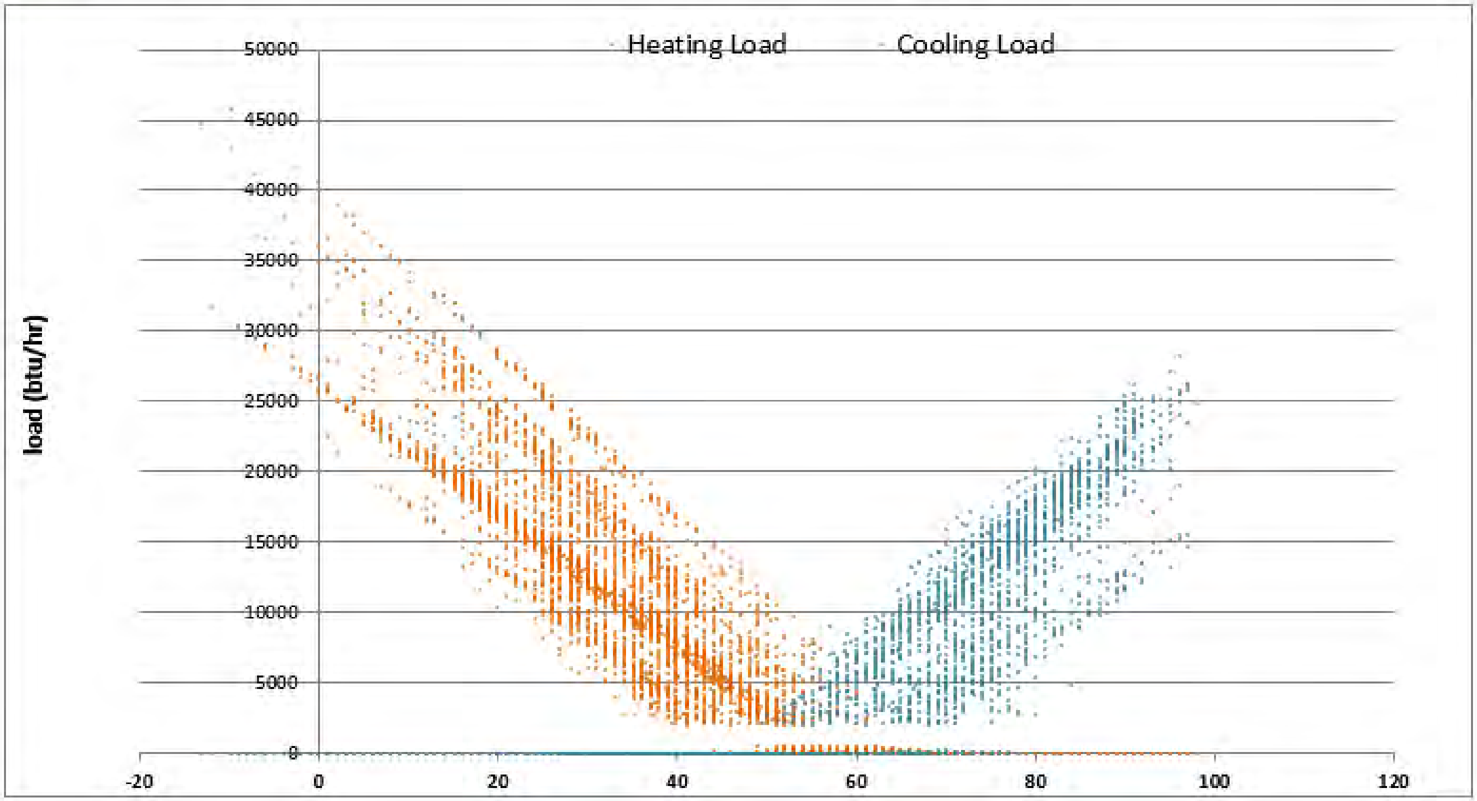

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HePESC - Results Summary

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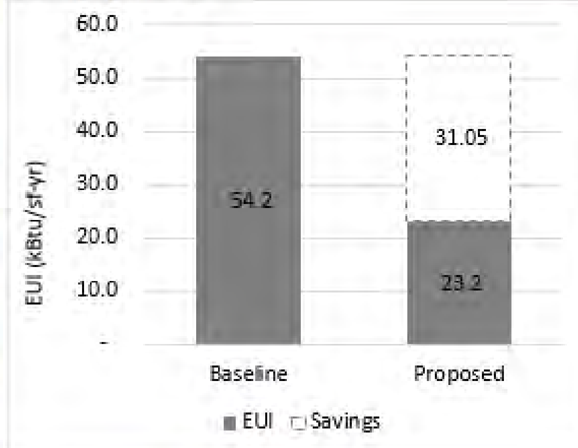
Final Comparison Stats

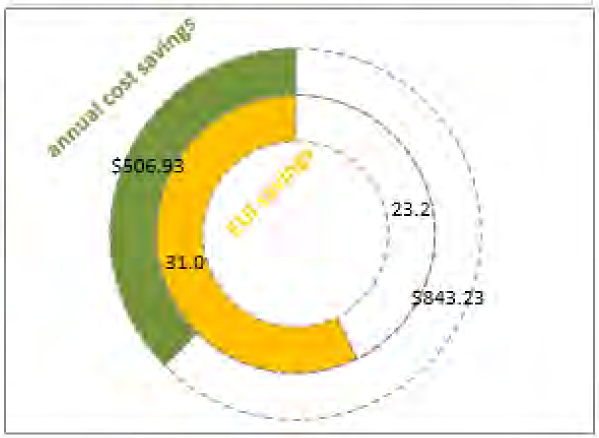
Syst	B+P	Baseline System = Furnace - Gas	posed System = Heat Pump variable sp	Iteration:

Item	Units	Baseline	Proposed	Savings Value	Savings %
EUI	kBtu/sf-yr	54.2	23.2	31.0	57.3%
Total Energy	kBtu	135,516	57,891	77,625	57.3%
Energy (by fuel)	kWh	15,555	16,966	-1,412	-9.1%
Energy (by fuel)	therms	824	0	824	100.0%
Total Cost	$	$1,350	$843	$507	37.5%
Cost (by fuel)	kWh $	$773	$843	-$70	-9.1%
Cost (by fuel)	therm $	$577	$0	$577	100.0%

Item	Units	Baseline	Proposed	Incr Cost	Smp Payback
Capital Cost	$	$14,044	$7,004	-$7,040	Immediate
LCCA Savings	$	$13,638			

Summary Charts





HePESC - Advanced Design Strategies

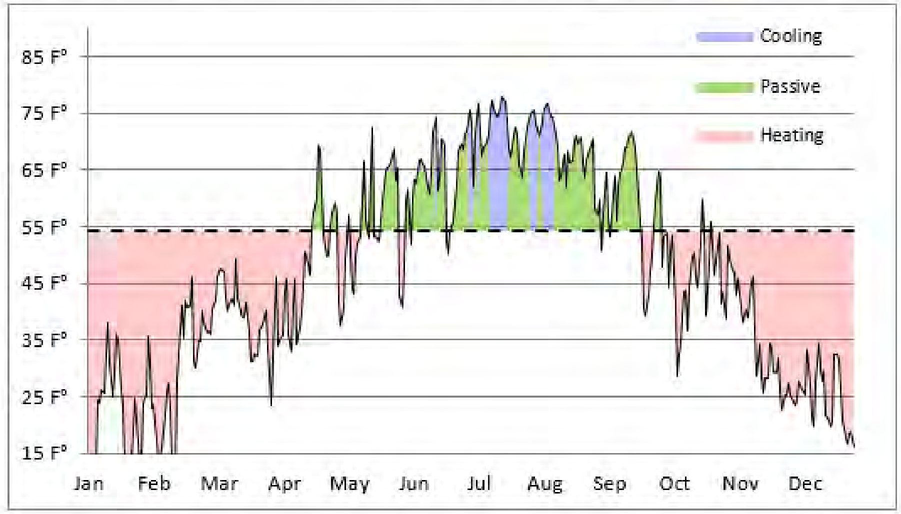
PASSIVE COOLING & NATURAL VENTILATION

Objective: Use natural outdoor air movement and pressure differentials to reduce cooling and ventilation loads.

Benefits: Reduction in fan and cooling energy, longer equipment life, potential equipment downsizing or elimination, greater connection to the

Simple Balance Point Feasibility Study

Average Operation (hrs/day):	7.98
Potential HG Rate (Btu/hr):	28,766
Qi (Btu/hr):	9,562
Heat Loss Rate (Btu/hr-°F):	610
Balance Point (°F):	54.3



Setpoints

Occupied Cooling Setpoint (°F):	76
Unoccupied Cooling Setback (°F):	82
emperature difference allowed (°F):	3
Lowest Temp. allowed for open windows (°F):	64

Results

# of Hours with Potential for Passive Strategy:

1,977	23%

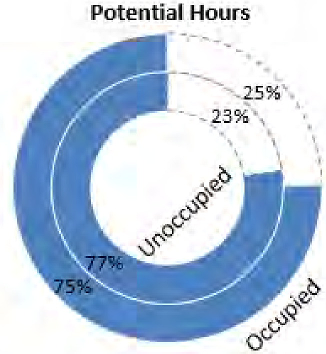
# of Hours During Occupied Times:

1,167	25%

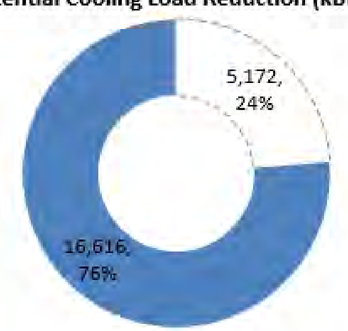
Sum of Potential Cooling Load Reductions (kBtuh)

5,172	24%

Potential Hours



Potential Cooling Load Reduction (kBtuh)



Implementation in this Tool:

HePESC - Advanced Design Strategies

CROSS VENTILATION

Objective: To passively cool a building by capturing the prevailing winds during the summertime and channeling them through a space

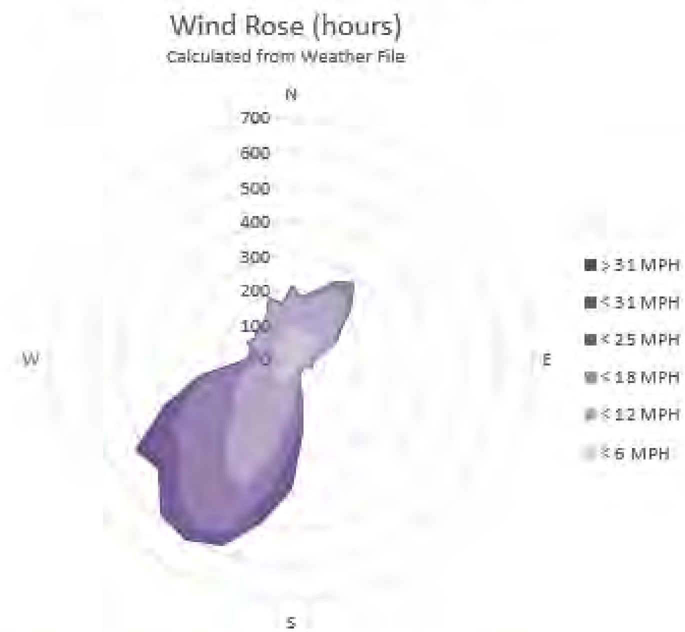
Benefits: Reduction in fan and cooling energy, longer equipment life, potential equipment downsizing or elimination, greater connection to the outdoors.

Inputs:

Cv Effectiveness Factor:	0.35
Area of openings for analysis (ft2):	150
Effective opening factor:	0.45
Area of operable opening (ft2):	67.5
Wind speed reduction factor:	0.5

Façade	Glazing Area (ft2)
North	75
South	75
East	75
West	75
NW	0
NE	0
SW	0
SE	0

Wind Rose Analysis Period: All Months



Results

# of Hours with Potential for Cross Ventilation:

707	8%

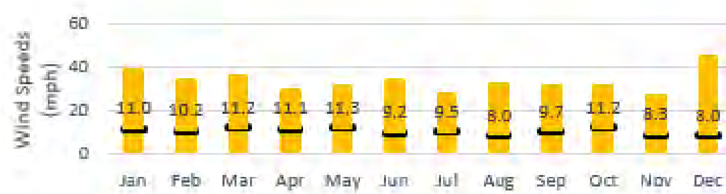
# of Hours During Occupied Times:

510	11%

Sum of Potential Cooling Load Reductions (kBtuh)

4,403	20%

Implementation in this Tool:



2018 Task 7: Building Energy Analytics Case Study

Summary of Effort and Outcomes

Idaho Power Company External Year-End Report

December 31, 2018

Prepared for:

Idaho Power Company

Authors:

Damon Woods

Report Number: 1801_010-07

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Idaho Power Company

Contract Number:
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Please cite this report as follows: Woods, D. (2018). *2018 TASK 7: Building Energy Analytics Case Study – Summary of Effort and Outcomes* (1801_010-07). University of Idaho Integrated Design Lab, Boise, ID.

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Acronyms and Abbreviations

ASHRAE	American Society of Heating, Refrigeration, and Air-Conditioning Engineers
BAS	Building Automation System
CBECS	Commercial Building Energy Consumption Survey
DDC	Direct Digital Controls
DOE	Department of Energy
EMS	Energy Management System
EUI	Energy Use Index
HVAC	Heating, Ventilation, and Air Conditioning
IAQ	Indoor Air Quality
IEQ	Indoor Environmental Quality
IDL	Integrated Design Lab
IPC	Idaho Power Company
UI	University of Idaho
VAV	Variable Air Volume

1. Introduction

The 2018 Idaho Power scope of work for the Building Energy Analytics Case Study was to identify potential savings from the implementation of a new type of energy management software. Several companies are promoting new software capabilities that monitor many control points within a building. Some examples of these analytic software packages include SkySpark, EnergyCap and BuildingIQ. These data analysis software packages can overlay traditional Building Automation Systems (BAS) or Energy Management Systems (EMS).

The analytic software does not directly control any building equipment. Instead, its primary use is to filter through the many control signals and identify potential operational problems within the building. This continuous monitoring has the potential to help maintain building commissioning and limit performance degradation through the building's life.

The first part of the IDL task included identifying a case study – a site that was considering adding an analytics system within 2018. The IDL team worked with the facility owners and control teams to document any implementation issues. The last step of the project was to identify whether the installation of the analytics software led to any operational changes and to estimate potential savings resulting from those changes.

2. Executive Summary

The use of energy analytics software at two case study sites proved key to identifying several energy efficiency measures and equipment faults. However, its full potential can only be realized when there is an existing DDC system, and a party that is dedicated to monitoring the system and follows through on communicating issues with the facilities team. The IDL project in 2018 shed light on both the strengths and weaknesses of building energy analytics.

Energy analytics systems work well in the following areas:

- Quickly calculating and tracking annual energy performance
- Understanding baseline energy operations and energy signatures
- Identifying operational anomalies

Energy Analytics do not work well in the following situations:

- Buildings with pneumatic controls or non-DDC systems
- Buildings without a trained operator dedicated to monitoring the system
- Building teams without a clear communication line between the analytics team and the operations team.

3. Case Study Identification

The IDL team identified a set of buildings linked to a campus meter as an initial case study. The campus had several advantages for selection as a case study. The facilities manager had seen a presentation on the capabilities of energy analytics and was eager to have it implemented. The campus also included a set of several different buildings which had the potential to provide a view on how effective the SkySpark program would be in generating savings within several different building types.

A limited version of the SkySpark software had been implemented at the site in 2017. The IDL team met with the controls contractor and the facilities manager to do a walk-through of the site and identify how the SkySpark program could be expanded to improve the energy performance at the site. The initial SkySpark set-up only included monitoring of each of the power meters at the buildings. Since the whole campus is billed by IPC on one central meter, the SkySpark software helped the facilities team better understand the energy patterns for individual buildings at the site.

3.1 Case Study 1 – A Campus

The campus includes an overnight facility, several maintenance buildings, a medical wing, and offices. SkySpark was used to quantify the annual energy use at each of the sub-metered sites. Information about each building was included in the Department of Energy (DOE) EnergyStar program to determine an Energy Star score from 0-100. This helped the facility managers at the complex identify particular areas on which to focus. Several of the buildings were grouped with other meters so no scores could be given to those structures. Information on the main buildings for which data was available are shown in Table 1.

Table 1: Annual energy use information collected through SkySpark

Building	Area [ft^2]	EUI [$kBtu/ft^2$]	Energy Star Score Estimate
Shop	2,414	225	4
Vehicle Maintenance	5,247	23	N/A
Housing 1	10,980	40	N/A
Medical Unit	24,607	57	69
Office 1	26,673	77	17
Office 2	45,276	121	N/A
Housing 2	167,610	91	N/A

Of the buildings listed in Table 1, three had remarkably high EUI's with correspondingly low EnergyStar scores, which indicated poor performance. These included the shop, office 2, and housing 2. The research team examined each of these in detail by using data from SkySpark.

The shop is a very small maintenance shop with heavy equipment and is used to repair items around the campus. It is open from Monday to Saturday but is not in continuous use. It is a workshop/repair space with a gas furnace and a DX rooftop unit that is controlled by a programmable thermostat. The building has a welding shop inside that is rarely used. When there is welding, there are large exhaust fans that run to maintain adequate indoor air quality. When SkySpark was used to plot the energy use, the typical profile of the shop showed times of very high use during the day, but little to no use at night. These high readings indicate simply that welding was occurring within the shop which skewed the typical energy one would expect. No operational changes were recommended for this site.

The Office 1 building functions as a set of offices for many of the campus employees and personnel. While it has perimeter heating, there is no interior heating and the core can become quite cold. The perimeter heating is driven by pneumatic controls and there is no central management of the HVAC system. This building's operational hours are M-F 8-5 with little to no weekend use. The poor comfort and high energy use of this building as identified by SkySpark should make it a campus priority for controls and HVAC upgrades.

The Office 2 building serves as the main intake and processing facility at the campus. The heating and cooling is provided by a Variable Air Volume (VAV) system with electric reheat. The data collection system at the site is in its 3rd generation and overlays some much older legacy equipment. This building includes a lab which has a walk-in cooler and several freezers. Without a more detailed walkthrough and limited details from the controls, it is unknown what makes this building such a high energy consumer although the labs and operational hours of the facility may be contributing factors.

Operational changes for much of the rest of the complex are limited as many of the operations are governed by housing standards for fresh air, setpoints, and lighting times. The air handlers for these buildings must remain on at all hours to maintain fresh air for the occupants. The external lighting has recently been upgraded to LED's. Interior pod lighting upgrades to LEDs are currently underway.

While the SkySpark software was helpful for sub-metering at the campus, many of the controls were tied to a legacy system without a central Energy Management System interface. The old age and autonomous setup of the existing controls limited the information that could be viewed or accessed by a building analytics software. Therefore the team shifted the focus away from the campus as a case study and towards a new building.

3.2 Case Study 2 – a Government Office

The facility selected for the second case study was completed in 2002 and it has 356,000 ft^2 of conference rooms and offices. The building is heated by a geothermal system and cooled by multi-staged chillers. The major pumps and motors are equipped with VFDs and the building has fully Direct Digital Controls (DDC). In 2004, the building was EnergyStar certified, with a score of 83. Since the DOE has updated the metrics with the latest CBECS data, the facility no longer qualifies for certification – it no longer performs 75% better than most other buildings of the same age and type. This performance degradation is exactly what an energy analytics program like SkySpark is intended to correct.

The team met with the facility manager, the controls contractor, and a SkySpark provider to look at the possibility of installing SkySpark at the site. A stand-alone modem was installed at the site to beta-test the equipment so that several hundred points at the site could be mapped to SkySpark without a full installation cost to the owner. This modem was installed by a SkySpark vendor who was able to map many of the control points in the building very quickly. That modem is still in operation at the site, but it is due for removal in January 2019.

4. RESULTS

4.1 Findings at the Campus

The first way that the energy analytics system was put to use at the campus was to provide the annual energy consumption at each of the campus buildings as shown earlier in Table 1. This allowed the campus energy specialist to identify which buildings to focus on for energy retrofits and informed the industrial survey implementation plan that is now underway at the site to retrofit and update existing equipment.

Unfortunately, much of the campus control system still relies on legacy hardware and pneumatic controls, which severely limits the capabilities of an analytics system. A building analytics system like SkySpark requires access to many clearly defined digital control points to be effective at identifying operational anomalies. Without such, it is only able to provide sub-metering and some energy signature analysis. Several of the graduate students at IDL worked with the SkySpark data to identify energy signatures and operation times for the individual campus buildings as shown in Appendix A. However, without regular communication with the facilities managers or training in the analytics software, the usefulness of this exercise was limited.

4.2 Findings at the Government Office

The facility in the second case study had a full DDC system in place and so mapping the control points on the SkySpark system was intuitive and relatively quick (within a few days) for a knowledgeable installer. Using proprietary code within the analytics software, the SkySpark provider was able to see a list of immediate operational schemes that might be causing issues. These included chiller over-cycling, high loop temperatures, and poor economizer operation. The analytics commissioning team shared these findings with the controls team. The controls team noted that some of the automated analytics had misdiagnosed some problems. The analytics software code from the commissioning team assumes several control points are associated with standard pieces of equipment like chillers. However, the controls at this site did not include several of these control points which showed up as static values. This interaction highlighted the need for close coordination between the controls contractor and the analytics provider to understand these possible discrepancies.

While several operational changes were discussed at the meeting including looking into the chiller cycling and loop temperatures, no further actions were taken that IDL is aware of. There was limited coordination between the controls provider and the facilities management at the site during the time of this project. Without a clear line of communication or personnel dedicated to following up, the information was not acted upon.

5. Conclusion

While each case study showed the potential for building analytics to be an asset, neither project was able to realize its full capabilities. Energy analytics in software such as SkySpark can be powerful tools for keeping buildings commissioned and operating efficiently. They provide both an overall image of performance by calculating Energy Use Indices (EUIs) and estimating savings by including weather normalization features. However, to target the performance of specific pieces of equipment, the software must be deployed at a site with a DDC system, and set up in close coordination with the controls contractor. After installation, it is key to have personnel who are trained in how to use the software dedicated to regularly checking in on the system and are in regular communication with the facilities team at the site. The IDL team found that in both of these case studies, there was an abundance of data, but few resources dedicated to analysis or implementation.

At the campus, the installation was limited by the age of the controls at the site. The analytics software was helpful at providing baseline energy signatures. The analytics helped to inform the retrofit implementation plan at the site. The IDL team provided only a small amount of assistance in going through the data. However, the facilities team had limited time resources available to spend on such analysis.

At the government office, the analytics software was installed quickly and was able to immediately identify several operational changes to improve energy efficiency. However, some of the analytics must be tuned specifically to each building to eliminate phantom anomalies from unused control points. This is best done by close coordination with the controls contractor. Lastly, although several items were identified, without dedicated personnel to follow-up on the analytics report, it is unknown if any actions were taken.

The IDL team found that it is not enough to merely install analytics software and expect savings. There must be three elements in place for energy analytics to be successful. The software must be installed at an appropriate building – one with a DDC system and properly labeled control points. The installation must be carried out by a knowledgeable team who can coordinate with the controls contractor for the site. Most importantly, there must be someone within the team whose job it is to follow up on the analytics reports and to coordinate with the facilities manager to implement the operational changes. Sometimes these follow-up services are provided by those who install the analytics software, and sometimes they are not. If the correct elements are in place, the IDL team believes that energy analytics could be very effective at preventing building performance degradation and maintaining building commissioning. If one of the preceding conditions is missing, then the analytics software will likely underperform its energy savings potential.

6. Appendices

Appendix A: Initial findings from IDL analysis of SkySpark data at the campus

1. Building 1
    a. There is a minimum of 20kW of lighting and plug loads on at all times. This is a significant amount of power – it might be worth a nighttime walkthrough to verify that all of the nighttime loads are necessary.
    b. Team should follow-up on nighttime HVAC power/setbacks during unoccupied periods by cross-referencing the expo schedule.

2. Building 2
    a. Max load 124 kW, minimum of 72 kW
    b. Operational schedule is M-F 8-5 (little to no weekend use). Perimeter heating only with pneumatic controls.
    c. Upgrades: improve supply air temperatures as internal offices can become quite cold – perhaps with an ERV.

3. Building 3
    a. An old housing unit now used for training. It has only a very small load: 8 kW max, 3.3 kW min.
    b. Recommendation: a slightly smaller load on the weekend indicates about 1kW of equipment is left on at night during the week.

4. Building 4
    a. Maximum 57kW (3pm-5pm), Minimum 39kW (3am).
    b. This is a 24-hour facility, so no walk-through was performed and there are no recommendations at this time.

5. Building 5
    a. The shop has irregular use Mon – Saturday.
    b. The facilities manager is in the shop regularly and keeps an eye out for equipment left on. A programmable thermostat manages the furnace and DX rooftop unit. No recommendations at this time.

6. Building 6
    a. The maintenance shop has 4-5 bays that are in operation M-F 8-5 PM
    b. The maximum load is 12 kW, with a minimum of 0 kW, so if in the future a load appears at night, it is an indication that equipment has been left on.

7. Building 7
    a. Residential building of approximately 100 occupants – vacant during the day and has one washer and one dryer. Maximum 28 kW (weekends around 4:00pm) minimum of 10 kW at night. No walkthrough performed and no recommendations at this time.

8. Building 8
    a. All on standards for fresh air, thermostats and lighting. AHUS are on 24/7 to maintain fresh air.
    b. Since the operation and schedule is so regulated, there are few efficiency recommendations at this time. The largest benefits are likely to be lighting upgrades to LED (underway) and ensuring the AHUs are maintained and replaced with high-efficiency equipment when possible as these see heavy use.

9. Building 9
    a. This is a 10x10 unit with AC installed to keep the equipment in a safe operating range.
    b. Facilities suspected there may be a ghost load – possibly tapped into by a prior construction project
    c. IDL should perform further analysis to quantify the AC unit power and operation (the tower load should be steady).

10. Building 10
    a. Max load 950 kW, minimum of 680 kW.
    b. There was some discrepancy between the main line and the total of the other loads indicating some power is being used that is not accounted for. IDL will study the data to verify this, but it may require a site visit from an IPC representative.

Other Notes:

a) The team should identify good baseline operation for reference
b) A back-up generator test is performed every Thursday morning from 6-7 am.
c) A new transformer that arrived in April should smooth out some of the power signature irregularities. The team should run a comparison to verify this improvement.

INTEGRATED DESIGN LAB
University of Idaho

2018 Task 8: Measuring Indoor Performance at Educational Facilities

Summary of Effort and Outcomes

Idaho Power Company External Year-End Report

December 31, 2018

Prepared for:
Idaho Power Company

Authors:
Damon Woods

Report Number: 1701_003-01

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Contract Number:
5277

Please cite this report as follows: Woods, D. (2018). *2018 TASK 8: Measuring Indoor Performance at Educational Facilities – Summary of Effort and Outcomes* (1801_010-08). University of Idaho Integrated Design Lab, Boise, ID.

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Table of Contents

Acronyms and Abbreviations

ASHRAE	American Society of Heating, Refrigeration, and Air-Conditioning Engineers
CBECS	Commercial Building Energy Consumption Survey
DOE	Department of Energy
HVAC	Heating, Ventilation, and Air Conditioning
IAQ	Indoor Air Quality
IEQ	Indoor Environmental Quality
IDL	Integrated Design Lab
IPC	Idaho Power Company
LEED	Leadership in Energy & Environmental Design
PMV	Predicted Mean Vote
PNNL	Pacific Northwest National Laboratory
PPD	Percentage of Population Dissatisfied
TMY	Typical Meteorological Year
UI	University of Idaho

1. Introduction

The Integrated Design Lab (IDL) proposed a task to Idaho Power Company (IPC) on Measuring Indoor Performance at Educational Facilities. The purpose of this task was to determine the effectiveness of HVAC systems at providing adequate conditioning in typical secondary school classrooms. The data was used to quantify energy savings that could be achieved through operational changes without adversely affecting occupant comfort. Four classrooms at two separate high schools were intensively monitored for several weeks. The measurements from these classrooms were used to extrapolate cooling required in the schools during the spring and fall when the buildings are still using air conditioning. Department of Energy (DOE) prototype models of the schools were used to show how adjustments to the HVAC operations could reduce peak loads and overall energy consumption at typical Idaho high schools while maintaining high thermal and environmental quality for the students.

2. Summary of Findings

Most classrooms measured in this project were over-cooled. They fell below the recommended comfort parameters as specified by ASHRAE Standard 55. Enhancing thermal performance of the classrooms will save on unnecessary cooling and could increase student productivity. The classrooms could be brought into compliance by raising the cooling setpoint by 4^{o}F. Adjusting the default thermostat setpoint is estimated to save an Idaho school \$4 per student in annual energy bills. Raising the cooling setpoint will save the utility an estimated 60 kWh of electrical energy per student and reduce electrical demand by 30 Watts per student.

3. Thermal Performance Analysis

Thermal performance is defined by ASHRAE Standard 55[1]. This standard includes air temperature, air velocity, relative humidity, mean radiant temperature, occupant clothing and activity levels. Based on these readings, one may estimate whether most occupants would be comfortable in that environment. The standard uses two metrics for gauging compliance: the Predicted Mean Vote (PMV) and the Percentage of People Dissatisfied (PPD). Both PMV and PPD are related through a series of equations. The PMV is an estimate of comfort on a sliding scale with -3 being very cold, 0 being comfortable, and +3 being too warm. Standard 55 specifies that occupants should be within ± 0.5 PMV for the space to be considered comfortable. The PPD is another way of predicting comfort by estimating the percentage of people in the room who are satisfied with the thermal environment. If more than 20% of people are predicted to be unsatisfied (a PMV greater than 0.5), then the space is considered uncomfortable.

It is important to note that these metrics are based on environmental conditions as inputs to a series of equations – not based on people's opinions. While testing on human subjects was used to develop these original comfort standards in the 1970's, no occupant surveys were conducted during this project. The comfort numbers provided in this report are merely predictions of what most people would state their comfort to be when in that environment.

[1] ASHRAE, "ASHRAE, ANSI/ASHRAE Standard 55-2013. Thermal Environmental Conditions for Human Occupancy," American Society of Heating Refrigerating, and Air-Conditioning Engineers, Inc., Atlanta, 2013.

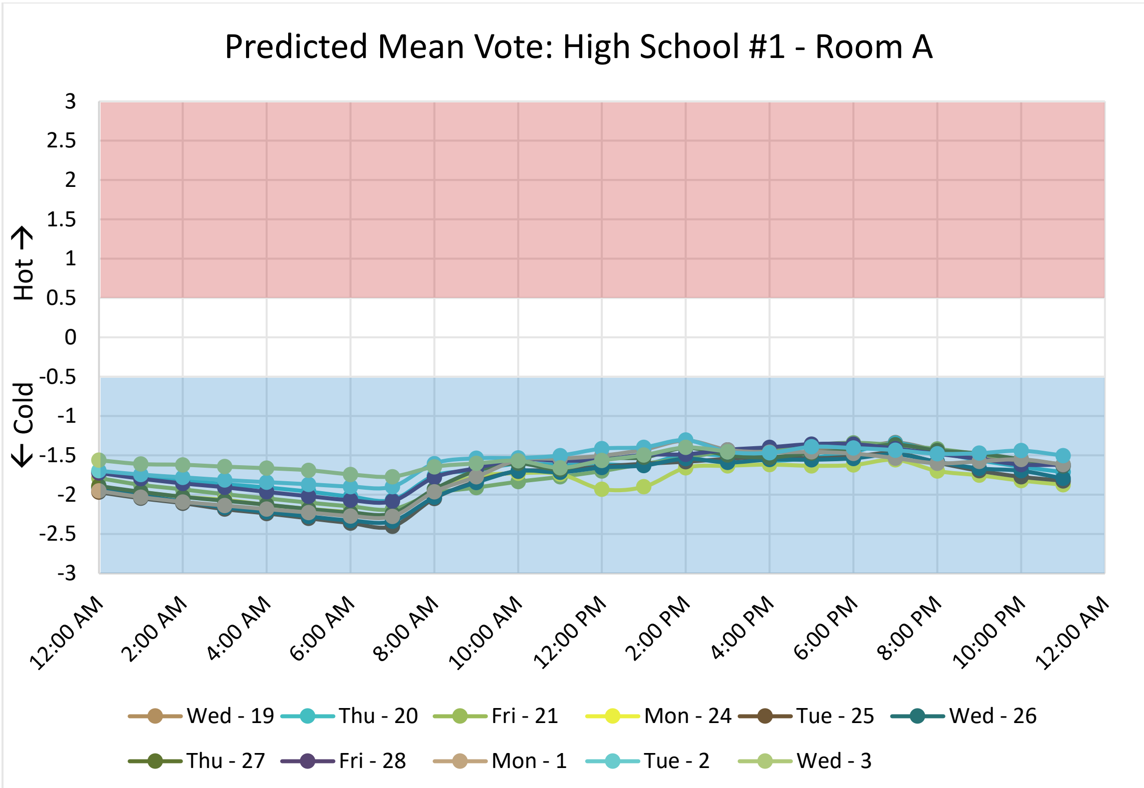
While a thermostat is often used as a proxy for thermal comfort, it misses the nuance of many other interacting features – most importantly the mean radiant temperature. The Mean Radiant Temperature (MRT) is the average of the surrounding surface temperatures and has nearly twice the impact on comfort than air temperature. Most thermostats do not incorporate the surface temperatures and therefore many HVAC systems over-cool the rooms they are meant to condition, which wastes energy.

The PMV calculations were based on the set of equations laid out in ASHRAE Standard 55. The equations can be strung together in computer code and within the standard, these equations are listed in the language of BASIC. This code was re-written in Excel so that time-series graphs could be produced for this project. The equations include several assumptions and measurements. The equation inputs are listed in Table 1.

Table 1: Measurements used to estimate comfort level in classrooms

Input	**Value**	**Meaning**
Activity Level	1.1 [Mets]	Sitting and writing
Clothing Level	0.5 [Clo]	Shoes, socks, pants, and short-sleeved shirt
External Work	0 [Mets]	No weight-lifting
Air Velocity	20 [ft/min]	Default indoor velocity based on ASHRAE 55
Dry Bulb Air Temperature	Measured [°F]	Air temperature
Relative Humidity	Measured [%]	Relative humidity
Mean Radiant Temperature	Measured [°F]	Average of surface temperatures

The thermal performance as measured at four classrooms in two high schools is shown in the following figures. In each graph, the PMV is shown along the vertical axis. Any measurements above 0.5 are considered too warm (as indicated by the red bars) and measurements below -0.5 are considered too cold (as indicated by the blue bars).


Predicted Mean Vote: High School #1 - Room A
Hot →
← Cold
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
12:00 AM
2:00 AM
4:00 AM
6:00 AM
8:00 AM
10:00 AM
12:00 PM
2:00 PM
4:00 PM
6:00 PM
8:00 PM
10:00 PM
12:00 AM
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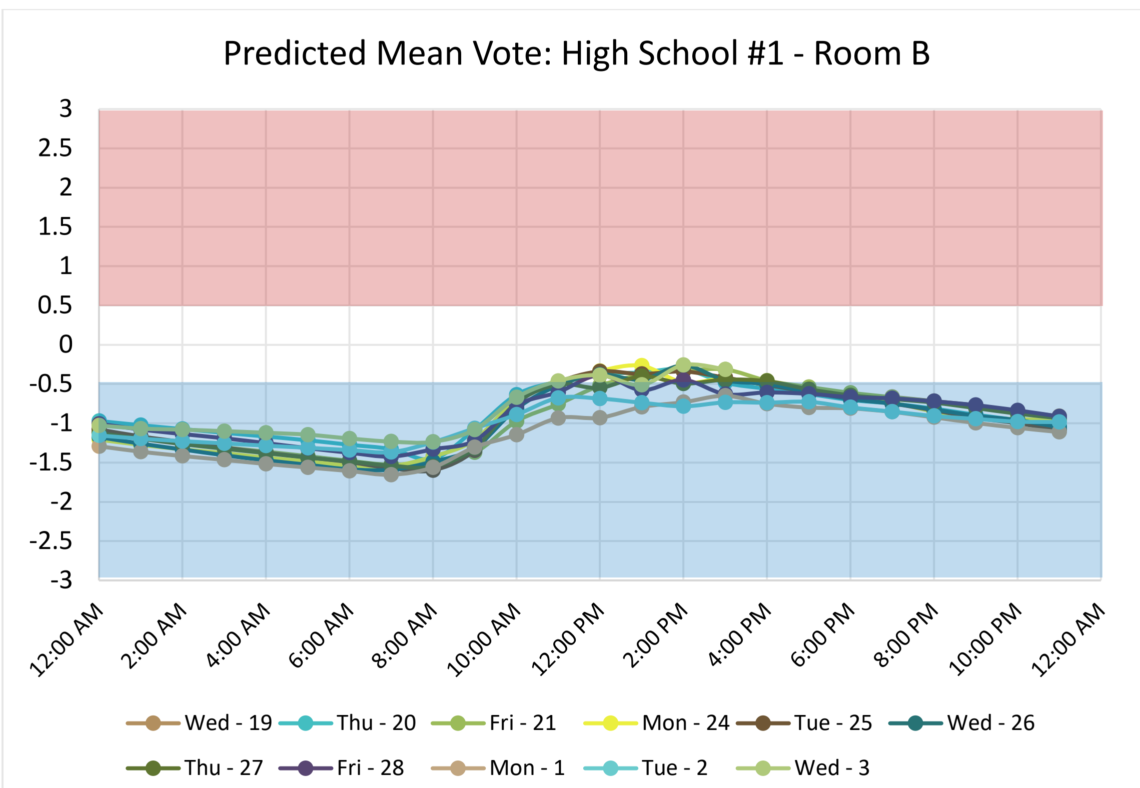
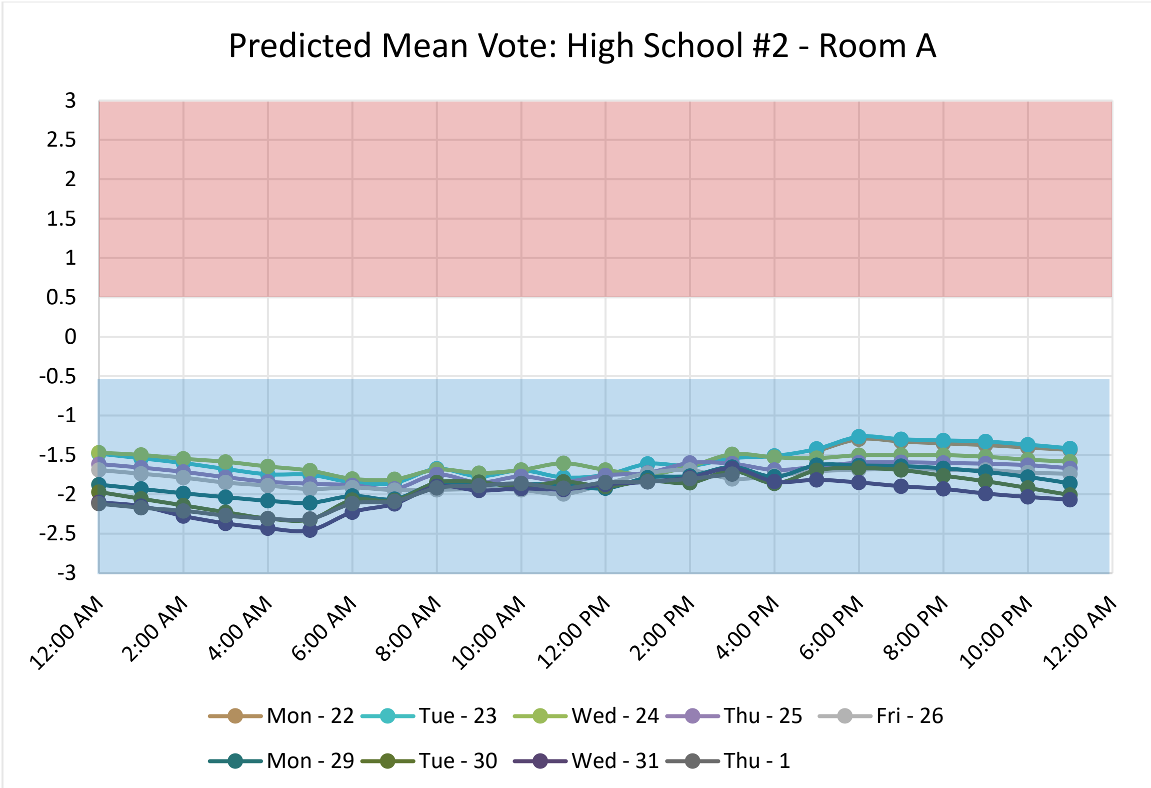
Mon - 1
Tue - 2
Wed - 3


Predicted Mean Vote: High School #1 - Room B
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
12:00 AM
2:00 AM
4:00 AM
6:00 AM
8:00 AM
10:00 AM
12:00 PM
2:00 PM
4:00 PM
6:00 PM
8:00 PM
10:00 PM
12:00 AM
Wed - 19
Thu - 20
Fri - 21
Mon - 24
Tue - 25
Wed - 26
Thu - 27
Fri - 28
Mon - 1
Tue - 2
Wed - 3



Predicted Mean Vote: High School #2 - Room A
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
12:00 AM
2:00 AM
4:00 AM
6:00 AM
8:00 AM
10:00 AM
12:00 PM
2:00 PM
4:00 PM
6:00 PM
8:00 PM
10:00 PM
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Mon - 22
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Wed - 24
Thu - 25
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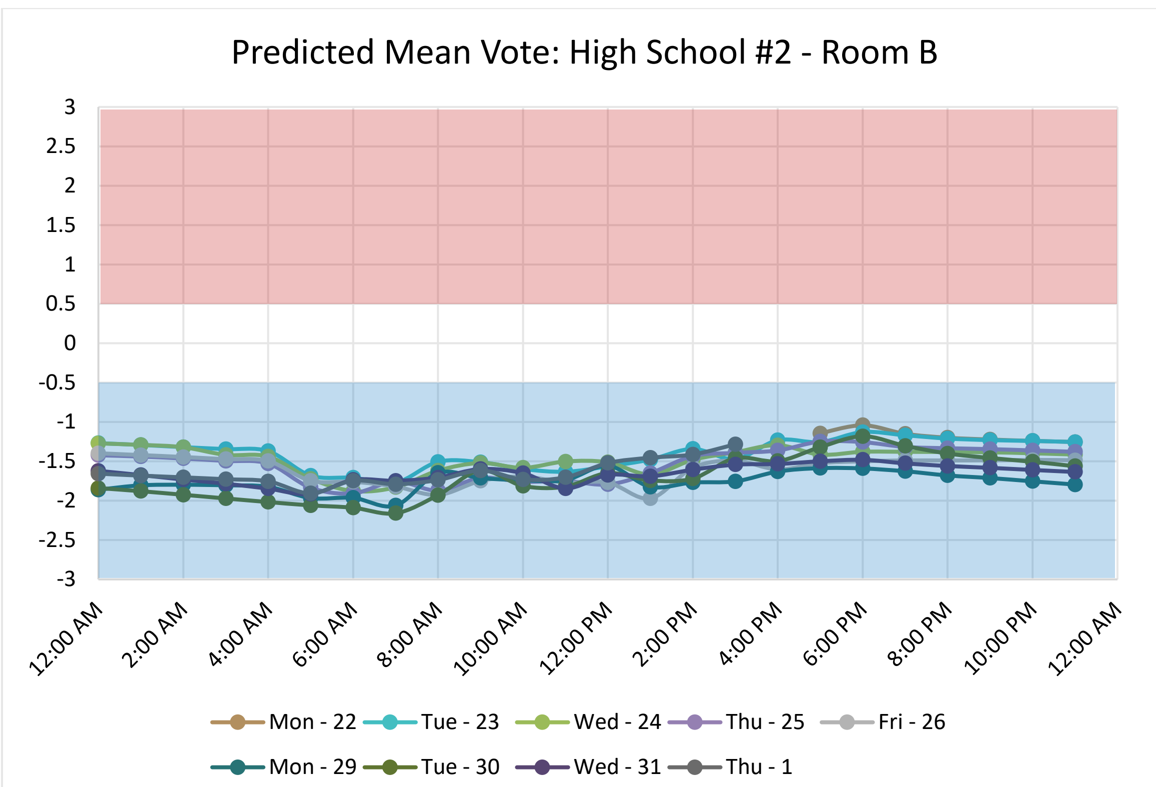
Mon - 29
Tue - 30
Wed - 31
Thu - 1



Predicted Mean Vote: High School #2 - Room B
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
12:00 AM
2:00 AM
4:00 AM
6:00 AM
8:00 AM
10:00 AM
12:00 PM
2:00 PM
4:00 PM
6:00 PM
8:00 PM
10:00 PM
12:00 AM
Mon - 22
Tue - 23
Wed - 24
Thu - 25
Fri - 26
Mon - 29
Tue - 30
Wed - 31
Thu - 1

3.1 2018 Evaluations

Every classroom that was measured indicated generally cold conditions. These cold conditions persisted even though the measurements were taken during the fall at a time when the outdoor air temperature rose above the balance point each day and the buildings were in cooling mode. In Figure 1, the outdoor temperature is shown on the same graph as the indoor temperature.

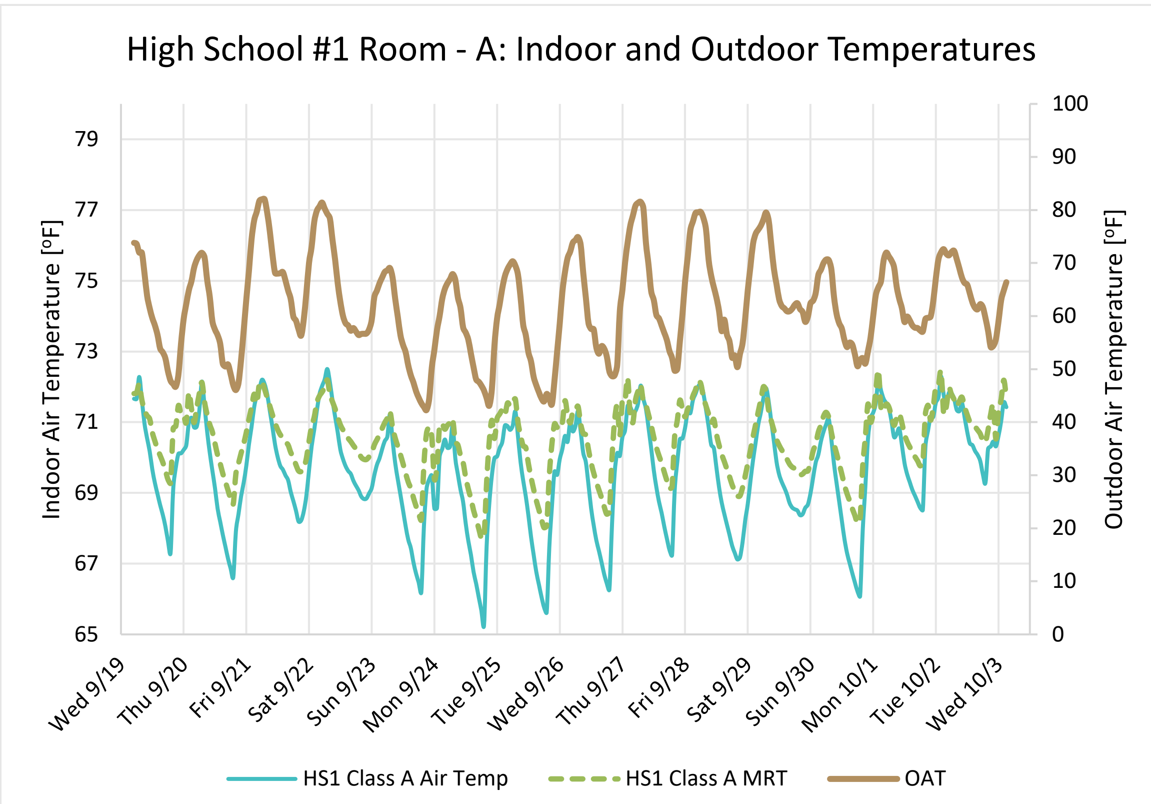


Figure 1: The measured air and surface temperatures of a classroom at one of the high schools

During the measurement period, the outdoor temperature regularly rose above 70°F and even up to 80°F, while the indoor temperature peaked at 72°F. The peaks of the indoor air temperature are staggered showing that the air conditioning system is active.

4. Prototype Models

4.1 Matching Setpoints and Conditions

Since each of the classrooms measured showed a tendency towards overcooling, the IDL team proposed raising the cooling setpoints. The team used an energy model to estimate the savings from the setpoint adjustments. The model was a DOE prototype for a secondary school constructed to 90.1 – 2004 code standards. An image of the model is shown below.

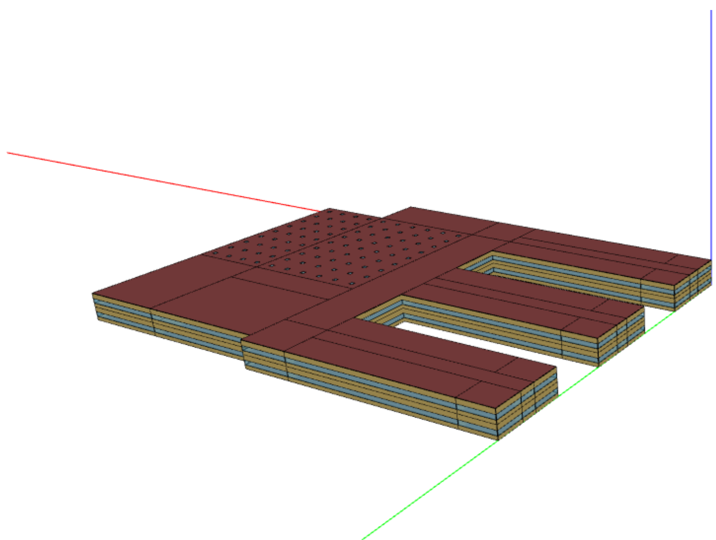


Figure 2: The DOE prototype model used to estimate energy savings

This model is used as a representation for a generic high school in Idaho. It is based on data collected by the Commercial Building Energy Consumption Survey (CBECS) data and the specific energy model was produced by Pacific Northwest National Lab (PNNL). Since this model is a stand-in for a generic high school, it was not calibrated for a specific building monitored in this project. These DOE prototype models by PNNL have been used in the development of energy codes around the country. The measurements taken at the classrooms formed the baseline setpoints. The average recorded indoor cooling setpoints were between 70°F – 72°F.

One example is shown in Figure 3, where the temperature falls during the occupied period and rises when unoccupied. This indicates that the classroom is being cooled between about 6:00 AM – 4:00 PM.

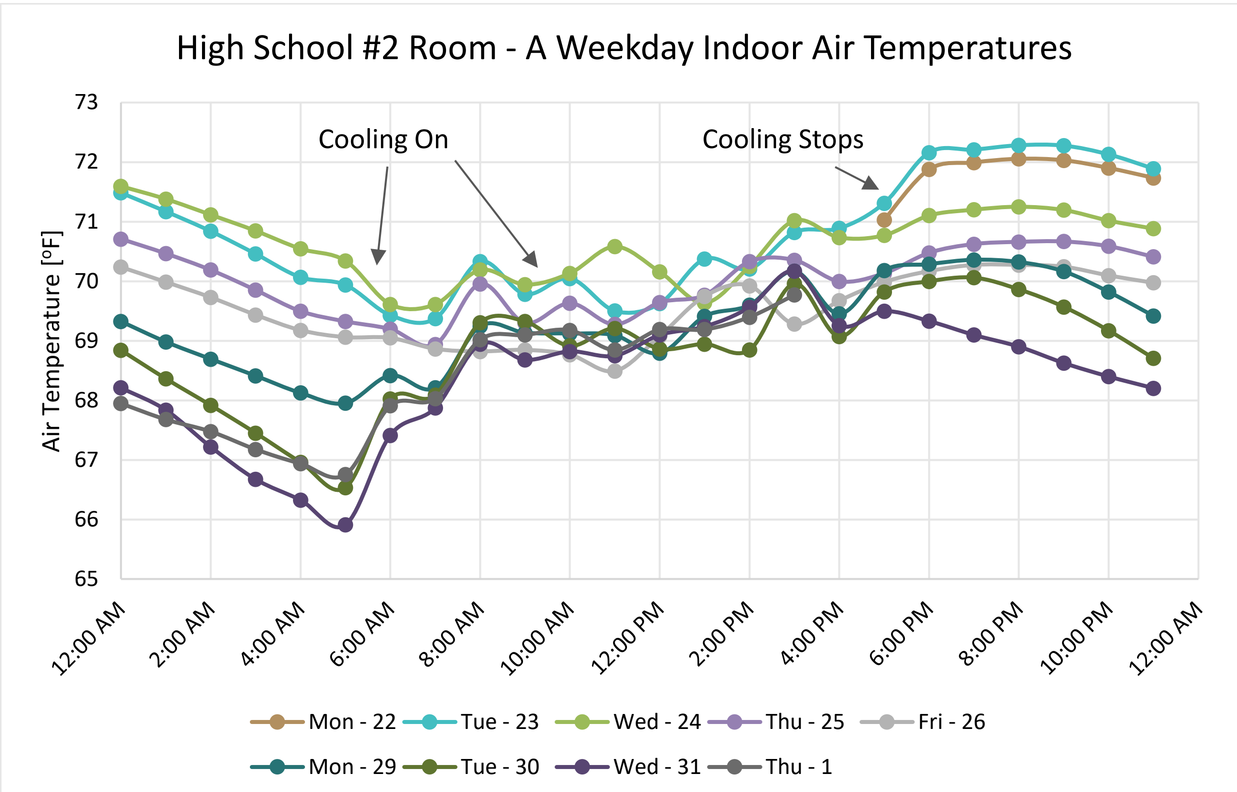


Figure 3: The average indoor air temperatures recorded at one of the high school classrooms

Three of the classrooms had similar thermal profiles to what is shown in Figure 3 with setpoints near or below 72°F and low comfort performance. Only one classroom that was measured showed times when the indoor conditions rose into the comfort zone as defined by Standard 55. This was at High School #1 in Classroom B. This room has a much higher cooling setpoint of 76°F-78°F as shown in Figure 4.

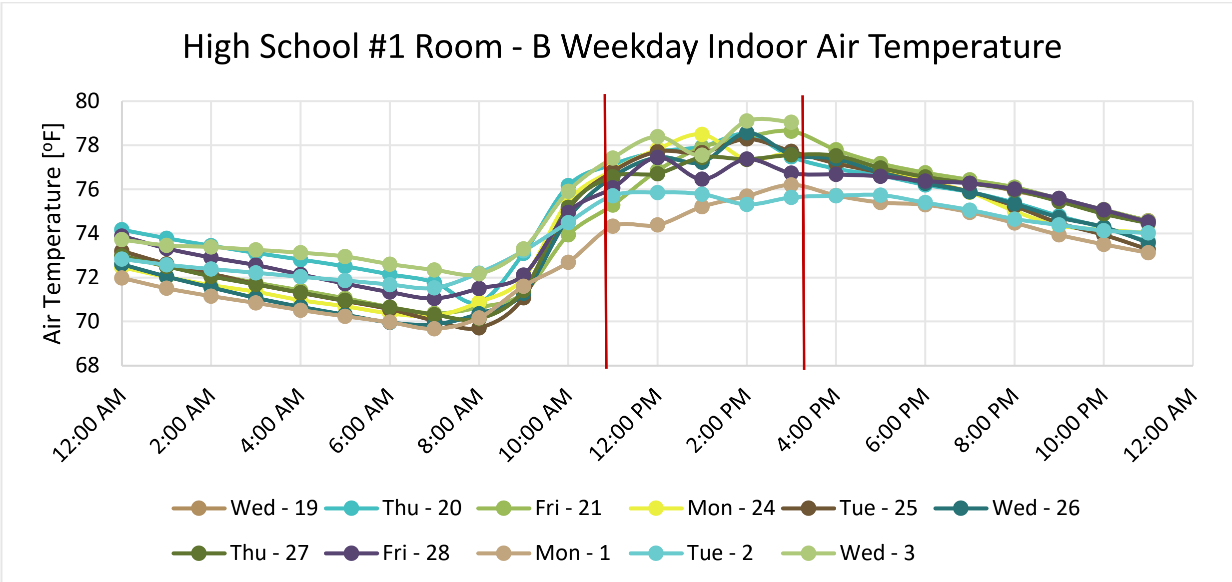


Figure 4: The indoor temperatures measured at the one classroom that showed thermal comfort

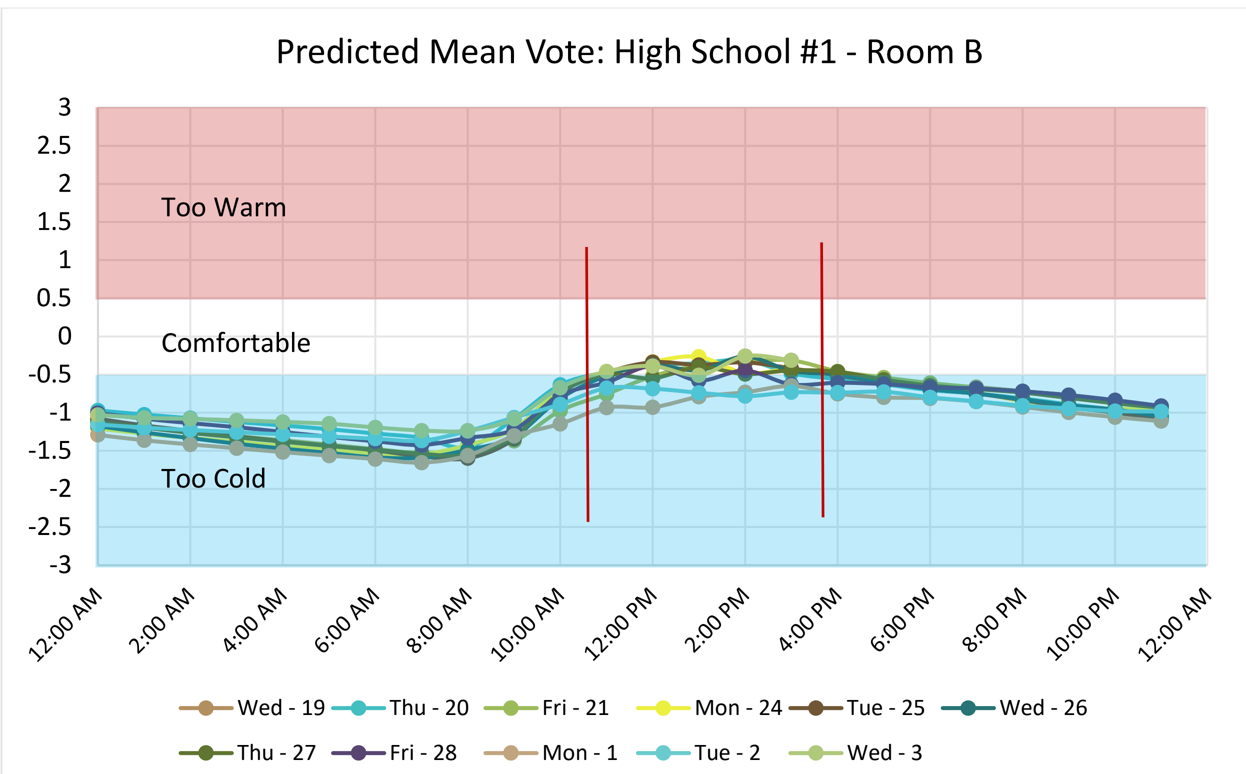


Figure 5: The comfort metrics for the classroom with higher setpoints

The measurements at this particular classroom, as shown in Figure 4 and Figure 5, formed the basis for the proposed change in setpoints. The classroom only approached the thermal comfort range once the indoor temperature reached above 75°F. Another observation was that the average surface temperatures started out cooler and rose throughout the afternoon. This meant that in the morning, the space could have a higher air temperature and maintain the same level of thermal comfort because the cool surfaces in the morning offset the higher air temperature. The proposed setpoint is contrasted with the original setpoint observed in the rest of the classrooms as shown in Figure 6.

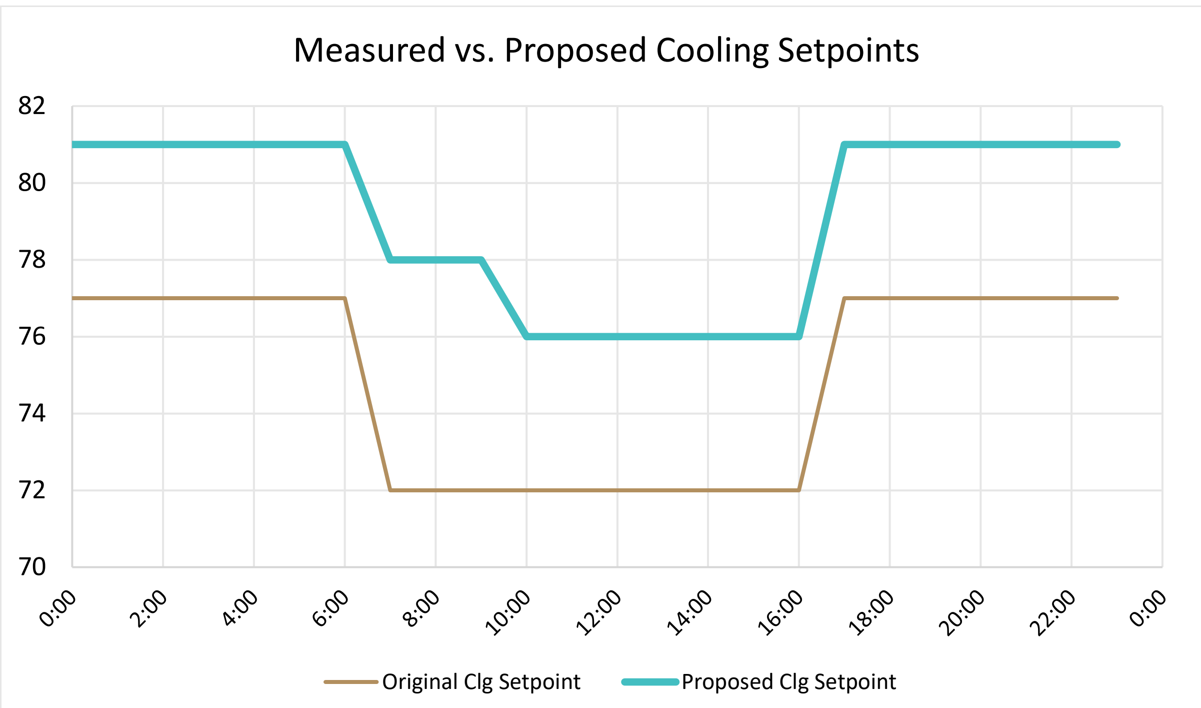


Figure 6 Proposed adjustment for the cooling setpoint in classrooms to improve thermal comfort

The adjustment to the cooling setpoint is to raise the original setpoint at the schools by 4°F from 72°F to 76°F with a 5°F setback and a staggered start to the cooling to account for the low surface temperatures in the space. This improved both the predicted energy savings and the occupant comfort in the model.

5. Results

Raising the cooling setpoint by 4ºF is expected to increase comfort in the classrooms and save on annual energy consumption. Since each school is unique and ranges by size, the prototype model was used as a stand-in for a generic high school in southern Idaho run for a Typical Meteorological Year (TMY). To provide a common metric between schools, the savings are estimated per student. The energy savings calculated are shown in Table 2.

Table 2: Energy simulation results of setpoint adjustment

Category	Annual Estimated Savings
Electricity Cost	$4.44/student
Electricity Consumption	63 kWh/student
Electricity Demand	0.03 kW/student

6. Conclusions and Future Steps

The measurements showed that clear energy efficiency improvements could be made through simple operational adjustments. While both high schools were in Southern Idaho, neither school was part of the IPC Schools Cohort and so there is room for them to further connect with IPC's energy efficiency initiatives. The readings for each site will be sent back to the science teachers and facilities managers at each school. Adjustments to the setpoints may be implemented at any point and could potentially begin saving energy as soon as April of this coming year. The adjusted setpoints not only improve energy performance but also increase comfort, making a strong case for the facilities managers to implement these changes and maintain these new setpoint guidelines to reduce occupant complaints.

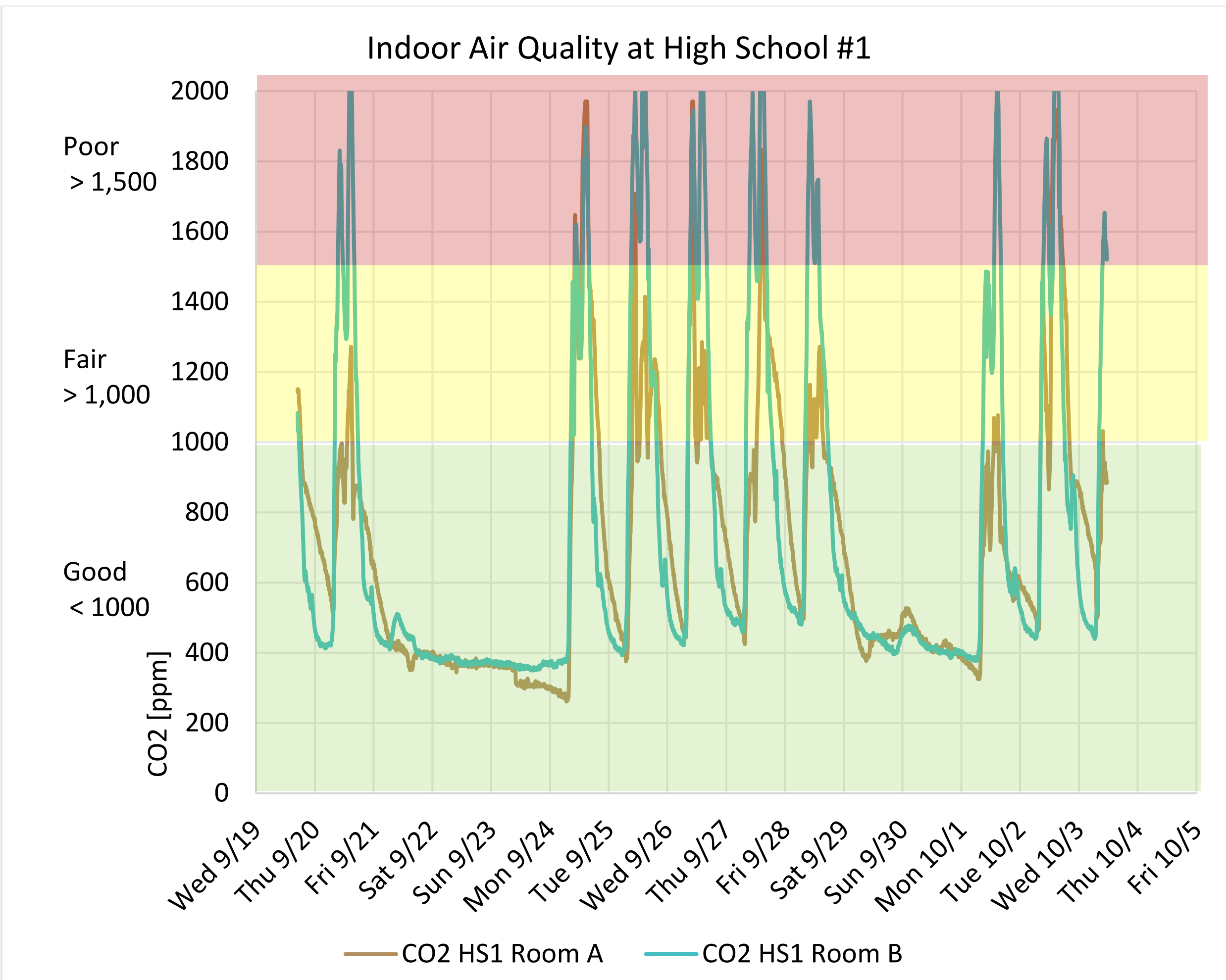
While this study highlights potential savings, Idaho Power could choose to build upon this study in several ways. One way to engage schools would be to work with science teachers to incorporate a project like this into the curriculum so that students may see the relationship between building operations, comfort, and energy bills. A second way IPC could work with schools is to identify facilities that require HVAC improvements if the current equipment cannot properly condition the classrooms or provide adequate fresh air. The IDL team included several air quality monitors within the classrooms to measure whether the HVAC systems were providing adequate ventilation. One provided only fair performance, while the other showed poor performance. Details are shown in Appendix A.

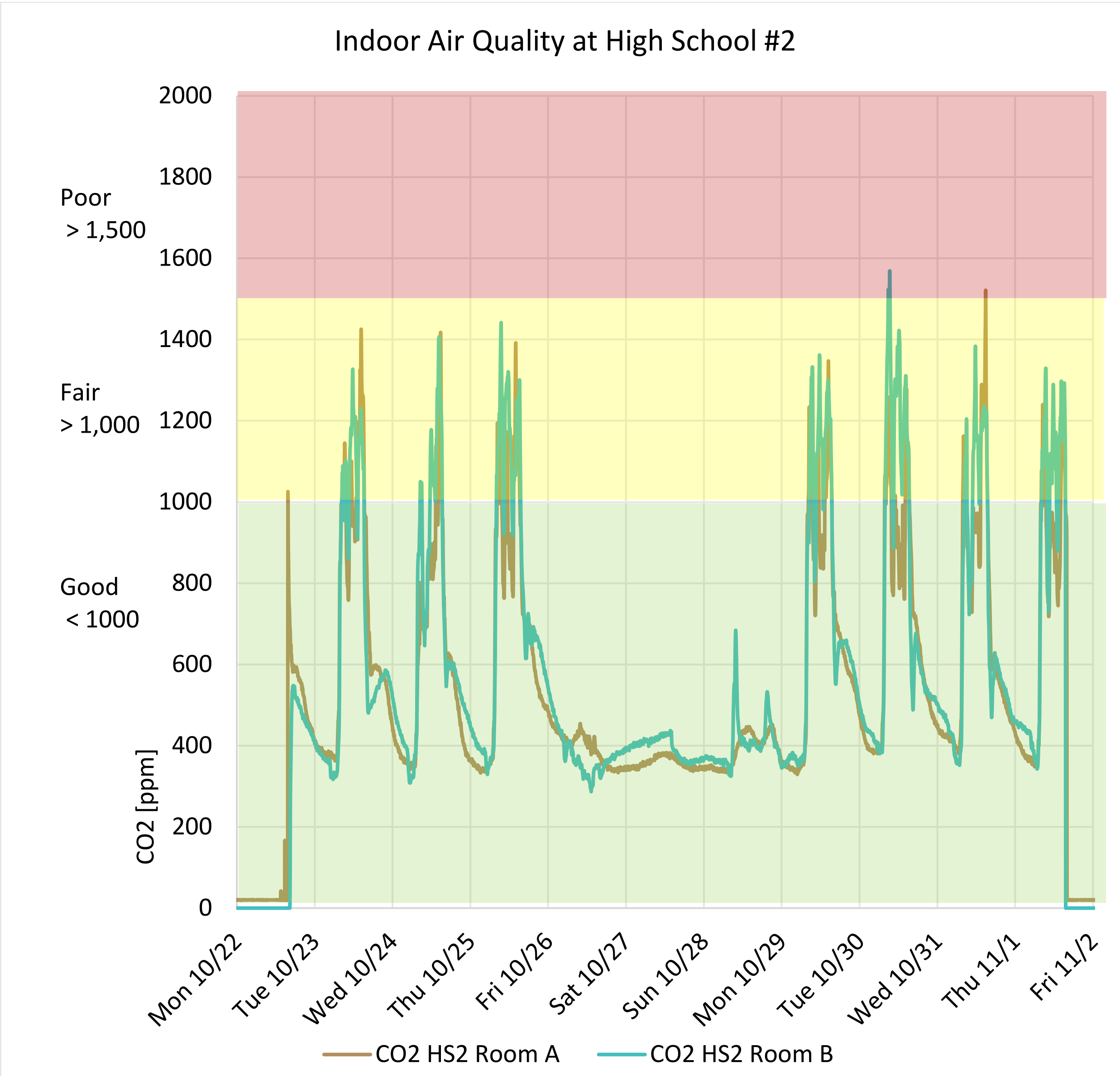
The IDL team achieved the goals of the task by measuring HVAC performance at four classrooms. IDL was able to identify operational changes that can improve energy efficiency while enhancing occupant satisfaction. This study engaged the schools on several levels including: facilities managers, teachers, and students at each of the buildings. Results of the energy simulations showed that there is room for energy savings of over $4 per student in high schools throughout the Idaho Power service territory that have sub-optimal setpoints. These savings could be realized by further outreach and engagement with school facilities personnel.

7. Appendices

Appendix A: Indoor air quality of the classrooms

As part of the assessment for thermal quality, the IDL team also installed CO_2 sensors to monitor the indoor air quality of the classrooms. One of the schools appeared to have adequate fresh air, while the other did not. Schools equipped with Dedicated Outdoor Air Systems (DOAS) can provide much more consistent indoor air quality and be paired with high efficiency heating and cooling systems like Variable Refrigerant Flow (VRF) systems. Neither of these schools had a DOAS or VRF.




Indoor Air Quality at High School #2
Poor
> 1,500
Fair
> 1,000
Good
< 1000
CO2 [ppm]
2000
1800
1600
1400
1200
1000
800
600
400
200
0
Mon 10/22
Tue 10/23
Wed 10/24
Thu 10/25
Fri 10/26
Sat 10/27
Sun 10/28
Mon 10/29
Tue 10/30
Wed 10/31
Thu 11/1
Fri 11/2
CO2 HS2 Room A
CO2 HS2 Room B

RESEARCH/SURVEYS

Report Title	Sector	Analysis Performed By	Study Manager	Study/Evaluation Type
2018 Home Energy Audit Program Survey	Residential	Idaho Power	Idaho Power	Survey
2018 Idaho Power Shade Tree Project Survey	Residential	Idaho Power	Idaho Power	Survey
2018 Smart-Saver Pledge Follow-Up Survey	Residential	Idaho Power	Idaho Power	Survey
2018 WAQC Survey Results	Residential	Idaho Power	Idaho Power	Survey
2018 Weatherization Solutions Survey Results	Residential	Idaho Power	Idaho Power	Survey
Multifamily Direct-Install Project Customer Survey	Residential	Idaho Power	Idaho Power	Survey

2018 Home Energy Audit Program Survey

How easy was it for you to apply for the Home Energy Audit program?

Answer Choices	Percent	Responses
Very easy	80.77%	126
Somewhat easy	16.03%	25
Somewhat difficult	3.21%	5
Very difficult	0.00%	0
Answered		156

If the application process was difficult what was it about that process that made it difficult?

Answered 15

Please identify the auditor that you used for your home audit.

Answer Choices	Percent	Responses
Brian Bennett, The Energy Auditor	1.31%	2
Chris Callor, Professional Inspection Services, LLC	18.95%	29
Dallen Ward, H.E.E.T.	4.58%	7
Rod Burk, Home Energy Management	0.00%	0
Tad Duby, On Point, LLC	37.91%	58
I don't know/I don't remember	37.25%	57
Answered		153

Please rate your home auditor on each of the following:

	Excellent	Good	Fair	Poor	Total
Courteousness	84.97%	13.73%	1.31%	0.00%	153
Professionalism	80.92%	15.79%	3.29%	0.00%	152
Explanation of work/measurements to be performed as part of the audit	76.97%	15.79%	5.92%	1.32%	152
Explanation of recommendations resulting from audit	71.71%	18.42%	6.58%	3.29%	152
Overall experience with auditor (from scheduling an appointment to follow up after the audit)	76.16%	17.22%	4.64%	1.99%	151
Answered					153

If you have additional comments you would like to offer about your home auditor, please enter them in the space below.

Answered 36

How much did the audit influence you to reduce the amount of electricity you consume?

Answer Choices	Percent	Responses
Influenced me a lot	38.56%	59
Influenced me some	44.44%	68
Didn't influence me much	11.76%	18
Didn't influence me at all	5.23%	8
Answered		153

As a result of the Home Energy Audit program, please indicate how strongly you agree or disagree with the following statements.

	Strongly agree	Somewhat agree	Somewhat disagree	Strongly disagree	N/A	Total
I am more informed about energy usage in my home	56.38%	36.91%	3.36%	3.36%	0.00%	149
Other members of my household are more informed about our household energy usage	36.49%	33.78%	8.11%	5.41%	16.22%	148
I am more informed about energy efficiency programs that are available to me through Idaho Power	35.57%	41.61%	12.75%	8.05%	2.01%	149
I know what no- to low-cost actions I can take	47.97%	36.49%	10.14%	5.41%	0.00%	148
I know what next steps I should take	56.08%	33.11%	6.76%	4.05%	0.00%	148
Answered						149

After receiving your audit through the Home Energy Audit program, please indicate if you have taken any of the following actions:

	Yes	No	Total
Visited the Idaho Power website	54.93%	45.07%	142
Unplugged appliances when not in use	60.42%	39.58%	144
Signed up for My Account	39.86%	60.14%	138
Shared my energy audit experience with relatives and/or friends	76.87%	23.13%	147
Other	55.07%	44.93%	69
If you selected "other", please specify what other actions you have taken:			40
Answered			147

Since receiving your audit through the Home Energy Audit program, please indicate when, or if, you will complete any of the following improvements:

	Already completed	Plan to in next 6 months	Plan to in 6-12 months	Want to but not sure when	Do not plan to at all	Home does not need	Total
Replace additional incandescent light bulbs with more efficient light bulbs (e.g., CFLs and LEDs)	74.50%	13.42%	1.34%	2.01%	0.67%	8.05%	149
Replace additional showerheads with low-flow models	46.26%	6.12%	3.40%	6.12%	21.77%	16.33%	147
Recycle an extra refrigerator or freezer	12.84%	2.70%	2.03%	14.86%	21.62%	45.95%	148
Replace an older, inefficient appliance with a new ENERGY STAR model	21.09%	3.40%	10.20%	21.77%	12.93%	30.61%	147
Service heating equipment	53.06%	17.01%	7.48%	6.12%	3.40%	12.93%	147
Service cooling equipment	48.98%	12.24%	8.16%	6.80%	2.72%	21.09%	147
Increase attic insulation	21.09%	13.61%	10.20%	22.45%	8.84%	23.81%	147
Increase wall insulation	6.94%	2.78%	4.86%	16.67%	29.86%	38.89%	144
Increase underfloor insulation	13.79%	8.97%	5.52%	23.45%	17.93%	30.34%	145
Seal air leaks	38.62%	13.10%	4.83%	17.24%	8.97%	17.24%	145
Seal duct work	30.56%	11.81%	2.78%	19.44%	6.94%	28.47%	144
Other	43.90%	4.88%	2.44%	17.07%	4.88%	26.83%	41
If you selected "other", please specify what other actions you have taken or plan to take:							29
Answered							149

For any improvements you indicated you do not plan to do, please tell us why.

Answered	47

What benefits did you experience from the Home Energy Audit program? (Check all that apply)

Answer Choices	Percent	Responses
Cost savings	52.94%	72
Personal satisfaction	71.32%	97
Raised awareness of energy use	75.00%	102
Benefit to the environment	35.29%	48
Home improvement	57.35%	78
Comfort	39.71%	54
Other	7.35%	10
(please specify)		12
Answered		136

What barriers do you encounter in making energy savings changes in your home? (Check all that apply)

Answer Choices	Percent	Responses
Cost	78.52%	106
Time	40.00%	54
Convenience	20.74%	28
Lack of necessity	14.81%	20
Do not know who to contact	19.26%	26
Other (please specify)	8.89%	12
Answered		135

The most effective method for Idaho Power to provide information about energy efficiency is to: (Check all that apply)

Answer Choices	Percent	Responses
Offer classes in convenient locations	20.44%	28
Communicate information in local newspapers	11.68%	16
Communicate information on the Idaho Power website	40.15%	55
Communicate information on social media	17.52%	24
Offer a minimal cost home audit service	56.93%	78
Send newsletters or information directly to homeowners	42.34%	58
Send email communications to homeowners	34.31%	47
Send information in monthly Idaho Power bill	66.42%	91
Other (please specify)	5.84%	8
Answered		137

How much do you agree with the following statements:

	Strongly agree	Somewhat agree	Somewhat disagree	Strongly disagree	Total
My Home Energy Audit report contained valuable information	72.73%	20.98%	2.80%	3.50%	143
I would recommend the Home Energy Audit program to a friend or relative	72.03%	18.18%	3.50%	6.29%	143
I am satisfied with my overall experience with the Home Energy Audit program	73.94%	16.90%	4.23%	4.93%	142
Answered					143

If you disagree with any of these statements, please tell us why.

Answered 15

Please identify your age in the ranges below:

Answer Choices	Percent	Responses
Under 25	0.69%	1
26-35	6.90%	10
36-50	19.31%	28
51-65	36.55%	53
Over 65	36.55%	53
Answered		145

What is the highest level of education you completed?

Answer Choices	Percent	Responses
Less than high school	0.00%	0
Some high school	0.00%	0
High school graduate or equivalent	8.33%	12
Some college	18.75%	27
Two year Associate degree or Trade/Technical school	11.11%	16
Four year college degree	28.47%	41
Some graduate courses	10.42%	15
Advanced degree	22.92%	33
Answered		144

2018 Idaho Power Shade Tree Project Survey

How did you hear about Idaho Power's Shade Tree Project? (Check all that apply)

Answer Choices	Percent	Respondents
Letter from Idaho Power	65.66%	457
Friend or relative	20.40%	142
Neighbor	5.17%	36
Idaho Power employee	2.87%	20
Other (please specify)	9.20%	64
Answered		696

What was the primary reason you participated in the program? (Mark one)

Answer Choices	Percent	Respondents
Tree was free	16.52%	115
Home too warm in the summer	12.36%	86
Reduce energy bill	21.26%	148
Improve landscape/property value	17.24%	120
Wanted a tree	20.11%	140
Help the environment	7.61%	53
Other (please specify)	4.89%	34
Answered		696

What kept you from planting a tree prior to the Shade Tree Project? (Mark one)

Answer Choices	Percent	Respondents
Lack of knowledge	17.08%	118
Cost	44.86%	310
Time	11.87%	82
Other (please specify)	26.19%	181
Answered		691

Where would you typically purchase a new tree? (Mark one)

Answer Choices	Percent	Respondents
Garden section of a do-it-yourself/home improvement store	30.47%	209
Nursery/garden store	65.74%	451
Other (please specify)	3.79%	26
Answered		686

How long did you spend on the online enrollment tool? (Mark one)

Answer Choices	Percent	Respondents
10 minutes or less	66.14%	457
11-20 minutes	23.59%	163
21-30 minutes	6.22%	43
31 minutes or more	2.32%	16
Not applicable	1.74%	12
Answered		691

Overall, how easy was it for you to use the online enrollment tool?

Answer Choices	Percent	Respondents
Very easy	74.78%	516
Somewhat easy	21.16%	146
Somewhat difficult	2.32%	16
Very difficult	0.58%	4
Not applicable	1.16%	8
Answered		690

How many trees did you pick up at the Shade Tree event?

Answer Choices	Percent	Respondents
One	33.67%	233
Two	66.33%	459
Answered		692

When did you plant your shade tree?

Answer Choices	Percent	Respondents
Same day as the tree pickup	28.76%	67
1-3 days after the tree pickup	49.79%	116
4-7 days after the tree pickup	13.30%	31
More than 1 week after the tree pickup	5.58%	13
Did not plant the tree	2.58%	6
Answered		233

On which side of your home did you plant your shade tree?

Answer Choices	Percent	Respondents
North	4.04%	9
Northeast	5.83%	13
East	13.00%	29
Southeast	6.28%	14
South	8.52%	19
Southwest	17.49%	39
West	35.87%	80
Northwest	8.97%	20
Answered		223

How far from the home did you plant your shade tree?

Answer Choices	Percent	Respondents
20 feet or less	34.67%	78
21-40 feet	54.22%	122
41-60 feet	8.44%	19
More than 60 feet	2.67%	6
Answered		225

How many shade trees did you plant?

Answer Choices	Percent	Respondents
One tree	2.39%	11
Both trees	95.22%	438
Did not plant trees	2.39%	11
Answered		460

When did you plant your shade tree?

Answer Choices	Percent	Respondents
Same day as the tree pickup	30.00%	3
1-3 days after the tree pickup	30.00%	3
4-7 days after the tree pickup	0.00%	0
More than 1 week after the tree pickup	40.00%	4
Answered		10

On which side of your home did you plant your shade tree?

Answer Choices	Percent	Respondents
North	11.11%	1
Northeast	22.22%	2
East	0.00%	0
Southeast	0.00%	0
South	0.00%	0
Southwest	22.22%	2
West	44.44%	4
Northwest	0.00%	0
Answered		9

How far from the home did you plant your shade tree?

Answer Choices	Percent	Respondents
20 feet or less	10.00%	1
21-40 feet	70.00%	7
41-60 feet	10.00%	1
More than 60 feet	10.00%	1
Answered		10

When did you plant your shade trees?

	Same day as the tree pickup	1-3 days after the tree pickup	4-7 days after the tree pickup	More than 1 week after the tree pickup	Respondents
Tree 1	16.51%	55.28%	18.12%	10.09%	436
Tree 2	15.62%	53.15%	19.90%	11.34%	397
Answered					436

On which side of your home did you plant your shade trees?

	N	NE	E	SE	S	SW	W	NW	Total
Tree 1	9.18%	4.59%	14.49%	6.52%	8.45%	14.25%	35.27%	7.25%	414
Tree 2	6.14%	6.88%	10.81%	11.55%	10.32%	17.20%	31.45%	5.65%	407
Answered									414

How far from the home did you plant your shade trees?

	20 feet or less	21-40 feet	41-60 feet	More than 60 feet	Total
Tree 1	30.97%	50.83%	14.42%	3.78%	423
Tree 2	23.08%	52.11%	18.61%	6.20%	403
Answered					423

How satisfied are you with the information you received on the planting and care of your shade tree?

Answer Choices	Percent	Respondents
Very satisfied	88.04%	596
Somewhat satisfied	9.45%	64
Somewhat dissatisfied	0.59%	4
Very dissatisfied	0.44%	3
Not applicable	1.48%	10
Answered		677

What information did you find most valuable?

Answer Choices	Percent	Respondents
Planting depth	53.69%	364
Circling roots	12.83%	87
Staking	9.44%	64
Watering	9.00%	61
Not applicable	9.14%	62
Other (please specify)	5.90%	40
Answered		678

How much do you agree with the following statements?

	Strongly agree	Somewhat agree	Somewhat disagree	Strongly disagree	NA	Total
I am satisfied with the Shade Tree Project pick up event	90.43%	8.39%	1.03%	0.00%	0.15%	679
It was easy to plant my shade tree	85.78%	11.85%	0.59%	0.15%	1.63%	675
I would recommend the Shade Tree Project to a friend or relative	95.72%	3.69%	0.15%	0.30%	0.15%	677
I am satisfied with my overall experience with the Shade Tree Project	92.32%	6.79%	0.89%	0.00%	0.00%	677
Answered						679

If you have additional comments you would like to offer about the Shade Tree Project, please enter them in the space below.

Answered	209

When was this residence originally built? (Select when the building was originally constructed, not when it was remodeled, added to, or converted.)

Answer Choices	Percent	Respondents
Before 1950	4.29%	27
1950–1959	2.38%	15
1960–1969	1.59%	10
1970–1979	6.67%	42
1980–1989	3.81%	24
1990–1999	6.03%	38
2000–2006	18.25%	115
2007–2015	51.27%	323
Don't know	5.71%	36
Answered		630

What one fuel is most often used to heat this residence? (Mark one)

Answer Choices	Percent	Respondents
Electricity	33.03%	220
Natural gas	56.16%	374
Propane	3.15%	21
Fuel Oil	0.00%	0
Wood	4.20%	28
Other (please specify)	3.45%	23
Answered		666

What type of air conditioning system is used at this residence? (Check all that apply)

Answer Choices	Percent	Respondents
None	2.11%	14
Central air conditioner	79.37%	527
Heat pump	16.57%	110
Individual room or window air conditioner	3.92%	26
Evaporative/swamp cooler	0.90%	6
Other (please specify)	0.90%	6
Answered		664

What is your gender?

Answer Choices	Percent	Respondents
Female	59.45%	390
Male	40.55%	266
Answered		656

Which of the following best describes your age?

Answer Choices	Percent	Respondents
Under 18	0.15%	1
18-24	1.06%	7
25-34	21.12%	140
35-44	27.15%	180
45-60	26.70%	177
Over 60	23.83%	158
Answered		663

What is the highest level of education you have completed?

Answer Choices	Percent	Respondents
Less than high school	0.31%	2
High school or equivalent	9.19%	60
Some college/technical school	42.11%	275
4-year college degree	24.66%	161
Some graduate courses	7.81%	51
Graduate degree	15.93%	104
Answered		653

2018 Smart-Saver Pledge Follow-Up Survey

Thank you for taking the Smart-saver Pledge. We'd love to hear how you did in meeting your pledge as well as find out a bit more about you. Which of the following pledges did you commit to? (Select all that apply)

Answer Choices	Percent	Responses
Change the porch light to an LED or add a sensor	45.96%	1,058
Use a programmable pressure cooker once a week instead of the oven or stove	27.32%	629
Hang-dry clothes after washing	28.28%	651
Unplug cell phone charger when not in use	55.73%	1,283
Use kitchen and bath exhaust fans only when needed – don't leave them running	67.25%	1,548
Answered		2,302

Were you able to meet your pledge(s) for the full 21 days?

Answer Choices	Percent	Responses
Yes	94.44%	2,173
No	5.56%	128
Answered		2,301

What kept you from meeting the Smart-saver Pledge? (Select all that apply)

Answer Choices	Percent	Responses
Comfort	7.09%	9
Time	14.96%	19
Low priority	7.87%	10
Other individuals in my household were not aligned	29.13%	37
Other (please specify)	62.99%	80
Answered		127

Will you continue with your energy-saving change(s) now that the pledge has ended?

Answer Choices	Percent	Responses
Yes	99.72%	2,168
No	0.28%	6
Answered		2,174

What is the primary reason you will continue with the energy-saving change(s)?

Answer Choices	Percent	Responses
Save energy	15.88%	344
Save money	38.83%	841
Help the environment	12.83%	278
It's the right thing to do	27.01%	585
Other (please specify)	5.45%	118
Answered		2,166

What is the primary reason why you won't continue with the energy-savings change(s)?

Answer Choices	Percent	Responses
Comfort	0.00%	0
Time	40.00%	2
Low priority	0.00%	0
Other individuals in my household are not aligned	0.00%	0
Other (please specify)	60.00%	3
Answered		5

How did taking the Smart-saver Pledge affect your awareness of your energy habits?

Answer Choices	Percent	Responses
Made me much more aware	32.18%	736
Made me somewhat more aware	49.41%	1,130
Did not affect my awareness	18.41%	421
Answered		2,287

After taking the Smart-saver Pledge, how likely are you to seek out additional ways to save energy?

Answer Choices	Percent	Responses
Very likely	61.10%	1,398
Somewhat likely	36.93%	845
Not very likely	1.79%	41
Not likely at all	0.17%	4
Answered		2,288

What is your level of awareness of other Idaho Power Energy Efficiency programs?

Answer Choices	Percent	Responses
Very aware	14.23%	325
Somewhat aware	58.36%	1,333
Not very aware	23.51%	537
Not aware at all	3.90%	89
Answered		2,284

After taking the Smart-saver Pledge, how likely are you to participate in an Idaho Power Energy Efficiency program?

Answer Choices	Percent	Responses
Very likely	54.21%	889
Somewhat likely	43.29%	710
Not very likely	2.44%	40
Not likely at all	0.06%	1
Answered		1,640

How did you first learn about the Smart-saver Pledge?

Answer Choices	Percent	Responses
Bill insert	41.16%	941
Facebook	3.32%	76
Twitter	0.17%	4
TV	0.52%	12
Idaho Power website	37.75%	863
Idaho Power employee	1.27%	29
Friend, relative or neighbor	2.67%	61
Other (please specify)	13.12%	300
Answered		2,286

What is the primary fuel used to heat your home?

Answer Choices	Percent	Responses
Electricity	29.90%	682
Natural gas	62.25%	1,420
Propane	2.37%	54
Wood	3.86%	88
Other	1.62%	37
Answered		2,281

Do you own or rent your home?

Answer Choices	Percent	Responses
Own	83.61%	1,903
Rent	16.39%	373
Answered		2,276

How many people (including yourself) are in your household?

Answer Choices	Percent	Responses
1	18.68%	426
2	38.46%	877
3	14.61%	333
4	14.65%	334
5	8.51%	194
More than 5	5.09%	116
Answered		2,280

What is your gender?

Answer Choices	Percent	Responses
Male	35.18%	794
Female	64.82%	1,463
Answered		2,257

Which of the following best describes your age?

Answer Choices	Percent	Responses
Under 25	3.67%	83
26-35	22.98%	520
36-50	28.41%	643
51-65	26.82%	607
Over 65	18.12%	410
Answered		2,263

What is the highest level of education you completed?

Answer Choices	Percent	Responses
Less than high school	0.27%	6
Some high school	0.57%	13
High school graduate or equivalent	10.64%	241
Some college	23.63%	535
Two year Associate degree orTrade/Technical school	15.37%	348
Four year college degree	27.78%	629
Some graduate courses	5.74%	130
Advanced degree	15.99%	362
Answered		2,264

2018 WAQC Survey Results

Agency/Contractor Name:

Answer Choices	Percent	Responses
Metro Community Services	14.19%	22
Eastern Idaho Community Action Partnership	0.65%	1
El Ada Community Action Partnership	54.19%	84
South Central Community Action Partnership	16.77%	26
Southeastern Idaho Community Action Agency	12.26%	19
Community Connection of Northeast Oregon	0.00%	0
Community in Action	1.94%	3
Answered		155

How did you learn about the weatherization program(s)?

Answer Choices	Percent	Responses
Agency/Contractor flyer	18.75%	27
Idaho Power employee	7.64%	11
Idaho Power web site	11.81%	17
Friend or relative	35.42%	51
Letter in mail	4.86%	7
Other (please specify)	21.53%	31
Answered		144

What was your primary reason for participating in the weatherization program?

Answer Choices	Percent	Responses
Reduce utility bills	79.33%	119
Improve comfort of home	39.33%	59
Furnace concerns	30.67%	46
Water heater concerns	5.33%	8
Improve insulation	28.67%	43
Other (please specify)	5.33%	8
Answered		150

If you received any energy efficiency equipment upgrade as part of the weatherization, how well was the equipment's operation explained to you?

Answer Choices	Percent	Responses
Completely	86.52%	122
Somewhat	11.35%	16
Not at all	2.13%	3
Answered		141

Which of the following did you learn about from the auditor or crew during the weatherization process? (Check all that apply)

Answer Choices	Percent	Responses
How air leaks affect energy usage	76.92%	110
How insulation affects energy usage	66.43%	95
How to program the new thermostat	46.85%	67
How to reduce the amount of hot water used	32.87%	47
How to use energy wisely	60.84%	87
How to understand what uses the most energy in my home	48.25%	69
Other (please specify)	4.20%	6
Answered		143

Based on the information you received from the agency/contractor about energy use, how likely are you to change your habits to save energy?

Answer Choices	Percent	Responses
Very likely	85.42%	123
Somewhat likely	13.89%	20
Not very likely	0.00%	0
Not likely at all	0.69%	1
Answered		144

How much of the information about energy use have you shared with other members of your household?

Answer Choices	Percent	Responses
All of it	68.49%	100
Some of it	15.07%	22
None of it	1.37%	2
N/A	15.07%	22
Answered		146

If you shared the energy use information with other members of your household, how likely do you think household members will change habits to save energy?

Answer Choices	Percent	Responses
Very likely	53.42%	78
Somewhat likely	23.97%	35
Somewhat unlikely	2.05%	3
Very unlikely	2.74%	4
N/A	17.81%	26
Answered		146

What habits are you and other members of your household most likely to change to save energy? (check all that apply)

Answer Choices	Percent	Responses
Washing full loads of clothes	67.36%	97
Washing full loads of dishes	43.06%	62
Turning off lights when not in use	84.03%	121
Unplugging electrical equipment when not in use	52.08%	75
Turning the thermostat up in the summer	54.17%	78
Turning the thermostat down in the winter	58.33%	84
Other (please specify)		4
Answered		144

How much do you think the weatherization you received will affect the comfort of your home?

Answer Choices	Percent	Responses
Significantly	91.03%	132
Somewhat	6.21%	9
Very little	1.38%	2
Not at all	1.38%	2
Answered		145

Rate the Agency/Contractor based on your interactions with them.

	Excellent	Good	Fair	Poor	Total
Courteousness	95.17%	4.14%	0.69%	0.00%	145
Professionalism	93.01%	6.99%	0.00%	0.00%	143
Explanation of work to be performed on your home	91.67%	7.64%	0.69%	0.00%	144
Overall experience with Agency/Contractor	94.41%	5.59%	0.00%	0.00%	143
Answered					145

Were you aware of Idaho Power's role in the weatherization of your home?

Answer Choices	Percent	Responses
Yes	76.81%	106
No	23.19%	32
Answered		138

Overall how satisfied are you with the weatherization program you participated in?

Answer Choices	Percent	Responses
Very satisfied	97.24%	141
Somewhat satisfied	1.38%	2
Somewhat dissatisfied	0.00%	0
Very dissatisfied	1.38%	2
Answered		145

How has your opinion of Idaho Power changed as a result of its role in the weatherization program?

Answer Choices	Percent	Responses
Improved	85.51%	118
Stayed the same	13.77%	19
Decreased	0.72%	1
Answered		138

How many people beside yourself live in your home year-round?

Answer Choices	Percent	Responses
0	33.10%	47
1	15.49%	22
2	17.61%	25
3	13.38%	19
4	7.75%	11
5	4.23%	6
6 or more	8.45%	12
Answered		142

How long have you been an Idaho Power customer?

Answer Choices	Percent	Responses
Less than 1 year	4.29%	6
1 - 10 years	27.86%	39
11 - 25 years	30.00%	42
26 years or more	37.86%	53
Answered		140

Please select the category below that best describes your age:

Answer Choices	Percent	Responses
Under 25	2.13%	3
25 - 34	14.18%	20
35 - 44	19.86%	28
45 - 54	8.51%	12
55 - 64	19.15%	27
65 - 74	21.99%	31
75 or older	14.18%	20
Answered		141

Select the response below that best describes the highest level of education you have attained:

Answer Choices	Percent	Responses
Less than High School	22.14%	31
High School graduate or GED	30.71%	43
Some College or Technical School	32.14%	45
Associate Degree	7.14%	10
College Degree (including any graduate school or graduate degrees)	7.86%	11
Answered		140

2018 Weatherization Solutions Survey Results

Agency/Contractor Name:

Answer Choices	Percent	Responses
Metro Contractor Services	27.52%	30
Home Energy Management	48.62%	53
Savings Around Power	3.67%	4
Power Savers	20.18%	22
Answered		109

How did you learn about the weatherization program(s)?

Answer Choices	Percent	Responses
Agency/Contractor flyer	17.59%	19
Idaho Power employee	6.48%	7
Idaho Power web site	7.41%	8
Friend or relative	24.07%	26
Letter in mail	37.04%	40
Other (please specify)	7.41%	8
Answered		108

What was your primary reason for participating in the weatherization program?

Answer Choices	Percent	Responses
Reduce utility bills	80.73%	88
Improve comfort of home	29.36%	32
Furnace concerns	14.68%	16
Water heater concerns	0.92%	1
Improve insulation	15.60%	17
Other (please specify)	9.17%	10
Answered		109

If you received any energy efficiency equipment upgrade as part of the weatherization, how well was the equipment's operation explained to you?

Answer Choices	Percent	Responses
Completely	76.77%	76
Somewhat	7.07%	7
Not at all	16.16%	16
Answered		99

Which of the following did you learn about from the auditor or crew during the weatherization process? (Check all that apply)

Answer Choices	Percent	Responses
How air leaks affect energy usage	88.35%	91
How insulation affects energy usage	77.67%	80
How to program the new thermostat	39.81%	41
How to reduce the amount of hot water used	53.40%	55
How to use energy wisely	65.05%	67
How to understand what uses the most energy ir	59.22%	61
Other (please specify)	0.97%	1
Answered		103

Based on the information you received from the agency/contractor about energy use, how likely are you to change your habits to save energy?

Answer Choices	Percent	Responses
Very likely	74.07%	80
Somewhat likely	24.07%	26
Not very likely	0.93%	1
Not likely at all	0.93%	1
Answered		108

How much of the information about energy use have you shared with other members of your household?

Answer Choices	Percent	Responses
All of it	68.52%	74
Some of it	12.04%	13
None of it	1.85%	2
N/A	17.59%	19
Answered		108

If you shared the energy use information with other members of your household, how likely do you think household members will change habits to save energy?

Answer Choices	Percent	Responses
Very likely	50.93%	55
Somewhat likely	21.30%	23
Somewhat unlikely	0.93%	1
Very unlikely	1.85%	2
N/A	25.00%	27
Answered		108

What habits are you and other members of your household most likely to change to save energy? (check all that apply)

Answer Choices	Percent	Responses
Washing full loads of clothes	59.55%	53
Washing full loads of dishes	48.31%	43
Turning off lights when not in use	73.03%	65
Unplugging electrical equipment when not in use	53.93%	48
Turning the thermostat up in the summer	57.30%	51
Turning the thermostat down in the winter	71.91%	64
Other (please specify)		10
Answered		89

How much do you think the weatherization you received will affect the comfort of your home?

Answer Choices	Percent	Responses
Significantly	84.26%	91
Somewhat	13.89%	15
Very little	0.93%	1
Not at all	0.93%	1
Answered		108

Rate the Agency/Contractor based on your interactions with them.

Rated	Excellent	Good	Fair	Poor	Total
Courteousness	95.37%	4.63%	0.00%	0.00%	108
Professionalism	93.52%	6.48%	0.00%	0.00%	108
Explanation of work to be performed on your home……………………………………………	86.11%	12.96%	0.93%	0.00%	108
Overall experience with Agency/Contractor	92.59%	6.48%	0.93%	0.00%	108
Answered					108

Were you aware of Idaho Power's role in the weatherization of your home?

Answer Choices	Percent	Responses
Yes	94.34%	100
No	5.66%	6
Answered		106

Overall how satisfied are you with the weatherization program you participated in?

Answer Choices	Percent	Responses
Very satisfied	94.50%	103
Somewhat satisfied	4.59%	5
Somewhat dissatisfied	0.92%	1
Very dissatisfied	0.00%	0
Answered		109

How has your opinion of Idaho Power changed as a result of its role in the weatherization program?

Answer Choices	Percent	Responses
Improved	86.24%	94
Stayed the same	13.76%	15
Decreased	0.00%	0
Answered		109

How many people beside yourself live in your home year-round?

Answer Choices	Percent	Responses
0	24.77%	27
1	37.61%	41
2	11.93%	13
3	15.60%	17
4	3.67%	4
5	5.50%	6
6 or more	0.92%	1
Answered		109

How long have you been an Idaho Power customer?

Answer Choices	Percent	Responses
Less than 1 year	0.93%	1
1 - 10 years	21.50%	23
11 - 25 years	29.91%	32
26 years or more	47.66%	51
Answered		107

Please select the category below that best describes your age:

Answer Choices	Percent	Responses
Under 25	3.67%	4
25 - 34	9.17%	10
35 - 44	20.18%	22
45 - 54	8.26%	9
55 - 64	16.51%	18
65 - 74	26.61%	29
75 or older	15.60%	17
Answered		109

Select the response below that best describes the highest level of education you have attained:

Answer Choices	Percent	Responses
Less than High School	4.63%	5
High School graduate or GED	28.70%	31
Some College or Technical School	48.15%	52
Associate Degree	11.11%	12
College Degree (including any graduate school c	7.41%	8
Answered		108

Multifamily Direct-Install Project Customer Survey

Please select the project location.

Answer Choices	Percent	Responses
Aspen Grove (Filer)	30.77%	16
Autumn Lane (Wendell)	1.92%	1
Briarwood (Blackfoot)	0.00%	0
Brown Gables (Wendell)	21.15%	11
Camas Street (Blackfoot)	1.92%	1
Colonia Cesar Chavez (Blackfoot)	0.00%	0
Colonia de Colores (Twin Falls)	1.92%	1
Columbia Garden (Caldwell)	1.92%	1
Curtis Meadow (Boise)	0.00%	0
El Rancho Grande (American Falls)	0.00%	0
Fawnbrook (Twin Falls)	0.00%	0
Glenns Landing (Glenns Ferry)	0.00%	0
Green Properties (Pocatello)	0.00%	0
Harrison Hills (Boise)	9.62%	5
North River (Boise)	0.00%	0
Owyhee Place (Boise)	3.85%	2
Park Center (Boise)	1.92%	1
Park Hill (Boise)	0.00%	0
Park Lane (Boise)	0.00%	0
Sister's Villa Eagle Senior Living (Eagle)	19.23%	10
Sundown Square (Ontario)	1.92%	1
5th Ave Apartments (Ontario)	0.00%	0
9th Street Apartments (Ontario)	3.85%	2
19th Street Apartments (Ontario)	0.00%	0
Answered		52

On a scale from 1 (very dissatisfied) to 5 (very satisfied), please rate the following:

Rated	1	2	3	4	5	Total	Weighted Average
LED Bulbs	5.77%	3.85%	3.85%	7.69%	78.85%	52	4.5
High-efficiency showerhead	17.24%	3.45%	6.90%	13.79%	58.62%	29	3.93
Kitchen and bathroom faucet aerators	6.00%	2.00%	10.00%	8.00%	74.00%	50	4.42
Overall satisfaction with the quality of the products	5.77%	1.92%	5.77%	5.77%	80.77%	52	4.54
Overall satisfaction with the Idaho Power energy-saving project	3.92%	0.00%	1.96%	13.73%	80.39%	51	4.67
Answered						52	

How would you describe the brightness of the LED light bulbs?

Answer Choices	Percent	Responses
Too Bright	7.69%	4
Somewhat Bright	21.15%	11
Just Right	63.46%	33
Somewhat Dim	3.85%	2
Too Dim	3.85%	2
Answered		52

EVALUATIONS

Report Title	Sector	Analysis Performed By	Study Manager	Study/Evaluation Type
Idaho Power Company Commercial and Industrial Efficiency Program — Custom Projects	Commercial/Industrial	Tetra Tech, MA	Idaho Power	Impact Evaluation
Idaho Power Company Energy Efficient Lighting Program	Residential	Tetra Tech, MA	Idaho Power	Impact Evaluation
Idaho Power Company Multifamily Energy Savings Program	Residential	Tetra Tech, MA	Idaho Power	Impact and Process Evaluation
Shade Tree Project Evaluation	Residential	DNV GL	Idaho Power	Savings Determination Analysis

Idaho Power Company

Idaho Power Company Commercial and Industrial Efficiency Program – Custom Projects

2017 Impact Evaluation Results

TETRA TECH

January 4, 2019

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ACKNOWLEDGEMENTS

We would like to acknowledge the many individuals who contributed to the 2017 impact evaluation of the Custom Projects component of the Idaho Power Commercial and Industrial Efficiency program. This evaluation effort would not have been possible without their help and support.

We would like to specifically thank Gary Grayson and Engineers Chris Pollow, Chellie Jensen, and Randy Thorn of Idaho Power, who provided invaluable insight into the program and operations. These individuals participated in ongoing evaluation deliverable reviews and discussions and graciously responded to follow-up questions and data and documentation requests. Tetra Tech received valuable assistance from Customer Representatives with scheduling verification site visits.

The Tetra Tech Evaluation Team was made up of the following individuals: Kimberly Bakalars, Mark Bergum, Adam Jablonski, Katie Hanlon, Dallas McCoy, Tom Saxton, and Luke Ramirez.

1.0 EXECUTIVE SUMMARY

Tetra Tech is pleased to provide Idaho Power Company (Idaho Power) with a report for the 2018 impact evaluation of the 2017 Custom Projects component of the Idaho Power Commercial and Industrial Efficiency program. This section of the report consists of an introduction describing the program, evaluation activities, and key findings and recommendations. The detailed impact results can be found in section 3, along with recommendations.

1.1 PROGRAM DESCRIPTION

The Custom Option of the Commercial and Industrial Efficiency program provides monetary incentives and energy auditing services to help identify and evaluate potential energy saving modifications or projects in new and existing facilities. The goal is to encourage commercial and industrial energy savings in Idaho and Oregon service areas. The Custom Option offers an incentive level of up to 70 percent of the project cost or 18 cents per kWh for first year estimated savings, whichever is less.

Interested customers submit applications to Idaho Power for potential modifications. Idaho Power reviews each application and works with the customer and vendors to gather sufficient information to support the energy-savings calculations. Once projects are completed, customers submit a payment application and each project is reviewed by Idaho Power engineering staff, or a third-party consultant, to verify the energy savings methods and calculations. An Idaho Power lighting tool is used to determine all lighting savings and incentives. End-use measure information, project photographs, and project costs are collected through the verification process.

On many projects, especially the larger and more complex projects, Idaho Power or a third-party consultant conducts on-site power monitoring and data collection before and after project implementation to ensure energy savings are obtained and are within program guidelines. If changes in scope take place on a project, Idaho Power recalculates the energy savings and incentive amount based on the actual installed equipment and performance. The measurement and verification reports provided to Idaho Power include a verification of energy savings, costs, estimates of measure life, and any final recommendations.

1.2 METHODOLOGY

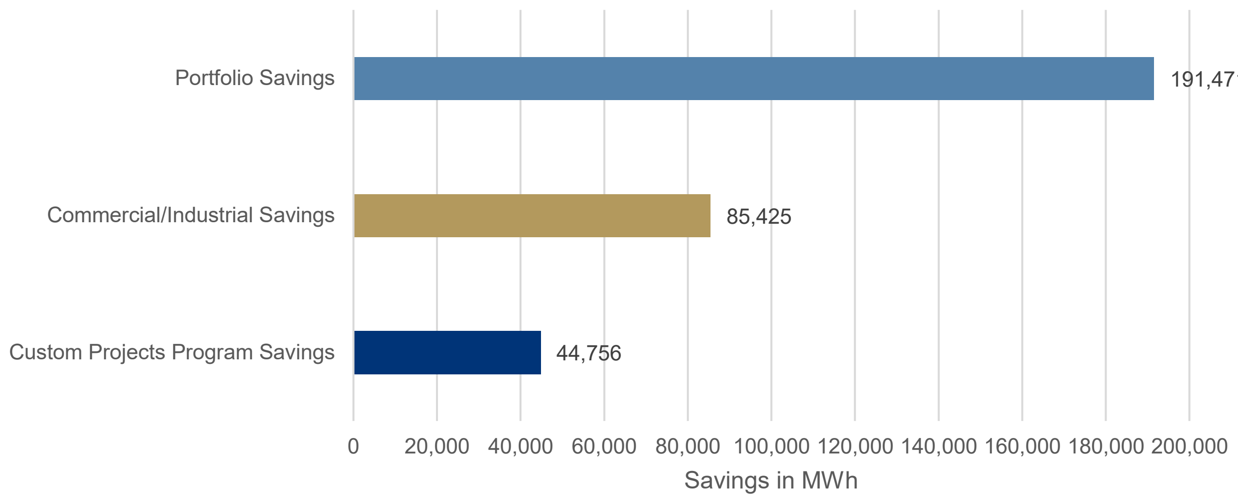
In order to address the evaluation objectives, which included verifying energy impacts attributable to the 2017 program, providing estimates of realization rates, and suggesting enhancements to the savings analysis and reporting, the evaluation team conducted the evaluation activities shown in Figure 1-1.

Figure 1-1. Process for Verifying Program Savings

1.3 FINDINGS AND RECOMMENDATIONS

The impact evaluation for the Custom Projects program revealed a successfully run program. The majority of savings adjustments were made as a result of customer changes to the operation of the equipment after installation. Based on the detailed evaluation activities, Tetra Tech provides some minor areas of improvement for Idaho Power to consider as they continue the program. All findings and recommendations should be considered in the context of the program size and contribution to the Commercial & Industrial sector (52 percent) and overall portfolio savings (23 percent), shown in Figure 1-2.

Figure 1-2. Relative Program Savings



Overall, findings from the impact evaluation show the program savings calculations are reasonable. The evaluation found accurate equipment descriptions, well substantiated and conservative assumptions, and technically correct calculations for most evaluated projects. As Table 1-1 below indicates, Tetra Tech found a 100.4 percent realization rate overall for the Custom C&I program.

Table 1-1. PY2017 Realization Rates[1]

Category	Measure	Ex-Ante kWh	Ex-Post kWh	Realization Rate
Lighting	Lighting	1,321,437	1,311,121	99.2%
Streamlined Cohort	SCE - VFD	1,158,673	1,393,909	120.3%
	SCE - Doors	386,021	309,130	80.1%
	SCE - Comp Air	379,678	369,239	97.3%
	SCE-Refrig Ctrlr	21,007	18,267	87.0%
W/WW Cohort	WWEEC	1,169,362	1,169,362	100.0%
Custom	VFD	11,693,386	11,826,855	101.1%
	Compressed Air	979,090	654,382	66.8%
	Refrigeration	568,627	568,627	100.0%
	HVAC	400,965	389,047	97.0%
	Pump	267,044	414,348	155.2%
	Fan	53,325	53,325	100.0%
	Motors	9,074	8,865	97.7%
	Overall	**18,407,689**	**18,486,478**	**100.4%**

[1] Results reflect a confidence and precision of 90% +/- 3.2%.

The documentation provided for the program showed both Pre-Application submittal and analysis and the post-install final application and analysis. When a change occurred, an explanation of the adjustment was included. The IPC files provided included:

- Pre-Application
- Pre-Application third-party analysis and calculations
- Pre-Approval notice
- Documentation for integration coordination with the IPC grid, when necessary
- Final Application
- Final third-party analysis and calculations
- Incentive check
- Incentive check cover letter for mailing

The IPC files did not originally include the spreadsheet calculation files completed by the third-party engineer. These files were obtained over the course of the evaluation. Obtaining these files when receiving a report from the third party will create a more robust and flexible system.

1.3.1 Impact Recommendations

The following impact recommendations are provided for Idaho Power's consideration:

Collect and file electronic calculators. For the project savings calculated by the third-party contractor, Idaho Power should collect and file the Excel calculators. The calculators were available from the third-party engineer but having them in-house once each project is completed will facilitate any additional quality control or adjustments that Idaho Power would like to make to improve accuracy.

Consider including post-verification customer follow-up for control-based projects. Based on the variation found in savings for projects with controls, and the value Idaho Power places on customer relationships, Tetra Tech recommends that the engineering team identify customers for post-verification visits to discuss control settings and the potential adjustment impacts. This is most useful for projects that have easily adjusted controls such as; variable frequency drives, fast acting doors, and compressed air upgrades. Not only will it help Idaho Power report more accurate savings, it will assist the customer in maximizing savings from their investment in the project.

Review goals for the Streamlined process. The Streamlined process is used to market to customers with a less customized project and provide a more efficient application process. However, the evaluation found that the assumptions for the streamlined projects resulted in more variation from actual conditions than their more "custom" counterpart projects. Idaho Power should continue to monitor the benefits of the process efficiency with the potential variation in savings rigor.

Continue close communications with Wastewater Cohort contacts. The Wastewater cohort has developed a process to claim annual savings from behavioral improvements, but the conditions of the projects and baselines continue to evolve. Changes in project managers at customer facilities and the addition of other capital projects may affect future savings. Idaho Power staff should continue to closely monitor and communicate with their Wastewater project contacts.

Review various energy calculation components for improved accuracy. Idaho Power calculations are currently found to be accurate and well-documented. However, for particular measure categories, the calculation accuracy could be further improved with the following adjustments:

- **Use Regional Technical Forum (RTF) method for New Construction Baseline.** The RTF issues new construction baselines based upon market research. Use the RTF baseline, when available, for project calculations to minimize risk associated with variable baselines per project. This was found specifically in the sample for Compressed Air new construction projects, although it will apply across many different new construction equipment types.
- **Use rated capacity and wattage for equipment.** Lighting and Heating, Ventilation, and Air Conditioning (HVAC) equipment have third party certification agencies which provide rated wattage and capacities of specific equipment models. Utilizing this information will reduce the risk that a manufacturer spec sheet may misrepresent the performance. This was noticed for an HVAC project which did not utilize the rated Air-Conditioning, Heating, and Refrigeration (AHRI) capacity and energy consumption metrics.
- **Consider requiring a pump curve submission for pumping projects.** Pump curves detail the pump efficiency at various operating conditions. Many pumping projects change pump conditions and the pump efficiency will generally have a large impact on the energy savings of the project. To estimate pump performance at multiple condition points, a pump curve is necessary.
- **Monitor specific dairy projects for adjustments to incoming milk temperature.** The RTF states to use 98 degrees based on industry standard practice of milk temperature production unless otherwise measured. Dairies collect milk at approximately 98 degrees in the milking parlor and need to transfer the milk to the chilling system through uninsulated piping. This fluid transfer results in heat dissipation and therefore lower milk temperature at the start of chilling. For at least one of the projects reviewed, the milk traveled a lengthy distance to reach the chilling system which would have resulted in a lower incoming milk temperature assumption of 95 degrees.

2.0 INTRODUCTION

2.1 PROGRAM OVERVIEW

The Custom Option provides monetary incentives and energy auditing services to help identify and evaluate potential energy saving modifications or projects in new and existing facilities. The goal is to encourage commercial and industrial energy savings in Idaho and Oregon service areas. The Custom Option offers an incentive level of up to 70 percent of the project cost or 18 cents per kWh for first year estimated savings, whichever is less.

Interested customers submit applications to Idaho Power for potential modifications that have been identified by the customers, Idaho Power, or by a third-party consultant. Idaho Power reviews each application and works with the customer and vendors to gather sufficient information, through audits if needed, to support the energy-savings calculations. Idaho Power currently has eleven third-party contractors assisting them with audits and savings estimates.

Once projects are completed, customers submit a payment application and each project is reviewed by Idaho Power engineering staff, or a third-party consultant, to verify the energy savings methods and calculations. An Idaho Power lighting tool is used to determine all lighting savings and incentives. End-use measure information, project photographs, and project costs are collected through the verification process.

On many projects, especially the larger and more complex projects, Idaho Power or a third-party consultant conducts on-site power monitoring and data collection before and after project implementation to ensure energy savings are obtained and are within program guidelines. If changes in scope take place on a project, Idaho Power recalculates the energy savings and incentive amount based on the actual installed equipment and performance. The measurement and verification reports provided to Idaho Power include a verification of energy savings, costs, estimates of measure life, and any final recommendations. Table 2-1 shows the 2017 projects and annual energy savings by primary project measure:

Table 2-1. PY2017 Custom Option Summary by Primary Project Measure

Program Summary by Measure	Number of Projects	kWh Saved	Percent of Program Savings
Lighting	84	9,868,688	22.0%
Refrigeration	13	7,454,336	16.7%
HVAC	6	509,777	1.1%
Compressed Air	32	6,650,953	14.9%
Commissioning	6	2,454,702	5.5%
Controls	3	1,832,897	4.1%
Pump	1	850,203	1.9%
VFD	24	14,049,196	31.4%
Other	1	1,094,602	2.4%
Total	**170**	**44,765,354**	**100.0%**

2.1.1 Marketing & Outreach

The Custom program is promoted through Idaho Power's existing account management and program management relationships with customers and trade allies, including engineers and equipment providers. The Custom program is also utilizing a cohort system to focus on outreach and participation for specific customer types to provide more meaningful projects. Program engineers are building training into the program with cohorts to create behavioral savings. The Water/Wastewater Cohort (W/WW) was reviewed for PY2017. Additionally, the Streamlined Process is available to provide customers a more efficient custom process for projects with less uncertainty.

2.1.2 Tracking & Reporting

The Project Pre-Approval and Payment Applications for the Custom program collect information from the program applicant, including the following:

- Account information including business name and account number, installation address and contact information
- Project description
- Estimated project costs and savings
- Project timeline information (dates)
- Payee information if different from the account holder

This information is stored in the program tracking database, CLRIS. In addition to the information above, the CLRIS database includes:

- Project ID
- Customer rate class and SIC code
- Application and approval dates with Idaho Power contacts
- Measure description and category
- Gross kWh savings estimates for application, post-install, and final
- Project cost and incentive amounts

2.2 EVALUATION ACTIVITIES

The evaluation activities conducted for the Custom program are summarized in Table 2-2. Researchable issues and the sampling strategy for desk reviews and on-site visits are also discussed in this section.

Table 2-2. PY2017 Custom Program Evaluation Activities

Activity	Sample Size	Objective
Interviews with program staff	3	Understand program design and delivery. Obtain program staff perspective on program successes and challenges. Identify researchable issues.
Tracking system review	NA	The tracking system was reviewed to determine if all necessary inputs are tracked and if reporting tools contain sufficient information for program review.
Desk reviews	31 projects	Review project documentation and calculations to assess the accuracy of savings claimed for each project. This included review of the custom calculators and the project documentation for agreement with RTF calculators and guidelines for custom projects.
Site visits	29 projects	Visited a sample of sites to verify installation of measures and check assumptions used in savings calculations. The locations were matched to projects that had a completed desk review.

2.2.1 Evaluation Goals

The following impact evaluation goals were addressed through the various evaluation activities:

- Determine and verify the energy impacts attributable to the 2017 program. Ex-ante savings estimates are determined using various sources including the RTF deemed savings, program technical reference manuals, lighting calculator, VFD calculator, and internal/external engineering estimates.
- Provide credible and reliable program energy impact estimates and ex-post realization rates attributed to the program for the 2017 program year.
- Report findings and observations. Provide recommendations that enhance the effectiveness of future ex-ante savings analysis and the accurate and transparent reporting of program savings.

Additional researchable issues were identified during the program staff interviews:

- Are there custom measures that could become prescriptive or streamlined measures?
- What are best practices for Custom programs and how can Idaho Power improve?
- What can be done to increase realization rates of Custom projects?
- How do program staff confidently claim savings on behavioral activity past the first year? How long is reasonable?
- Are Idaho Power baselines set appropriately compared with industry standards?
- How are measure life assumptions affecting cost effectiveness, and is Idaho Power using the correct assumptions?
- Are there any changes that Idaho Power should make to their Measurement and Verification (M&V) process? Does that vary by site or type of project?

3.0 IMPACT EVALUATION

The following sections provide a detailed review of the impact evaluation methodology, evaluation results, and recommendations from the evaluation activities.

3.1 METHODOLOGY

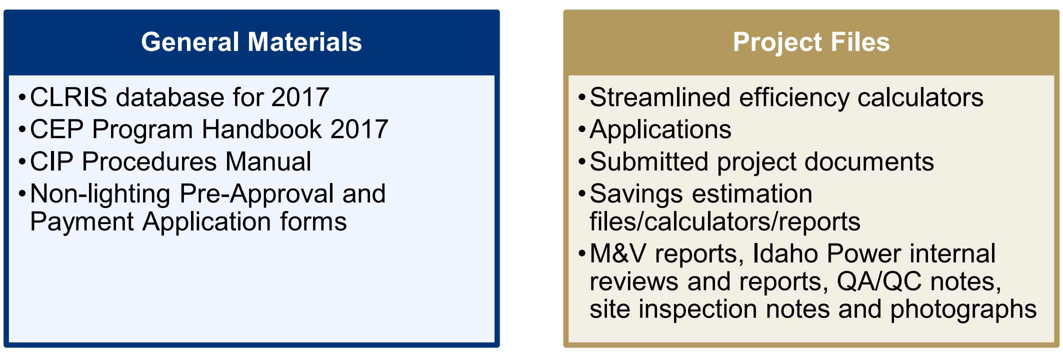
The impact methodology consisted of the five primary evaluation activities shown in Figure 3-1. Each activity is explained in more detail below.

Figure 3-1. Process for Verifying Program Savings

3.1.1 Data Review and Sampling

Idaho Power program staff made the following files in Figure 3-2 available to the Tetra Tech team for review.

Figure 3-2. Custom Project Files



Most review was based upon the documentation folder which was copied and securely delivered to the evaluation team. This folder included the project steps from initial application through pre-install and post-install calculations of savings, description of projects through to the award of incentive, and a copy of the checks delivered. In addition, for most of the projects evaluated, Idaho Power delivered the calculation spreadsheets utilized to create the savings information detailed in the documentation file. Critical components relating to onsite data collection were delivered to onsite staff to minimize customer disruption.

Due to the previous review of lighting projects through the Retrofit program evaluation in 2017, and the prescriptive method for claiming lighting savings, Idaho Power and Tetra Tech agreed to exclude the lighting-only projects from the Custom sampling process, to focus on the custom measures with the most uncertainty. The stratum was selected to isolate lighting projects from the cohorts and other custom projects as summarized in Table 3-1.

Table 3-1. PY2017 Custom Sampling Summary

Sampling Stratum	Addresses (Unique Qty.)	Projects (Total Qty.)	Final Total kWh Savings percentage	Sample Participants
Lighting only	47	84	22.1%	0
Streamlined Process	39	42	9.1%	40
W/WW Cohort	10	11	13.9%	
Custom	29	33	54.9%	
Total	**125***	**170**	**100.00%**	**40**

* There are 117 unique addresses, but some fall into multiple categories.

Sampling was conducted at the service point level[1]. Using tracking data from the 2017 CLRIS database, we drew participants into the sample with a probability proportionate to size, with kWh savings at each site representing its size. Using this approach, every participant had a known probability of selection, but the probability was no longer equal. Rather, a participant with twice the kWh savings as another participant had twice the probability of being selected. The resulting evaluated savings and realization rates are unbiased and represent the population more efficiently, i.e., with a smaller sampling error.

3.1.2 Schedule Site Visits

An oversample of 40 sites was pulled to allow more flexibility in scheduling the 30 site visits needed to achieve 90/10 confidence and precision. The Idaho Power customer representatives were provided with all 40 addresses and were requested to schedule site visits for the sample in three different geographic regions. One to two weeks ahead of each of the weeks designated for site visits, Tetra Tech and Idaho Power staff participated in a conference call to review the logistics and goals for scheduling site visits. Schedules were set up with four time periods per day to choose from and visit duration and drive time were factored into the scheduling process. This process worked well to avoid overlapping appointments and the scheduling overall was very smooth and successful, resulting in 30 sites scheduled over a three-week period, with 29 completed, as shown in Figure 3-3.

Figure 3-3. Site Visit Scheduling Summary

September 24 to September 28	• Eastern Region/East side of Southern Region • 10 site visits scheduled - 10 completed
October 1 to October 5	• Southern Region • 11 site visits scheduled - 11 completed
October 8 to October 12	• Western/Canyon/Capitol Regions • 9 site visits scheduled - 8 completed

3.1.3 Complete Desk Reviews and Site Visits

To provide guidance to onsite staff on what to look for during the site visits, Tetra Tech staff conducted an initial review of the project files. This engineering review of documentation was conducted to

[1] Each service point is a participant facility with a unique address.

describe the project, confirm tracking data, identify key assumptions, and determine critical questions prior to the site visits. Site inspectors then reviewed equipment installation and interviewed customer to identify equipment installed, ask key questions and confirm assumptions, and identify or collect other relevant information.

The data gathered from the site visits was reconciled with the information from the initial desk reviews. There were 29 sites that had a completed desk review and site visit and an additional two sites had only a desk review completed, for a total of 31 projects which were evaluated. For each project, we reviewed all measures for each site, resulting in the review of 57 measures as shown in Table 3-2.

Table 3-2. PY2017 Custom Project Review Summary

Sampling Stratum	Reviewed Addresses	Reviewed Projects (Total Qty.)	Reviewed kWh Savings Percentage	Reviewed kWh
Lighting	31	19	7.2%	1,321,437
Streamlined Process		18	10.6%	1,945,379
W/WW Cohort		2	6.3%	1,169,362
Custom		18	75.9%	13,971,511
Total	31	57		18,407,689

The amount of time spent at each site to review equipment and gather the information required ranged from one hour to four hours. A Tetra Tech engineer conducted each site visit and was frequently accompanied by an Idaho Power customer representative.

3.1.4 Verify kWh Savings

The final step of the impact evaluation combined desk review and site inspection information to provide quality assurance for each reviewed project, describe any revisions to project assumptions and actual conditions, and update calculations to finalize evaluated savings.

3.2 IMPACT REVIEW RESULTS

Overall, the evaluation found that the C&I Custom Energy Efficiency Program had a relative precision of 3.23 percent at the 90 percent confidence interval and an impact realization rate of 100.4 percent as shown in Table 3-3.

Table 3-3. PY2017 Realization Rates

Category	Measure	Ex-Ante kWh	Ex-Post kWh	Realization Rate
Lighting	Lighting	1,321,437	1,311,121	99.2%
Streamlined Cohort	SCE - VFD	1,158,673	1,393,909	120.3%
	SCE - Doors	386,021	309,130	80.1%
	SCE - Comp Air	379,678	369,239	97.3%
	SCE-Refrig Ctrlr	21,007	18,267	87.0%
W/WW Cohort	WWEEC	1,169,362	1,169,362	100.0%
Custom	VFD	11,693,386	11,826,855	101.1%
	Compressed Air	979,090	654,382	66.8%
	Refrigeration	568,627	568,627	100.0%
	HVAC	400,965	389,047	97.0%
	Pump	267,044	414,348	155.2%
	Fan	53,325	53,325	100.0%
	Motors	9,074	8,865	97.7%
	Overall	**18,407,689**	**18,486,478**	**100.4%**

The Custom Energy Efficiency Program has many types of measures installed, and although the overall realization rate was 100 percent, this result does not indicate that each measure category had a realization rate near 100 percent. The following sections will provide more detail on differences within measure categories.

3.2.1 Variable Speed Drives

Variable Speed Drive projects account for 31 percent of the 2017 C&I Custom program. The sample included four projects which accounted for 64 percent of the sampled kWh. Two of the projects claimed 8 million and 3 million kWh per year respectively and themselves accounted for nearly all the VFD claimed efficiency savings. The overall realization rate in Table 3-4 for the savings claimed is 101.1 percent.

Table 3-4. PY2017 Custom VFD Impact Results Summary

Project ID	Claimed kWh	Evaluated kWh	Realization Rate
1869	8,207,124	8,340,593	101.6%
1687	3,109,500	3,109,500	100.0%
1566	312,833	312,833	100.0%
1759	63,929	63,929	100.0%
Overall	**11,693,386**	**11,826,855**	**101.1%**

<u>Project ID 1869:</u>

The site visits confirmed the equipment and control settings were equal to what was identified in the documentation. The site inspection verified that the actual energy consumption at the operating condition was slightly lower than the claimed baseline, therefore the savings increased slightly when that finding was multiplied over the hours of operation.

3.2.2 Lighting

Lighting projects account for 22 percent of the 2017 C&I Custom Energy Program. The sample included 19 projects which accounted for seven percent of the sampled kWh. All projects sampled were at five sites that completed another non-lighting project in 2017. Table 3-5 shows realization rates for each project with the total realization rate for lighting savings claimed at 99.2 percent.

Table 3-5. PY2017 Custom Lighting Impact Results Summary

Project ID	Claimed kWh	Evaluated kWh	Realization Rate
1593*	411,172	411,172	100.0%
1639*	354,997	354,997	100.0%
1673	152,652	152,652	100.0%
1768	103,136	103,136	100.0%
1727*	91,040	89,000	97.8%
1450	64,330	64,330	100.0%
1650	37,802	28,909	76.5%
1737	22,180	25,793	116.3%
1785	13,314	13,314	100.0%
1856	13,314	13,314	100.0%
1554*	13,089	13,089	100.0%
1656	12,382	12,382	100.0%
1603	10,354	8,620	83.3%
1828	8,830	7,568	85.7%
1854	4,457	4,457	100.0%
1750	2,992	2,992	100.0%
1733	2,991	2,991	100.0%
1697	1,496	1,496	100.0%
1753	909	909	100.0%
Overall	**1,321,437**	**1,311,121**	**99.2%**

*The customer for which only a desk review was completed had a significant amount of lighting in the sample under project IDs, 1554, 1593, 1639, and 1727.

<u>Project ID 1727:</u>

The review of the submitted documentation noted that the DesignLights Consortium® (DLC) database contained a rated energy consumption value for high bay fixtures of 102 watts versus the claimed value of 95 watts per fixture. In addition, the explosion proof lighting noted that the DLC database contained a rated energy consumption value for high bay fixtures of 72 watts versus the claimed value of 67 watts per fixture.

<u>Project ID 1650:</u>

The site visit found that 14 fixtures were removed and 15 fixtures were installed. This is less than the claimed amount of 18 fixtures.

Project ID 1737:

The site visit found that occupancy sensors were included on the high bay lighting, increasing the savings for the project over the claimed amount.

Project ID 1603:

The site visit found that the controls for the lighting were not installed.

Project ID 1828:

The site visit found that there were six fixtures replaced, less than the claimed seven fixtures.

3.2.3 Compressed Air

Compressed Air projects account for 10 percent of the 2017 C&I Custom Energy Program. The sample included three projects which accounted for 3.7 percent of the sampled kWh. All three projects were retrofits of existing equipment. The realization rate for the savings claimed is 66.8 percent in Table 3-6.

Table 3-6. PY2017 Custom Compressed Air Impact Results Summary

Project ID	Claimed kWh	Evaluated kWh	Realization Rate
1598	505,344	180,636	35.8%
1422	452,981	452,981	100.0%
1630-1	20,765	20,765	100.0%
Overall	**979,090**	**654,382**	**66.8%**

Project ID 1598:

The site visit found that the intended control structure for the two compressors to work in conjunction using a lead-lag programming was not operating. Both compressors were operating at the same power level. This adjustment in the programming control eliminated a majority of the claimed savings for this project.

3.2.4 Refrigeration

Refrigeration projects account for 16 percent of the 2017 C&I Custom Energy Program. The sample included four projects which accounted for 3.1 percent of the sampled kWh. The four projects were retrofits of existing refrigerated food storage at two locations. Table 3-7 shows the realization rates for the savings claimed is 100 percent for all projects.

Table 3-7. PY2017 Custom Refrigeration Impact Results Summary

Project ID	Claimed kWh	Evaluated kWh	Realization Rate
1222	264,975	264,975	100.0%
1770	201,277	201,277	100.0%
1769	75,539	75,539	100.0%
1893	26,836	26,836	100.0%
Overall	**568,627**	**568,627**	**100.0%**

Food storage refrigeration requires many assumptions based upon the heat load in the food brought into storage. The assumptions claimed in this calculation were made conservatively and the evaluation team agrees with the savings calculations.

3.2.5 HVAC

HVAC projects account for one percent of the 2017 C&I Custom Energy Program. The sample included three projects which accounted for 2.1 percent of the sampled kWh. All three projects were retrofits of existing equipment. Table 3-8 shows the realization rate for the savings claimed is 97.0 percent.

Table 3-8. PY2017 Custom HVAC Impact Results Summary

Project ID	Claimed kWh	Evaluated kWh	Realization Rate
1440	218,937	218,937	100.0%
1706	123,908	114,072	92.1%
1906	58,120	56,038	96.4%
Overall	**400,965**	**389,047**	**97.0%**

Project ID 1706:

The project was intended to provide heat to keep pipes from freezing in an entry area. The claimed savings used the occupancy hours. The evaluation team adjusted the hours of use to match the freezing temperature hours from the weather file.

Project ID 1906:

The claimed savings did not use the AHRI rated capacity of the installed units, the evaluation team adjusted these capacities. In addition, one heat pump was adjusted to claim savings for a <1.5 ton unit from the "1.5 ton – 5 ton" category. This adjustment also required that the unit have a COP of 4.6, which it did not. Therefore, the unit savings were removed from project savings.

3.2.6 Pump

Pump projects account for less than one percent of the 2017 C&I Custom Energy Program. The sample included one project which accounted for 1.3 percent of the sampled kWh. Table 3-9 shows the realization rate for the savings claimed is 155.1 percent.

Table 3-9. PY2017 Custom Pump Impact Results Summary

Project ID	Claimed kWh	Evaluated kWh	Realization Rate
1622	236,885	384,189	162.2%
1630-2	30,159	30,159	100.0%
Overall	**267,044**	**414,348**	**155.1%**

Project ID 1622:

The claimed savings did not appear to account for variable pump efficiencies as the pumping conditions change. The claimed calculation used 80.1% efficiency and the evaluated savings used an average of 76% efficiency to approximate changing conditions. A pump curve was not available and therefore exact values could not be identified. In addition to the reduction of pumping efficiency, the claimed savings assumed that the pump hours would remain constant before and after the improvement. The evaluated savings utilized an assumption that the pumping was volume based and therefore the new pump will operate less hours than the baseline. These combined adjustments increased the energy savings for this project.

3.2.7 Fan

Fan projects account for less than one percent of the 2017 C&I Custom Energy Program. The sample included one project which accounted for 0.3 percent of the sampled kWh. The realization rate for the savings claimed is 100 percent, as shown in Table 3-10. The industrial fan calculator was used to claim savings for this project.

Table 3-10. PY2017 Custom Fan Impact Results Summary

Project ID	Claimed kWh	Evaluated kWh	Realization Rate
1864	53,325	53,325	100.0%

3.2.8 Motors

Motor projects account for less than one percent of the 2017 C&I Custom Energy Program. The sample included one project which accounted for 0.05 percent of the sampled kWh. The realization rate for the savings claimed is 97.7 percent, as shown in Table 3-11.

Table 3-11. PY2017 Custom Motors Impact Results Summary

Project ID	Claimed kWh	Evaluated kWh	Realization Rate
1456	9,074	8,865	97.7%

<u>Project ID 1456:</u>

The evaluated savings adjusted hours of operation from 3,000 to 2,931 to match operations.

3.2.9 Wastewater Energy Efficiency Cohort

The Wastewater Energy Efficiency Cohort (WWEEC) accounted for five percent of the 2017 C&I Custom program savings. The sample included two projects which accounted for 6.3 percent of the sampled kWh. Both projects received 100 percent realization rates, as shown in Table 3-12.

Table 3-12. PY2017 Custom WWEEC Impact Results Summary

Project ID	Claimed kWh	Evaluated kWh	Realization Rate
1121	814,638	814,638	100.0%
1089	354,724	354,724	100.0%
Overall	**1,169,362**	**1,169,362**	**100.0%**

The projects positively identified best practices and relatively quickly were able to support the transition to focus effort on energy efficiency through daily operations at the plant. The M&V process to compare savings utilizes the energy consumed normalized to flow volumes and then subtracting out the raw values of any capital projects was reasonable. The program took a conservative approach to remove the energy savings from capital improvements which received incentives outside the cohort.

In Year 3 & 4 of the program, the energy savings may be more complicated as the staff begins to change at the participating wastewater treatment plants and additional capital improvement projects are constructed at the facilities. As the energy savings occurs from multiple pathways, such as capital improvements, operational efficiency variations of previous process adjustments, and new operational decisions, the claimed savings values from the WWEEC will need to be balanced between multiple interconnected projects claiming savings. The decision to break up the energy savings may not be clear, so it will be important to detail assumptions for sources of energy savings and how they are attributed, with a portion of the total savings values of all these projects attributed to WWEEC.

3.2.10 Streamlined Process

The Streamlined projects account for 10 percent of the overall 2017 C&I Custom Energy Program. The sample included 18 projects which accounted for 10 percent of the sampled kWh. These projects included VFDs, fast acting doors, compressed air upgrades, and dairy pre-cooling. Table 3-13 shows the individual realization rates and an overall realization rate for the savings claimed of 106.2 percent.

Table 3-13. PY2017 Custom Streamlined Impact Results Summary

Project Type	Project ID	Claimed kWh	Evaluated kWh	Realization Rate
VFD	1754	397,844	397,844	100.0%
	1690	364,723	566,409	155.3%
	1685	216,370	241,170	111.5%
	1576	47,720	47,720	100.0%
	1833	38,861	42,708	109.9%
	1698	37,670	37,670	100.0%
	1577	35,790	35,790	100.0%
	1812	19,695	24,598	124.9%
	1754	397,844	397,844	100.0%
Fast Acting Door	1469	185,512	185,512	100.0%
	1699	120,931	44,040	36.4%
	1913	79,578	79,578	100.0%
Compressed Air	1767	85,948	85,948	100.0%
	1746	77,101	71,380	92.6%
	1504	73,851	73,851	100.0%
	1726	73,432	74,205	101.1%
	1795	43,335	37,856	87.4%
	1834	26,011	25,999	100.0%
Dairy Pre-Cooling	1734	21,007	18,267	87.0%
	Overall	**2,343,223**	**2,488,389**	**106.2%**

Overall the streamlined project calculations varied more than the projects which followed the standard Custom program process. This is expected as they are smaller projects and were not calculated with the same amount of rigor. There were several reasons for adjustments, but many focused around the control of equipment post-installation.

Project ID 1690:

The site visit found a different operation profile for both the mixer and the grinder. The mixer increased both the baseline energy consumption and decreased the efficient case energy consumption with increased savings. The grinder baseline and efficient energy consumption both increased, which led to slightly decreased savings.

Project ID 1685:

The site visit found the length of storage to be longer than claimed. The increased hours of operation led to increased savings.

Project ID 1833:

The site visit found a different operation profile for the farm. This is a 24-hour milking operation, although 2-4 hours of this is not milking and therefore the cooling system would not be necessary during that time. The site inspection verified baseline consumption was higher than claimed and the maximum consumption was lower than claimed. Using the hours of operation and the VFD programming, these factors combined to increase savings slightly.

Project ID 1812:

The site visit noted that the thermostat for control of this project was located inside the milking parlor and barn which would be at an elevated temperature compared with the outdoor temperature. Therefore, the hours of operation increased for the project which increased the savings.

Project ID 1699:

The site visit noted several discrepancies for the installation of this project. The doors were smaller than claimed, the controls were site adjusted to allow the door to stay open longer when activated, and the gap between the door and wall was larger than anticipated. It appears that the site staff is working to figure out the best control for the door because the activation sensor is opening the door when employees pass by the door without intending to exit. Combining all these effects, the energy savings for this door is significantly decreased.

Project ID 1746:

The claimed calculation utilized a custom baseline for this new construction project. The calculation was updated to utilize the RTF regional baseline for new construction. In addition, the site visit report noted that the operating profile was most often at 50 percent for the integrated VFD. This adjusted the operating profile slightly which reduced savings.

Project ID 1795:

The claimed calculation included a typo which used 5,880 hours per year instead of the intended 5,088 hours per year. Correcting this resulted in lower savings.

Project ID 1734:

The current savings calculation assumes that there would be no heat loss as the milk was transported to the pre-cooler. Due to the distance of the piping, and the typical associated heat loss, the entering milk temperature was reduced to 95 degrees. This decreased the energy savings.

3.3 IMPACT RECOMMENDATIONS

The following impact recommendations are provided for Idaho Power's consideration:

Collect and file electronic calculators. For the project savings calculated by the third-party contractor, Idaho Power should collect and file the Excel calculators. The calculators were available from the third-party engineer but having them in-house once each project is completed will facilitate any additional quality control or adjustments that Idaho Power would like to make to improve accuracy.

Consider including post-verification customer follow-up for control-based projects. Based on the variation found in savings for projects with controls, and the value Idaho Power places on customer relationships, Tetra Tech recommends that the engineering team identify customers for post-verification visits to discuss control settings and the potential adjustment impacts. This is most useful for projects that have easily adjusted controls such as; variable frequency drives, fast acting doors, and compressed air upgrades. Not only will it help Idaho Power report more accurate savings, it will assist the customer in maximizing savings from their investment in the project.

Review goals for the Streamlined process. The Streamlined process is used to market to customers with a less customized project and provide a more efficient application process. However, the evaluation found that the assumptions for the streamlined projects resulted in more variation from actual conditions than their more "custom" counterpart projects. Idaho Power should continue to monitor the benefits of the process efficiency with the potential variation in savings rigor.

Continue close communications with Wastewater Cohort contacts. The Wastewater cohort has developed a process to claim annual savings from behavioral improvements, but the conditions of the projects and baselines continue to evolve. Changes in project managers at customer facilities and the addition of other capital projects may affect future savings. Idaho Power staff should continue to closely monitor and communicate with their Wastewater project contacts.

Review various energy calculation components for improved accuracy. Idaho Power calculations are currently found to be accurate and well-documented. However, for particular measure categories, the calculation accuracy could be further improved with the following adjustments:

- **Use Regional Technical Forum (RTF) method for New Construction Baseline.** The RTF issues new construction baselines based upon market research. Use the RTF baseline, when available, for project calculations to minimize risk associated with variable baselines per project. This was found specifically in the sample for Compressed Air new construction projects, although it will apply across many different new construction equipment types.
- **Use rated capacity and wattage for equipment.** Lighting and HVAC equipment have third party certification agencies which provide rated wattage and capacities of specific equipment models. Utilizing this information will reduce the risk that a manufacturer spec sheet may misrepresent the performance. This was noticed for an HVAC project which did not utilize the rated Air-Conditioning, Heating, and Refrigeration (AHRI) capacity and energy consumption metrics.
- **Consider requiring a pump curve submission for pumping projects.** Pump curves detail the pump efficiency at various operating conditions. Many pumping projects change pump conditions and the pump efficiency will generally have a large impact on the energy savings of the project. To estimate pump performance at multiple condition points, a pump curve is necessary.
- **Monitor specific dairy projects for adjustments to incoming milk temperature.** The RTF states to use 98 degrees based on industry standard practice of milk temperature production

unless otherwise measured. Dairies collect milk at approximately 98 degrees in the milking parlor and need to transfer the milk to the chilling system through uninsulated piping. This fluid transfer results in heat dissipation and therefore lower milk temperature at the start of chilling. For at least one of the projects reviewed, the milk traveled a lengthy distance to reach the chilling system which would have resulted in a lower incoming milk temperature assumption of 95 degrees.

Idaho Power Company

Idaho Power Company
Energy Efficient Lighting Program

2017 Impact Evaluation Results

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January 16, 2019

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ACKNOWLEDGEMENTS

We would like to acknowledge the many individuals who contributed to the impact evaluation of the Idaho Power Energy Efficient Lighting program savings from 2017. This evaluation effort would not have been possible without their help and support.

We would like to specifically thank Gary Grayson, Mindi Shodeen, and Kathy Yi of Idaho Power, who provided invaluable insight into the program and operations. These individuals participated in ongoing evaluation deliverable reviews and discussions and graciously responded to follow-up questions and data and documentation requests.

The Tetra Tech Evaluation Team was made up of the following individuals: Kimberly Bakalars, Mark Bergum, and Josh Verbeten.

1.0 EXECUTIVE SUMMARY

Tetra Tech is pleased to provide Idaho Power Company (Idaho Power) with a report for the 2018 impact evaluation of the 2017 Energy Efficient Lighting (EEL) program, a component of the Simple Steps, Smart Savings program. This section of the report consists of an introduction describing the program, evaluation activities, and key findings and recommendations. The detailed impact results can be found in Section 3, along with recommendations.

1.1 PROGRAM DESCRIPTION

Idaho Power and other regional utilities participate in the Simple Steps, Smart Savings™ program. Idaho Power promotes Simple Steps, Smart Savings offerings to customers for both lighting and appliance promotion. Initiated in 2002, the Energy Efficient Lighting program follows a markdown model that provides incentives directly to manufacturers or retailers, with discounted prices passed on to the customer at the point of purchase. The program goal is to help Idaho Power's Idaho and Oregon residential customers afford more efficient lighting technology.

The EEL program is managed by CLEAResult. In addition to managing the program's promotions, which include special product placement, additional discounts, and other retail merchandising tactics designed to increase sales, CLEAResult is responsible for contracting with retailers and manufacturers, providing marketing materials at the point of purchase, and supporting and training retailers.

1.2 METHODOLOGY

To address the evaluation objectives, the impact methodology consisted of the four primary evaluation activities shown in Figure 1-1.

Figure 1-1. Process for Verifying Program Savings

1.3 FINDINGS AND RECOMMENDATIONS

Tetra Tech found no issues with the savings calculations other than a similar rounding issue that was identified through the Multifamily Energy Savings program evaluation. However, there is evidence that Idaho Power applied what was found during the Multifamily evaluation to the EEL program savings and this substantially improved the accuracy of the savings claimed for the EEL program.

The quality control processes already in place for the EEL program result in a realization rate very close to 100 percent. It also appears that Idaho Power has applied many of the previous EEL evaluation recommendations to improve program tracking and savings accuracy. The evaluation team has no recommendations for the program related to claimed savings other than to continue the current processes and rigorous QA/QC.

2.0 INTRODUCTION

2.1 PROGRAM OVERVIEW

Idaho Power and other regional utilities participate in the Simple Steps, Smart Savings™ program. Idaho Power promotes Simple Steps, Smart Savings offerings to customers for both lighting and appliance promotion. Initiated in 2002, the Energy Efficient Lighting (EEL) program follows a markdown model that provides incentives directly to manufacturers or retailers, with discounted prices passed on to the customer at the point of purchase. The benefits of this model are low administration costs, better availability of products to the customer, and the ability to provide an incentive for specific products. The program goal is to help Idaho Power's Idaho and Oregon residential customers afford more efficient lighting technology.

The EEL program is managed by CLEAResult. In addition to managing the program's promotions, which include special product placement, additional discounts, and other retail merchandising tactics designed to increase sales, CLEAResult is responsible for contracting with retailers and manufacturers, providing marketing materials at the point of purchase, and supporting and training retailers. CLEAResult negotiates bulb prices directly with each retail store and contracts can vary by retailer.

Idaho Power pays a flat fee for each kWh of energy savings achieved. A portion of the funding Idaho Power provides is used to buy down the price of the product, and a portion is applied to administration and marketing which varies and can be used for retailer promotions.

Figure 2-1. Payment Process

2.1.1 Marketing & Outreach

In 2017, CLEAResult conducted special product placement and signage promotions for Simple Steps, Smart Savings. CLEAResult staff conducted monthly store visits to check on stock, point-of-purchase signs, and displays, and staffed 13 lighting events at local Home Depot and Costco stores to educate customers about the importance of using LED lightbulbs and the Simple Steps promotion. Additional activities in 2017 involved education and marketing. During events where Idaho Power sponsored a booth and distributed LED lightbulbs, customers were informed about the importance of using energy-efficient lighting, the quality of LED lightbulbs, and the special pricing available for the Simple Steps, Smart Savings products.

The company continued to host an Energy Efficient Lighting program website; to make available a *Change a Light* program brochure designed to help customers select the right lightbulb for their needs; and to discuss energy-efficient lighting with customers at community events. Also, ads for the Fridge and Freezer Recycling Program promoted the free LED lightbulb offer. Several *#TipTuesday* posts on social media throughout the year also focused on energy-efficient lighting. The Idaho Power winter *Energy Efficiency Guide* and the January issue of *Connections* also recommended using ENERGY STAR certified light bulbs.

2.1.2 Tracking & Reporting

In 2017, through the Simple Steps, Smart Savings program, Idaho Power worked with 19 participating retailers, representing 129 individual store locations throughout its service area. Of those participating retailers, 58 percent were smaller grocery, drug, and hardware stores, and the remaining 42 percent were large retailers.

LED lightbulbs comprised 90 percent of lightbulb sales for 2017, an increase from 59 percent in 2016, while LED fixtures remained at approximately five percent of lighting sales. CFL lightbulbs manufactured before January 1, 2017 that had the ENERGY STAR certification did qualify for the Simple Steps markdown price; however, after May 2017 no CFL lightbulbs were included in the Energy Efficient Lighting program.

2.2 EVALUATION ACTIVITIES

The evaluation activities for the Energy Efficient Lighting program are summarized in Table 2-1 below. The impact evaluation of the 2017 Idaho Power EEL program included a database analysis of reported savings with a comparison to Regional Technical Forum (RTF) deemed savings.

Table 2-1. Energy Efficient Lighting Program Evaluation Activities

Activity	Sample Size	Objective
Interviews with Idaho Power staff	3	Understand program design and delivery. Obtain program staff perspective on program successes and challenges. Identify researchable issues.
Database analysis	Census	The tracking system was reviewed to determine if all necessary inputs are tracked and if reporting tools contain sufficient information for program review. A comparison with RTF deemed savings was included.
RTF compliance	Census	Review adoption of new RTF versions.
Retailer invoice checks		Review QA/QC procedures for data entry of retail sales and invoicing information.

3.0 IMPACT EVALUATION RESULTS

This chapter discusses the methodology and results of the impact evaluation of the 2017 EEL program. The impact evaluation was based on discussions with program staff as well as a review of the program tracking database.

3.1 METHODOLOGY

The impact methodology consisted of the four primary evaluation activities shown in Figure 3-1. Each activity is explained in more detail below.

Figure 3-1. Process for Verifying Program Savings

3.1.1 Program Staff Interview

Tetra Tech began the evaluation with a meeting with the Idaho Power evaluation lead to outline goals for the evaluation and identify key issues and Idaho Power personnel for subsequent interviews. Tetra Tech interviewed the program specialist and program analyst to understand data tracking, data availability, and program policies and to develop an ongoing dialogue to discuss questions that may emerge from the initial data review and findings.

3.1.2 Database Review

To review tracking data, Tetra Tech applied a census approach to the review of per-lamp savings tracked in the program's tracking system. The census approach avoids sampling error, resulting in an outcome that exceeds the minimum 90 percent ± 10 percent confidence required of the evaluation findings. Idaho Power program staff made the following files available to the Tetra Tech team for review.

Figure 3-2. Lighting Project Files

Materials Provided
•2017 YTD Lighting •ResLighting_Bulbs_v4_2 •ResLighting_v5.2 •Production_UES_Measures_List (v5.0) (Effective 2016-10-01) •UES_Measures_List_Version 6-1 (Effective 2017-10-01)

3.1.3 RTF Compliance

The RTF periodically updates savings values. Because Bonneville Power Administration maintains the master contract with CLEAResult, Idaho Power follows their timing on when new savings are adopted.

Tetra Tech utilized the program tracking system and RTF workbooks to verify compliance with RTF savings based on this policy.

3.1.4 Verification of kWh Savings

Idaho Power tracks energy savings for the EEL program in a Microsoft Excel® workbook for each program year. Idaho Power provided the 2017 tracking system to Tetra Tech for review as a foundation for verifying program savings. The tracking system contained itemized sales, allocation, incentive payment, and energy savings for each retailer and lamp stock keeping unit (SKU), with 46,884 records. The data spanned retail sales reported to Idaho Power for August 2016 through December 2017. Idaho Power calculated savings using RTF version 4.2 from October 2016 to September 2017 and updated to RTF version 5.2 from October 2017 to September 2018.

The savings verification process compared column AW (Total Savings) in the Idaho Power tracking database with a Verified Total Savings column that Tetra Tech calculated by multiplying Savings per Unit based on the RTF calculator times column AP (Units Counted for Energy Savings).

3.1.5 Retailer Invoice Checks

A portion of the impact review would typically focus on an independent quality control check of retailer sales data and invoices submitted to the program. However, given the description of the quality control and data entry process used by the EEL program staff, this review was determined by the evaluation team and Idaho Power to be an unnecessary burden on busy program staff.

We spoke with the program specialist and program analyst to understand the tracking process for the program as well as any quality control checks that were applied as the sales reports and invoices from CLEAResult were received. The internal quality control procedure is described further in Section 3.2.3.

3.2 IMPACT REVIEW RESULTS

Overall, the evaluation found that the EEL program calculations were accurate with little variation by individual measure type. As shown in Table 3-1, realization rates for each RTF version were very close to 100 percent and became even more accurate when RTF version 5.2 was adopted. Much of this increase in accuracy occurred because Idaho Power discontinued rounding of the unit savings to the nearest whole number after moving to RTF version 5.2.

Table 3-1. Overview of 2017 Program Realization Rate

RTF Applied to Savings	Ex-Ante kWh	Ex-Post kWh	Realization Rate
RTF version 4.2 Applied (10/2016-9/2017)	33,238,503.67	33,506,134.22	1.01
RTF version 5.2 Applied (10/2017-9/2018)	4,526,238.22	4,526,468.65	1.00
Program Year 2017	**37,764,741.89**	**38,032,602.87**	**1.01**

3.2.1 Database Review

The tracking system is comprehensive and allowed Tetra Tech to conduct a census review of all lamp types and aggregate reported energy savings. Tetra Tech found the tracking database to be very clean and consistently complete. In addition to tracking the program participation, the database included a tab with a data legend that explained what each column is used for and identified which column data comes directly from contractors. This is considered a best practice when tracking data and will ensure consistency if someone other than the current user needs to work with the database.

Review of the savings values by RTF version resulted in high realization rates for almost all measures. Table 3-2 below shows the measure level realization rates for savings claimed during the application of RTF version 4.2 and Table 3-3 shows the measure level realization rates for savings claimed during the application of RTF version 5.2.

Table 3-2. RTF v4.2 Savings Comparisons

Bulb Type	Ex-Ante kWh	Ex-Post kWh	Realization Rate
Fixtures LED Decorative Ceiling Flush Mount Retail	724,704.00	724,704.00	1.00
Fixtures LED Downlight Retrofit Kit Retail	1,372,920.00	1,372,920.00	1.00
Fixtures LED Exterior Porch Light Retail	283,498.77	283,498.77	1.00
Fixtures LED Exterior Security Retail	665,336.88	665,336.88	1.00
Fixtures LED Linear Flush Mount Retail	297.00	297.00	1.00
Fixtures LED Linear Shop Light Retail	4,781.70	4,781.70	1.00
Fixtures LED Track Light Retail	1,478.32	1,478.32	1.00
Retail Compact Fluorescent Decorative and Mini-Base1490 to 2600 lumens ANY	28.00	22.93	0.82
Retail Compact Fluorescent Decorative and Mini-Base250 to 1049 lumens ANY	4,290.00	4,347.18	1.01
Retail Compact Fluorescent General Purpose, Dimmable, and Three-Way1050 to 1489 lumens any	82,348.00	82,176.49	1.00
Retail Compact Fluorescent General Purpose, Dimmable, and Three-Way1490 to 2600 lumens any	153,350.00	152,083.81	0.99
Retail Compact Fluorescent General Purpose, Dimmable, and Three-Way250 to 1049 lumens any	505,540.00	509,178.65	1.01
Retail Compact FluorescentGlobe250 to 1049 lumens ANY	576.00	586.29	1.02
Retail Compact Fluorescent Reflectors and Outdoor1050 to 1489 lumens ANY	1,620.00	1,629.06	1.01
Retail Compact Fluorescent Reflectors and Outdoor1490 to 2600 lumens ANY	360.00	377.15	1.05
Retail Compact Fluorescent Reflectors and Outdoor250 to 1049 lumens ANY	108,030.00	108,205.54	1.00
Retail LED Decorative and Mini-Base250 to 1049 lumens ANY	1,523,184.00	1,545,641.85	1.01
Retail LED General Purpose, Dimmable, and Three-Way1050 to 1489 lumens any	187,374.00	188,282.43	1.00
Retail LED General Purpose, Dimmable, and Three-Way1490 to 2600 lumens any	1,591,234.00	1,607,029.90	1.01
Retail LED General Purpose, Dimmable, and Three-Way250 to 1049 lumens any	8,672,820.00	8,767,537.65	1.01
Retail LED Globe250 to 1049 lumens ANY	139,146.00	137,846.48	0.99
Retail LED Reflectors and Outdoor1050 to 1489 lumens ANY	301,872.00	303,412.19	1.01
Retail LED Reflectors and Outdoor1490 to 2600 lumens ANY	24,140.00	23,786.40	0.99
Retail LED Reflectors and Outdoor250 to 1049 lumens ANY	16,889,575.00	17,020,973.56	1.01
Total	**33,238,503.67**	**33,506,134.23**	**1.01**

Unit savings were rounded to the nearest whole number while Version 4.2 of the RTF calculator was being used to calculate savings (from October 2016-September 2017). Rounding to whole numbers stopped after Version 5.2 of the RTF calculator was applied (October 2017 - September 2018). The rounding to two decimal places greatly improves the accuracy of the claimed savings, as highlighted in Table 3-3 below.

Table 3-3. RTF v5.2 Savings Comparisons

Bulb Type	Ex-Ante kWh	Ex-Post kWh	Realization Rate
Retail_Ceiling and Wall Flush Mount _1000 to 1999 lumens	33,716.78	33,716.78	1.00
Retail_Ceiling and Wall Flush Mount _2000 to 3999 lumens	18,914.26	18,914.26	1.00
Retail_Ceiling and Wall Flush Mount _4000 to 7999 lumens	66,808.36	66,808.36	1.00
Retail_Ceiling and Wall Flush Mount _500 to 999 lumens	9,845.33	9,845.33	1.00
Retail_Downlight Fixture_1000 to 1999 lumens	4,267.39	4,267.39	1.00
Retail_Downlight Fixture_250 to 499 lumens	87.38	87.38	1.00
Retail_Downlight Fixture_500 to 999 lumens	237,416.64	237,416.64	1.00
Retail_Exterior Porch_500 to 999 lumens	104.99	104.99	1.00
Retail_Exterior Security_2000 to 3999 lumens	23,443.13	23,443.13	1.00
Retail_Linear Flush Mount_500 to 999 lumens	3.79	3.79	1.00
Retail_Linear Shop_4000 to 7999 lumens	11.19	11.19	1.00
Retail LED Decorative and Mini-Base250 to 1049 lumens ANY	215,968.32	216,049.90	1.00
Retail LED General Purpose, Dimmable, and Three-Way1050 to 1489 lumens any	54,276.16	54,266.44	1.00
Retail LED General Purpose, Dimmable, and Three-Way1490 to 2600 lumens any	275,782.50	275,795.42	1.00
Retail LED General Purpose, Dimmable, and Three-Way250 to 1049 lumens any	1,757,189.16	1,757,641.62	1.00
RetailLEDGlobe250 to 1049 lumens ANY	89,641.76	89,617.52	1.00
Retail LED Reflectors and Outdoor1050 to 1489 lumens ANY	75,243.93	75,253.00	1.00
Retail LED Reflectors and Outdoor1490 to 2600 lumens ANY	20,409.96	20,409.62	1.00
Retail LED Reflectors and Outdoor250 to 1049 lumens ANY	1,643,107.20	1,642,815.90	1.00
Total	**4,526,238.23**	**4,526,468.66**	**1.00**

3.2.2 Regional Technical Forum Compliance

The RTF periodically updates savings values. Because Bonneville Power Administration maintains the master contract with CLEAResult, Idaho Power follows their timing on when new savings are adopted. BPA was using RTF version 4.2 from October 2016-September 2017 and used RTF version 5.2 from October 2017-September 2018. Tetra Tech utilized the program tracking system and RTF workbooks to verify compliance with RTF savings based on this policy.

3.2.3 Retail Sales Report Quality Control

During discussions with the program specialist and program analyst to understand the tracking process for the program, it became clear that there is an extensive process for quality control applied as the sales reports and invoices from CLEAResult are received.

Idaho Power asks for raw sales data from each of the stores on a monthly basis. Their program specialist then verifies that the numbers provided by the contractor match the raw sales data. If there are any discrepancies, the program specialist follows up with the contractor until the discrepancies are resolved.

The program specialist also maintains a SKU lookup tab as part of the tracking database. Lighting SKUs are constantly changing, but the program specialist checks the ENERGY STAR list periodically to make adjustments. In addition, there are lookups in place to verify if a SKU from a store is part of the approved list. If a new SKU appears, the program specialist will do further research to determine if the item qualifies for an incentive.

3.3 IMPACT RECOMMENDATIONS

Tetra Tech found no issues with the savings calculations other than a similar rounding issue that was identified through the Multifamily Energy Savings program evaluation. However, there is evidence that Idaho Power applied what was found during the Multifamily evaluation to the EEL program savings and this substantially improved the accuracy of the savings claimed for the EEL program.

The quality control processes already in place for the EEL program result in a realization rate very close to 100 percent. It also appears that Idaho Power has applied many of the previous EEL evaluation recommendations to improve program tracking and savings accuracy. The evaluation team has no recommendations for the program related to claimed savings other than to continue the current processes and rigorous QA/QC.

Idaho Power Company

Idaho Power Company
Multifamily Energy Savings Program

2017 Impact and Process Evaluation Results

TETRA TECH

December 5, 2018

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ACKNOWLEDGEMENTS

We would like to acknowledge the many individuals who contributed to the 2017 impact and process evaluation of the Idaho Power Multifamily Energy Savings program. This evaluation effort would not have been possible without their help and support.

We would like to specifically thank Gary Grayson and Becky Arte-Howell of Idaho Power, who provided invaluable insight into the program and operations. These individuals participated in ongoing evaluation deliverable reviews and discussions and graciously responded to follow-up questions and data and documentation requests.

The Tetra Tech Evaluation Team was made up of the following individuals: Kimberly Bakalars, Mark Bergum, Josh Verbeten, and Katie Hanlon.

1.0 EXECUTIVE SUMMARY

Tetra Tech is pleased to provide Idaho Power Company (Idaho Power) with this report covering evaluation of current processes and 2017 program impacts for the Multifamily Energy Savings (Multifamily) program. This section of the report consists of an introduction describing the program, evaluation activities, and key findings and recommendations. Both the impact and process evaluations for the program are detailed in separate sections, along with their respective findings and recommendations.

1.1 PROGRAM DESCRIPTION

The Multifamily Energy Savings program began in March 2016 with a pilot project in Pocatello, ID, followed by direct install projects in Boise, ID and Twin Falls, ID in September and December 2016 respectively. There were a total of 196 apartment units served in 2016 and over 700 units were served in 2017, the first full year of the program.

The Multifamily Energy Savings program supports property owners and managers in helping their residents save on monthly energy bills while increasing the comfort of residents. The program allows for the direct installation of energy-saving products in multifamily dwellings consisting of five or more rental units with electric heating and water heating. Direct install products include: ENERGY STAR® LED lightbulbs, thermostatic shut-off valve showerheads, kitchen and bathroom faucet aerators, and water heater pipe insulation. These are installed by insured contractors at no cost to the property owner/property manager or the tenant.

1.2 METHODOLOGY

In order to address the evaluation objectives, which included verifying energy impacts attributable to the 2017 program, providing estimates of realization rates, suggesting enhancements to the savings analysis and reporting, evaluating program design (including implementation, management, outreach, and quality control) and program tracking, the evaluation team conducted several evaluation activities as shown in Figure 1-1.

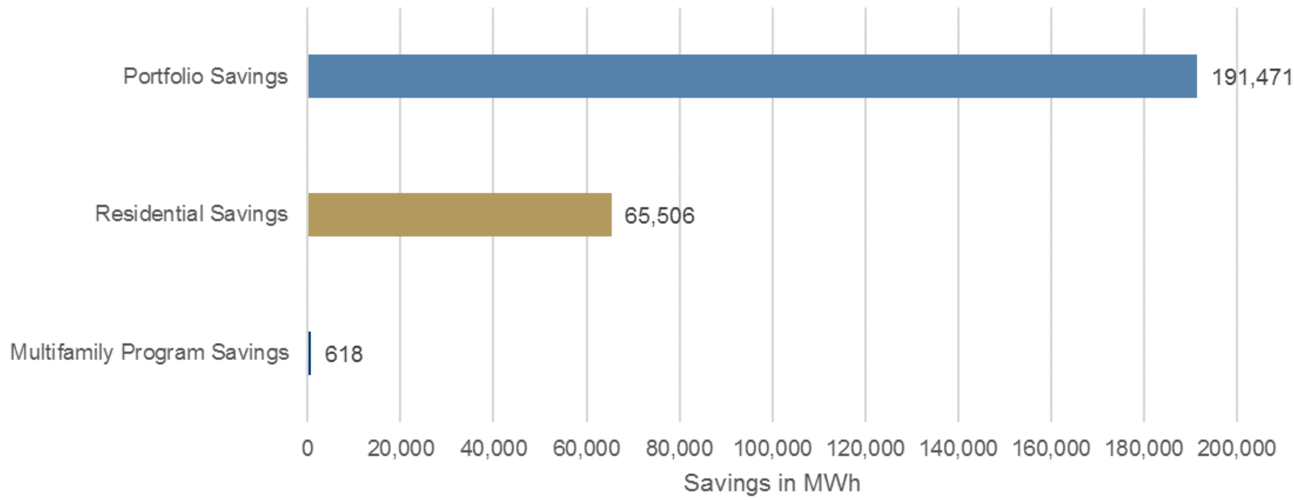
Figure 1-1. Impact and Process Evaluation Activities

Impact	Process
• Documentation and tracking review • Verify savings amounts • Check savings calculations • Review invoices	• Documentation review • Tracking review • Contractor interviews

1.3 FINDINGS AND RECOMMENDATIONS

The impact and process evaluations for the Multifamily Energy Savings program revealed a successful first-year program. There was one error transcribed for prescriptive savings values and no errors were identified in the calculated savings values. Installation contractors could offer no suggested changes to processes or communication. Based on the detailed evaluation activities, Tetra Tech provides some areas of improvement for Idaho Power to consider as they continue, and potentially expand, the program. All findings and recommendations should be considered in the context of the program size and contribution to the Residential sector (1%) and overall portfolio savings (.3%).

Figure 1-2. Relative Program Savings[1]



Overall, findings from the impact evaluation show the program savings calculations are reasonable. The evaluation found just one savings value error in the summary tracking spreadsheet or individual project tracking spreadsheets, resulting in the following realization rates for all measures included in the Multifamily program and an overall realization rate of 84 percent.

Table 1-1. Realization Rates

Measure	Ex-Ante kWh	Ex-Post kWh	Realization Rate[2]
9 W Bulb - 800 lumens	90,448	90,448	100%
15 W Bulbs - 1600 lumens	28,920	28,920	100%
6 W Globes - 450 lumens	61,264	61,264	100%
11 W Reflectors - 850 lumens	61,993	61,993	100%
6.5 W Decorative - 325 lumens	5,691	5,691	100%
Kitchen Aerator	71,232	43,116	61%
Bath Aerator	86,814	52,547	61%
Showerhead	105,922	105,922	100%
Thermostatic Combo	6,408	6,408	100%
Water Heater Pipe Wrap	98,850	60,154	61%
Total Savings	**617,542**	**516,463**	**84%**

While not errors, there are a few areas the evaluation team would like to mention where Idaho Power could increase the accuracy of their savings estimates.

[1] From Idaho Power's Demand-Side Management 2017 Annual Report. March 15, 2018
[2] Reductions to the realization rates for kitchen and bath aerators and the pipe wrap were all based on the use of single-family instead of multifamily unit savings values.

- The savings values from the Regional Technical Forum (RTF)[3] are out to two decimal places, but the Idaho Power calculations round savings values to the nearest whole number.
- Designation of primary and secondary showerhead status is not recorded at the time of installation. It is assigned using a formula based on number of bathrooms and showerheads installed. The “Any” category and savings value used in the spreadsheet is an average of Primary and Secondary.
- Lighting quantities are not recorded for each area of the home during installation. The current counts do not match the RTF categories, but are an average of savings values across multiple categories.

1.3.1 Impact Recommendations

The following impact recommendations are provided for Idaho Power’s consideration:

Ensure that all 2018 calculations are using the most updated potential study information and clearly referenced. We understand that a few of the 2017 calculations referenced the 2014 potential study, as the 2016 potential study was not final until April 2017. Upgrading at the beginning of the next program year is sufficient for these measures. In addition, the deemed values should be clearly sourced since the program is using a 20-year average for the proper residence type. This includes specifying the date range used for the average.

Update the savings calculator to use the RTF savings values out two decimal places. Rounding the deemed savings numbers to the whole kWh is affecting the accuracy of the measure savings, especially for 9 W and 6 W lighting categories where a high number of lamps are installed. Doing so will ensure that savings calculated by the program are more accurate.

Consider having installation contractors track the type of showerhead needed for savings calculations. The 2017 savings for showerheads was calculated using an underlying formula to assign showerheads as “primary’, “secondary”, or “any” instead of indicating specifics on the installation log. Adding one more column to the installation log spreadsheet would allow the installation contractor to indicate how many “primary” and how many “secondary” showerheads were installed in each unit. That would alleviate the need for the “any” category, which averages the savings amounts from “primary” and “secondary” and will improve savings accuracy as the number of units increases.

Consider having installation contractors track the area where 9 W lamps are installed. The 2017 savings for the 9 W lamps uses an average of the high use area and moderate use area savings values since contractors are not reporting actual installation location. Adding one more column to the installation log spreadsheet would allow the installation contractor to indicate how many lamps were installed in high use areas and how many were installed in moderate use areas, improving the accuracy of the savings estimates. This is particularly important as the number of units is expected to increase.

Work with the equipment supplier to investigate options for improved tracking of equipment distribution and provide a reduced cost to contractors that order directly. There are two contractors that are currently ordering supplies directly from the same vendor Idaho Power uses. However, contractors reported that the price is slightly higher for them to order directly as they do not get the bulk advantage that Idaho Power receives. In addition, as the program expands, it will be important for the program specialist to have clear counts on the inventory of program materials installed. The cleanest may be the invoices from the suppliers to the contractors for equipment they

[3] https://rtf.nwcouncil.org/measures

order directly for the Multifamily program. This will create a single process and minimize Idaho Power risk associated with the equipment use and storage.

1.3.2 Process Recommendations

The Idaho Power program specialist and installation contractors work well together to deliver the program to multifamily properties. Contractors indicated that the current process with screening and installation visits is working well to streamline the activity and reduce additional visits and burden on property managers and tenants. In general, communication and program processes are working well for contractors. They find the program materials to be professional, informative, and educational. The following process recommendations are provided for Idaho Power's consideration:

Expand the project tracking spreadsheet to contain more complete information. The tracking spreadsheet used for savings calculations is appropriate. However, the tracking for projects and contractors is not collected in a master spreadsheet. This could be problematic if someone other than the program specialist needed to access project information, and this will become more complicated as the program expands. Combining the separate information for evaluation purposes also exposed a few areas of potential errors. For instance, interviews with installation contractors revealed disagreement on who had served two sites. Contractors were not included with the projects but matched by region. The evaluation team has provided an example of a master tracking list of variables in Appendix C as well as an example spreadsheet. The tracking system can be as simple as an Excel spreadsheet, but should include the following information: property information (name, location, property manager contacts), the number of units served, dates of screening visits and installation, installation contractor (name, address, contact information), savings associated with each measure type installed and overall savings for the property, program year, region, and project status. We would not restrict the project status to those projects completed, but also include leads, those determined to be ineligible, projects in the screening phase, sites that declined to participate, and those in the installation phase.

Incorporate questions into customer surveys to gather feedback from Property Managers and tenants regarding the satisfaction with and benefits of the program. Gathering participant feedback was not within the scope of the current process evaluation, as Idaho Power already has multiple outreach methods for obtaining feedback from customers. However, it could provide additional insights into potential program improvements and keep the program on track as it expands.

2.0 INTRODUCTION

2.1 PROGRAM OVERVIEW

The Multifamily Energy Savings program began in March 2016 with a pilot project in Pocatello, ID. This was followed by direct install projects in Boise, ID and Twin Falls, ID in September and December 2016 respectively. There were measures directly installed at 73 units in Pocatello, 43 units in Boise, and 80 units in Twin Falls. Between all three projects, a total of 196 apartment units received the associated measures. 2017 was the first full year of operation for the program.

The Multifamily Energy Savings program supports property owners and managers in helping their residents save on monthly energy bills and increase residents' comfort, while improving the appearance of rental units, and adding value to their multifamily property. The program allows for the direct installation of energy-saving products in multifamily dwellings consisting of five or more rental units. In 2017, eligible buildings were required to have electric heating and water heating. For 2018, the program was adjusted to only require electric water heating.

The products installed are: ENERGY STAR® LED lightbulbs, thermostatic shut-off valve showerheads, kitchen and bathroom faucet aerators, and water heater pipe insulation. These are installed at no cost to the property owner/property manager or the tenant. To ensure energy savings and applicability, each building is pre-approved by the program specialist and contracted energy efficiency measure installation contractor. Items are installed at no cost to the property manager by an insured contractor. A representative from the property must accompany the installation contractor during the visits.

In 2017, 12 projects were completed as program participation increased. Between these projects, a total of 772 apartment units received measures. 2018 participation has been steady and on track to exceed 2017 participation. The table below shows the total number of measures installed in 2017.

Table 2-1. Multifamily Measures Installed in 2017

Activity	2017
Number of Projects	**12**
Number of Tenant Units	**772**
LEDs	12,101
Kitchen Aerators	672
Bath Aerators	819
Showerheads (Including Thermostatic Combo Measure)	685
Pipe Wrap	659

2.1.1 Marketing and Outreach

Idaho Power promotes the Multifamily program component via a number of methods including a web page specifically promoting the program and brochures mailed to landlords and property owners. Materials used on-site to alert tenants of dates and equipment to be installed were revised based on initial pilot participant feedback.

2.1.2 Tracking and Reporting

Idaho Power staff record interest from multifamily property managers and transfers this information to one of four contractors, depending on regional location, to conduct a walkthrough to determine eligibility and gather information on the number of measures needed. Installation log spreadsheets for each site are created by Idaho Power staff for the contractor and are used to record the quantity of each measure installed in each unit. Reasons for not installing measures are also tracked. Idaho Power analysts use these spreadsheets to calculate the energy savings for each location.

2.1.3 Evaluation Goals

The following impact valuation goals were addressed through the various evaluation activities:

- Determine and verify the energy impacts attributable to the 2017 program. Ex-ante savings estimates are determined using various sources including the Regional Technical Forum deemed savings, program technical reference manuals, lighting calculator, and internal/external engineering estimates.
- Provide credible and reliable program energy and non-electric impact estimates and ex-post realization rates attributed to each program for the 2017 program year with a 90/10 confidence and precision.
- Report findings and provide recommendations that enhance the effectiveness of future ex-ante savings analysis and the accurate and transparent reporting of program savings.

Because the program is new, a process evaluation was also conducted for the Multifamily program with the following objectives:

- Evaluate program design including program mission, logic, and use of industry best practices.
- Evaluate program implementation including quality control, operational practice, and outreach.
- Evaluate program administration including program oversight, staffing, management, training, documentation, and reporting.

Additional researchable issues were identified during the program staff interviews:

- Are there ways to streamline the current processes? Any processes that can be discontinued?
- Do contractors have enough bandwidth to handle increased volume if the program expands?
- How does the tracking system accommodate activity entry and tracking for the program?

2.1.4 Evaluation Activities

The process and impact evaluation activities for the Multifamily Energy Savings program are summarized in the table below. Researchable issues and the sampling strategy for desk reviews are also discussed in this section.

Table 2-2. Multifamily Program Evaluation Activities

Activity	Sample Size	Objective
Interviews with implementation staff	1	Understand program design and delivery. Obtain program staff perspective on program successes and challenges. Identify researchable issues.
Review of program materials	NA	Provide feedback on documentation, quality control, project tracking, and use of best practices.
Process interviews with installation contractors	4	Contractor interviews were conducted to understand product ordering, interaction with customers, ability to handle additional projects, and communication. The interview guide can be found in Appendix A.
Tracking system review	2017 tracking database	The tracking system was reviewed to determine if all necessary inputs were tracked, if tabs rolled up to the overview correctly, and if reporting tools contained sufficient information for program review.
Impact review	204 of 772 units Covering all four contractors	Determine the program level energy impacts through an engineering desk review of savings calculators from RTF and confirm the installation log and tracking data for a sample of installation logs and invoices.

3.0 IMPACT EVALUATION RESULTS

The impact evaluation sought to answer the following researchable issues:

- What were the energy impacts attributable to the 2017 program?
- How accurate are the savings and what are the realization rates attributable to the 2017 program?
- How can the reporting of savings improve and become more transparent?

3.1 METHODOLOGY

The impact methodology consisted of the four primary evaluation activities shown in Figure 3-1. Each activity is explained in more detail below.

Figure 3-1. Process for Verifying Program Savings

3.1.1 Program Documentation and Tracking Review

The first step in the evaluation of the Multifamily program for program year 2017 was to review the program documentation and energy savings tracking system provided by Idaho Power. To review tracking data, Tetra Tech applied a census approach to the review of the savings tracked in the program's tracking spreadsheet. The census approach avoids sampling error, resulting in an outcome that exceeds the minimum 90 percent ± 10 percent confidence and precision required of the evaluation findings.

The tracking system was provided to the evaluation team in an excel spreadsheet and included a summary worksheet with counts of measures installed at each individual apartment unit that the program served. An amount of kWh savings was given for each individual measure. The verification of these kWh savings amounts was the first objective of the evaluation team.

3.1.2 Verify kWh Savings Amounts

To verify the savings amounts, the evaluation team retrieved savings calculators from the appropriate online sources. The sources of the calculators that were used by Idaho Power were noted in the column headers for each individual measure in the summary spreadsheet. For instance, the kWh savings number for the 9 W bulb – 800 lumens came from the RTF V4.2 calculator. Additionally, the notes in the column header also describe the installation and usage rate, which directly affect the kWh savings number that was looked up and used from the calculators.

Tetra Tech retrieved the appropriate calculators from the Regional Technical Forum (RTF) website.[4] Calculators for residential lighting, showerheads, and thermostatic shower restriction valves were downloaded for this verification activity. The kWh savings for the remainder of the measures installed through the multifamily program (kitchen and bath aerators and pipe wrapping) were verified through the AEG 2014 potential study.

3.1.3 Check Savings Calculations

Once kWh savings were verified for the measures that were installed through the Multifamily program, the verification of kWh savings calculations was performed.

Tetra Tech selected six out of the twelve projects that were completed through the Multifamily program in 2017. At least one project was selected from each of the four contractors that worked as part of the Multifamily program with the largest project in terms of housing units served, selected for evaluation.

Table 3-1. Units Reviewed for Savings Calculation Accuracy

Apartment Name	Units	Contractor
Site 1 – Twin Falls	36	Home Energy Management
Site 2 - Hailey	42	Home Energy Management
Sire 3 - Pocatello	70	Savings Around Power
Site 4 - Boise	162	Momentum, LLC
Site 5 - Boise	24	Momentum, LLC
Site 6 - Nampa	204	Metro Contractor Services
Total Units	**538**	

These projects were used to confirm the accuracy of the claimed quantities for each unit as well as to confirm energy savings claimed by the program. The analysis was combined with the technical savings analysis for each measure to create a realization rate for each project.

First, the evaluation team verified the kWh savings calculations from the summary sheet for all six sampled projects. This was completed by taking the quantity of measures installed from the summary worksheet in the tracking system and multiplying that number by the savings for each measure that was verified from the calculators in the previous step. The resulting savings numbers were compared to the savings numbers that were calculated by Idaho Power. In addition, the numbers of measures installed at each individual apartment unit for each of the six sampled projects were taken from their individual project sheets within the tracking system. These numbers were multiplied by the savings verified from the savings calculators and were compared to the savings numbers that were calculated by Idaho Power.

3.1.4 Review Materials Invoices

Once the kWh savings were verified for each of the six sampled projects, an invoice review was completed to verify that the actual number of measures installed through the program were purchased and tracked by the Idaho Power Program Specialist and to verify that the correct measure attributes were used when calculating savings through the calculators. This was completed by verifying that the total number of measures installed through the program, as noted in the tracking system, was less than or equal to the total number of each individual measure documented in the program invoices. In

[4] https://rtf.nwcouncil.org/measures

addition to verifying the quantity of measures bought, the invoices were also used to verify that the equipment purchased were identical to what were looked up in the calculators for kWh savings verification purposes.

3.2 IMPACT REVIEW RESULTS

Overall, findings from the impact evaluation show the program savings calculations are reasonable. The evaluation found just one transcription error in the summary tracking spreadsheet or individual project tracking spreadsheets, resulting in the following realization rates for all measures included in the Multifamily program and an overall realization rate of 84 percent.

Table 3-2. Realization Rates

Measure	Ex-Ante kWh	Ex-Post kWh	Realization Rate[5]
9 W Bulb - 800 lumens	90,448	90,448	100%
15 W Bulbs - 1600 lumens	28,920	28,920	100%
6 W Globes - 450 lumens	61,264	61,264	100%
11 W Reflectors - 850 lumens	61,993	61,993	100%
6.5 W Decorative - 325 lumens	5,691	5,691	100%
Kitchen Aerator	71,232	43,116	61%
Bath Aerator	86,814	52,547	61%
Showerhead	105,922	105,922	100%
Thermostatic Combo	6,408	6,408	100%
Water Heater Pipe Wrap	98,850	60,154	61%
Total Savings	**617,542**	**516,463**	**84%**

Although they are not errors, there are a few areas the evaluation team would like to mention where Idaho Power can increase the accuracy of their savings estimates.

- While the savings values in the RTF are out to two decimal places, the Idaho Power calculations round savings values to the nearest whole number.
- Designation of primary and secondary showerhead status is not recorded at the time of installation. It is assigned using a formula based on number of bathrooms and showerheads installed. The “Any” category and savings value used in the spreadsheet is an average of primary and secondary savings values.
- Lighting quantities are not recorded for each area of the home during installation. The current counts do not match the RTF categories, but are an average of savings values across multiple categories.

3.2.1 Savings Inputs

The individual measure calculators provided a table of kWh savings for each combination of measure attributes, usage rate, and installation type. The evaluation team noted that this information was

[5] Reductions to the realization rates for kitchen and bath aerators and the pipe wrap were all based on the use of single-family instead of multifamily unit savings values.

provided by Idaho Power in the column headers in the summary page of the tracking system excel spreadsheet. The evaluation team looked up the kWh savings in the calculator savings tables to verify that the correct kWh savings from the RTF was used in the tracking system. The evaluation team found that Idaho Power did indeed look up and use the correct kWh savings for all residential lighting, showerheads, and thermostatic shower restriction valves. The only concern that the evaluation team came across when verifying the kWh savings values was that Idaho Power did seem to round to the nearest kWh. For example, for the 9 W bulb – 800 lumens, the measure description in the tracking system reads – “RTF. V4.2. Direct Install - LED General Purpose. 250 to 1049 lumens. Avg of High & Moderate Use”. From this measure description, the evaluation team needed to retrieve the kWh savings for high and moderate use lamps and average them together. Again, the kWh savings was looked up correctly by Idaho Power with the high use bulb saving 22 kWh and the moderate use saving 10 kWh. When averaging these savings together, the result is 15.9 kWh compared with 16 kWh used in the savings calculations. While this difference only works out to be 0.1 kWh, there were additional examples of rounding that were more substantial. In the case of the 6 W LED Globe lamps, the difference in kWh savings between the calculator (13.67 kWh) and the kWh savings used in the tracking system (14 kWh) is approximately 0.33 kWh per lamp. Additional detail on the rounding differences can be found in Appendix B.

The deemed savings values from the remaining three measures, kitchen aerators, bath aerators, and water heater pipe wrap, were sourced from the 2014 Potential Study. Kitchen and bath aerators used a 20-year average value of 106 kWh – the single-family value – not the multifamily value of 64 kWh. Water heater pipe wrap savings was also calculated using the single-family 20-year average of 150 kWh, not the multifamily value of 91 kWh. The 20-year average range was not specifically noted as well, which would provide more accuracy if recorded in future calculators. These changes resulted in a realization rate of 61 percent for each of the three measures using the 2014 Potential Study as a source.

3.2.2 Savings Accuracy

Once the evaluation team verified that the correct kWh savings were used in the tracking system, the next step was to verify savings calculations for all installed measures through the Multifamily program. The savings calculation was performed for six of the sampled projects both through the summary worksheet in the tracking system and through the individual project tracking sheets within the tracking system excel spreadsheet. The evaluation team found that Idaho Power was consistent in calculating kWh savings for all aerators, thermostatic shower restriction valves, and pipe wrap measures.

The only complication that the evaluation team encountered was that Idaho Power averaged savings across a few RTF categories for 9W bulbs and showerheads installed through the Multifamily program. Details are provided in the Lighting and Showerheads sections below.

Lighting

As previously mentioned, 9 W LED lamps at 800 lumens were installed through the program and the savings associated with these lamps were averaged between a high and moderate use category because installation areas were not recorded. In the RTF calculator that was used to calculate program savings, lamps are classified as high use when they are installed in a family room, kitchen, or living room fixture whereas moderate use lamps are those that are installed into all other rooms, except for closets.

Figure 3-2. Current Lighting Columns – From Installation Log Excerpt

FLOOR PLAN	STANDARD 9w LED bulbs (A19) installed	PATIO/ ENTRY 15w LED bulbs bulbs (A21) installed	GLOBES 6w LED globes installed	CANS 11w LED can lights installed	SCONCES 6.5w LED small base installed
3 Bed - 2 bath Townhome	9	1	20	4	3
2 bed - 1 bath	9	1	12	4	1

While Idaho Power averaged high and moderate use savings correctly, there could be greater accuracy achieved in the savings calculation by having contractors record the number of lamps installed under high and moderate use categories while on site, and then carrying that distinction through when calculating savings in the tracking system. Doing so would also alleviate the problem of not using the exact savings numbers that are found in the lighting calculator.

Figure 3-3. Suggested Lighting Columns – From Installation Log Excerpt

FLOOR PLAN	STANDARD High Kitchen/Family/ Living rm 9w LED bulbs (A19) installed	STANDARD Moderate All other except closets 9w LED bulbs (A19) installed	PATIO/ ENTRY 15w LED bulbs bulbs (A21) installed	GLOBES 6w LED globes installed	CANS 11w LED can lights installed	SCONCES 6.5w LED small base installed
3 Bed - 2 bath Townhome	3	6	1	20	4	3
2 bed - 1 bath	4	5	1	12	4	1

Showerheads

As with the lighting, the way showerheads are recorded on the installation log does not directly match how they are referenced in the RTF for savings values. The tracking system summary sheet shows that there are three possible kWh savings numbers that can be used in the calculation for showerhead savings. The correct value to use is prescribed by which shower the showerhead is installed in (primary, secondary, or any). While the summary worksheet in the tracking system did note this information, the individual worksheets for each project did not. Leaving this information out of the individual worksheets made it difficult to follow and confirm which value was used to calculate the kWh savings. It was determined that the calculation in the spreadsheet compares the number of showerheads installed with the number of bathrooms to assign “primary”, “secondary”, and “any”, which are used to apply savings. However, when noting the distinction in showerheads from the summary spreadsheet, it was confirmed that Idaho Power was using the correct kWh savings in the calculation of showerhead savings.

Figure 3-4. Current Showerhead Column – From Installation Log Excerpt

FLOOR PLAN	kitchen aerator installed (y/n)	# bathroom aerators installed	# shower heads installed	pipe wrap installed
3 Bed - 2 bath Townhome	1	2	2	1
2 bed - 1 bath	1	2	1	1

Similar to the tracking of the 9 W lamps, one additional column could be added to the installation log to capture the number of "primary" and "secondary" showerheads that would eliminate the need for a formula and the averaged "any" category.

Figure 3-5. Suggested Showerhead Columns – From Installation Log Excerpt

FLOOR PLAN	kitchen aerator installed (y/n)	# bathroom aerators installed	# Primary showerheads installed	# Secondary showerheads installed	pipe wrap installed
3 Bed - 2 bath Townhome	1	2	1	1	1
2 bed - 1 bath	1	2	1	0	1

3.2.3 Invoice Review

A review of the invoices for the purchase of measures installed through the Multifamily program was the last step in the evaluation process. The invoices available for review included the Idaho Power purchased materials for the Multifamily program and at least one other program. In addition to these purchases, two contractors did their own purchasing, although those invoices were not available. Because the invoices were not available, the evaluation team attempted to identify purchases of equipment that exceeded the quantity claimed in the program.

Of the measures listed in the invoices provided, four of the five different LED light bulb types and both types of aerators were found to have more units purchased than what the tracking system noted was installed through the program. Conversely, there was no record of any 6.5 W decorative lamps in the invoices provided. For showerheads, thermostatic shower restriction valves, and pipe wrap, the total number recorded in the program's invoices were less than the number that were noted to be installed through the program in the tracking system. Tetra Tech has encountered instances where contractors take advantage of lenient tracking protocols in other programs to redirect equipment or funds. Although we do not believe that is the case at this point, a tighter tracking process will ensure it does not become an issue.

The invoice review also had the evaluation team investigating whether the measures reported in the invoices matched the measure attributes that were noted in the tracking system. When comparing these two pieces of documentation, the evaluation team found that the purchased equipment met measure attributes.

3.3 IMPACT RECOMMENDATIONS

The following impact recommendations are provided for Idaho Power's consideration:

Ensure that all 2018 calculations are using the most updated potential study information and clearly referenced. We understand that a few of the 2017 calculations referenced the 2014 potential study, as the 2016 potential study was not final until April 2017. Upgrading at the beginning of the next program year is sufficient for these measures. In addition, the deemed values should be clearly sourced since the program is using a 20-year average for the proper residence type. This includes specifying the date range used for the average.

Update the savings calculator to use the RTF savings values out two decimal places. Rounding the deemed savings numbers to the whole kWh is affecting the accuracy of the measure savings, especially for 9 W and 6 W lighting categories where a high number of lamps are installed. Doing so will ensure that savings calculated by the program are more accurate.

Consider having installation contractors track the type of showerhead needed for savings calculations. The 2017 savings for showerheads was calculated using an underlying formula to assign showerheads as “primary’, “secondary”, or “any” instead of indicating specifics on the installation log. Adding one more column to the installation log spreadsheet would allow the installation contractor to indicate how many “primary” and how many “secondary” showerheads were installed in each unit. That would alleviate the need for the “any” category, which averages the savings amounts from “primary” and “secondary” and will improve savings accuracy as the number of units increases.

Consider having installation contractors track the area where 9 W lamps are installed. The 2017 savings for the 9 W lamps uses an average of the high use area and moderate use area savings values since contractors are not reporting actual installation location. Adding one more column to the installation log spreadsheet would allow the installation contractor to indicate how many lamps were installed in high use areas and how many were installed in moderate use areas, improving the accuracy of the savings estimates. This is particularly important as the number of units is expected to increase.

Work with the equipment supplier to investigate options for improved tracking of equipment distribution and providing a reduced cost to contractors that order directly. There are two contractors that are currently ordering supplies directly from the same vendor Idaho Power uses. However, contractors reported that the price is slightly higher for them to order directly as they do not get the bulk advantage that Idaho Power receives. In addition, as the program expands, it will be important for the program specialist to have clear counts on the inventory of program materials installed. The cleanest may be the invoices from the suppliers to the contractors for equipment they order directly for the Multifamily program. This will create a single process and minimize Idaho Power risk associated with the equipment use and storage.

4.0 PROCESS EVALUATION RESULTS

Because the program is new, with a pilot in 2016 and the first full year of activity in 2017, a process evaluation was also conducted for the Multifamily Energy Savings program. The process evaluation served as a check on the program design compared with industry best practices, marketing and outreach, the implementation process, contractor engagement and quality control, and program administration and tracking.

The process evaluation sought to answer the following researchable issues:

- Is the program design following industry best practice?
- How successful is the program implementation in terms of staffing, quality control, management, communication, and outreach?
- Are there ways to streamline the current processes?
- How does the tracking system accommodate activity entry and tracking for the program?

4.1 METHODOLOGY

The evaluation team conducted a number of activities in order to address the key process evaluation questions. First, we reviewed the program documentation, including the program description, 2017 reporting, and all materials used at the project sites (door hangers, brochures, and showerhead instruction cards). There is no documented logic model or process flow for the Multifamily program.

Figure 4-1. Process for Reviewing Program Processes

After the documentation review, we collected program tracking information from the program specialist. This included files such as the 2017 and 2018 list of projects completed as well as the contractor contact information.

The last step in the process review was to conduct interviews with the four installation contractors. They were asked to characterize their organization and role in the program as well as provide feedback on how they felt processes were implemented, communication effectiveness, and tracking ease.

4.2 PROCESS REVIEW RESULTS

The process evaluation activities indicate the program is operating smoothly for the first full year following a pilot year, with just a few opportunities for improvement, mostly associated with project tracking.

4.2.1 Program Documentation

The program description is complete and details the program delivery process. Materials provided to property managers have been revised since the program pilot and are professional, educational, and informative.

Tenant notification door hangers are provided to the property managers in advance of the screening and installation visits. The door hangers indicate when the direct installation will occur and what energy saving equipment will be installed.

Upon completion of the direct install visit, contractors leave behind materials provided by Idaho Power. Showerhead usage cards describe how to use the thermostatic showerheads. Leave-behind brochures provide additional detail on what was done, who to call with questions, and additional energy saving tips. A direct install survey postcard is also furnished to encourage tenants to provide feedback on the service provided. At the time of the evaluation, the program specialist reported that not many of the 772 tenants had completed and returned the postcard.

4.2.2 Program Tracking

As part of the process evaluation, we looked at how the projects were tracked and what information was collected. We received three files from the program specialist: a 2017 list of completed projects, a 2018 list of completed projects, and an email with the contractor contact information. Savings data are tracked in a separate file containing a program summary spreadsheet as well as individual spreadsheets containing installation details for each project.

Figure 4-2. Multifamily Energy Savings Program Files Reviewed

"MFDI Completed Jobs" spreadsheet	Participant Information	"2017 Multifamily Savings" spreadsheet	Contractor Information
• Property name • Region • City • Units • Date range	• Property name • Contact name • Address • Phone • Email	• Property name • Measure columns with quantities • Measure columns with savings • Individual log sheets for each complex	• Company name • Contact name • Phone • Address • Region

While the 2017 and 2018 project lists are clean summaries of completed projects for 2017, they do not track as much detail as we are accustomed to seeing in a typical program tracking spreadsheet or database. Separate files also increase the likelihood of tracking errors and missing information. For example, to match up information, key variables were required such as “Complex name” and “Region” shown in Figure 4-2 above. This was sufficient in most cases. However, during interviews with contractors, one contractor reported working at two properties that matched to another contractor based on Region. Entering that information for each property will result in fewer errors than matching separate files on key variable.

The layout of the file also makes it difficult to filter on a region, date range, or other information to understand participation and efficiently report. To understand which contractors provided installation services and what each property received, the evaluation team compiled the individual information into a master tracking spreadsheet. The list below outlines what the evaluation team would anticipate as part of a typical program tracking spreadsheet.

- Program Year
- Status (e.g. Lead, Ineligible, Screening, Declined, Installing, Completed)
- Property Name

- Units Served (may track units at complex as well as units served)
- Property Address
- Property Contact Name
- Property Contact Phone
- Property Contact Email
- Region
- Contractor Name
- Contractor Contact Name
- Contractor Contact Phone
- Contractor Contact Email
- Screening visit date
- Installation visit date
- Installation counts by measure
- Savings by measure
- Total savings

When tracking the project status, we would recommend not restricting the tracking spreadsheet to completed projects only. For a program of this size, it is often useful to track projects that are in process, especially with the eligibility requirements and screening visit. It may also be useful to track properties that were eligible but ultimately declined the service.

Because of the relatively low participation in the program, a rolling tracking spreadsheet could be used by including a program year variable. Reporting by program year could be done using a simple filter and in addition to annual savings might show how contractors have contributed over multiple program years, if some property owners are more active than others, and what is in the pipeline.

4.2.3 Contractor Characteristics

Idaho Power is currently working with four installation contractors, each serving a specific region. Three of the four contractors work closely with weatherization agencies, while the fourth's primary business activity is conducting audits and HERS ratings for residential new construction. Each contractor has completed multiple projects in both 2017 and 2018. Two of the four contractors source their supplies from Idaho Power storage, but the other two order directly from the same supplier as Idaho Power.

Table 4-1. Contractor Summary Characteristics

Contractor	Type	Region	2017 Projects	2018 Projects	Materials
Momentum LLC	NC	Capital	5 (300 units)	8 (301 units)	From Idaho Power storage
Savings Around Power (SEICAA)	Wx	Eastern	3 (150 units)	5 (168 units)	Order directly
Home Energy Management	Wx	Southern	2 (78 units)	4 (122 units)	1st from Idaho Power, now from same provider
Metro Contractor Services	Wx	Canyon/West	2 (244 units)	6 (134 units) some pending	Inventory from Idaho Power

All four contractors have worked with other Idaho Power programs and program specialists. That is how they all learned of the Multifamily program and were asked to provide installation services.

For three of the contractors, the installations through the Multifamily program represent less than 10 percent of their workload. The fourth contractor indicated the Multifamily work represented a much higher proportion of their work during the year. Three of the four contractors indicated they had the capacity to complete more projects if the program expanded and volume increased.

4.2.4 Communication and Support

Contractors have been working with Idaho Power on other programs and have developed good working relationships with Idaho Power. The pilot process helped to work out any issues and communication between the Idaho Power program specialist and the contractors is working well. Contractors had nothing but good things to say about the support from Idaho Power and how they interact with the program specialist. They find it reasonable that Idaho Power takes the lead on getting projects started and is appreciative that Idaho Power includes them as part of the screening visit so they can establish a relationship with the property manager. In addition, one of the contractors mentioned that Idaho Power took their recommendation for different pipe wrap into consideration and eventually upgraded to a better product.

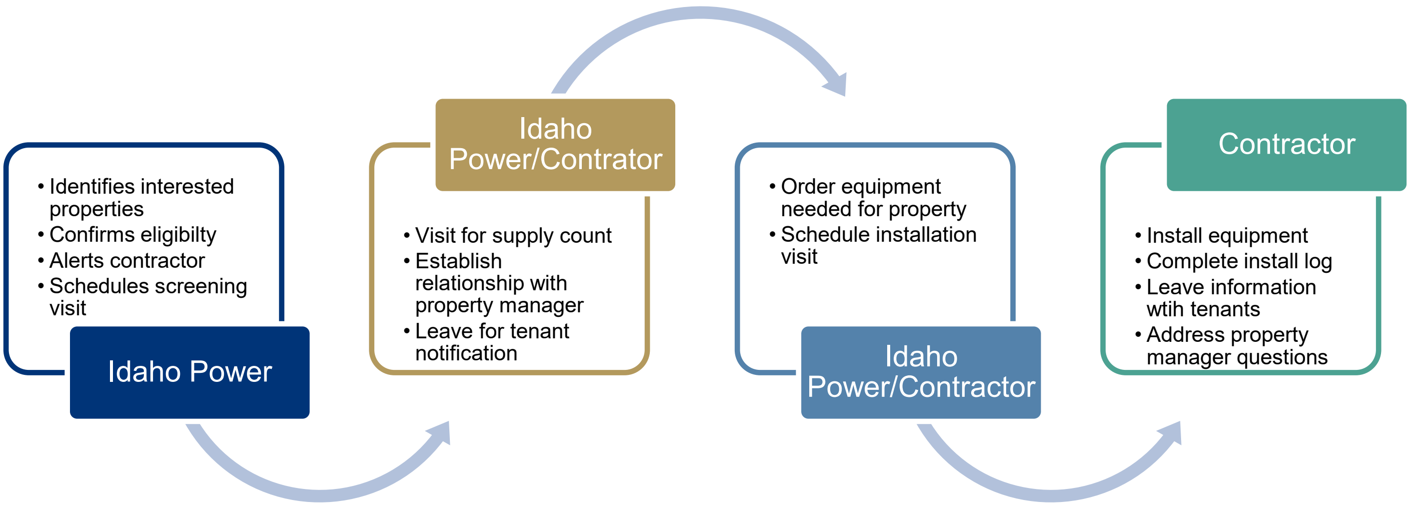
So far, the program specialist reports that most of the activity has been generated through word of mouth between property managers. Idaho Power marketing has set up a “promo pod” with a link to the website with program information and Facebook ads have been used. Contractors associated with community action agencies and weatherization programs are able to provide suggestions to the Idaho Power program specialist regarding potential properties that may benefit from the program.

While the current contractors are now comfortable with how the program works, they did learn a few things from their first few projects. Contractors suggested that new contractors take time to prepare a calendar and timeline for each project so that their presence impacts the property for as short a time as possible. In addition, due to the type of customers served by the program and the multifamily nature, contractors need to be flexible and patient, preparing for property manager changes and schedule changes.

4.2.5 Program Processes

The program does not currently have a logic model or process flow to review. However, the process is outlined in Figure 4-3.

Figure 4-3. Multifamily Energy Savings Program Process Overview



The Idaho Power program specialist identifies interested multifamily properties and checks them against eligibility requirements of the program. Once they are determined to be eligible, the program specialist alerts the contractor in the region and schedules the screening visit at the property. Once there, the Idaho Power program specialist and contractor confirm eligibility, establish a relationship with property manager, and collect material counts. The screening visit also enables contractors to understand potential installation barriers and talk with property managers about working with tenants to resolve them if possible before the installation visit. Materials are left with the property manager to alert tenants of the installation visit.

Next, the contractors will order their equipment directly from Idaho Power's supplier or collect equipment from Idaho Power stock. Materials are either ordered directly from a supplier or taken from Idaho Power inventory. It is slightly more costly for contractors ordering directly from the supplier, as they do not get the "bulk" discounts that Idaho Power gets, but it is more convenient for a couple of them. They then schedule the installation visit with the property manager. Most contractors have evolved their installation visit process to take a team of two to six installers so they can get through the property in one day, reducing the burden on the tenants and the property manager who must accompany them.

Finally, the contractors install the equipment and populate the installation log, leave behind program materials including a showerhead instruction card and feedback postcard, and address any property manager questions. Contractors believe this process, particularly the screening visit, greatly improves the experience for everyone involved and results in fewer visits to properties.

4.3 PROCESS RECOMMENDATIONS

The following recommendations are provided for Idaho Power's consideration:

Expand the project tracking spreadsheet to contain more complete information. The tracking spreadsheet used for savings calculations is appropriate. However, the tracking for projects and contractors is not collected in a master spreadsheet. This could be problematic if someone other than the program specialist needed to access project information, and this will become more complicated as the program expands. Combining the separate information for evaluation purposes also exposed a few areas of potential errors. For instance, interviews with installation contractors revealed disagreement on who had served two sites. Contractors were not included with the projects but matched by region. The evaluation team has provided an example of a master tracking list of variables in Appendix C as well as an example spreadsheet. The tracking system can be as simple as an Excel spreadsheet, but should include the following information: property information (name, location, property manager contacts), the number of units served, dates of screening visits and installation, installation contractor (name, address, contact information), savings associated with each measure type installed and overall savings for the property, program year, region, and project status. We would not restrict the project status to those projects completed, but also include leads, those determined to be ineligible, projects in the screening phase, sites that declined to participate, and those in the installation phase.

Incorporate questions into customer surveys to gather feedback from Property Managers and tenants regarding the satisfaction with and benefits of the program. Gathering participant feedback was not within the scope of the current process evaluation, as Idaho Power already has multiple outreach methods for obtaining feedback from customers. However, a customer survey could provide additional insights into potential program improvements and keep the program on track as it expands.

APPENDIX A: CONTRACTOR INTERVIEW GUIDE

IDAHO POWER MULTIFAMILY ENERGY EFFICIENCY PROGRAM

INSTALLATION CONTRACTOR INTERVIEW GUIDE

In-depth interviews will be conducted by senior Tetra Tech staff via telephone. The interviews will be semi-structured. Therefore, the following interview protocol is only a guide to ensure certain topics are covered, but evaluators will follow the flow of the interview and modify questions as needed to fit the interviewee's circumstance and flow of conversation.

This guide will be used to understand the perspectives of installation contractors involved with the Idaho Power Multifamily Energy Efficiency Program during 2017-2018. We expect the interviews to take approximately 30 minutes. We will attempt to schedule interviews with respondents in advance to accommodate each contractor's schedule.

A. Background

The program began in March 2016 with a pilot project in Pocatello, ID. This was followed by direct install projects in Boise, ID and Twin Falls, ID in September and December 2016 respectively. There were measures directly installed at 73 units in Pocatello, 43 units in Boise, and 80 units in Twin Falls. Between all three projects, a total of 196 apartment units received the associated measures.

The Multifamily Energy Savings program provides for the direct installation of energy-saving products in multi-family dwellings consisting of five or more rental units. In 2017, eligible buildings were required to have electric heating and water heating. For 2018, the program was adjusted to only require electric water heating.

The products installed are: ENERGY STAR® LED lightbulbs, high-efficiency showerheads, kitchen and bathroom faucet aerators, and water heater pipe insulation. These are installed at no cost to the property owner/property manager or the tenant. To ensure energy savings and applicability, each building is pre-approved by the contracted energy efficiency measure installation contractor. A representative from the property must accompany the installation contractor during the visits.

NOTE TO INTERVIEWER: Check the sample information and website for each contractor prior to calling.

B. Introduction

Hello, may I speak to [______]? My name is ______, and I'm calling from Tetra Tech on behalf of Idaho Power. We are conducting interviews with firms that install equipment and provide services through the Multifamily Energy Efficiency Program to get their feedback on the program, including what worked well and what improvements you might recommend.

Are you the best person at [COMPANY] to talk to about experience with Idaho Power's Multifamily program?

1 Yes -> [Continue]
2 No -> Can you tell me who I should speak with?

The interview should last less than 30 minutes. The information you provide will be treated as confidential and will help Idaho Power improve their program in the future.

Is this a convenient time for you to talk, or would you prefer to schedule another time?

[If needed: Offer the contact name from below as the person to contact with any questions about the validity of this research.]

Name	Phone #
Becky Arte-Howell	208-388-2785

With your permission, I would like to record the interview. Do I have your permission to do so?
[IF NEEDED: We will use the recording to help us compile the results, in order to make sure we accurately represent your responses. No one but Tetra Tech staff will listen to the recording.]

C. Business Scope

I understand from viewing your website that your company… (Overview what was found through website search. Then start as needed with questions below.)

1) I have a few additional questions about your business. Could you tell me…

- How long have you been in business?
- How many employees (full-time equivalents) does your company employ?
- What market does your firm typically serve? For example: residential, commercial, industrial, multifamily, etc.

2) What proportion (or percent) of your total projects in 2017 did the projects completed through Idaho Power's Multifamily program represent?

3) For 2018, do you expect this percentage to be higher, lower, or about the same?

1 Higher -> Why is that? How many more projects are you staffed to handle?
2 Lower -> Why is that?
3 About the same

D. Program Awareness, Marketing, and Recruitment

1) When did you first get involved with the Idaho Power Multifamily program?
- How did you first hear about it?
- Who do you get most of your program information from?

2) Do you feel adequately informed of program requirements and/or changes?

1 Yes -> What communication method is working best for you?
2 No -> How would you like to be better informed of program requirements and/or changes?

3) Are you aware of other Idaho Power (or other utility) energy efficiency programs?

1 No
2 Yes -> Which ones?
Do you have any involvement with these programs? Why or why not?

E. Participation Process and Support

For Interviewer: Number of projects per year and geographic location

# of 2017 projects:	
# of 2018 projects:	
Area:	

1) We understand this program consists of a screening visit where you determine eligibility and collect counts for items as well as a separate installation visit. Phone screening is not allowed. Is that correct?
- If NOT: What is the current process you follow?
- Who schedules the screening visit?
- Who schedules the installation visit?

2) Please describe the typical screening visit process…
- What do you look for during the screening visit?
  How many sites do not pass the screening visit?
- What is the benefit of the onsite screening visit?
- What are the pros and cons of screening over the phone?

3) Please describe the typical installation visit process…
- What are common barriers to installing items?
- What processes work well during the installation visits?
- Do you think the updated site materials (door hangers and shower cards) helped with tenant cooperation?

4) What type of reporting is required once you complete the installation visit?

5) Next I'm going to ask you a few scale questions. First, using a scale of 1 to 5 where 1 is "not at all satisfied" and 5 is "very satisfied," how satisfied are you with the program's technical support?

- [IF RATING IS A 1 OR 2, ASK] What could be done to improve the program's technical support?

6) On a scale of 1 to 5 where 1 is "not at all difficult" and 5 is "very difficult," how would you rate the program's administrative requirements (e.g., paperwork) for you?

- [IF RATING IS A 4 OR 5, ASK] What could be done to improve these requirements and/or process?

7) Thinking of a typical Idaho Power Multifamily project…
- What is the easiest part of the process?

- What is the most challenging?

8) Are there any energy saving opportunities that you identify during the visit that are not covered through the Multifamily program? Which are most common?

9) Is there anything in the current market or coming soon that would affect program participation, either positively or negatively? What are they? [PROBE: example issues (e.g., changes to building codes and standards, market for MF housing, low income requirements, etc.)].

G. Overall Program

Now I'd like to wrap up with a few final questions.

1) Using a five-point scale where 1 means "not at all satisfied," and 5 means "very satisfied," overall, how satisfied are you with Idaho Power's Multifamily Energy Efficiency program?

2) If you were to recommend anything to Idaho Power regarding the program design or operations, what would it be?

3) Is there anything else you'd like to share with us about Idaho Power's Multifamily Energy Efficiency program?

4) In case we would like to clarify anything we discussed, would it be alright if I contacted you again? If YES, get best phone number and email address

Those are all the questions I have today. If you think of anything you would like to add, please feel free to contact us. Thank you very much for your time.

APPENDIX B: DETAILED IMPACT TABLE

Measure In Tracking System	Measure in Calculator	Calculator Savings (kWh/yr)	Final Calculator Savings (kWh/yr)	Tracking System Savings (kWh/yr)	Quantity Installed
9W 800 lumens - Direct Install - LED General Purpose. 250 to 1049 lumens. Avg of High & Moderate Use.	Direct install - High Use_LED_General Purpose, Dimmable, and Three-Way_250 to 1049 lumens	21.55	15.90	16	5,653
	Direct install - Moderate Use_LED_General Purpose, Dimmable, and Three-Way_250 to 1049 lumens	10.25			
15W 1600 lumens - Direct Install - LED General Purpose. 1490 to 2600 lumens. Exterior.	Direct install - Exterior_LED_General Purpose, Dimmable, and Three-Way_1490 to 2600 lumens	60.10	60.10	60	482
6W Globes 450 lumens - Direct Install - LED Globe. 250 to 1049 lumens. Moderate Use.	Direct install - Moderate Use_LED_Globe_250 to 1049 lumens	13.67	13.67	14	4,376
11W Reflectors 850 lumens - Direct Install - LED Reflectors and Outdoor. 250 to 1049 lumens. High Use.	Direct install - High Use_LED_Reflectors and Outdoor_250 to 1049 lumens	46.88	46.88	47	1,319
6.5W Decorative 325 lumens - Direct Install - LED Decorative and Mini-base. 250 to 1049 lumens. Moderate Use.	Direct install - Moderate Use_LED_Decorative and Mini-Base_250 to 1049 lumens	21.48	21.48	21	271
Thermostats					
Thermostatic Combo - Measure_Table tab. Residential. Electric Resistance. Direct Install. 1.75 gpm.	Residential_Direct install_Valve and 1.75 gpm showerhead_Electric resistance DHW - Water Heating	256.48	266.64	267	24
	Residential_Direct install_Valve and 1.75 gpm showerhead_Electric resistance DHW - Water Treatment	10.15			
Showerhead Savings - Residential Showerhead Replacement. Electric Water heat. Direct Install. 2.0 gpm. Combined Water heating and water treatment savings. Primary	Residential Showerhead Replacement_2_00gpm_Primary Shower_ Electric Water Heating_Direct Install	182.29	182.29	182	465

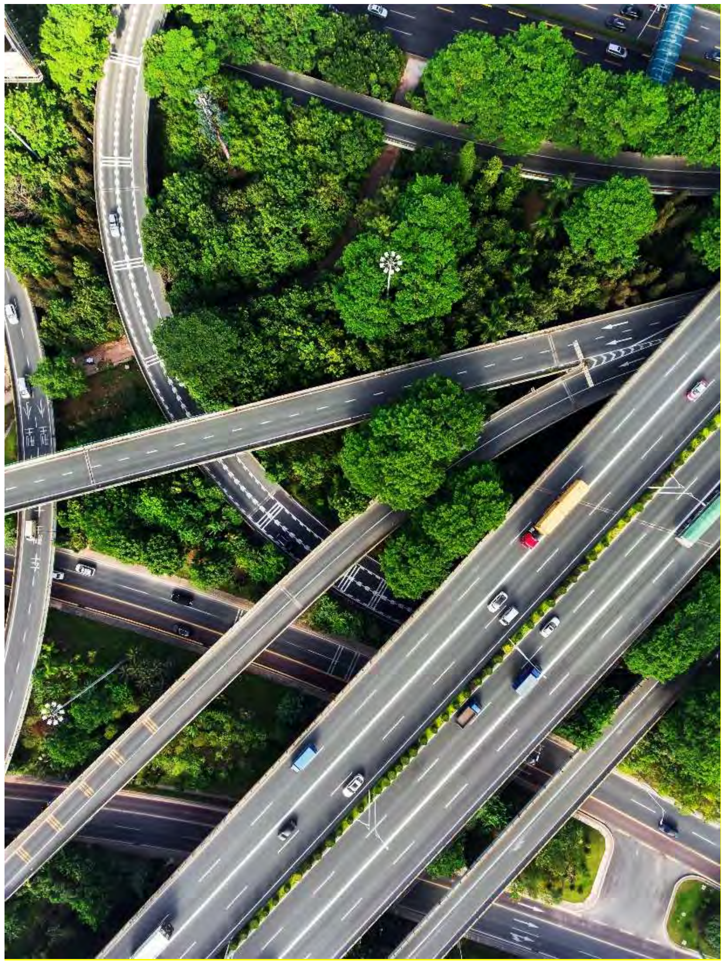
Showerhead Savings - Residential Showerhead Replacement. Electric Water heat. Direct Install. 2.0 gpm. Combined Water heating and water treatment savings. Any	Residential Showerhead Replacement_2_00gpm_Any Shower_ Electric Water Heating_Direct Install	145.08	145.08	145	64
Showerhead Savings - Residential Showerhead Replacement. Electric Water heat. Direct Install. 2.0 gpm. Combined Water heating and water treatment savings. Secondary	Residential Showerhead Replacement_2_00gpm_Secondary Shower_ Electric Water Heating_Direct Install	91.14	91.14	91	132

APPENDIX C: PROJECT TRACKING FILE EXAMPLE

As an example of what could be tracked in terms of program participation, we have included the table below as suggested tracking variables and values. During the evaluation, Tetra Tech also compiled the current information available into a Master Tracking Spreadsheet and will provide that to the Idaho Power Multifamily Energy Savings program specialist.

Table C-1. Suggested Tracking Variables and Description of Values

Tracking Variables	Values
Program Year	2016, 2017, or 2018
Status	Lead, Ineligible, Screening, Declined, Installing, Completed
Property Name	
Units at Property	#
Units Served	#
Property Address	
Property Contact Name	
Property Contact Phone	
Property Contact Email	
Region	Capital, Eastern, Southern, Canyon/West
Contractor Name	
Contractor Contact Name	
Contractor Contact Phone	
Contractor Contact Email	
Screening visit date	
Installation visit date	
Installation counts by measure	Pull from Multifamily Savings spreadsheet
Savings by measure	Pull from Multifamily Savings spreadsheet
Total savings	Pull from Multifamily Savings spreadsheet



Shade Tree Project Evaluation

Prepared for Idaho Power

December 21, 2018

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1 EXECUTIVE SUMMARY

According to the U.S. Department of Energy, a well-placed shade tree can reduce energy used for summer cooling by 15 percent or more. Idaho Power implements the Shade Tree Project in partnership with the Arbor Day Foundation's Energy-Saving Trees program. Arbor Day Foundation provides a software tool that estimates energy savings at enrollment based on the tree species, orientation, and distance from home.

The Shade Tree Project has been active since beginning as a pilot in 2013. Idaho Power records contained usable data for 9,830 enrolled trees. Idaho Power conducted two rounds of onsite audits to verify survivorship and tree placement relative to the home. Idaho Power provided usable records for 1,748 trees selected for audits and 1,196 trees that received an audit.

1.1 Evaluation activities

DNV GL reviewed benefits calculations based on enrollment data provided by Idaho Power for program years 2013-2018. We reconciled the enrollment data with data obtained during audits of a random selection of 2013-2016 program year trees conducted by Idaho Power in 2015 and 2017. The audits recorded actual orientation and distance from home and recalculated savings based on those actual values. The audits also provided mortality data.

The i-Trees software estimates kWh savings (and other benefits) for years 5, 10, 15, and 20 after the tree planting year. DNV GL calculated average realization rates for each of these four quinquennial benefits, for each planting year, by audited tree species. We then assigned these average realization rates to the unaudited trees and calculated evaluated savings by multiplying the enrollment savings by the realization rates. We then averaged all values per planting year to calculate the average per-tree benefits. Next, we used linear interpolation to calculate annual per-tree average benefits for the inter-quinquennial years. Finally, we calculated total benefits by multiplying the per-tree average benefits by the number of trees planted each year (based on original enrollment data counts) and an estimated survival rate for that year.

1.2 Key findings

Claimable savings: DNV GL recommends Idaho Power claim the following energy savings. Additional calendar year savings recommendations are provided in the accompanying Excel workbook.

Table 1. Recommended kWh savings summary

Planting Years	Saving Year	kWh Savings
2013	2017	3,724
2013, 2014	2018	39,095
2013, 2014, 2015	2019	80,212

Mortality: The audits resulted in a mortality rate of 36% at 3-5 years since planting.

Enrollment savings calculations: Davey, the primary developer of i-Trees, periodically updates their algorithms to keep pace with Forestry science. They made a substantial update in late 2015 that cut calculated benefits approximately in half. The realization rates in this study account for this change. However, Idaho Power should stay alert for other significant software updates in the future.

Additional non-electric impacts calculations: The i-Trees software provides estimated impacts for therms, air pollutants, carbon, and stormwater runoff in addition to kWh. If Idaho Power chooses to claim additional non-electric impacts from the sponsored trees, DNV GL recommends the following numbers. Note that the Therms and Carbon impacts are negative, while the Air pollution and Stormwater imapcts are positive. Additional calendar year impact recommendations are provided in the accompanying Excel workbook.

Table 2. Recommended non-electric impacts summary

Planting Years	Saving Year	Therms	Air Pollutant $	Carbon $	Stormwater Runoff $
2013	2017	(195)	$9	($12)	$71
2013, 2014	2018	(2,049)	$99	($127)	$743
2013, 2014, 2015	2019	(4,364)	$203	($257)	$1,537

2 INTRODUCTION

2.1 Program background

The Shade Tree Project began as a pilot in 2013. According to the U.S. Department of Energy (DOE), a well-placed shade tree can reduce energy used for summer cooling by 15 percent or more. Utility programs throughout the country report high customer satisfaction with shade tree programs and an enhanced public image for the utility related to sustainability and environmental stewardship. Other utilities report energy savings between 40 kWh per year (coastal climate San Diego) and over 200 kWh per year (Phoenix) per tree planted.

To be successful, trees should be planted to maximize energy savings and ensure survivability. Two technological developments in urban forestry—the state-sponsored Treasure Valley Urban Tree Canopy Assessment and the Arbor Day Foundation's Energy-Saving Trees tool—provided Idaho Power with the information to facilitate a shade tree project. Arbor Day's tool is based on the i-Trees software package, developed by Davey and the U.S. Forestry Service (USFS).

The Shade Tree Project operates in a small geographic area each spring and fall, offering free shade trees to Idaho Power's residential customers. Participants enroll using the online Energy-Saving Trees tool and pick up their tree at specific events. Unclaimed trees are donated to cities and schools.

Using the online enrollment tool, participants locate their home on a map, indicate the basic outline of their exterior walls, select from a list of available trees, and evaluate the potential energy savings associated with planting in different locations. During enrollment, participants learn how trees planted to the west and east save more energy over time than trees planted to the south and north.

Ensuring the tree is planted properly helps it grow to provide maximum energy savings. At the tree pickup events, participants receive additional education on where to plant trees for maximum energy savings and other tree care guidance from experts. Local specialists include city arborists from participating municipalities; Idaho Power utility arborists; county master gardeners; and College of Western Idaho horticulture students.

Idaho Power records contained usable data for 9,830 enrolled trees. Idaho Power conducted two rounds of onsite audits to verify survivorship and tree placement relative to the home. Idaho Power provided usable records for 1,748 trees selected for audits and 1,196 trees that received an audit.

2.2 Evaluation overview

The primary goals of the evaluation were to:

- Review the available data for participants for all available program years,
- Confirm the energy savings and non-energy benefits recorded are correctly calculated using the Arbor Day Foundation's Energy Saving Trees Tool, which is based on the Davey/USFS i-Tree design tool,

- Review the audit information collected by Idaho Power on random samples of participants in 2015 and 2017,
- Derive adjustments to the claimed savings to reflect differences between the original i-Tree data in the tracking system and what was eventually done at customer homes, and to adjust for mortality, and
- Apply those adjustments to calculate recommended savings across all program years.

To achieve these goals, DNV GL received and combined the following data from Idaho Power:

- Enrollment data, which includes the inputs to the savings tool, and the estimated savings in 5-year increments for 20 years
- Audit data, from audits conducted in 2015 and 2017, with the updated tree and placement information and the resulting updated savings estimates

After combining these data, DNV GL performed the following analyses:

- Reviewed the enrollment data and calculations for accuracy, appropriate use of the tool, and consistency of data
- Assessed the similarity of the sample audited to the total participant population to ensure that the audit sample is representative of that total population
- For the participants audited, compared the audit results with the enrollment data, and developed appropriate adjustment factors based on the differences between the two datasets
- Developed adjustments for mortality based on the audit data results and the survey data
- Applied all adjustments to the i-Trees output to provide evaluated benefits metrics.

Additionally, DNV GL searched for and reviewed publicly available evaluations and peer-reviewed papers on the energy savings from similar shade tree programs to provide a secondary check on the savings estimates.

3 FINDINGS

3.1 Enrollment and audit data analysis

3.1.1 Enrollment population versus audited sample

DNV GL split the trees into three groups and compared enrollment data for tree orientation and species for the trees. The three groups were: trees that were not selected for an audit, trees selected for an audit but that did not receive one (usually because the customer reported that the tree died), and trees that were selected for an audit and received one.

The distribution of enrollment orientation was similar across the three groups with one exception. Trees that were selected for an audit but did not receive one (10%) were slightly more likely to be enrolled with a “North” orientation than those not audited (6%) or those selected and audited (7%).

For species, the trees selected for audit differed somewhat from those not selected (Table 3). These differences appear to be within reasonable thresholds for random selection.

Table 3. Enrollment species by audit selection and completion

Species	Not selected	Selected, no Audit	Audited
Birch	13%	20%	19%
Elm	14%	8%	10%
Ginkgo	3%	2%	2%
Hackberry	7%	3%	4%
Linden	5%	4%	3%
Oak	28%	22%	24%
Other	4%	8%	7%
Planetree	4%	1%	2%
Sweetgum	11%	18%	13%
Tuliptree	11%	12%	15%
Unknown	1%	2%	1%

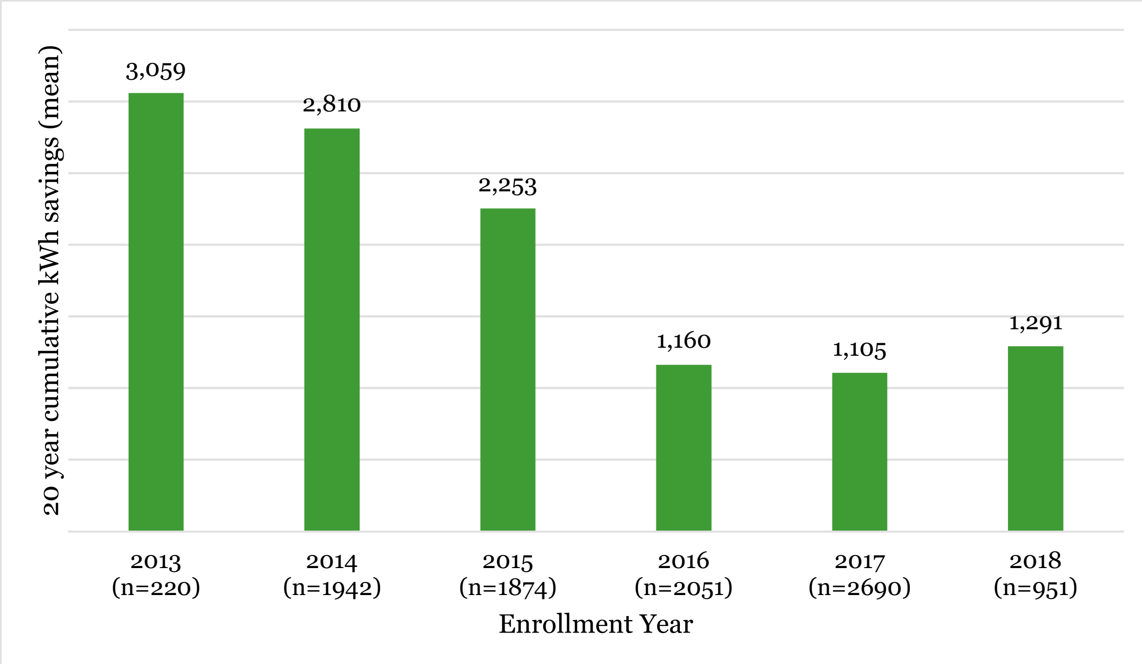
3.1.2 Mortality rates

Approximately 36% (589 trees) were confirmed as dead by the audit process. Based on conversation with Davey (the company that develops the i-Trees software) and review of the i-Trees program manual, the algorithms i-Trees uses to calculate benefits do not factor in an estimated mortality rate.

3.1.3 Enrollment benefits calculations changes

Davey reported that they made significant changes to their benefits calculation algorithms in late 2015. Davey reported that they periodically update the algorithm to keep pace with the state-of-the-art in Forestry science, so the new benefits calculations should be more accurate than the older ones. The result of this change is a substantial decrease in calculated benefits for trees entered into i-Trees after 2015. Figure 1 shows this effect using the 20 year cumulative kWh savings calculated during enrollment. The effect occurs across all benefits and all species in Idaho Power's program.

Figure 1. Savings per tree by year



The data re-entry and savings calculations for all audited trees occurred after the 2015 change to the tool. This means that all re-entry calculations were based on the updated (changed) i-Trees algorithm. This has two effects on our calculation of the audit realization rate:

1. Trees ordered before 2016 have low realization rates because they are and should be affected by the change to the benefits calculations.
2. Trees ordered after 2016 have a separate realization rate, which is greater than the realization rate for the pre-2016 trees because both the enrollment and audit savings calculations used the same, updated algorithm.

3.2 Evaluated savings calculations

The i-Trees software calculates annual kWh and cumulative kWh savings at 5, 10, 15, and 20 year increments based on tree species, orientation to home, and distance from home. DNV GL's review of these calculations revealed the following:

- Annual savings estimates follow a nearly linear trend, increasing approximately 30 kWh each five-year period.
- Reported cumulative savings in years 10, 15, and 20 match very closely to the values obtained by summing the annual savings over the same periods.
- Reported cumulative savings in year 5 did not match the sum of individual annual savings for years 1 through 5 based on any interpolation method that DNV GL tried for estimating annual savings in years 1 to 5.

Based on these findings, DNV GL decided to base evaluated savings estimates on i-Tree's reported annual savings values using the following method:

1. Calculate an audit realization rate by tree species for each planting year based on the audit results. Planting years 2013 – 2016 received realization rates. Audits were not conducted for trees planted in 2017 or 2018, so those years received realization rates of 1 for all species.
2. Audited trees received individual realization rates based on actual audit results. Unaudited trees received the average realization rate of the other trees of the same species, planted in the same year, that were audited.[1] Thus all enrolled trees received a realization rate.
3. Calculate adjusted savings by multiplying savings calculated during enrollment by the realization rate.
4. We repeat steps 1-3 for each of the five-year periods for which i-Trees reported annual savings. Thus, each enrolled tree gets an adjusted annual savings for years 5, 10, 15, and 20.
5. Calculate the per-tree average adjusted annual savings for years 5, 10, 15, and 20 across all enrolled trees.
6. Use linear interpolation to calculate the per-tree average adjusted annual savings for all intermediate years. We assumed zero savings per year for years 1-3.
7. Estimate tree survival rate starting at 66% for year 4, based on the audit results, and subtract 1% per year up to year 20. This approach results in a 50% survival rate for year 20.[2]

This process resulted in a per-tree average annual savings for each year for years 4 through 20. We calculated total program year savings claimable by Idaho Power by multiplying the number of trees planted (based on the original data set) in a particular year by per-tree average annual savings for the tree age represented by any particular calendar year relative to the planting year (e.g. 2018 is year 5 for trees planted in 2013 and year 4 for trees planted in 2014). We then multiplied this number by survival rate for that year of life.

We calculated total kWh savings claimable by Idaho Power for each calendar year by summing all planting year savings applicable to that calendar year (Table 4). An accompanying workbook provides calculations up to calendar year 2033.

Table 4. Claimable kWh savings by calendar year

Number of Trees	Year Planted	Calendar Year		
		2017	2018	2019
220	2013	3,724	4,584	5,367
2,039	2014	-	34,511	42,485
1,912	2015	-	-	32,361
2,061	2016	-	-	-
2,711	2017	-	-	-
952	2018	-	-	-
	Annual Claimable kWh	3,724	39,095	80,212
	Total Cumulative Claimable kWh	3,724	42,818	123,030

[1] There were three exceptions:

- Trees with species grouping of "Unknown" received the average ratio across all audited trees in their year.
- Linden trees planted in 2016 received a ratio of 1 because none were audited after 2016 and giving them the same ratios as 2013-2015 Lindens would unfairly penalize them for the benefits calculation change.
- Trees planted in 2017 and 2018 all received realization rates of 1 because none were audited.

[2] A 50% survival rate is close to but slightly more conservative than the 22-year 52% savings rate adjustment based on survivability found by Ko, et al (2015) based on their review of the SMUD trees planted in 1997 on which the i-Trees algorithms were originally based.

Note: The number of trees in this table represent the total enrolled, which is slightly higher than the total used to compute the average savings per tree. See Appendix A for detail on why the numbers differ.

3.2.1 Non-electric impacts

DNV GL used the same method to calculate the non-electric impacts for four additional metrics provided by the i-Trees software: Therms, air pollution dollars, carbon dollars, and stormwater runoff dollars. Table 5 summarizes DNV GL's recommendations for annual claimable impacts for these metrics. Impacts for additional years are included in the accompanying workbook.

Table 5. Recommended non-electric impacts summary

Planting Years	Saving Year	Therms	Air Pollutant $	Carbon $	Stormwater Runoff $
2013	2017	(195)	$9	($12)	$71
2013, 2014	2018	(2,049)	$99	($127)	$743
2013, 2014, 2015	2019	(4,364)	$203	($257)	$1,537

3.3 Industry shade tree program review

DNV GL attempted to review evaluations of similar shade tree programs across the country. The purpose of this activity was to provide a check on the reasonableness of the impact results. DNV GL searched the following sources for relevant information:

- Our own internal report libraries
- Calmac.org
- ACEEE and IEPEC proceedings online databases
- Elsevier press
- Google

Our search turned up 13 relevant studies and peer-reviewed papers (see Appendix B for bibliography). These studies produce a consensus annual electricity savings of approximately 140 kWh per tree. However, DNV GL observed several limitations that lead us to recommend against using this consensus value as a check on Idaho Power electricity savings:

- The consistency occurs because all the programs use the same basis to estimate savings. All of the savings estimates appear to be based on the i-Trees software package, which is itself based on Simpson and McPherson (1997) that used shadow pattern simulations to estimate the home-cooling effects of shade produced by trees in Sacramento.
- We found no evidence of independent verification of the accuracy of these estimates using alternative methods such as billing analysis or experimental designs.
- Davey updates the algorithm in the i-Trees software on a regular basis to keep pace with new Forestry science findings.

Several studies found that factors such as tree size, orientation to home, distance from home, and mortality affected the savings. These findings support the practice of using audits to confirm characteristics of the trees after they have been planted and adjust savings according to the audit findings.

- DNV GL (2011) found that approximately 14% of trees were planted at a site other than the home of the person participating in the program.
- Zebedee & Associates (2009) study of San Diego Gas & Electric's program:
  - found a first year mortality rate of 8.1%
  - eliminated 31% of trees from impact calculations because of orientation and distance from home, tree size, and climate zone
- Donovan & Butry (2009) study of the Sacramento Municipal Utility District's (SMUD's) program found significantly less savings for trees planted on the north side of home (~55 kWh annually) compared to those planted on the west or south sides (~185 kWh annually).
- Ko, et al. (2015) revisited the 1997 Sacramento study sites and found that annual cooling savings were about half (52% or 80 kWh per tree) their original estimates, mostly due to mortality.

While DNV GL recommends against a strong interpretation of the fact there is consensus in savings estimates, we also did not find any evidence to invalidate the commonly used i-Trees software. The group maintaining the i-Trees software clearly makes periodic updates to the software and savings algorithms, and through the years has added factors such as tree orientation and distance from home to the savings estimates.

Two additional findings bear mention, although at this point in time, DNV GL does not recommend any adjustments to program savings estimates based upon them:

- Sawka and colleagues (2013) adjusted the Sacramento results to Toronto and estimated per tree savings of 167 kWh annually. A notable finding from this study was that approximately half of the savings came from shading of *neighboring* homes.
- At this point in time, the Arbor Day Energy-Saving Trees program is a dominant player in the implementation of tree programs. According to Arbor Day Foundation records, approximately 60 utilities in 36 states are partnered with the program.

Appendix A ADDITIONAL METHOD DETAIL

A.1.1 Data preparation

The first step in data preparation was to match enrollment records with audit records. These matches were done based on a numeric identifier that Idaho Power assigned to both data sets and tree species. In cases where the same id had two trees of the same species, we chose the pairing that resulted in the shortest combined distance between the latitude and longitude coordinates in the enrollment and audit data.

Idaho Power provided enrollment records for 9,895 trees that it sponsored between 2013 and Spring 2018 and audit records for 1,856 trees. After merging the enrollment and audit data and removing records with data and matching issues, there were usable records for 9,830 enrolled trees, 1,748 trees selected for audits, and 1,196 trees that received audits. The final data contained records for 102 trees without enrollment benefits data because they were an additional tree taken at pickup or workshop trees (and therefore never went through the i-Trees tool at enrollment). Table 6 provides a summary of the number of original and analysis records by program year.

Table 6. Original and analysis data records by year

	Original Data			Analysis Data		
Year	Total records	Selected for Audit	Received Audit	Total records	Selected for Audit	Received Audit
2013	220	134	79	220	134	79
2014	2,039	945	586	2,005	877	554
2015	1,912	487	370	1,887	458	347
2016	2,061	290	227	2,055	279	216
2017	2,711	0	0	2,711	0	0
2018	952	0	0	952	0	0
Total	9,895	1,856	1,262	9,830	1,748	1,196

We then grouped the trees into species groups based on the tree ordered (as recorded in the data) as shown in Table 7. As can be seen in the table, some of the differences in the data entered are clearly data entry inconsistencies such as “Bur Oak” and “Burr Oak”. We used the species group for the trees’ species throughout the rest of the methods.

Table 7. Tree species categories

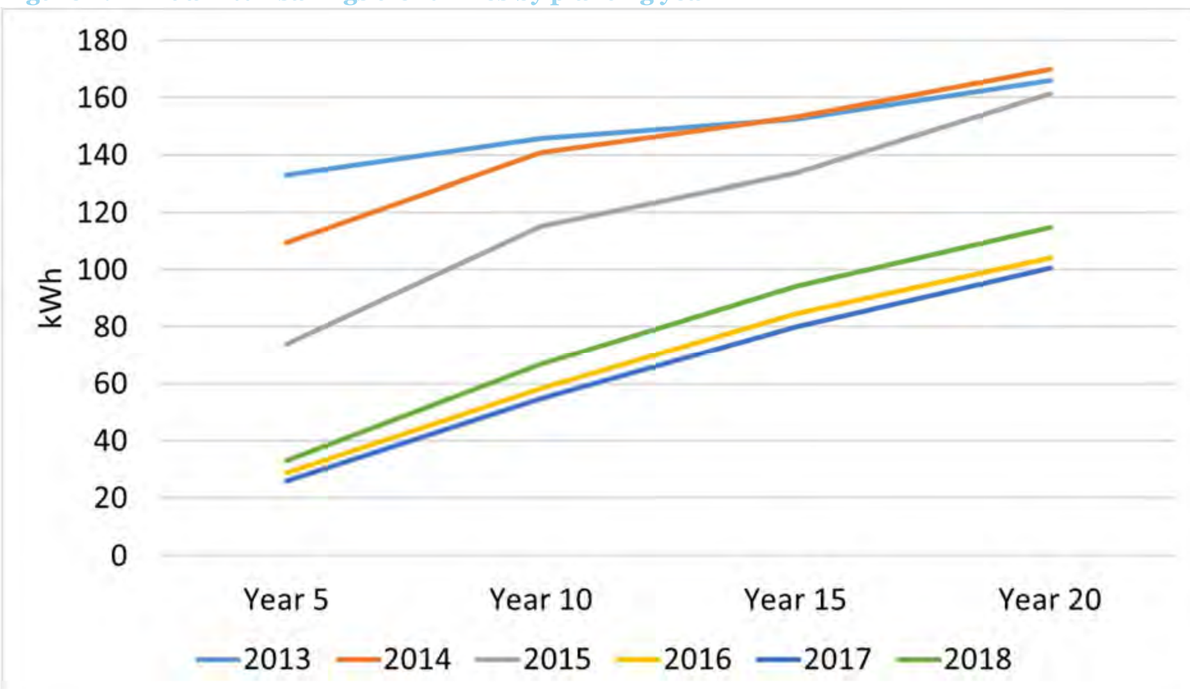
Species Group	Tree Ordered	Frequency
Birch	Heritage River Birch	197
	River Birch (clump form)	281
	River Birch Clump	846
Elm	Frontier Elm	495
	New Harmony Elm	394
	Princeton Elm	201
	Valley Forge Elm	248
Ginkgo	Ginkgo	169
Hackberry	Common Hackberry	543
	Hackberry	218
Linden	Greenspire Linden	524
	Greenspire Littleleaf Linden	139
	Redmond Linden	53
Oak	Bur Oak	826
	Burr Oak	188
	Northern Red Oak	861
	Swamp White Oak	940
Other	Kentucky Coffeetree	39
	Kentucky coffeetree	87
	Red Maple Armstrong	34
	Sourwood	87
	Suncole" Sunburst Honeylocust"	46
Planetree	Exclamation London Planetree	59
	London Planetree Bloodgood""	114
	London planetree	13
Sweetgum	Happidaze Sweetgum	105
	Moraine Sweetgum	143
	Worplesdon Sweetgum	731
Tuliptree	Tulip Tree	852
	Tuliptree	280
Unknown[1]		5
	NA	20
	None	92
Total		9,830

[1] Trees with an unknown species were predominately workshop trees. A few were also extras taken at pickup.

A.1.2 Review of annual and cumulative kWh

The i-Trees software calculates annual kWh and cumulative kWh savings at 5, 10, 15, and 20 year increments based on tree species, orientation to home, and distance from home. DNV GL's review of these calculations revealed that annual savings estimates follow a nearly linear trend. Annual savings increase by approximately 30 kWh each five-year period (Figure 2). The gap in the upper and lower groups of lines in this figure also demonstrates the savings discontinuity caused by the algorithm update in late 2015.

Figure 2. Annual kWh savings trend lines by planting year



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OTHER REPORTS

Report Title	Sector	Analysis Performed By	Study Manager	Study/Evaluation Type
2018 Flex Peak Program End-of-Season Annual Report	Commercial/Industrial	Idaho Power	Idaho Power	Other
2018 Irrigation Peak Results	Irrigation	Idaho Power	Idaho Power	Other
A/C Cool Credit: 2018 Demand Response Analysis	Residential	Idaho Power	Idaho Power	Other
Energy-Saving Kit Program Summary Report, 2018	Residential	Resource Action Programs	Idaho Power	Summary
Historical DSM Expense and Performance, 2002–2018	Residential, Commercial/Industrial, and Irrigation	Idaho Power	Idaho Power	Other
Home Energy Report Program Summary Report (Year One)	Residential	Aclara	Idaho Power	Summary
Idaho Power Energy Wise Program Summary Report, 2017–2018	Residential	Resource Action Programs	Idaho Power	Summary
Technical Reference Manual 2.2	Commercial/Industrial	ADM Associates	Idaho Power	Other

Report titles appearing in blue are links to the online versions of the reports. A PDF of this supplement can be found at idahopower.com/ways-to-save/energy-efficiency-program-reports/.

2018 Flex Peak Program
End-of-Season Annual Report

November 2, 2018

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Executive Summary

The Flex Peak Program ("Program") has been operated by Idaho Power Company ("Idaho Power" or "Company") since 2015. The Program is a voluntary demand response ("DR") program available to large commercial and industrial customers that can reduce their electrical energy loads for short periods during summer peak days. By reducing demand on extreme system load days, the Program reduces the amount of generation and transmission resources required to serve customers. This Program, along with Idaho Power's other DR programs, Irrigation Peak Rewards and the Residential Air Conditioner Cycling Program, have helped delay the need to build supply-side resources.

The results presented in this report are from the 2018 Program season, the Company's fourth year of operating the Program. In its fourth year, the Program maintained similar load reduction and realization rates as the prior year (2017). There were five new sites added and overall participation resulted in the highest hourly load reduction for the season of 33 megawatts ("MW"). The average realization rate for the three load reduction events that occurred in the 2018 Program season was 89 percent. Enrollment in the Program virtually stayed the same for the 2018 Program season and 96 percent of previously participating sites re-enrolled in the Program. The total Program costs through October 1, 2018, were $417,819. The cost of having this resource available was $12.66 per kilowatt ("kW") based on the maximum demand reduction of 33 MW achieved on July 31, 2018.

Background

In 2015, the Company requested approval to implement the Flex Peak Program as an Idaho Power operated program. The Idaho Public Utilities Commission ("IPUC") approved the Company's request in Order No. 33292,[1] and the Public Utility Commission of Oregon ("OPUC") accepted the proposal from Advice No. 15-03.[2] Prior to 2015, a similar DR program for commercial and industrial customers was operated by a third-party vendor.

As part of Advice No. 15-03, the OPUC adopted Staff's recommendation that the Company file an annual end-of-season report with information regarding the Program. The Company was also directed by the IPUC in Order No. 33292 to file an annual end-of-season report detailing the results of the Program. In compliance with the reporting requirements, the annual end-of-season report includes the following:

- Number of participating customers
- Number of participating sites

[1] *In the Matter of Idaho Power's Company's Application for Approval of New Tariff Schedule 82, A Commercial and Industrial Demand-Response Program (Flex Peak Program)*, Case No. IPC-E-15-03, Order No. 33292 (May 7, 2015).

[2] Schedule 76, Flex Peak Program, Docket No. ADV 7/Advice No. 15-03 (approved April 28, 2015).

- MW of demand response under contract
- MW of demand response realized and incented per dispatch
- Percent of nominated MW achieved in each dispatch event by participant
- Cost analysis of the Program
- Number of events called
- Total load dropped for each event
- Event duration
- Total capacity payments made
- Total energy payments made
- Number of customers who failed to meet their load
- Number of Program applications denied due to Program subscription limit
- Benefits identified with each dispatch of the resource
- Assessment of whether the trigger or dispatch price is properly set to utilize the asset most often
- Participant attrition
- Issues the utility has identified meeting requests to participate in the Program
- Changes in baseline methodology taken or anticipated
- Improvements Idaho Power and the Program might benefit from

Program Details

The Program pays participants a financial incentive for reducing load within their facility and is active June 15 to August 15, between the hours of 2 p.m. and 8 p.m. on non-holiday weekdays.

Customers with the ability to nominate or provide load reduction of at least 20 kW are eligible to enroll in the Program. The 20 kW threshold allows a broad range of customers the ability to participate in the Program. Participants receive notification of a load reduction event ("event") two hours prior to the start of the event, and events last between two to four hours.

The parameters of the optional Program are set forth in Schedule 76[3] in Oregon and Schedule 82[4] in Idaho, and include the following:

- A minimum of three load reduction events will occur each Program season.

- Events can occur any weekday, excluding July 4, between the hours of 2 p.m. and 8 p.m.

- Events can occur up to four hours per day and up to 15 hours per week, but no more than 60 hours per program season.

[3] Idaho Power Company, P.U.C. ORE. No. E-27, Schedule 76.

[4] Idaho Power Company, I.P.U.C. No. 29, Tariff No. 101, Schedule 82.

- Idaho Power will provide notification to participants two hours prior to the initiation of an event.
- If prior notice of a load reduction event has been sent, Idaho Power can choose to cancel the event and notify participants of cancellation 30 minutes prior to the start of the event.

Program Incentives

The Program includes both a fixed and variable incentive payment. The fixed incentive is calculated by multiplying the actual kW reduction by $3.25 for weeks when an event is called or the weekly nominated kW amount by $3.25 for weeks when an event is not called. The variable energy incentive is calculated by multiplying the kW reduction by the event duration hours to achieve the total kilowatt-hour ("kWh") reduction during an event. The variable incentive payment is $0.16 per kWh and is implemented for events that occur after the first three events.

The Program also includes an incentive adjustment of $2.00 when participants do not achieve their nominated amount during load reduction events. This adjustment amount is used for the first three events. After the third event, the adjustment is reduced to $0.25 per kW. Incentives are calculated using Idaho Power's interval metering billing data and participants received the incentive checks within 30 days of the end of the Program season. Participants were mailed their incentive checks or had their Idaho Power account credited by September 15 in 2018. The incentive structure offered for the 2018 season is listed in Table 1.

Table 1.

Fixed-Capacity Payment Rate*	Variable Energy Payment Rate**
$3.25 per Weekly Effective kW Reduction	$0.16 per kWh (Actual kW x Hours of Event)
Adjustment for first three events	**Adjustment after first three events**
$2.00 per kW not achieved up to nomination	$0.25 per kW not achieved up to nomination
*To be prorated for partial weeks	**Does not apply to first three Program events

Program Results

The results presented throughout this report are at the generation level and system losses have been considered. Idaho Power called three load reduction events in 2018. The first event occurred on July 16, the second on July 25, and the third on July 31. The maximum realization rate during the season was 108 percent and the average for all three events combined was 89 percent. The realization rate is the percentage of load reduction achieved versus the amount of load reduction committed for an event. The highest hourly load reduction achieved was during the July 31 event at 33 MW.

Participants had a committed load reduction of 29.4 MW in the first week of the Program. This weekly commitment, or "nomination", was comprised of customers participating in the Program totaling 140 sites. Out of the total number of sites, 135 sites participated in the 2017 season, and five sites were newly added in 2018. The committed load reduction at the end of the season was 29.6 MW and was the peak committed load reduction for the season.

The first event was called on Monday, July 16. Participants were notified at 2 p.m. for a four-hour event from 4-8 p.m. The total nomination for this event was 29.4 MW. The average load reduction was 26 MW. The highest hourly load reduction was 27 MW during hour two. The realization rate for this event was 88 percent.

The second event was called on Wednesday, July 25. Participants were notified at 2 p.m. for a four-hour event from 4-8 p.m. The total nomination for this event was 29.3 MW. The average load reduction was 21 MW. The highest hourly load reduction was 22 MW during hour one. The realization rate for this event was 72 percent. The lower realization rate for this event was primarily due to some larger sites that underperformed or had reduced participation due to operational needs of the sites.

The third event was called on Tuesday, July 31. Participants were notified at 2 p.m. for a four-hour event from 4-8 p.m. The total nomination for this event was 29.5 MW. The average load reduction was 32 MW. The highest hourly load reduction was 33 MW during hour one. The realization rate for this event was 108 percent.

Enrollment specific to the Oregon service territory included six participants totaling nine sites enrolled. These nine sites had a nominated capacity of 5.6 MW and achieved a maximum reduction during the season of 6.3 MW during hour four on the July 16 event.

Participation

The number of sites enrolled in the Program for 2018 was 140 sites from 65 participants, with five new sites enrolling for the Program season. The average number of sites enrolled per participating customer was 2.1. The Program did not experience significant attrition and re-enrollment in the Program was high as 135 of the 141 sites participating from the prior season re-enrolled. Four sites did not re-enroll from the 2017 season because the vendor supporting the site's demand response control platform no longer offered that service. The remaining two sites did not enroll as one business closed and the other site reduced its operating hours significantly such that it no longer was a good program candidate.

This past season Idaho Power continued the auto-enrollment option with good success. Existing participants were re-enrolled in the Program automatically and mailed a confirmation packet early in March based on the prior year's enrollment information. Participants notified the Company in writing if they no longer wanted to participate as well as to change their nomination amount or update/change contact information regarding personnel for event notification. The auto-enrollment implementation was successful and the Company will continue to utilize this process in the future.

While Idaho Power did not actively market the Program, the Company has worked to maintain the number and size diversity (in terms of nominated load reduction) of sites enrolled. The breakout of nomination groups among the sites has stayed very consistent from the 2017 season with the largest quantity of sites falling within the 0-50 kW segment followed by 51-200 kW.

Pursuant to the Settlement Agreement approved in IPUC Case No. IPC-E-13-14[5] and OPUC Docket No. UM 1653[6] ("Settlement"), Idaho Power did not actively market the Program prior to the 2018 season as enrolled capacity was maintained at approximately 35 MW, which was the amount agreed upon in the 2013 Settlement. However, the Program did have reduced capacity for the 2018 season as one single large customer reduced its nomination significantly a week prior to the season starting. The Company did not deny any Program applications in 2018.

Figure 1 represents Idaho Power's service area divided into three regional areas with two sub areas: Canyon (Canyon West), Capital, and Southern (South East).

Figure 1.

[5] *In the Matter of the Continuation of Idaho Power Company's A/C Cool Credit, Irrigation Peak Rewards, and FlexPeak Demand Response Programs for 2014 and Beyond*, Case No. IPC-E-13-14, Order No. 32923 (Nov. 12, 2013).

[6] *In the Matter of Idaho Power Company, Staff Evaluation of the Demand Response Programs*, UM 1653, Order No. 13-482 (Dec. 19, 2013).

Figure 2 represents the enrolled capacity (total nominations) that were enrolled in 2018 and the distribution by Idaho Power's regional service areas.

Figure 2.

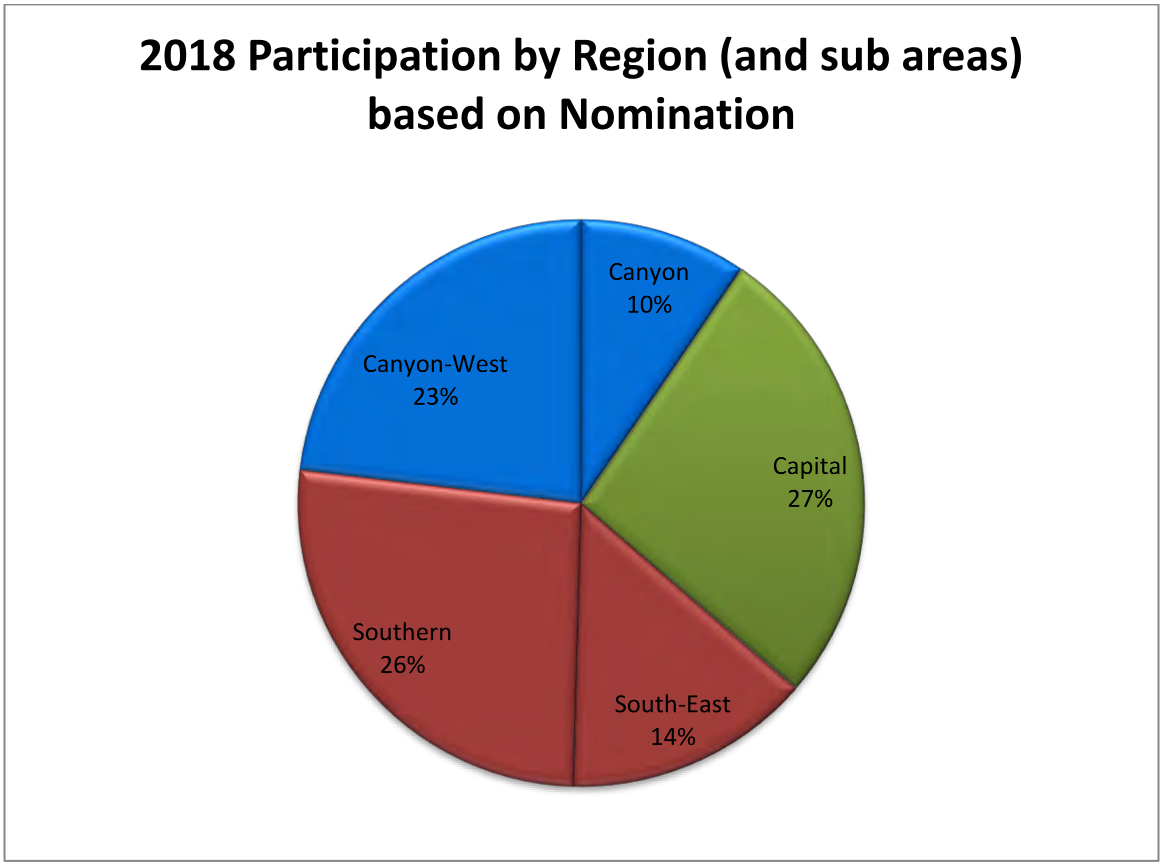
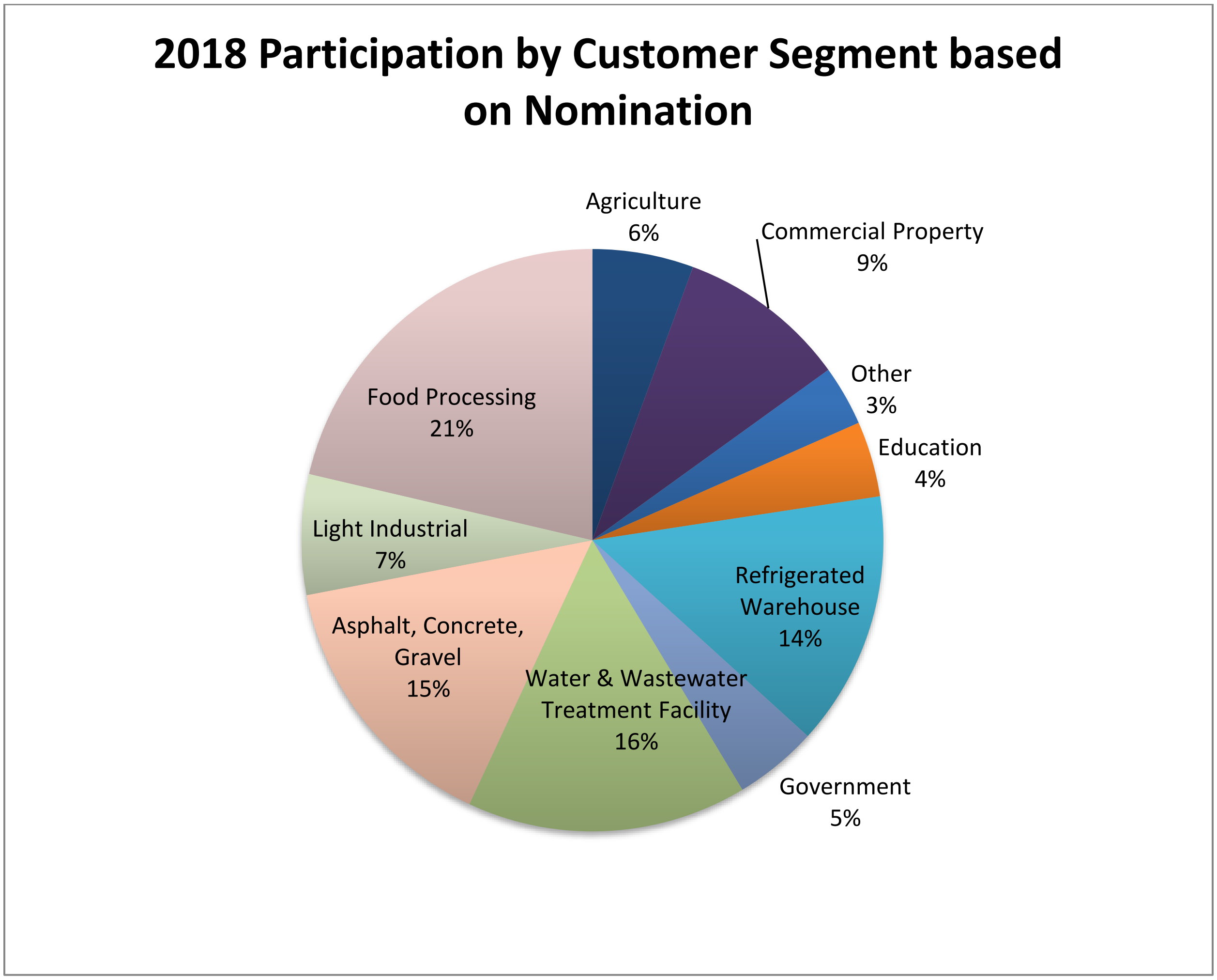


Figure 3 represents the enrolled capacity in 2018 and the diversity based on business type.

Figure 3.



Operations

Interval metering data provides Idaho Power the ability to view all participants' load after events, and calculate the reduction achieved per site during load reduction events. Using this data, Idaho Power provided participants post-event usage reports that showed hourly baseline, actual usage, and reduction during an event. The data assists participants in refining their nomination for future events. This data also provides information useful in determining which participating sites may have opportunity to provide more reduction or change their reduction strategy if nomination amounts were not achieved.

Load Reduction Analysis

An evaluation of the potential load reduction impacts in 2018 was conducted internally by Idaho Power. The goal of the review performed by Idaho Power was to calculate the load reduction in MW for the Program. The analysis also verified load reduction per site and per event.

The baseline methodology used in 2018 is the same methodology utilized in prior seasons. The baseline that load reductions are measured against during load reduction events is calculated using a 10-day period. The baseline is the average kW of the highest energy usage days during the event availability time (2-8 p.m.) from the highest three days out of the last 10 non-event weekdays. Individual baselines are calculated for each facility site. Once the original baseline is calculated, there is an adjustment included in the methodology called the Day-of-Adjustment ("DOA") that is used to arrive at the adjusted baseline.

Adjustments address situations where load is lower or higher than it has historically been and the baseline does not accurately reflect the load behavior immediately prior to the event. The DOA is applied to each site's original baseline by accounting for the difference between the average baseline kW and the average curtailment day kW during hours 2-3 prior to the start of the event. The DOA is calculated as a flat kW and is applied to all baseline hours and capped at +/- 20 percent of the original baseline kW. The DOA is symmetrical, having either an upward or downward adjustment to the baseline, and is applied to the original baseline kW for each facility site for each hour during the Program event.

As Figure 4 below depicts, the most commonly nominated load reduction was in the 0-50 kW range, accounting for approximately 39 percent of the sites.

Figure 4.

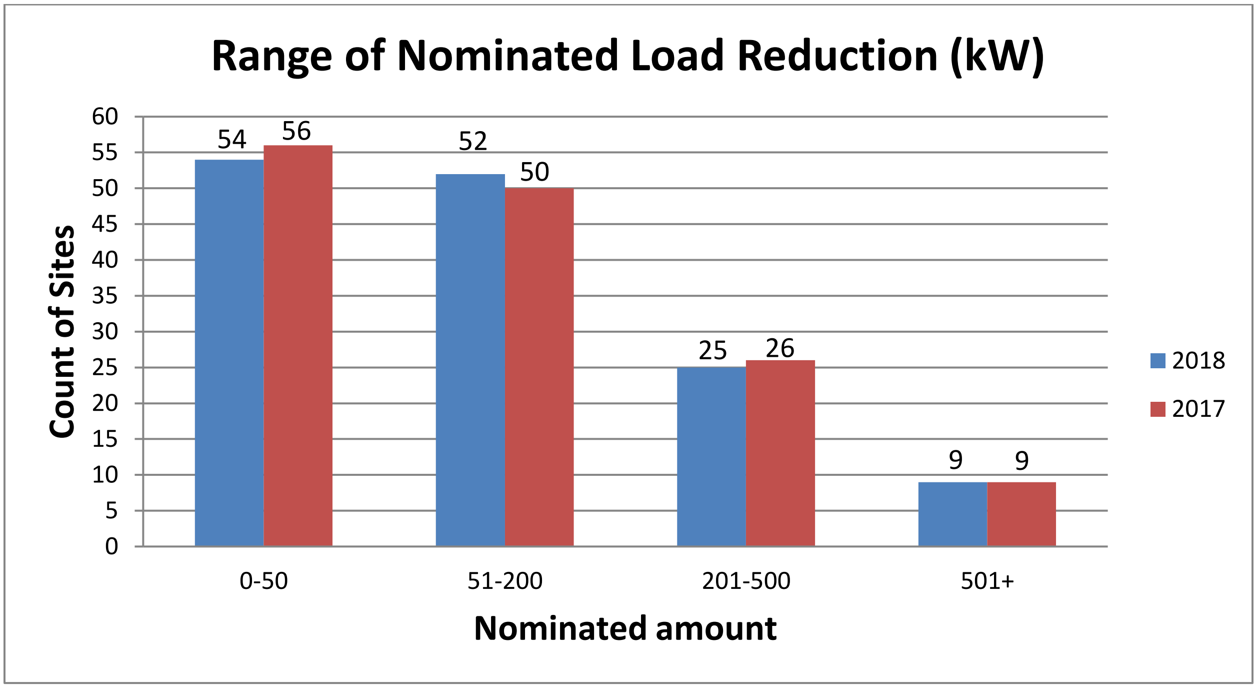


Table 2 shows the Program realization rates for 2018 based on average load reduction per event.

Table 2.

Curtailment Event	Event Timeframe	Nominated Demand Reduction	Average Demand Reduction (MW)	Max Demand Reduction (MW)	Realization Rate*
July 16	4-8 pm	29.4	26	27	88%
July 25	4-8 pm	29.3	21	22	72%
July 31	4-8 pm	29.5	32	33	108%
Average		29.4	26.3	27.3	89%

** Based on average reduction*

Figure 5 below shows both the average and peak demand reduction achieved during each of the three curtailment events. The maximum demand reduction achieved ranged from a low of 22 MW for the July 25 event to a high of 33 MW for the July 31 event. The July 25 event's 22 MW reduction achieved a realization rate of 72 percent, while the July 31 event's 33 MW reduction achieved a realization rate of 108 percent. Combined, the three events had an average realization rate of 89 percent.

The realization rate analysis shows that maximum load reduction was achieved in the middle to late portion of the Program season during the third event.

Figure 5.

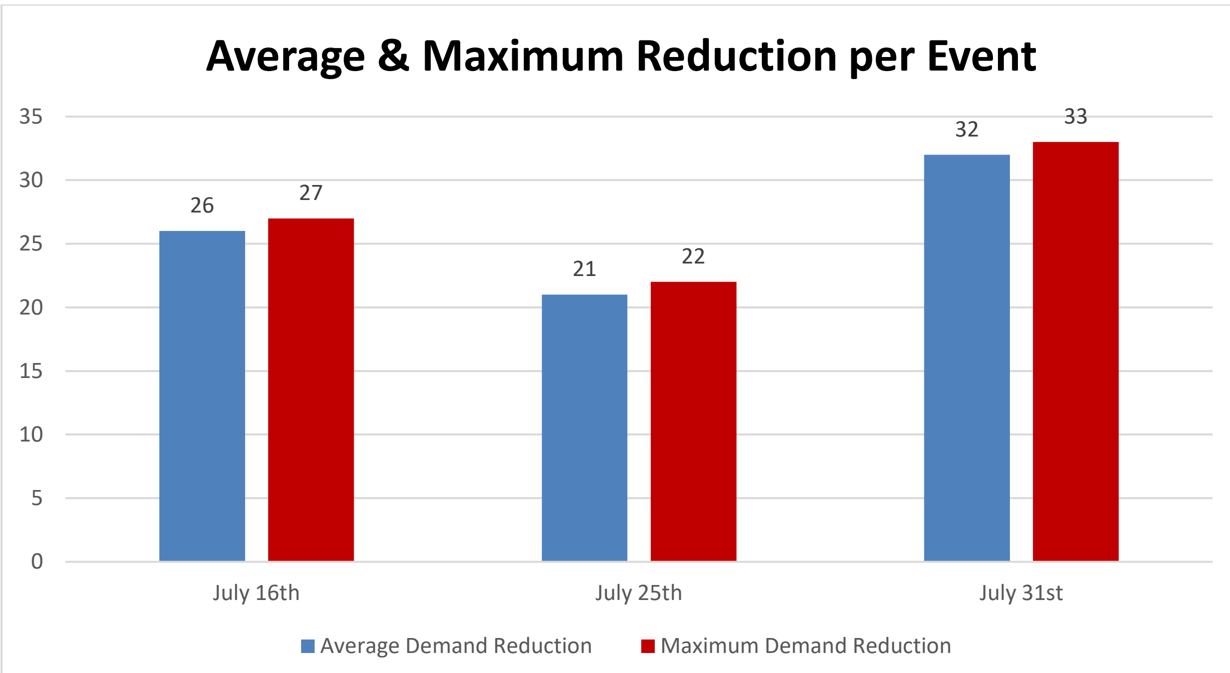


Table 3 shows the realization rate for each participant in the Program for 2018.

Table 3.

Participant Number	July 16 Event Realization	July 23 Event Realization	July 31 Event Realization	2018 Season Realization
1	140%	77%	172%	130%
2	17%	70%	9%	32%
3	74%	74%	98%	82%
4	25%	0%	44%	23%
5	13%	0%	11%	8%
6	101%	52%	87%	80%
7	557%	150%	5%	237%
8	132%	150%	146%	142%
9	106%	120%	114%	113%
10	196%	168%	140%	168%
11	0%	0%	0%	0%
12	45%	40%	44%	43%
13	113%	130%	121%	121%
14	139%	126%	69%	111%
15	102%	103%	97%	101%
16	28%	0%	0%	9%
17	54%	41%	30%	42%
18	30%	216%	293%	180%
19	104%	139%	141%	128%
20	127%	204%	182%	171%
21	137%	88%	107%	111%
22	65%	76%	64%	68%
23	97%	100%	112%	103%
24	0%	45%	11%	19%
25	59%	38%	75%	57%
26	101%	83%	42%	76%
27	74%	90%	97%	87%
28	15%	38%	8%	20%
29	18%	0%	86%	35%
30	455%	132%	123%	237%
31	8%	180%	180%	122%
32	114%	140%	109%	121%
33	0%	55%	16%	24%
34	124%	45%	129%	100%
35	932%	639%	1832%	1134%
36	14%	20%	76%	37%

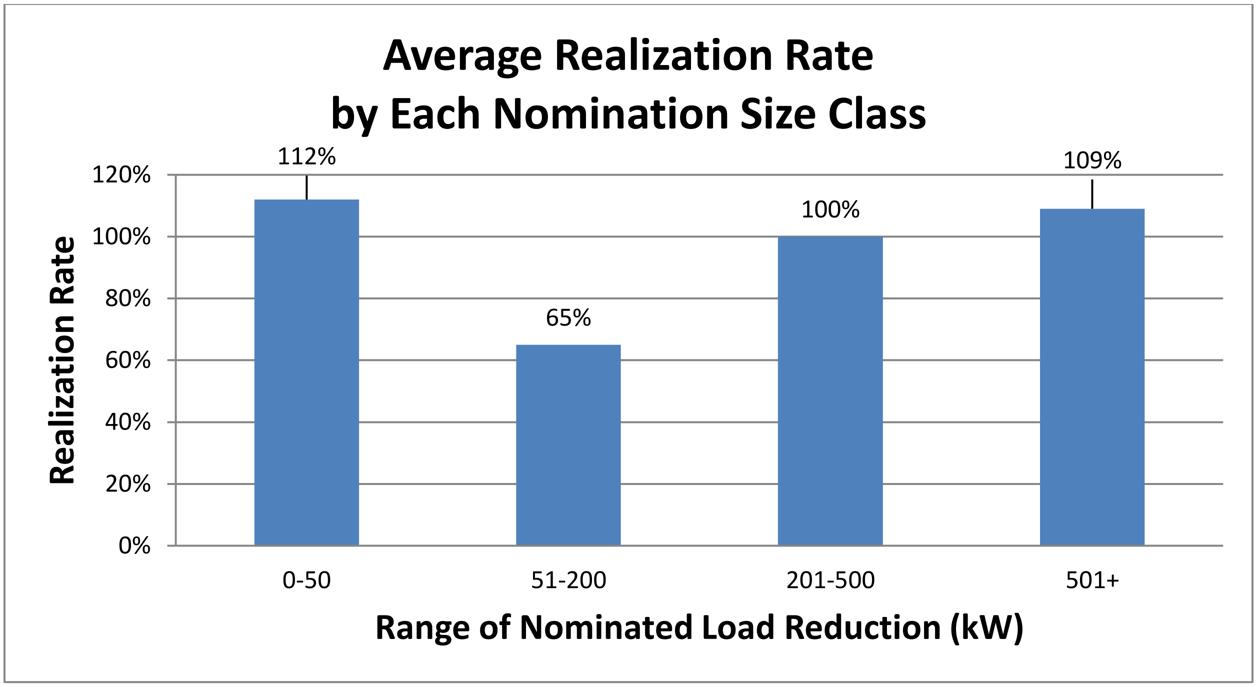
37	74%	47%	78%	66%
38	80%	180%	9%	89%
39	209%	171%	864%	415%
40	18%	0%	0%	6%
41	31%	77%	0%	36%
42	119%	44%	57%	74%
43	153%	42%	73%	89%
44	124%	130%	15%	90%
45	25%	40%	44%	36%
46	2%	55%	14%	23%
47	119%	23%	326%	156%
48	50%	67%	97%	71%
49	0%	0%	0%	0%
50	4%	19%	0%	8%
51	8%	22%	38%	23%
52	102%	112%	111%	108%
53	36%	3%	35%	25%
54	61%	70%	64%	65%
55	64%	0%	58%	41%
56	206%	43%	0%	83%
57	59%	74%	57%	63%
58	17%	3%	0%	7%
59	119%	89%	96%	101%
60	63%	123%	124%	104%
61	144%	96%	149%	130%
62	11%	0%	67%	26%
63	2%	0%	12%	4%
64	94%	103%	117%	105%
65	74%	97%	91%	87%

Broken out across four size classes, the sites with the smallest nominated load reduction, 0–50 kW, achieved the highest average realization rate across the three events at 112 percent. The 0-50 kW group had the largest portion of sites enrolled in the Program, totaling 54 sites that accounted for 39 percent of total enrolled sites. The second smallest size class, 51–200 kW, had 52 sites enrolled and achieved the lowest average realization rate at 65 percent. The 201-500 kW group had 25 sites enrolled and achieved a realization rate of 100 percent. The largest size class, 501+ kW, had nine sites enrolled and achieved a realization rate of 109 percent.

Idaho Power will continue to work with all customer segments to help refine nominations to align closer with realistic reduction opportunities which will increase the overall program realization rate.

Figure 6 below represents the realization rate achieved by each nomination group, averaged across all three events. To calculate the results, each site's average load reduction (across three events) was divided by its average nomination across the three events and then grouped by size.

Figure 6.



Program Costs

Program costs totaled $417,819 through October 1, 2018. Incentive payments were the largest expenditure comprising approximately 89 percent of total costs.

The incentive payments were fixed-capacity payments resulting from the three events called during the 2018 Program season. The fixed capacity payments total was $371,496 and the variable energy payment total was $0. Variable energy payments were not made during the season because the variable energy payment is implemented starting with the fourth event.

Preliminarily,[7] the total Program costs for 2018 are estimated to be $12.66 per kW based on the maximum demand reduction of 33 MW, or $15.89 per kW, based on average load reduction for the season of 26.3 MW.

[7] Final Program costs for 2018 will be available after the close of the Company's 2018 financial reporting year, December 31, 2018.

Table 4 below displays the 2018 year-to-date ("YTD") Program costs by expense category.

Table 4.

Expense Category	2018 YTD Program Costs
Materials & Equipment	$1,001
Marketing & Administration	$45,322
Incentive payments	$371,496
Total	**$417,819**

Benefit-Cost Analysis

Idaho Power believes the purpose of demand response is to minimize or delay the need to build new supply-side peaking generation resources and to reduce load during extreme system peaks. The benefits of having the Program available, and with each load reduction event, provide Idaho Power a supply side resource to mitigate any system peak deficits. DR helps fulfill the current system capacity need and prolongs the need to build new generation resources.

The Benefit-Cost analysis for the Program is based on a 20-year model that uses financial and demand-side management alternate cost assumptions from the most recently acknowledged Integrated Resource Plan ("IRP") available during budgeting for the upcoming Program year, the *2015 Integrated Resource Plan*. The Settlement, as approved in IPUC Order No. 32923 and OPUC Order No.13-482, established a new method for valuing DR and defined the annual cost of operating Idaho Power's three DR programs for the maximum allowable 60 hours as no more than $16.7 million.

The annual value calculation is updated with each IRP based on changes that include, but are not limited to, need, capital cost, or financial assumptions. This amount was re-evaluated in the 2015 IRP to be $18.5 million. Under the 2017 IRP, this value is $19.8 million.

In 2018, the preliminary cost estimate of operating all three of Idaho Power's DR programs was $7.9 million through October 1, 2018. It is estimated that if the three programs were dispatched for the full 60 hours, the total costs would have been approximately $11.1 million, which is below the total annual costs agreed upon in the Settlement as revised in both the 2015 and 2017 IRP.

The Company believes by calling at least three events per season the Program will be more effective in providing consistent and reliable reduction. Having a minimum of three events allows the Company to test processes and software and helps customers fine tune their curtailment plan. The Company did not call more than three load reduction events during the 2018 Program season because Idaho Power's generation resources were sufficient to satisfy system load. However, in all three events the Program provided a resource to assist Load Serving Operators balancing the forecast when it did not align with actual peak load, as well as potentially avoid additional market purchases. Based on market prices for each of the days in 2018 the Program was dispatched, Idaho Power estimates the Program saved a total of $20,000 worth of energy purchases.

The variable energy price for utilizing the Program after the third event is $0.16/kWh and could be considered the dispatch price for calling load reduction events beginning with the fourth event. The price of $0.16/kWh is typically higher than the energy market price. The Company believes the variable energy price is appropriate because having a dispatch price below $0.16/kWh could cause the Company to call events more frequently resulting in reduced participant performance and event fatigue. The Company also believes that a lower dispatch price to trigger more load reduction events could send the wrong signal regarding the purpose of the Program and DR.

Idaho Power's cost-effectiveness evaluation for DR programs is updated annually. A more comprehensive cost-benefit analysis will be included in the Company's Demand-Side Management 2018 Annual Report when all the final 2018 financial data will be available.

Customer Satisfaction Results

Idaho Power did not conduct a post-season survey this year as there were not significant changes made to the Program from the last three seasons. The prior two surveys conducted in 2015 and 2016 were favorable and the Company believes conducting a survey every 2-3 years will reduce survey fatigue considering this customer segment also participates in the quarterly *Customer Satisfaction Research Survey* conducted by Burke, Inc. The Company plans to conduct a post season survey after the 2019 season to re-evaluate customer satisfaction with the Program offering.

Program Activities for 2019

The primary improvement Idaho Power and the Program could benefit from is a larger enrolled nominated capacity and more consistent load reduction when events are called. The Company will continue to communicate the value proposition with enrolled participants and the importance of active participation when events are called. Recruitment efforts for the 2019 season will begin the fourth quarter of 2018 to encourage participation. Idaho Power will meet with existing participants during the off-season to discuss past-season performance and upcoming season details. The Program Specialist has already started meeting with new potential candidates for the 2019 season.

The Program will be jointly marketed along with Idaho Power's applicable energy efficiency programs as needed. The Company will utilize its field representatives to retain the currently enrolled sites and encourage new sites to participate.

Both the nomination and achieved reduction amounts decreased in 2018 due to one large customer that reduced its nominated amount in the Program by 65 percent due to market conditions. This specific customer reduced its enrolled nomination amount on June 5, 2018, after the auto-enrollment had been sent out in early March. This allowed the Company only 10 days to seek out new candidates to make up the 5 MW reduction.

For the upcoming season, Idaho Power plans to focus on retaining currently enrolled participants and will actively market the Program. The Company is not seeking to expand the capacity of the FlexPeak Program, but recognizes there is attrition over time and many participants may reduce their nomination based on operational and business needs so it is important to consistently have at least 37-40 MW of nominated capacity available. This level of nominated capacity will allow events to achieve 35 MW of load reduction considering the typical realization rate of nominated capacity ranging from 85-95 percent.

Conclusion

The Program currently contributes approximately 10 percent of the Company's overall DR portfolio and can be relied on to provide dispatchable load reduction to the electrical grid. When analyzing the Program at the generation level, industrial and commercial customers have made noteworthy contributions to Idaho Power's DR programs. The cost of having this resource available was $15.89 per kW based on average reduction (26.3 MW) for the season.

2018 Irrigation Peak Rewards Program Report

January 2019

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INTRODUCTION

The Irrigation Peak Rewards Program (IPR) is a voluntary demand response program available to Idaho Power Company's (IPC) agricultural irrigation customers since 2004. IPR pays irrigation customers a financial incentive for the ability to turn off participating irrigation pumps at potentially high system load periods (summer peak). IPC estimates future capacity needs through the Integrated Resource Plan and then plans resources to mitigate these shortfalls. IPR is a result of this planning process and the success of the program is measured by the amount of demand reduction available to IPC during potential system peak periods.

Details

Interruption Options

IPR is available to Idaho Power irrigation customers receiving service under Schedules 24 and 84 in Idaho and Oregon respectively. Eligibility is based on prior program participation at the pump location. The pump location may have a device installed on the panel to automatically dispatch or remotely turn off the pump when a demand response event is called, or the participant may shut down manually at the event start time.

Automatic Dispatch Option

Pumps enrolled in the automatic dispatch option have one of two devices installed at the pump location to allow IPC the ability to send a signal that controls the associated irrigation pump(s). This option requires all pumps at a site be controlled. Communication is sent to the device during a load control event to turn off the pump. Nearly 90% of the devices use IPC's Automated Metering Infrastructure (AMI) to send the signal to the demand response unit (DRU). If the meter at the service location is an AMI meter, then the pump panel will have a DRU installed. If AMI technology is not available, a cellular network device (cell device) is installed on the pump panel. Approximately 12% of the automatic dispatch option pumps have a cell device installed. The device has the same load control feature as the AMI DRU but a cellular network signal is used to communicate with the device.

Manual Dispatch Option

Pumps with at least 1,000 cumulative horse power (HP) or that IPC has determined to have limited communication availability, are eligible for the manual dispatch option (manual). Participants under this classification choose to manually control which pumps are turned off during a load control event. Manual participants are required to select a nominated load reduction of kilowatts (kW) they plan to turn off during load control season.

Parameters

- Season dates June 15th – August 15th
- Minimum of three load control events
- Load control events may occur any weekday or Saturday, excluding July 4th holiday between the hours of 1:00 pm and 9:00 pm
- Load control events may occur up to four hours per day and up to 15 hours per week, but no more than 60 hours per program season
- Two ways to participate; Automatic or Manual
- IPC provides notification via phone, email and/or text messaging to Automatic participants four hours prior to the start of the event whenever possible
- IPC provides notification via phone, email and/or text to Manual participants four hours prior to the start of the event
- IPC could choose to cancel the load control event and notify participants of cancellation up to 30 minutes prior to the event start time
- Parameters for IPR do not apply to system emergencies

Incentives

Automatic dispatch participants receive incentives in the form of a billing credit. The billing credit is made up of a demand credit and an energy credit applied to the monthly bill June 15th through August 15th. The demand and energy credits for the Manual dispatch participants are paid with a physical check.

Demand credits are calculated by multiplying the monthly billing kW by the demand-related incentive amount. The energy credits are calculated by multiplying the monthly billing kilowatt-hour (kWh) usage by the energy-related incentive amount. Credits are prorated for periods when meter reading/billing cycles do not align with the IPR season dates.

The incentive structure includes 'Fixed' and 'Variable' incentives. Variable incentives apply if more than three events occur in the season. Participants who allow the later dispatch time until 9:00 pm are paid a larger variable credit incentive if more than three events are called in the same season. No 'Variable' incentive payments were made in 2018. Incentives are calculated for Manual and Automatic dispatch participants using IPC metered billing data.

Monthly billing credits are calculated and applied using IPC's billing software. Manual credits are calculated using interval metering data and nominated kW and issued via mail in the form of a check. The incentive rates for 2018 are listed in Table 1.

Table 1. Monthly incentive rates for manual and automatic options

Fixed Demand Credit ($/billing kW)	Fixed Energy Credit ($/billing kWh)	Variable Energy Credit ($/billing kWh)	Extended Variable Energy Credit* ($/billing kWh)
$5.00	$0.0076	$0.148	$0.198

*(5-9 pm group)

Opt-Outs

Under the rules of the automatic dispatch option, participants have the option to opt-out of a load control event up to five times per pump per season. Opt-out fees are equal to $5.00 multiplied by the billed kW for that billing cycle. An explicit opt-out occurs when the participant asks IPC to remove the pump for that specific load control event.

PARTICIPATION

IPR enrollment packets were mailed to all past participants in February 2018. Contents of the packet included an IPR brochure, program application, incentive structure details, eligible pump locations and an estimated incentive for each pump location.

IPC presented IPR details at irrigation workshops across the service area. IPC also had the opportunity to communicate program details while staffing the IPC booth at four agricultural shows across the service territory. IPC continues to make a concerted effort to encourage past participants to re-enroll.

2018 total billing demand enrollment was 416.8 MW with 2,335 pumps. The pump count and nominated kW increased over 2017 numbers. A total of 85.2% of the eligible pumps enrolled, an increase over last year of 1.7%.

Figure 1 shows IPC's service area divided into three regional areas; Canyon-West, Capital and South-East. Five areas within the three regions will be referenced throughout this report; Western, Canyon, Capital, Southern and Eastern.

Figure 1. Idaho Power service area

Figure 2. Distribution of participants by service area

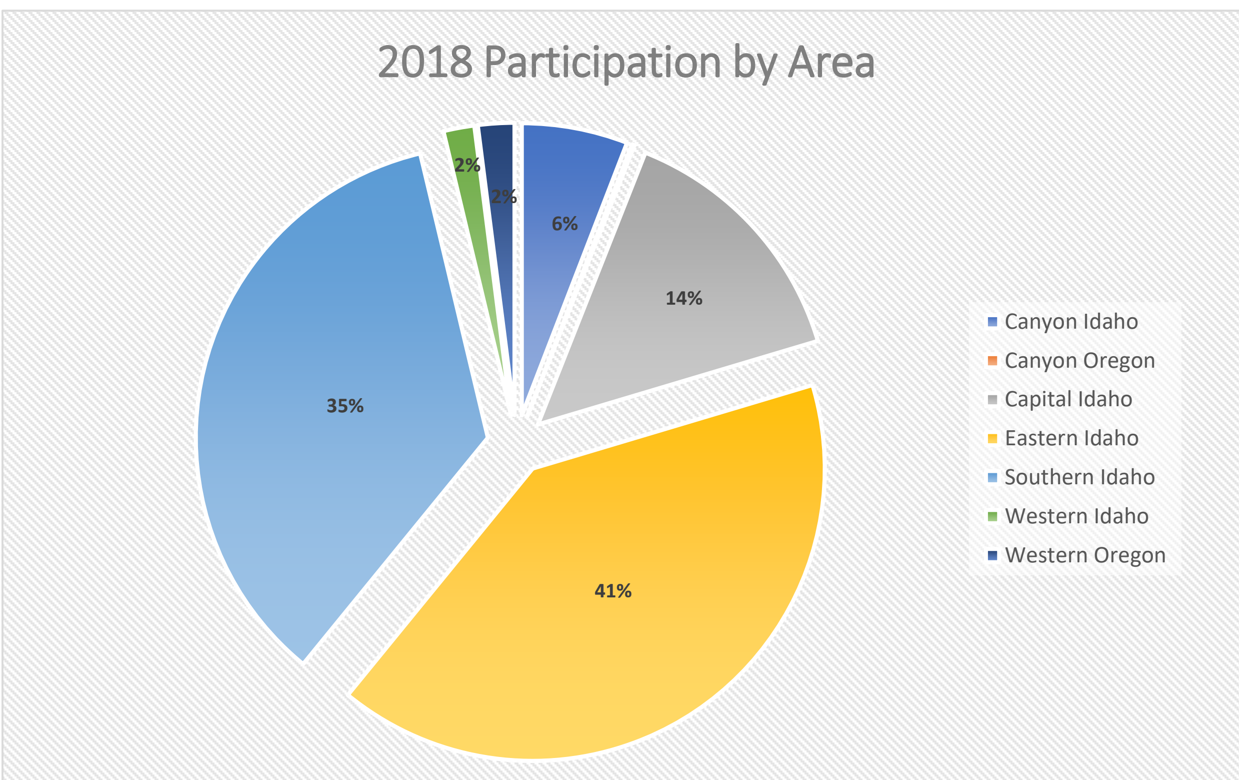


Table 2. Eligible pump locations, nominated MW and participation levels by area

IPC Regional Area	Eligible Service Locations	Manual Dispatch Option	Automatic Dispatch Option	Total Enrolled by Area	Eligible Enrolled	Nominated MW
Canyon Idaho	154	11	126	137	89.0%	38.1
Canyon Oregon	4	0	3	3	75.0%	0.2
Capital Idaho	374	30	306	336	89.8%	91.1
Eastern Idaho	1,118	0	946	946	84.6%	133.7
Southern Idaho	971	5	821	826	85.1%	138.9
Western Idaho	60	0	40	40	66.7%	3.3
Western Oregon	59	3	44	47	79.7%	11.5
Totals	2,740	49	2,286	2,335	85.2%	416.8

OPERATIONS

Equipment

IPC has expanded the use of AMI technology with the use of DRUs installed at pump locations. AMI technology provides the ability to turn off pumps during an IPR event by sending communication through the power line to the DRU.

AMI technology allows IPC to monitor the status of many participating pumps during load control events through an hourly usage report. These reports provide data to help determine which DRU's functioned properly and which pumps were off during the event. During the 2018 season 2438 DRU's were active and installed at 1998 pump locations.

In addition to using AMI technology, IPC developed its own load control device. These devices utilize a cellular network signal to communicate with and shut off the pump during a load control event. The data available from the cellular device systems allows IPC to view status information for each location and successful cellular communication. Hourly usage data is not available at these sites. During the 2018 season 319 cellular devices were active and installed at 275 pump locations.

In order to spread load reduction out over a period long enough to utilize full program capacity, IPC has four dispatch groups. Each group is a four-hour block of time. The 5:00 – 9:00 pm option may have an additional variable payment should four or more events be dispatched during the season. The four options for dispatch groups are as follows:

- 2:00 – 6:00 pm
- 3:00 – 7:00 pm
- 4:00 – 8:00 pm
- 5:00 – 9:00 pm

Monitoring

Identification and correction of device failure is an ongoing effort before the season begins and throughout the season. The AMI hourly data and the AMI communication reports provide information as to which DRU's are malfunctioning and need repair and/or replacement.

A variety of issues with the DRU's and Cellular devices were identified including:

- Inoperable
- Damaged or missing fuse in the DRU
- DRU serial number had been recorded inaccurately and the system could not find the correct communication path
- New panel install at the pump site
- Water damage to the DRU
- DRU missing - no longer at the pump location

ANALYSIS

The load reduction analysis or program performance for the season is calculated utilizing six primary sources:

1. Program participant list
2. AMI hourly usage data
3. Interval metering data
4. Cellular device data
5. Cellular device event communication data
6. Total system load data for event days and surrogate days

The IPR participant data for each load reduction event day includes the following:

- Pump number
- Meter number
- 2018 dispatch option
- 2018 dispatch group
- Nominated kW
- Cellular device or DRU number

IPC system load monitoring was used as a comparison for impact of the load reduction during the event. The total system load monitoring provides megawatt hour (MW) readings in five-minute increments on event days as well as comparative nonevent days.

Data Gathering and Processing

Troubleshooting, customer payments and program performance are informed by data analysis. The first steps of the data analysis are gathering and processing the data. This included AMI Data, cellular device data, MV-90 hourly data and logged data from manually read meters. The data was then separated into three data sets:

1. Pumps with AMI technology and hourly usage data
2. Pumps with cellular device data
3. Pumps running on the manual dispatch option with interval data

Individual Pump Location Load Reduction Results

Calculating the performance of the program requires a comparison between usage prior to the event and usage during the event.

- Average of the hourly interval readings in the second, third and fourth hours of each dispatch group. The first hour is not considered in the baseline data due to the potential for a delay in AMI communications and the message may take up to 10 minutes to register at any specific pump location to shut down for the event therefore showing usage data in the first hour.
- Each pump's usage during the baseline hours is summed to arrive at a combined baseline for each dispatch group (reference Appendix for the demand reduction calculation method and definition of terms).

Table 3 displays the load reduction results for each event day. Each event day includes the four dispatch groups. The load reductions at generation level include a 9.7 percent line loss.

Table 3. Hourly demand reduction results (MW) for each event including line losses.

Event Date	2 - 3 PM	3 - 4 PM	4 - 5 PM	5 - 6 PM	6 - 7 PM	7 - 8 PM	8 - 9 PM
7/13/2018	75.9	149.3	231.8	296.7	218.0	139.3	58.3
7/17/2018	71.3	125.9	206.8	256.6	180.9	121.5	43.6
8/1/2018	54.3	117.3	206.8	263.8	208.5	142.7	54.6

Baseline Calculations and Event Reduction Calculations

July 13th

For the first event, some pumps that should have been active were still listed as inactive due to 2017 information that had not been written over. This occurred due to a modification file not being uploaded for the 2018 enrollments listing active and inactive participants. The modification file is tied to IPC customer information system (CR&B). CR&B holds the record throughout the program season. Without the update some of the pumps were not sent the communication for the DRU to turn the pump off. The mislabeled DRU's were 1.08% of the 2018 program's nominated kW. The modification file was uploaded after the first event and a process put in place to ensure timely uploading in the future.

July 17th

The second event communication to the DRU's for multiple pumps failed due to a vendor provided software issue. This issue impacted the 4:00 pm dispatch group the most, of the DRU's enrolled in the program 6.12% did not receive the communication due to this issue. IPC substations contain equipment to transmit the communication to the service points/ DRU's served in that area. After the issue was identified through the metering department, the technical expert reinstated the communications in time for the 5:00 pm dispatch group to work successfully. In addition to the communication failure on the July 17th event, there were also three substations with no communication to the DRU's. Two substations provided no communication due to power outages in the area and one substation provided no communication because the AMI communication equipment was not operating.

August 1st

The third event of the season went smoothly. The notifications to participants went out as designed and the communication to the DRU's occurred without delays. Overall, the event had lower load reduction due to being scheduled later in the season when many of the participants were done watering their crops for the year.

Potential Realization Rate Analysis

Realization rate is used to determine the IPR potential performance for any day during the season. It is defined as the likelihood that an irrigation pump is on and available for shut off during the demand response event. Potential realization rate is reduced by device failures, opt-outs and small loads left on during an event. These reductions averaged 3.59% for the 2018 season. Table 4 shows results for each event and identifies and categorizes the load left on at participating service locations.

Table 4. Results for all options by percentage

Percentage of MW on during each event by reason				
Event Date	Small Load	Opt Out	Device Failure	Total
7/13/2018	0.39%	0.67%	3.80%	4.86%
7/17/2018	0.24%	0.47%	1.70%	2.41%
8/1/2018	0.28%	1.29%	1.92%	3.49%
Season Average	0.30%	0.81%	2.47%	3.59%

The potential realization rate is the percentage of enrolled demand expected to result in an actual load reduction on the system during a given interruption period in a typical summer.

This rate is highest at the end of June and the beginning of July when a larger percentage of irrigation pumps are operating nearly 24 hours per day seven days per week. The potential realization rate is lower later in the season when many pumps are not operating due to crop maturity and reduced watering demands, primarily for grain crops. Figure 3 shows eligible days in the season and the pumping load of participating pumps. The percentage of load running is reduced by the average percentage of load left on during the three load control event days. The graph shows a maximum potential realization rate of 68.5% which results in a maximum potential load reduction for IPR of 313.5 MW.

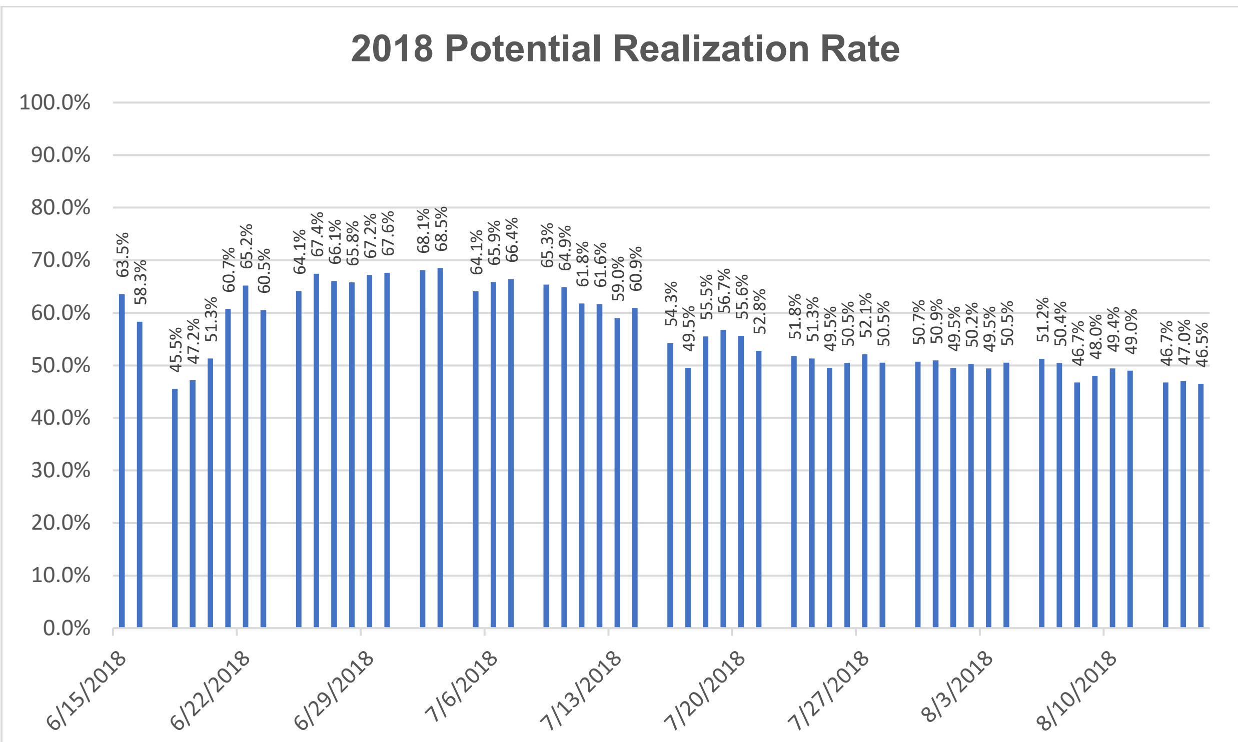


Figure 3. Potential realization rate per day excluding Sunday's and July 4th

Load Reduction Results – Total System Load Data

Idaho Power measures system load data in five-minute intervals. These data were also used to estimate load reduction for IPR. Each event day is considered to evaluate the results of the program operation. The reduction is considered an estimate due to the magnitude of what would have happened absent an event. Figure 4 shows an approximate reduction of 300 MW at 6:00 pm which correlates well with the interval metering data analysis.

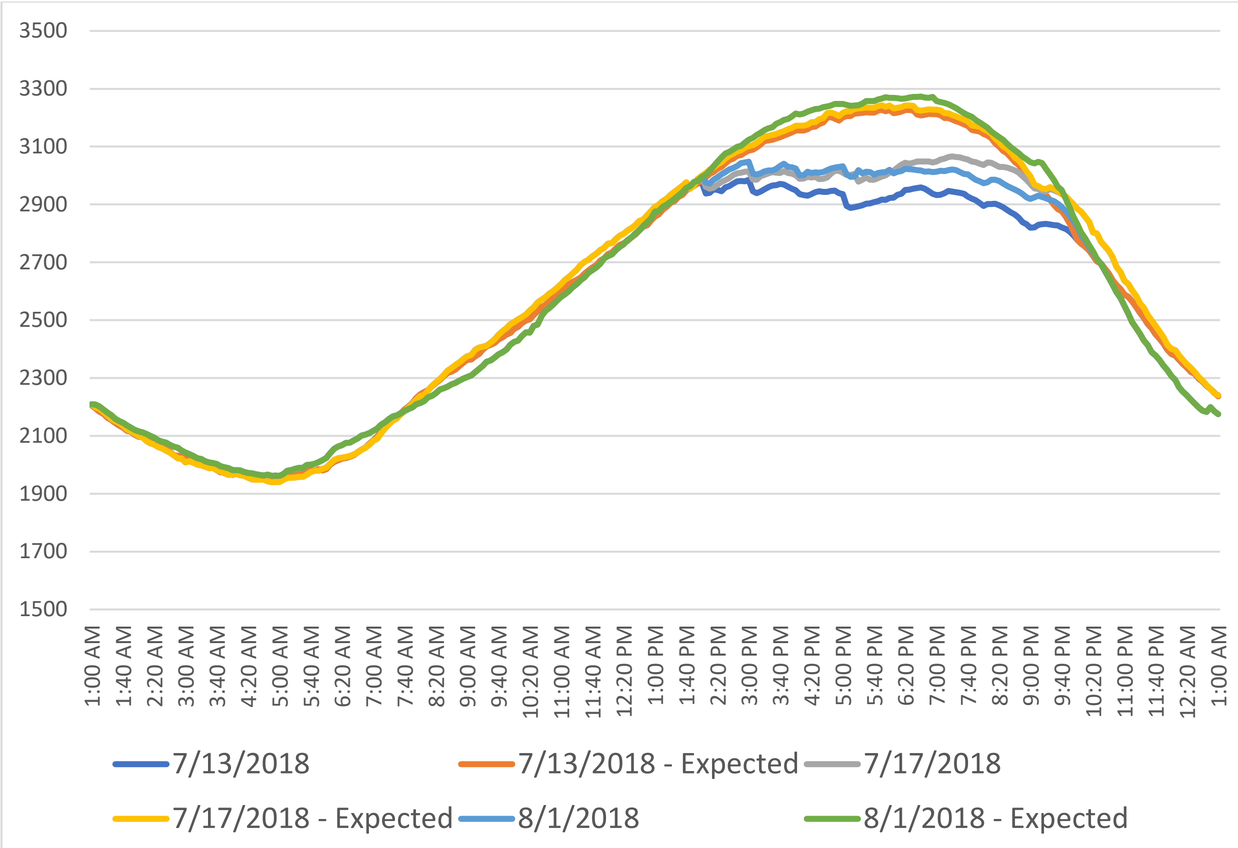


Figure 4. Load reduction results – total system load data

Costs

IPR spent a total of $6,891,737.00 with the incentive credit being the largest portion at 96.2% of total program costs. Incentives paid for the 2018 season totaled $6,636,510.

Table 5. Annual program costs by category

Expense Item	2018 Total Cost
Materials & Equipment	$ 67,887.00
Purchased Services	$ 77,028.00
Other Expense	$ 2,476.00
Incentives	$ 6,636,510.00
Labor/Administrative Expense	$ 107,836.00
Total	$ 6,891,737.00

CONCLUSIONS

2018 Irrigation Peak Rewards had a demand reduction potential reduction of 313.5 MW and an actual reduction of 296.7 including line losses. Idaho Power Company runs three demand response programs; Irrigation Peak Rewards - Irrigation, Flex Peak - Commercial/Industrial and A/C Cool Credit - Residential. The total load reduction for all three demand response programs was 384.5. Irrigation Peak Rewards presents approximately 81.5% of the total load reduction for the company. Highlights listed below:

- 2,335 pumps enrolled
- 2,438 active AMI DRU's
- 319 active IPC cellular devices
- 85.2% of eligible pump locations participated
- Event 1 – July 13th - max reduction 296.7 MW
- Event 2 – July 17th - max reduction 256.6 MW
- Event 3 – August 1st - max reduction 263.8 MW
- The cost of having this resource available was $21.98 per kW
- The cost of running the program for three events this season was $6.9 million
- The estimated additional cost of running the program at the full 60 hours per season or an additional 48 hours is approximately $2.9 million

APPENDIX

This appendix is a detailed account of the demand reduction calculation method.

Abbreviations

ADO—Automatic Dispatch Option

AEL—Average Event Load

AMI—Automated Metering Infrastructure

BL—Baseline Load

DR—Demand Reduction

MDO—Manual Dispatch Option

MV-90—Specific Meter Package with Interval Data

Σ—Sum

Automatic Dispatch Option

Load reduction for each event was calculated using hourly data for each pump using the last three hours of each curtailment event as follows:

$$DR_{pump} = BL_{pump} - AEL_{pump}$$

The load reduction for all pumps within a dispatch group is the total hourly reduction for each group as calculated below:

$$DR_{group} = \Sigma\ DR_{pump\ (groups\ 1\text{-}4)}$$

Load reduction for the automatic dispatch option was calculated as follows:

$$DR_{ado} = \Sigma\ DR_{group}$$

Manual Dispatch Option

Data utilized for manual dispatch option participants is AMI hourly usage or MV-90 interval data.

Load reduction for manual dispatch option was calculated as follows:

$$DR_{group} = \Sigma\, DR_{pump\ AMI} + \Sigma\, DR_{pump\ MV\text{-}90}$$

The total demand reduction for the Manual Dispatch Option was calculated as follows:

$$DR_{MDO} = \Sigma\, DR_{group}$$

The total IPR load reduction was calculated by summing the Automatic Dispatch Option sites and the Manual Dispatch Option sites calculated reduction:

$$\text{Total Program DR} = DR_{MDO} + DR_{Group}$$

A/C Cool Credit

2018 Demand Response Analysis

Prepared by: Idaho Power

December 2018

Executive Summary

Four three-hour AC Cool Credit events were run July 16, 25, 31, and August 6. Peak program demand reduction occurred July 16th (1.05 kW/participant, 26.5 MW). Accounting for system average energy losses at peak of 9.7% between generation facilities and customers, the max 2018 peak reduction in reduction was 29.1 MW.

The average hourly meter level demand reduction between the four events ranged from 0.33 kW per participant on August 6th to 0.98 on July 16th. The August 6th event was called despite lower temperatures to help regional reliability following a major power line outside of Idaho Power service area went out of service.

Analysis Methodology

AC Cool Credit participants' hourly consumption data was used to estimate demand reduction for all events. The hourly consumption data approach was validated in the 2012 impact evaluation, which analyzed both AMI and logger data, and demonstrated that both sources produced similar estimations of energy reduction per curtailment event. The analytical approach was established through 3rd party evaluations from 2014-2016.

Data Cleaning

Participants were merged with hourly consumption data for each event day and the 10 previous non-weekend days. Error codes were pulled in for all hours and any hour that had an error code, outage flag or was marked as an estimated read during the 4-7 pm event hours or 3 pm prior to the event was removed from the analysis. 96% of all customer sites were preserved after data cleaning.

The sub-sections below describe the project's methodology related to the sampling plan, demand reduction analysis, and updating of the predictive model.

Table 1. 2018 Summary of events and participation

Curtailment Event	Event Hours	AC units enrolled	Sites Analyzed for Reduction*
July 16	4pm – 7pm	26,180	25,175
July 25	4pm – 7pm	26,059	25,063
July 31	4pm – 7pm	25,975	24,981
Aug 6	4pm – 7pm	25,975	24,981

Notes: Customer sites may have more than one AC unit enrolled in program.

Baseline Data

The load reduction achieved during curtailment events was calculated by comparing the average load from each curtailment day against the average load developed from non-curtailment days selected for the baseline. The "previous days" approach was used, which utilizes the average load data from the previous ten non-weekend, non-curtailment days. Baseline kW was calculated as the average of the three days with the greatest demand from these previous ten non-curtailment days, as ranked by the highest hourly demand occurring during the curtailment timeframe. Curtailment days normally occur on hot, high demand days, thus selecting high demand days for the baseline ensures a similar load profile is used for the baseline days as the curtailment days.

Offset Factor

To effectively compare baseline and curtailment day loads, the baseline load was adjusted using an offset factor, calculated as the difference in kW between the baseline and curtailment event day load during the hour prior to the start of the curtailment. The offset factor was applied to the baseline day to "normalize" the baseline kW to the curtailment day kW. The offset factor mitigates underlying differences in load due to slight differences in outdoor temperature or other external factors.

Results

A total of four curtailment events were completed as part of the 2018 A/C Cool Credit program. Table 2 below details the characteristics of these events, including daily high temperature, event time period, and cycling percent.

Table 2. 2018 Summary Results of Curtailment Events

Event Date and High Temp	Cycling %	Region	Avg. kW Reduction per Participant	Max kW Reduction per Participant	Avg. Total kW Reduction	Max Total kW Reduction
July 16 Boise: 97° Poc/TF: 91°	55%	All	.98	1.05	24,578	26,468
		Boise	1.05	1.14	22,458	24,393
		Poc/TF	0.55	0.57	-2,064	-2,108
July 25 Boise: 100° Poc/TF: 94°	55%	All	0.94	0.99	24,436	24,893
		Boise	1.00	0.95	20,193	21,419
		Poc/TF	0.89	0.96	3,396	3,632
July 31 Boise: 97° Poc/TF: 93°	55%	All	0.55	0.59	13,884	14,661
		Boise	0.57	0.61	12,218	12,939
		Poc/TF	0.49	0.45	1,686	1,710
August 6 Boise: 93° Poc/TF: 87°	55%	All	0.33	0.38	8,148	9,520
		Boise	.37	.39	7,759	8,693
		Poc/TF	0.13	0.22	475	846

Figure 1. July 16th 2018

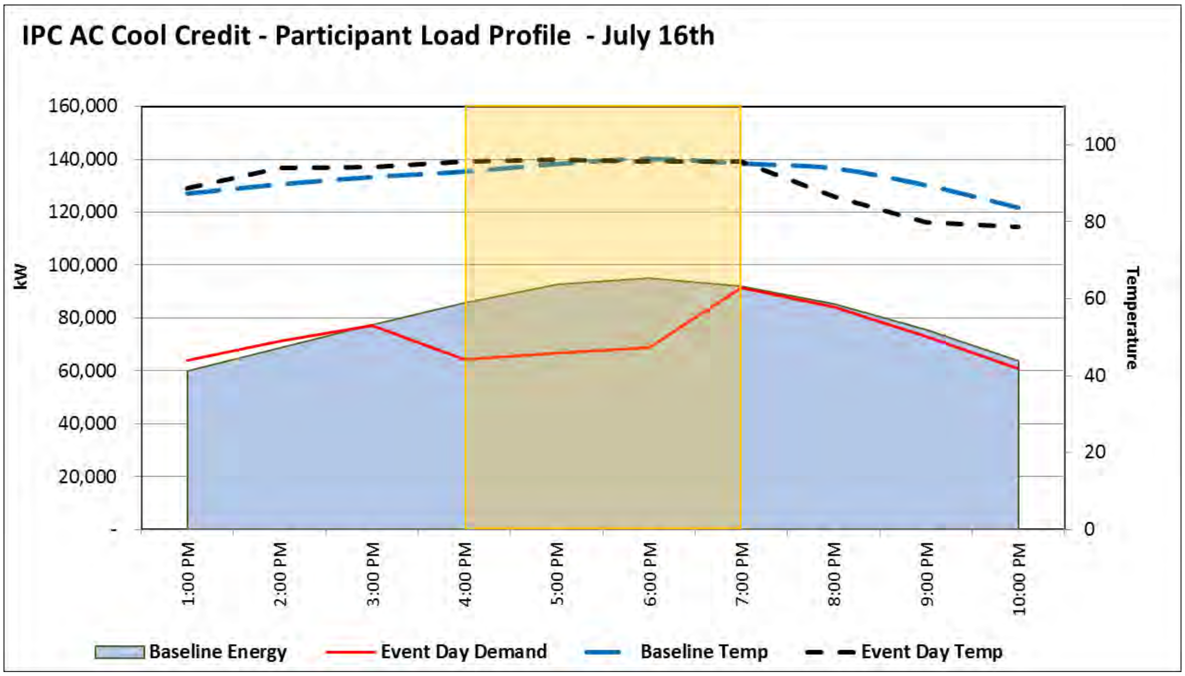


Figure 2. July 25th 2018

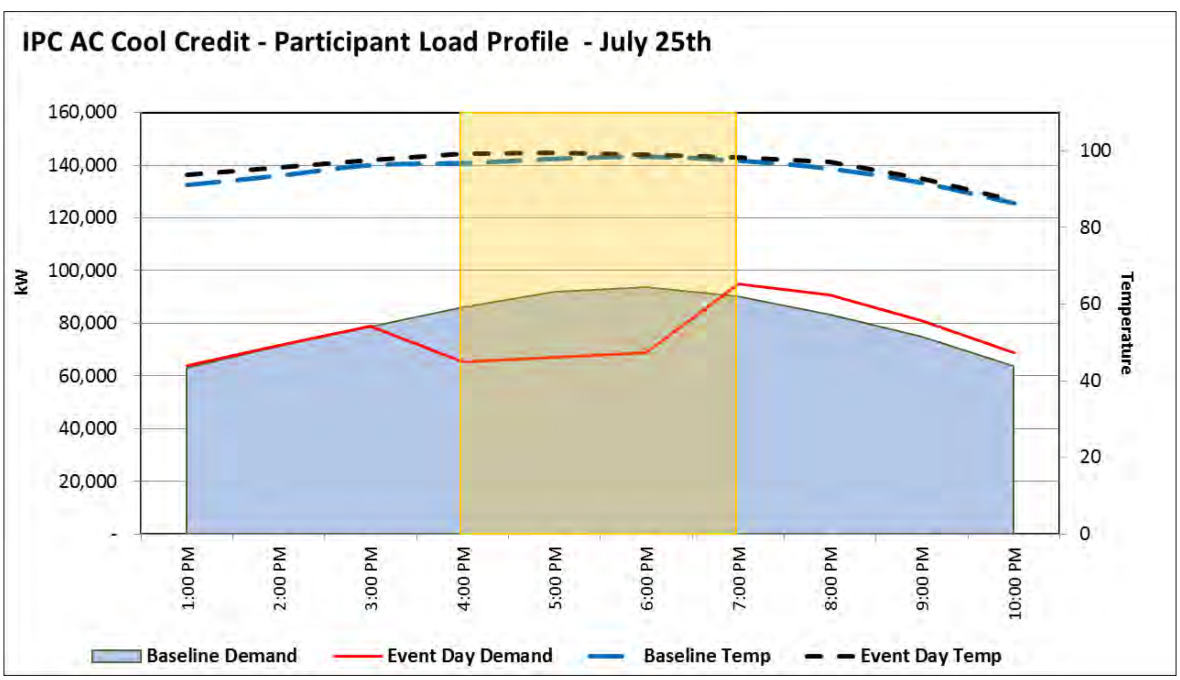


Figure 3 July 31st 2018

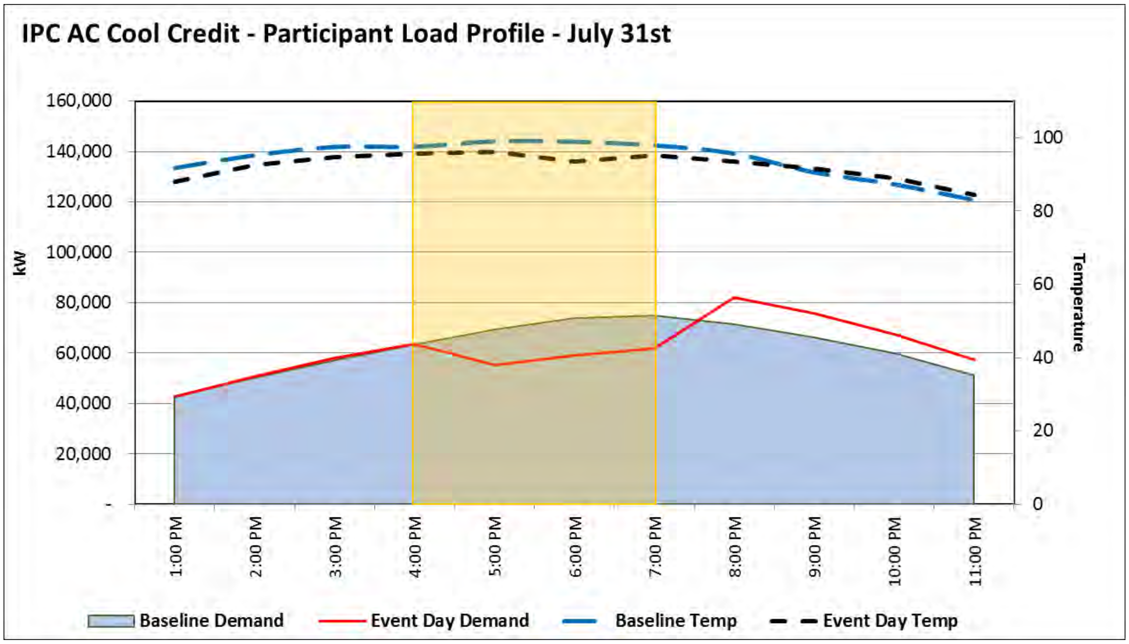
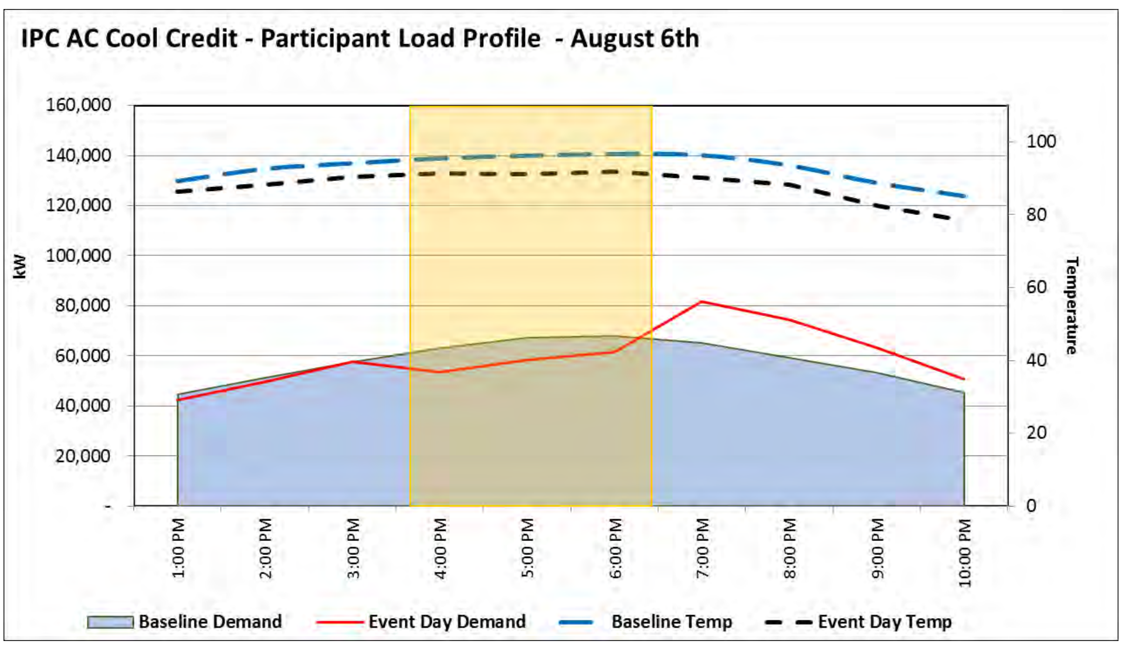


Figure 4 August 6th 2018



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ENERGY-SAVING KIT PROGRAM SUMMARY REPORT
2018

SUBMITTED BY:
RESOURCE ACTION PROGRAMS®

Idaho Power Energy-Saving Kit Program Summary Report 2018

Sponsored by:

IDAHO POWER®

An IDACORP Company

Submitted by:

RESOURCEACTION PROGRAMS

January 2019

"Shower timer: 3 people — 40 gallon water heater — you do the math. :)"

– Idaho Power Energy-Saving Kit Program Participant

Table of Contents

"Really love all the bulbs! Thank you for helping us out!"

– Idaho Power Energy-Saving Kit Program Participant

Executive Summary

The Idaho Power Energy-Saving Kit Program was designed and implemented to provide Idaho Power's residential households with energy-efficiency education, measures to reduce their energy costs, and help them develop energy-efficient behaviors consistent with Idaho Power. This report summarizes the 2018 Energy-Saving Kit program, which was implemented by forty-three thousand, eight-hundred forty nine (43,849) Idaho households and eight-hundred forty two (842) Oregon households. Funding was provided by Idaho Power.

The program achieved or exceeded expectations and the results are listed below.

PROGRAM ACHIEVEMENTS

1. Provided residential energy-saving measures and energy-efficiency education to 43,849 Idaho and 842 Oregon households.

- Affected all five regions of the Idaho Power service territory
- Affected 107 cities & towns in Idaho
- Affected 19 cities & towns in Oregon

REGIONS	HOUSEHOLDS	ELECTRIC KIT	NON-ELECTRIC KIT
Canyon	7,182	3,334	3,848
Capital	27,341	8,317	19,024
Eastern	3,049	1,805	1,244
Southern	3,878	2,426	1,416
Western	3,241	2,465	776
TOTALS	44,691	18,383	26,308

2. Generated residential energy and water savings. Projected annual savings:

- 214,488,146 gallons of water saved
- 16,823,689 kWh of electricity saved
- 103,394 therms of gas saved

(continued on next page)

(continued)

3. Idaho Power supported their customers through utilization of the following diverse marketing methods.

- Direct Mail
- Email from Idaho Power
- Idaho Power employee
- Idaho Power website
- Info in bill
- Facebook/Twitter
- Friend or Family
- Other:
  - ✔ Fair/Expo/Tradeshow
  - ✔ Fit One
  - ✔ Home and Garden Show
  - ✔ Home Energy Report
  - ✔ Energy Savings Booklet
  - ✔ Flyer
  - ✔ New customer Welcome Kit
  - ✔ Nextdoor
  - ✔ Reddit
  - ✔ School
  - ✔ Senior Center
  - ✔ Smart Women Smart Money Conf.
  - ✔ TV
  - ✔ WICAP Head Start
  - ✔ Miscellaneous
  - ✔ Other
  - ✔ Blank

4. Designed and provided complementary educational materials and incentives to maximize installation of targeted efficiency measures (Installation rates ranged from 44 – 96 percent).
5. Maintained data collection and management services to collect and process audit ready data from participating households.
6. Maintained tracking and reporting to summarize the Program participation.

OPTING-IN METHODS	HOUSEHOLDS	%
Website	**16,256**	**36.4%**
Phone	**1,638**	**3.7%**
Postcards	**26,797**	**60.0%**

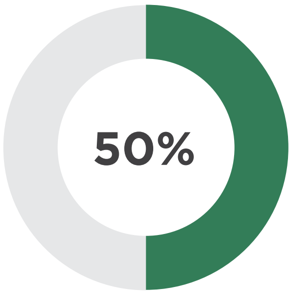
The program was launched in January. Direct mailings were distributed in January (49,288), April (47,537) and September (92,500) and resulted in immediate positive response from Idaho Power customers.

Program content on the Idaho Power website, mention on the Idaho Power Infomercial combined with community events generated a steady demand for the energy-saving kit. The program served a total of 44,691 households in both Idaho and Oregon.

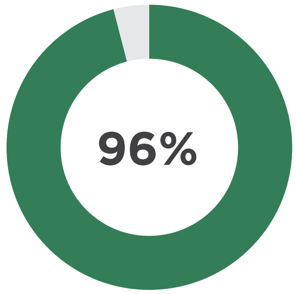
The Program provided customized Direct-to-Customer Program modules, which included educational materials and energy-saving products. A participant survey was included with the program materials (in-kit). The purpose of the survey was to increase educational retention and impact while serving as a data collection tool.

New to 2018, a second follow-up survey was distributed two months after participants' kit receipt. The objective being to determine if those initially responding they had not yet installed but will followed through. The installation responses in the follow-up surveys confirmed they did as overall installation percentages improved.

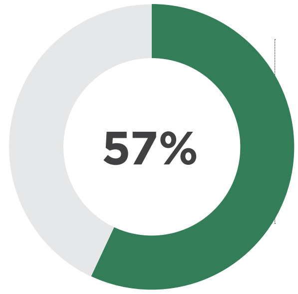
Survey responses indicated high participant satisfaction and participation in product retrofits and adoption of new energy saving behaviors. Total 16,078 households returned completed surveys and the responses were overwhelmingly positive. Highlights include:



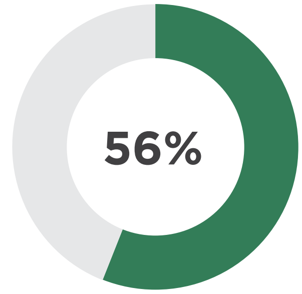
Reported households with ALL 9 LED Light Bulbs installed.



Reported households with the LED Night Light installed.



Reported households with the Evolve TSV & Showerhead installed.



Reported households who used the Shower Timer.

Projected Resource Savings

A list of assumptions and formulas used for these calculations can be found in Appendix A.

Projected energy savings from this program are significant. Based on the reported actions, annual and lifetime resource savings are as follows:

PROJECTED ANNUAL SAVINGS	
214,488,146	gallons of water saved
16,823,689	kWh of electricity saved
103,394	therms of gas saved

PROJECTED LIFETIME SAVINGS	
1,845,124,456	gallons of water saved
156,010,094	kWh of electricity saved
206,787	therms of gas saved

PROJECTED ANNUAL SAVINGS PER HOME	
11,668	gallons of water saved
376	kWh of electricity saved
2	therms of gas saved

PROJECTED LIFETIME SAVINGS PER HOME	
100,371	gallons of water saved
3,491	kWh of electricity saved
5	therms of gas saved

“Love the showerhead.”

– Idaho Power Energy-Saving Kit Program Participant

RAP Direct-to-Customer Programs

For more than 25 years, Resource Action Programs® (RAP) has designed and implemented resource efficiency and education programs, changing household energy and water use while delivering significant, measurable resource savings for program sponsors. All RAP programs feature a proven blend of innovative education and comprehensive implementation services.

RAP Programs serve more than 650,000 households each year through school and adult delivered Measure Based Education Programs. Our forty-person staff manages the implementation process and program oversight for nearly 300 individual programs annually. Recognized nationally as a leader in energy and water efficiency education and program design, RAP has a strong reputation for providing the highest level of service to program sponsors as part of a wide range of conservation and resource efficiency solutions for municipalities, utilities, states, community agencies, and corporations.

All aspects of program design and implementation are completed at the Program Center in Sparks, Nevada. These include: graphic and web design, print production, procurement, warehousing, logistics, module production, marketing, program tracking, data tabulation and reporting.

The Direct-to-Customer Program represents the leading edge of community energy efficiency education program design and implementation. The Program uses a client-directed Measure Based Education model to generate lasting residential energy savings from both retrofits and new behaviors. Initially, participants choose their personal savings target. Then they select retrofits using provided measures and energy-saving behaviors to reach their goal. The Direct-to-Customer Program is tremendously versatile, and can easily be introduced and distributed via a wide range of delivery channels, including Opt-in Direct Mail, CBO/CAA distribution, workshops, community events, affinity groups (volunteers, CAAs, CBOs, churches) or public events.

Cost-effective energy savings from the measure installations will justify program investments on their own, but the Program delivers several other important benefits as well. The educational component is designed to include each household member in order to manage household energy use. Measures, immediate savings actions and additional savings ideas for all areas of residential energy use are grouped by areas of the home and provided to participants as options to help them reach their personal savings targets. Additional rebates and program opportunities can be introduced through the Program or offered as incentives for program performance.

Participation in the Direct-to-Customer Program provides a strong, personalized pathway for participants to realize both initial and ongoing savings from new products and behavior choices in their homes.

Idaho Power Energy-Saving Kit Program Overview

The overarching goal of this measure based program was to assist Idaho Power in providing their residential households with energy-efficiency education and reduced energy costs as well as developing energy efficiency behaviors consistent with Idaho Power's energy efficiency objectives. The energy-savings Kits empowered the Idaho and Oregon households to save energy and money.

The program created and distributed a custom educational savings module consisting of efficiency measures, educational materials, and household surveys. Educational materials included a Quick Start Guide, Survey, Installation Instructions, Mini-Home Assessment (Idaho Power provided) and other tools such as stickers and magnets as reminders for new energy-efficient conservation behaviors. All elements were customized to meet Idaho Power priorities, regional conditions and regulatory requirements.

The program was offered to eligible Idaho Power residential households as defined by Idaho Power. Those in participating households cited the categories shown in the table (at right) when asked how they heard of the program.

HEARD ABOUT PROGRAM	HOUSEHOLDS	%
Direct Mail	31,937	71.46%
Email from Idaho Power	1,112	2.49%
Idaho Power employee	1,371	3.07%
Idaho Power Website	1,372	3.07%
Info in Bill	1,330	2.98%
Facebook/Twitter	323	0.72%
Friend or Family	3,509	7.85%
Other - Fair/Expo/Tradeshow	70	0.16%
Other - Fit One	46	0.10%
Other - Home and Garden Show	75	0.17%
Other - Home Energy Report	15	0.03%
Other - Energy Savings Booklet	12	0.03%
Other - Flyer	22	0.05%
Other - New Customer Welcome Kit	10	0.02%
Other - Nextdoor	33	0.07%
Other - Reddit	11	0.02%
Other - School	20	0.04%
Other - Senior Center	15	0.03%
Other - Smart Women Smart Money Conference	10	0.02%
Other - TV	157	0.35%
Other - WICAP Head Start	17	0.04%
Other - Miscellaneous	446	1.00%
Other	196	0.44%
Blank	2,582	5.78%
TOTALS	44,691	100%

Those in eligible households opting-in to receive the energy-saving kit utilized one of three primary methods:

1. RAP developed and maintained a program website to process energy-saving kit orders as well as to provide program information, including product installation videos and instructions.
2. RAP maintained a toll-free phone number to process the called-in kit orders and address any inquiries and issues.
3. Custom-designed direct mailers were sent to households with program information and instructions on ordering a kit.

Kit installation surveys were received from 16,078 participating households, representing an average response rate of 36% of the 44,691 energy-saving kits distributed. A monthly drawing for a $100 gift card provided the incentive for returning the household installation surveys.

OPTING-IN METHODS	HOUSEHOLDS	%
Website	**16,256**	**36.4%**
Phone	**1,638**	**3.7%**
Postcards	**26,797**	**60.0%**


QUICK START GUIDE
Español en el otro lado
IDAHO POWER
An IDACORP Company
START SAVING NOW!
1 Install the energy-efficient products in your kit.
2 Follow the energy-saving tips provided in this Quick Start Guide.
3 For additional ways to save, visit idahopower.com/save2day.
117419
Shower Timer
LED Lighting
Water Flow-Rate Test Bag
Refrigerator/Freezer
Want to Save More?
Water Heater
Evolve Showerhead Plus TSV
Installation Questions?
Don't forget!
Return your survey for a chance to win a $100 gift card.
Developed in partnership:
RESOURCE ACTION PROGRAMS
A FRANKLIN ENERGY COMPANY

Idaho Power Energy-Saving Kit Program Materials

Each participating household received an energy-saving kit containing efficiency measures for their homes and a Quick Start Guide with energy efficiency information and behavioral tips. The materials were customized for Idaho Power. Households with electric water heating received an electric kit (including water-saving measures). Households with other water heating options received a non-electric kit (excluding water-saving measures).

Included Educational Materials

Quick Start Guide

Survey

Survey Envelope (postage prepaid)

Sticker and Magnet Reminder

Mini-Home Assessment (Idaho Power provided)

Installation Instructions

* An Electric Kit

Included Efficiency Measures

Six 9-Watt LEDs (800 Lumens)

Three 6-Watt LEDs (480 Lumens)

IPC branded LED Night Light

Evolve TSV & Showerhead*

Kitchen and Bathroom Faucet Aerators*

Shower Timer

Digital Thermometer


117429
INSTALLATION SURVEY
(Español en el otro lado)
Complete this survey for a chance to win a
$100* Gift Card
All you have to do is...
1. Install the energy-efficient products in your kit.
quick start guide.
gift card!
15039 A0092 Idaho Power DTC
0000000
1. What type of home do you live in?
Single family home - Detached
Apartment, Condo, Townhouse, or Multi-family with 2-3 units
Apartment, Condo, Townhouse, or Multi-family with 4 or more units
Mobile/Manufactured home
2. How many people live in your home?
5 or more
4
3
2
1
3. How many of the LEDs did you install?
All of them
7-8
5-6
3-4
1-2
None
4. If you did not install all of the LEDs, what did you do with the remainder?
Plan to install, just haven't yet
Stored for later use
Gave them to someone else
Other
Have you used the
5. LED Night Light?
6. Shower Timer?
7. Flow-Rate Test Bag to test the flow rate of your shower or faucets?
Yes
Not yet, but will
No, won't use
8. If you used the Digital Thermometer to check the temperature of your water, what was the temperature?
> 140° F
131° F to 140° F
120° F to 130° F
< 120° F
Did not check water temperature
Did you adjust the temperature of your
9. Electric water heater?
10. Refrigerator?
11. Freezer?
Yes I lowered it
Yes I raised it
No I did not adjust
12. How satisfied were you with the kit ordering process?
Very satisfied
Somewhat satisfied
Somewhat dissatisfied
Very dissatisfied
13. Did you receive your kit within 3 weeks?
Yes
No
14. How likely would you be to tell a friend or family member to order a kit?
Very likely
Somewhat likely
Somewhat unlikely
Very unlikely
15. Prior to hearing about the Energy-Saving Kits, were you aware Idaho Power had energy efficiency programs and incentives?
Yes
No
16. Have you ever gone to Idaho Power's website to look for information about energy efficiency programs or to find ways to save?
Yes
No
17. How likely are you to participate in another energy efficiency program?
Very likely
Somewhat likely
Somewhat unlikely
Very unlikely
18. If you did not install some of the kit items, please tell us why.
Return this survey in the postage-paid envelope included in your kit.
You will be entered into our monthly drawing for a chance to win a $100 gift card.

Idaho Power Energy-Saving Kit Program Implementation

An introductory marketing direct mailer, supported by the information on the Idaho Power website, merited positive results. Many shared their positive program experience with their family and friends though social media, word of mouth, and emails. Additional exposure through bill inserts and community events resulted in a steady demand for the program.

Participation was processed and tracked at the RAP Program Center, which has the capacity to handle in excess of 100,000 requests per month. The program website, a toll-free phone number, and the business reply postcards provided convenient methods for interested households to order a kit and participate in the program.

Orders were tracked and managed daily from all outreach and enrollment sources. Program materials and products were packaged and addressed for individual home delivery. All Program modules received a unique ID number to improve the accuracy of data tracking and reduce the amount of information required from respondents.

All enrollments, shipping, and survey data were managed by RAP's proprietary Program Database. In addition, all returned surveys were tabulated and included in the program database. This procedure allows for reporting, which is an important element for tracking the measurements and goals of this program.

“Installed all and happy with all.”

– Idaho Power Energy-Saving Kit Program Participant

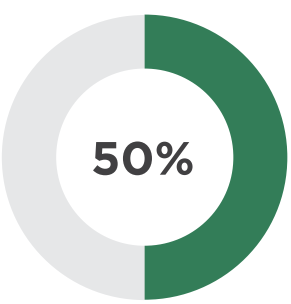
Idaho Power Energy-Saving Kit Program Impact

The program impacted 107 cities and towns throughout Idaho and 19 cities and towns in Oregon. As illustrated below, the program successfully educated those in participating households about energy and water efficiency while generating resource savings through the installation of efficiency measures in their homes. Home survey and installation information was collected to track savings and gather household consumption and demographic data. The three program elements, described on the next few pages, were used to collect this data.

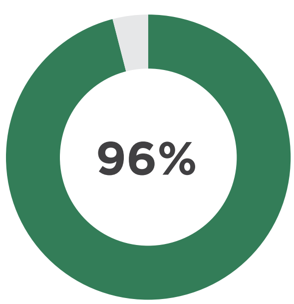
A. Home Survey and Retrofit Data

Upon completion of the program, participating households were asked to complete a home survey to assess their resource use, verify product installation, provide demographic information, and measure participation rates. Sample questions appear below and a complete summary of all responses is included in Appendix B.

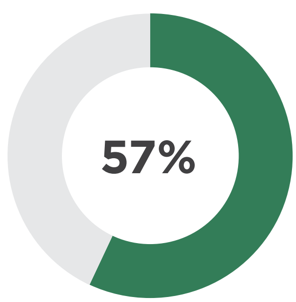
Did you install ALL 9 LED Light Bulbs?	**Yes - 50%**
Did you install the LED Night Light?	**Yes - 96%**
Did you install the Evolve TSV & Showerhead?	**Yes - 57%**
Did you use the Shower Timer?	**Yes - 56%**



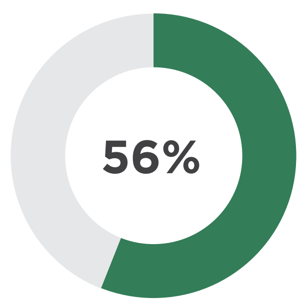
Reported households with ALL 9 LED Light Bulbs installed.



Reported households with the LED Night Light installed.



Reported households with the Evolve TSV & Showerhead installed.



Reported households who used the Shower Timer.

B. Water and Energy Savings Summary

As part of the program, participants installed retrofit efficiency measures in their homes. Using the family habits collected from the home surveys as the basis for this calculation, 44,691 households are expected to save the following resource totals. Savings from these actions and new behaviors will continue for many years to come.

Projected Resource Savings

A list of assumptions and formulas used for these calculations can be found in Appendix A.

Total Number of Participants:	**44,691**		
Number of Electric Only Participants:	**18,383**		
Number of Non-Electric Participants:	**26,308**		
	Annual	**Lifetime**	
Projected reduction from Showerhead retrofit:	**102,246,454**	**1,022,464,540**	gallons
Measure Life: **10 years**	**4,411,920**	**44,119,200**	kWh
Projected reduction from Shower Timer installation:	**37,469,625**	**74,939,250**	gallons
Product Life: **2 years**	**2,806,400**	**5,612,800**	kWh
	103,394	**206,787**	therms
Projected reduction from Kitchen Faucet Aerator retrofit:	**43,472,132**	**434,721,318**	gallons
Measure Life: **10 years**	**2,463,322**	**24,633,220**	kWh
Projected reduction from Bathroom Faucet Aerator retrofit:	**31,299,935**	**312,999,349**	gallons
Measure Life: **10 years**	**2,757,450**	**27,574,500**	kWh
Projected reduction from **9**-watt LED Light Bulbs:	**2,198,797**	**28,804,243**	kWh
Measure Life: **13.1 years**			
Projected reduction from **6**-watt LED Light Bulbs:	**1,099,399**	**14,402,122**	kWh
Measure Life: **13.1 years**			
Projected reduction from LED Night Light:	**1,086,401**	**10,864,009**	kWh
Measure Life: **10 years**			
TOTAL PROJECTED PROGRAM SAVINGS:	**214,488,146**	**1,845,124,456**	gallons
	16,823,689	**156,010,094**	kWh
	103,394	**206,787**	therms
TOTAL PROJECTED PROGRAM SAVINGS PER HOUSEHOLD:	**11,667.74**	**100,371.24**	gallons
	376	**3,491**	kWh
	2	**5**	therms

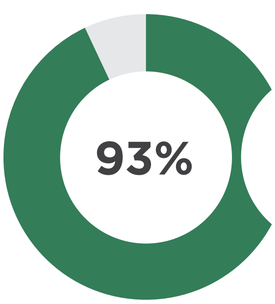
C. Participant Response

Participant response to Idaho Power's various outreach methods combined with social media and interpersonal communication resulted in an overwhelming demand for the program. Idaho Power increased the budget and the kit availability for this program in order to fulfill all residential customer orders. The participants utilized the Quick Start Guide to choose which measures and actions to take. Installation videos and text instructions made retrofit projects easy to complete. The installation rate data and the participant satisfaction data presented in this report were provided by kit surveys.

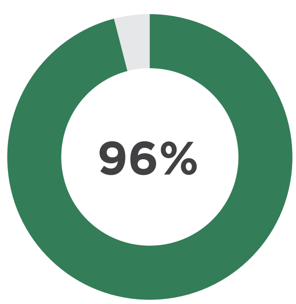
SURVEY TYPE	KITS SHIPPED	IN-KIT SURVEYS RECEIVED	IN-KIT SURVEY RESPONSE %	FOLLOW-UP SURVEYS RECEIVED*	FOLLOW-UP SURVEY RESPONSE%*
Electric	18,383	2,051	11.2%	6,220	33.8%
Non-Electric	26,308	4,084	15.5%	9,858	37.5%
TOTAL	44,691	6,135	13.7%	16,078	36.0%

**Includes Q3 2017 served, excludes November & December 2018 served due to every other month distribution.*

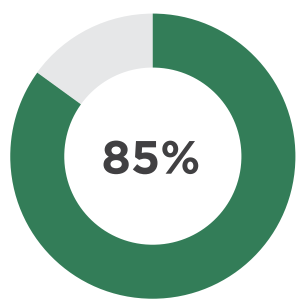
How satisfied were you with the kit ordering process?	**Very Satisfied - 93%**
Did you receive your kit within 3 weeks?	**Yes - 96%**
How likely would you be to tell a friend or family member to order a kit?	**Very Likely - 85%**
How likely are you to participate in another energy efficiency program?	**Very Likely - 78%**



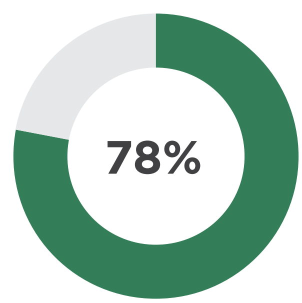
Reported households that were very satisfied with the ordering process.



Reported households that received their kits within 3 weeks.



Reported households that were very likely to tell a friend or family member to order a kit.



Reported households that were very likely to participate in another energy efficiency program.

Participant Responses

Really love all the LED bulbs! Thank you for helping us out! :)

Thank you so much for sending all these helpful items. I'm sure they will be a big change for the better. Again — thank you.

We installed them in all of our lights :) Thank you!

I liked it and went and got more light bulbs to complete the house. Thank you.

I was very satisfied with all the products you supplied. Idaho Power has done an excellent job of informing consumers of cost-energy savings — thanx.

I put them in and I love them all. Thank you. My kids told me about it. And I am so glad.

Will use as needed, just replaced kitchen and bath aerator. Showerhead goes in today. Checking freezer temp but turned down hot water heater and freezer after talking to Idaho Power representative, prior to receiving kit, which we are so pleased with. Thank you.

Installed all items, thank you very much for this program. I hope more ID Power Company customers will take advantage of the program.

So excited about these items — we are always looking for ways to reduce our footprint and save money!

Thank you! I will use or share everything.

I am very energy conscious. I installed what I could. Would like solar power incentives. All lights had been changed!

I installed all of them and I think this is one of the finest programs available to the public.

We are very delighted with the kit. The light is so much brighter and the kids are having a blast trying to keep their showers to 5 minutes, so we appreciate our gift very much.

Great kit! Thank you.

We've been in our home since 1974. Thank you for such a great service. We're in our 80s, so it really helps us.

I installed everything but the LED light bulbs, but will when the old ones need replacing.

I'm 100% LED now. I really looked forward to having you pick up my old refrigerator. I just replaced — why did you end that program!?

Participant Responses *(continued)*

Plan on installing all of it. Already had some installed. Thanks so much for the kit.

I now have them all installed.

Kitchen faucet aerator already installed.

We have CFL bulbs in some of our lights. As soon as they burn out we will replace them with the LEDs.

I installed everything. Thank you for the great energy-saving kit.

Thank you for making me more aware of energy saving items and ideas.

I use all of the kit items… I love it because it did save me energy.

We plan to use all. Thank you.

Going to install everything. :)

We've already implemented many of these features — the biggest help was the webpage and its "hour usage" function. Wow — we cut our power in half!

Everything is installed. Thank you for the kit.

Used all of the LED bulbs, plus went out and bought more. All lights in our house are now LED. The other items we did not need and gave to less fortunate family member to use.

Thank you so much! Awesome kit!

We used and loved everything.

The thermometer is/was excellent. We have adjusted many things because of it. Thanks! Great program!

Kids love shower timer!

Thank you! Please keep this kind of program going!

We are very grateful for our energy kit and have used everything we can. We will try our best to continue saving energy with your help!

Each household needs one of these kits!! :)

* An Electric Kit

Appendices

Appendix A

Appendix B

Appendix C

Projected Savings from 9-watt LED Retrofit

9-watt LED Light Bulb retrofit inputs and assumptions:		
Lamps per participant:	**6**	
Number of participants:	**44,691**	
Deemed savings per lamp (kWh):	**8.20**	kWh[1]
Measure life:	**13.1**	years[1]
Projected Electricity Savings:		
The LED retrofit projects an **annual** reduction of:	**2,198,797**	kWh[2]
The LED retrofit projects a **lifetime** reduction of:	**28,804,243**	kWh[3]

1 Based on Regional Technical Forum. By request. General purpose and Three-Way. 250 to 1049 lumens.

2 LED kWh savings formula (Deemed savings per lamp x Number of participants x Lamps per participant).

3 LED kWh lifetime savings formula (Annual savings x Measure Life).

Projected Savings from 6-watt LED Retrofit

6-watt LED Light Bulb retrofit inputs and assumptions:		
Lamps per participant:	**3**	
Number of participants:	**44,691**	
Deemed savings per lamp (kWh):	**8.20**	kWh[1]
Measure life:	**13.1**	years[1]
Projected Electricity Savings:		
The LED retrofit projects an **annual** reduction of:	**1,099,399**	kWh[2]
The LED retrofit projects a **lifetime** reduction of:	**14,402,122**	kWh[3]

1. Based on Regional Technical Forum. By request. General purpose and Three-Way. 250 to 1049 lumens.

2. LED kWh savings formula (Deemed savings per lamp x Number of participants x Lamps per participant).

3. LED kWh lifetime savings formula (Annual savings x Measure Life).

Projected Savings from Evolve TSV Combo Showerhead Retrofit

Evolve TSV Combo showerhead retrofit inputs and assumptions:		
Showerheads per electric DHW kit:	**1**	
Number of electric DHW participants:	**18,383**	
Domestic electric hot water reported:	**100%**	[1]
Number of people per household:	**2.59**	[1]
Deemed Savings:	**240.00**	[2]
Length of average shower:	**7.84**	minutes[3]
Showerhead (baseline):	**2.50**	gpm[3]
TSV Combo showerhead new (retrofit):	**1.75**	gpm
Measure life:	**10.00**	years[2]
Projected Electricity Savings:		
TSV Combo showerhead retrofit projects an **annual** reduction of:	**4,411,920**	kWh[5]
TSV Combo showerhead retrofit projects a **lifetime** reduction of:	**44,119,200**	kWh[5]
Potential Water Savings with 100 Percent Installation:		
TSV Combo showerhead retrofit projects an **annual** reduction of:	**102,246,454**	gallons[4]
TSV Combo showerhead retrofit projects a **lifetime** reduction of:	**1,022,464,540**	gallons[4]

1. *Data Reported by Program Participants.*
2. *Based on Regional Technical Forum. ThermostaticShowerRestrictionValve_1_3.xlsm.*
3. *(March 20, 2014). Blessing Memo for LivingWise Kits for 2014, Paul Sklar, E.I., Planning Engineer Energy Trust of Oregon.*
4. *Showerhead Gallons Formula (Number of participants x (Showerhead baseline - Showerhead new) x Length of average shower x Days per year x People per household).*
5. *Showerhead kWh formula (Number of Participants x Deemed Savings).*

Projected Savings from Kitchen Faucet Aerator Retrofit

Kitchen Faucet Aerator retrofit inputs and assumptions:

Kitchen Faucet Aerator per electric DHW kit:	**1**	
Number of electric DHW participants:	**18,383**	
Domestic electric hot water reported:	**100%**	[1]
Number of people per household:	**2.59**	[1]
Savings:	**134**	kWh[2]
Average daily use:	**2.50**	minutes [3]
Kitchen Faucet Aerator (baseline):	**2.50**	gpm[3]
Kitchen Faucet Aerator (retrofit):	**1.50**	gpm
Measure life:	**10.00**	years[3]

Projected Electricity Savings:

Kitchen Faucet Aerator retrofit projects an **annual** reduction of:	**2,463,322**	kWh[4]
Kitchen Faucet Aerator retrofit projects a **lifetime** reduction of:	**24,633,220**	kWh[5]

Potential Water Savings with 100 Percent Installation:

Kitchen Faucet Aerator retrofit projects an **annual** reduction of:	**43,472,132**	gallons[6]
Kitchen Faucet Aerator retrofit projects a **lifetime** reduction of:	**434,721,318**	gallons[6]

1. *Data Reported by Program Participants.*
2. *Provided by Idaho Power. From Measure Approval Document for Energy Saver Kits. January 1, 2018-December 31, 2018. Energy Trust of Oregon.*
3. *(March 20, 2014). Blessing Memo for LivingWise Kits for 2014, Paul Sklar, E.I., Planning Engineer Energy Trust of Oregon.*
4. *Kitchen Aerators kWh formula (Number of Participants x Savings).*
5. *Kitchen Faucet Aerator kWh lifetime savings formula (Annual savings x Measure life).*
6. *Kitchen Aerators gallons formula (Number of Participants x (Kitchen aerator baseline - Kitchen aerator retrofit) x Average Daily Use x Days per year x People per household).*

Projected Savings from Bathroom Faucet Aerator Retrofit

Bathroom Faucet Aerator retrofit inputs and assumptions:

Bathroom Faucet Aerator per electric DHW kit:	**2**	
Number of electric DHW participants:	**18,383**	
Domestic electric hot water reported:	**100%**	[1]
Number of people per household:	**2.59**	[1]
Savings:	**75**	kWh[2]
Average daily use:	**1.50**	minutes [3]
Bathroom Faucet Aerator (baseline):	**2.20**	gpm[3]
Bathroom Faucet Aerator (retrofit):	**1.00**	gpm
Measure life:	**10.00**	years[3]

Projected Electricity Savings:

Bathroom Faucet Aerator retrofit projects an **annual** reduction of:	**2,757,450**	kWh[4]
Bathroom Faucet Aerator retrofit projects a **lifetime** reduction of:	**27,574,500**	kWh[5]

Potential Water Savings with 100 Percent Installation:

Bathroom Faucet Aerator retrofit projects an **annual** reduction of:	**31,299,935**	gallons[6]
Bathroom Faucet Aerator retrofit projects a **lifetime** reduction of:	**312,999,349**	gallons[6]

1. *Data Reported by Program Participants.*
2. *Provided by Idaho Power. From Measure Approval Document for Energy Saver Kits. January 1, 2018-December 31, 2018. Energy Trust of Oregon.*
3. *(March 20, 2014). Blessing Memo for LivingWise Kits for 2014, Paul Sklar, E.I., Planning Engineer Energy Trust of Oregon.*
4. *Bathroom Faucet Aerator kWh formula (Number of participants x savings x Bathroom Faucet Aerators per electric DHW kit).*

5 *Bathroom Faucet Aerator kWh lifetime savings formula (Annual savings x Measure life).*

6. *Bathroom Faucet Aerator gallons formula ((People per Household x Average daily use) x (Bathroom faucet baseline - Bathroom faucet retrofit) x Days per year x Number of Participants).*

Projected Savings from LED Night Light Installation

Energy Efficient Night Light Retrofit Inputs and Assumptions:

Average length of use:	**4,380**	hours per year[1]
Average night light uses:	**7**	watts
Retrofit night light uses:	**0.5**	watts
Measure life:	**10**	years[2]
Energy saved per year:	**28**	kWh per year
Energy saved over life expectancy:	**285**	kWh
Installation / participation rate of:	**85.39%**	[3]
Number of participants:	**44,691**	[3]

Projected Electricity Savings:

The Energy Efficient Night Light retrofit projects an **annual** reduction of:	**1,086,401**	kWh[4]
The Energy Efficient Night Light retrofit projects a **lifetime** reduction of:	**10,864,009**	kWh[5]

1. *Assumption (12 hours per day)*
2. *Product life provided by manufacturer*
3. *Data reported by program participants*
4. *Energy Efficient Night Light kWh savings formula (Energy saved per year x Number of participants x Installation rate)*
5. *Energy Efficient Night Light kWh lifetime savings formula (Energy saved over life expectancy x Number of participants x Installation rate)*

Projected Savings from Shower Timer Installation

Shower TImer inputs and assumptions:

% of water heated by gas:	**42.00%**	[1]
% of water heated by electricity:	**57.00%**	[1]
Installation / participation rate of Shower Timer:	**50.42%**	[1]
Average showerhead has a flow rate of:	**2.50**	gallons per minute[1]
Retrofit showerhead has flow rate of:	**1.75**	gallons per minute[1]
Number of participants:	**44,691**	[1]
Average of baseline and retrofit showerhead flow rate:	**2.13**	gallons per minute[2]
Shower duration:	**8.20**	minutes per day[3]
Shower Timer duration:	**5.00**	minutes per day[4]
Showers per capita per day (SPCD):	**0.67**	showers per day[3]
Percent of water that is hot water:	**73%**	[5]
Days per year:	**365.00**	days
Product life:	**2.00**	years[5]

Projected Water Savings:

Shower Timer installation projects an **annual** reduction of:	**37,469,625**	gallons[6]
Shower Timer installation projects a **lifetime** reduction of:	**74,939,250**	gallons[7]

Projected Electricity Savings:

Shower Timer installation projects an **annual** reduction of:	**2,806,400**	kWh[8]
Shower Timer installation projects a **lifetime** reduction of:	**5,612,800**	kWh[9]

Projected Natural Gas Savings:

Shower Timer installation projects an **annual** reduction of:	**103,394**	therms[10]
Shower Timer installation projects a **lifetime** reduction of:	**206,787**	therms[11]

1. *Data Reported by Program Participants.*
2. *Average of the baseline GPM and the retrofit GPM*
3. *(March 4, 2010). EPA WaterSense® Specification for Showerheads Supporting Statement. Retrieved from http://www.epa.gov/WaterSense/docs/showerheads_finalsuppstat508.pdf*
4. *Provided by manufacturer.*
5. *Navigant EM&V Report for Super Savers Program in Illinois PY7*
6. *Annual water savings = Water Flow (Average of baseline and retrofit flow) × (Baseline Shower duration - Shower Timer duration) × Participants × Days per year × SPCD × Installation Rate of Shower Timer*
7. *Projected Annual Water Savings x Product Life*
8. *Projected Annual Water Savings x Percent of Water that is Hot Water x 0.18 kWh/gal x % of Water Heated by Electricity x Participants*
9. *Projected Annual Water Savings x Percent of Water that is Hot Water x 0.18 kWh/gal x % of Water Heated by Electricity x Product Life x Participants*
10. *Projected Annual Water Savings x Percent of Water that is Hot Water x 0.009 Therms/gal x % of Water Heated by Natural Gas x Participants*
11. *Projected Annual Water Savings x Percent of Water that is Hot Water x 0.009 Therms/gal x % of Water Heated by Natural Gas x Product Life x Participants*

Enrollment Survey Response Summary

1 How is the water heated in your home?

Electricity	41%
Gas	58%
Other	1%

2 Do you own or rent your home?

Own	88%
Rent	12%

3 What is the primary method of heating your home?

Gas forced air	68%
Heat pump	6%
Electric forced air	17%
Baseboard or ceiling cable	4%
Other	5%

4 What is the primary method of cooling your home?

Central A/C	77%
Window A/C	11%
Heat pump	6%
Other	2%
None	4%

5 What, if any, energy-saving improvements are you planning to make in the next two years?

Windows	27%
Furnace or A/C	16%
Insulation	11%
Appliances	19%
Smart thermostat	16%
Other	11%

6 How did you hear about this kit offering?

Direct mail	77%
Idaho Power employee	3%
Idaho Power website	3%
Info in bill	3%
Facebook/Twitter	1%
Friend or Family	9%
Other	3%
Blank	1%

Due to rounding of numbers, percentages may not add up to 100%

Kit Survey Response Summary

1 What type of home do you live in?	
Single family home - detached	86%
Apartment, Condo, Townhouses, or Multi-family with 2-3 units	5%
Apartment, Condo, Townhouses, or Multi-family with 4 or more units	2%
Mobile/Manufactured home	7%
2 How many people live in your home?	
5 or more	8%
4	11%
3	13%
2	48%
1	20%
3 How many of the LEDs did you install?	
All of them	48%
7-8	5%
5-6	16%
3-4	17%
1-2	8%
None	6%
4 If you did not install all of the LEDs, what did you do with the remainer?	
Plan to install, just haven't yet	29%
Stored for later use	65%
Gave them to someone else	2%
Other _________	5%
5 Have you installed the Evolve Showerhead?	
Yes	46%
Not yet, but will	40%
No, won't use	14%
6 Have you installed the Kitchen Faucet Aerator?	
Yes	47%
Not yet, but will	29%
No, won't use	23%
7 Have you installed the Bathroom Faucet Aerator #1?	
Yes	55%
Not yet, but will	33%
No, won't use	12%
8 Have you installed the Bathroom Faucet Aerator #2?	
Yes	38%
Not yet, but will	37%
No, won't use	25%

Due to rounding of numbers, percentages may not add up to 100%

Kit Survey Response Summary *(continued)*

9 Have you used the LED Night Light?	
Yes	87%
Not yet, but will	11%
No, won't use	2%
10 Have you used the Shower Timer?	
Yes	50%
Not yet, but will	32%
No, won't use	18%
11 Have you used the Flow-Rate Test Bag to test the flow rate of your shower or faucets?	
Yes	22%
Not yet, but will	56%
No, won't use	22%
12 If you used the Digital Thermometer to check the temperature of your water, what was the temperature?	
> 140 F	2%
131 F to 140 F	8%
121 F - 130 F	24%
< 121 F	26%
Did not check water temperature	39%
13 Did you adjust the temperature of your electric water heater?	
Yes, I lowered it	20%
Yes, I raised it	2%
No, I did not adjust	79%
14 Did you adjust the temperature of your refrigerator?	
Yes, I lowered it	24%
Yes, I raised it	12%
No, I did not adjust	64%
15 Did you adjust the temperature of your freezer?	
Yes, I lowered it	19%
Yes, I raised it	10%
No, I did not adjust	71%
16 How satisfied were you with the kit ordering process?	
Very satisfied	93%
Somewhat satisfied	5%
Somewhat dissatisfied	0%
Very dissatisfied	1%
17 Did you receive your kit within 3 weeks?	
Yes	96%
No	4%

Due to rounding of numbers, percentages may not add up to 100%

Kit Survey Response Summary *(continued)*

18 How likely would you be to tell a friend or family member to order a kit?

Very likely	85%
Somewhat likely	13%
Somewhat unlikely	1%
Very unlikely	1%

19 Prior to hearing about the Energy-Saving Kits, were you aware Idaho Power had energy efficiency programs and incentives?

Yes	53%
No	47%

20 Have you ever gone to Idaho Power's website to look for information about energy efficiency programs and incentives?

Yes	31%
No	69%

21 How likely are you to participate in another energy efficiency program?

Very likely	78%
Somewhat likely	19%
Somewhat unlikely	2%
Very unlikely	1%

22 If you did not install some of the kit items, please tell us why.

Due to rounding of numbers, percentages may not add up to 100%

Idaho Cities & Towns Served

IDAHO CITIES & TOWNS SERVED		
ABERDEEN	GLENNS FERRY	NEW MEADOWS
AMERICAN FALLS	GOODING	NEW PLYMOUTH
ARBON	GRANDVIEW	NORTH FORK
BANKS	GREENLEAF	NOTUS
BELLEVUE	HAGERMAN	OAKLEY
BLACKFOOT	HAILEY	OLA
BLISS	HAMMETT	OREANA
BOISE	HANSEN	PARMA
BRUNEAU	HAZELTON	PAUL
BUHL	HOMEDALE	PAYETTE
BURLEY	HORSESHOE BEND	PICABO
CALDWELL	IDAHO CITY	PINE
CAMBRIDGE	INDIAN VALLEY	PINGREE
CAREY	INKOM	PLACERVILLE
CARMEN	JEROME	POCATELLO
CASCADE	KETCHUM	POLLOCK
CASTLEFORD	KIMBERLY	RICHFIELD
CENTERVILLE	KING HILL	RIGGINS
CHUBBUCK	KUNA	ROCKLAND
CORRAL	LAKE FORK	ROGERSON
COUNCIL	LEADORE	RUPERT
DIETRICH	LEMHI	SALMON
DONNELLY	LETHA	SHOSHONE
EAGLE	LOWMAN	SPRINGFIELD
EAST MAGIC	MARSING	STAR
EDEN	MCCALL	STERLING
EMMETT	MELBA	SUN VALLEY
FAIRFIELD	MERIDIAN	SWEET
FEATHERVILLE	MESA	TENDOY
FILER	MIDDLETON	TWIN FALLS
FORT HALL	MIDVALE	WEISER
FRUITLAND	MONTOUR	WENDELL
FRUITVALE	MOUNTAIN HOME	WEST MAGIC
GARDEN CITY	MURPHY	WILDER
GARDEN VALLEY	MURTAUGH	YELLOW PINE
GIBBONSVILLE	NAMPA	
TOTAL NUMBER OF CITIES & TOWNS SERVED: 107		
TOTAL NUMBER OF HOUSEHOLDS SERVED: 43,849		

Oregon Cities & Towns Served

OREGON CITIES & TOWNS SERVED		
ADRIAN	HEREFORD	ONTARIO
AROCK	HUNTINGTON	OXBOW
BROGAN	IRONSIDE	RICHLAND
DREWSEY	JAMIESON	UNITY
DURKEE	JORDAN VALLEY	VALE
HALFWAY	JUNTURA	
HARPER	NYSSA	
TOTAL NUMBER OF CITIES & TOWNS SERVED: 19		
TOTAL NUMBER OF HOUSEHOLDS SERVED: 842		

Idaho Power Regions Served

REGIONS (IDAHO)	ELECTRIC	NON-ELECTRIC
CANYON	3,315	3,848
CAPITAL	8,317	19,024
EASTERN	1,805	1,244
SOUTHERN	2,462	1,416
WESTERN	1,789	629
NUMBER OF HOUSEHOLDS IMPACTED:	17,688	26,161
TOTAL NUMBER OF HOUSEHOLDS IMPACTED:	43,849	

REGIONS (OREGON)	ELECTRIC	NON-ELECTRIC
CANYON	19	0
WESTERN	676	147
NUMBER OF HOUSEHOLDS IMPACTED:	695	147
TOTAL NUMBER OF HOUSEHOLDS IMPACTED:	842	

REGIONS (IDAHO POWER)	ELECTRIC	NON-ELECTRIC
NUMBER OF HOUSEHOLDS IMPACTED:	18,383	26,308
TOTAL NUMBER OF HOUSEHOLDS IMPACTED:	44,691	

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Historical DSM Expense and Performance

2002–2018

Historical DSM Expense and Performance, 2002–2018

		Total Costs		Savings and Demand Reductions			Levelized Costs [a]	
Program/Year	Participants	Utility Cost [b]	Resource Cost [c]	Annual Energy (kWh)	Peak Demand [d] (MW)	Measure Life (Years)	Total Utility ($/kWh)	Total Resource ($/kWh)
Demand Response								
A/C Cool Credit								
2003	204	$ 275,645	$ 275,645		0.0			
2004	420	287,253	287,253		0.5			
2005	2,369	754,062	754,062		3			
2006	5,369	1,235,476	1,235,476		6			
2007	13,692	2,426,154	2,426,154		12			
2008	20,195	2,969,377	2,969,377		26			
2009	30,391	3,451,988	3,451,988		39			
2010	30,803	2,002,546	2,002,546		39			
2011..................	37,728	2,896,542	2,896,542		24			
2012	36,454	5,727,994	5,727,994		45			
2013	n/a	663,858	663,858		n/a			
2014	29,642	1,465,646	1,465,646		44			
2015	29,000	1,148,935	1,148,935		36			
2016	28,315	1,103,295	1,103,295		34			
2017	28,214	936,272	936,272		29			
2018	25,845	844,369	844,369		29			
Total		**$ 28,189,412**	**$ $28,189,411**					
Flex Peak Program								
2009	33	528,681	528,681		19			
2010	60	1,902,680	1,902,680		48			
2011..................	111	2,057,730	2,057,730		59			
2012	102	3,009,822	3,009,822		53			
2013	100	2,743,615	2,743,615		48			
2014	93	1,563,211	1,563,211		40			
2015	72	592,872	592,872		26			
2016	137	767,997	767,997		42			
2017	141	658,156	658,156		36			
2018	140	433,313	433,313		33			
Total		**$ $14,258,076**	**$ $14,258,076**					

		Total Costs		Savings and Demand Reductions			Levelized Costs [a]	
Program/Year	Participants	Utility Cost [b]	Resource Cost [c]	Annual Energy (kWh)	Peak Demand [d] (MW)	Measure Life (Years)	Total Utility ($/kWh)	Total Resource ($/kWh)
Irrigation Peak Rewards								
2004	58	344,714	344,714		6			
2005	894	1,468,282	1,468,282		40			
2006	906	1,324,418	1,324,418		32			
2007	947	1,615,881	1,615,881		37			
2008	897	1,431,840	1,431,840		35			
2009	1,512	9,655,283	9,655,283		160			
2010	2,038	13,330,826	13,330,826		250			
2011....................	2,342	12,086,222	12,086,222		320			
2012	2,433	12,423,364	12,423,364		340			
2013	n/a	2,072,107	2,072,107		n/a			
2014	2,225	7,597,213	7,597,213		295			
2015	2,259	7,258,831	7,258,831		305			
2016	2,286	7,600,076	7,600,076		303			
2017	2,307	7,223,101	7,223,101		318			
2018	2,335	6,891,737	6,891,737		297			
Total		**$ 92,323,895**	**$ 92,323,895**					
Residential Efficiency								
Ductless Heat Pump Pilot								
2009	96	202,005	451,605	409,180		18	0.031	0.086
2010	104	189,231	439,559	364,000		20	0.044	0.103
2011....................	131	191,183	550,033	458,500		20	0.028	0.081
2012	127	159,867	617,833	444,500		20	0.024	0.094
2013	215	237,575	992,440	589,142		15	0.032	0.132
2014	179	251,446	884,211	462,747		15	0.042	0.148
Total	**852**	**$ 1,231,307**	**$ 3,935,681**	**2,728,069**		15	**$ 0.044**	**$ 0.138**
Easy Savings : Low-Income Energy Efficiency Education								
2015	2,068	127,477	127,477	624,536		10	0.021	0.021
2016	2,001	127,587	127,587	402,961		9	0.035	0.035
2017	2,470	149,813	149,813	280,049		8	0.064	0.064
2018	282	147,936	147,936	29,610		3	1.37	1.37
Total	**6,821**	**$ 552,812**	**$ 552,812**	**1,337,156**		**3**	**$ 0.138**	**$ 0.138**

		Total Costs		Savings and Demand Reductions			Levelized Costs[a]	
Program/Year	Participants	Utility Cost[b]	Resource Cost[c]	Annual Energy (kWh)	Peak Demand[d] (MW)	Measure Life (Years)	Total Utility ($/kWh)	Total Resource ($/kWh)
Educational Distributions								
2015	28,197	432,185	432,185	1,669,495		10	0.026	0.026
2016	67,065	2,392,884	2,392,884	15,149,605		10	0.016	0.016
2017	84,399	3,466,027	3,466,027	21,187,261		11	0.016	0.016
2018	94,717	3,180,380	3,180,380	16,051,888		11	0.019	0.019
Total	**274,378**	**$ 9,471,476**	**$ 9,471,476**	**54,058,249**		**11**	**$ 0.020**	**$ 0.020**
Energy Efficiency Packets								
2002	2,925	755	755	155,757		7	0.001	0.001
Total	**2,925**	**$ 755**	**$ 755**	**155,757**		**7**	**$ 0.001**	**$ 0.001**
Energy Efficient Lighting								
2002	11,618	243,033	310,643	3,299,654		7	0.012	0.015
2003	12,662	314,641	464,059	3,596,150		7	0.014	0.021
2004								
2005	43,760	73,152	107,810	1,734,646		7	0.007	0.010
2006	178,514	298,754	539,877	6,302,794		7	0.008	0.014
2007	219,739	557,646	433,626	7,207,439		7	0.012	0.017
2008	436,234	1,018,292	793,265	14,309,444		7	0.011	0.013
2009	549,846	1,207,366	1,456,796	13,410,748		5	0.020	0.024
2010	1,190,139	2,501,278	3,976,476	28,082,738		5	0.020	0.031
2011....................	1,039,755	1,719,133	2,764,623	19,694,381		5	0.015	0.024
2012	925,460	1,126,836	2,407,355	16,708,659		5	0.012	0.025
2013	1,085,225	1,356,926	4,889,501	9,995,753		8	0.016	0.058
2014	1,161,553	1,909,823	7,148,427	12,882,151		8	0.018	0.066
2015	1,343,255	2,063,383	4,428,676	15,876,117		10	0.013	0.028
2016	1,442,561	3,080,708	10,770,703	21,093,813		11	0.014	0.049
2017	1,766,758	4,872,888	11,078,990	37,765,190		12	0.012	0.026
2018	1,340,842	2,435,130	3,277,039	18,856,933		14	0.011	0.014
Total	**12,747,921**	**$ 24,778,988**	**$ 54,847,866**	**230,816,609**		**12**	**$ 0.012**	**$ 0.026**
Energy House Calls								
2002	17	26,053	26,053	25,989		20	0.082	0.082
2003	420	167,076	167,076	602,723		20	0.023	0.023
2004	1,708	725,981	725,981	2,349,783		20	0.025	0.025
2005	891	375,610	375,610	1,775,770		20	0.017	0.017

		Total Costs		Savings and Demand Reductions			Levelized Costs[a]	
Program/Year	Participants	Utility Cost[b]	Resource Cost[c]	Annual Energy (kWh)	Peak Demand[d] (MW)	Measure Life (Years)	Total Utility ($/kWh)	Total Resource ($/kWh)
2006	819	336,701	336,701	777,244		20	0.035	0.035
2007	700	336,372	336,372	699,899		20	0.039	0.039
2008	1,099	484,379	484,379	883,038		20	0.045	0.045
2009	1,266	569,594	569,594	928,875		20	0.052	0.052
2010	1,602	762,330	762,330	1,198,655		20	0.054	0.054
2011	881	483,375	483,375	1,214,004		20	0.027	0.027
2012	668	275,884	275,884	1,192,039		18	0.016	0.016
2013	411	199,995	199,995	837,261		18	0.016	0.016
2014	297	197,987	197,987	579,126		18	0.029	0.029
2015	362	214,103	214,103	754,646		18	0.020	0.020
2016	375	206,437	206,437	509,859		18	0.029	0.029
2017	335	183,035	183,035	428,819		16	0.032	0.032
2018	280	160,777	160,777	374,484		16	0.032	0.032
Total	**12,131**	**$ 5,705,689**	**$ 5,705,689**	**15,132,214**		**16**	**$ 0.035**	**$ 0.035**
ENERGY STAR® Homes Northwest (gas heated)								
2014	282			195,372		22		
2015	69			46,872		22		
Total	**351**	**$ 0**	**$ 0**	**242,244**		**22**		
Fridge and Freezer Recycling Program								
2009	1,661	305,401	305,401	1,132,802		22	0.041	0.041
2010	3,152	565,079	565,079	1,567,736		8	0.054	0.054
2011	3,449	654,393	654,393	1,712,423		8	0.046	0.046
2012	3,176	613,146	613,146	1,576,426		8	0.046	0.046
2013	3,307	589,054	589,054	1,442,344		8	0.061	0.061
2014	3,194	576,051	576,051	1,390,760		6	0.062	0.062
2015	1,630	227,179	227,179	720,208		6	0.048	0.048
2016	1,539	257,916	257,916	632,186		6	0.062	0.062
2017	2,031	265,942	265,942	498,513		6	0.080	0.080
2018	304	33,907	33,907	73,602		7	0.061	0.061
Total	**23,443**	**$ 4,088,068**	**$ 4,088,068**	**10,747,000**		**7**	**$ 0.062**	**$ 0.062**
Heating & Cooling Efficiency Program								
2006		17,444	17,444					
2007	4	488,211	494,989	1,595		18	27.344	27.710

		Total Costs		Savings and Demand Reductions			Levelized Costs [a]	
Program/Year	Participants	Utility Cost [b]	Resource Cost [c]	Annual Energy (kWh)	Peak Demand [d] (MW)	Measure Life (Years)	Total Utility ($/kWh)	Total Resource ($/kWh)
2008	359	473,551	599,771	561,440		18	0.073	0.092
2009	349	478,373	764,671	1,274,829		18	0.034	0.054
2010	217	327,669	1,073,604	1,104,497		20	0.025	0.083
2011..................	130	195,770	614,523	733,405		20	0.018	0.056
2012	141	182,281	676,530	688,855		20	0.018	0.066
2013	210	329,674	741,586	1,003,730		20	0.022	0.050
2014	230	362,014	1,247,560	1,099,464		20	0.022	0.075
2015	427	626,369	2,064,055	1,502,172		20	0.028	0.092
2016	483	594,913	1,404,625	1,113,574		20	0.040	0.040
2017	654	597,198	1,433,357	1,138,744		15	0.041	0.099
2018	712	585,211	1,686,618	1,556,065		15	0.029	0.085
Total	**3,916**	**$ 5,258,678**	**$ 12,819,332**	**11,778,370**		**15**	**$ 0.043**	**$ 0.104**
Home Energy Audits								
2013		88,740	88,740					
2014	354	170,648	170,648	141,077		10		
2015	251	201,957	226,806	136,002		10		
2016	539	289,812	289,812	207,249		11	0.13	0.13
2017	524	282,809	353,385	175,010		12	0.146	0.182
2018	466	264,394	321,978	211,003		12	0.113	0.137
Total	**2,134**	**$ 1,298,360**	**$ 1,451,369**	**870,341**		**12**	**$ 0.164**	**$ 0.183**
Home Energy Reports Pilot Program								
2018	23,914	194,812	194,812	3,281,780		1	0.046	0.046
Total	**23,914**	**$ 194,812**	**$ 194,812**	**3,281,780**		**1**	**$ 0.046**	**$ 0.046**
Home Improvement Program								
2008	282	123,454	157,866	317,814		25	0.029	0.037
2009	1,188	321,140	550,148	1,338,876		25	0.019	0.032
2010	3,537	944,716	2,112,737	3,986,199		45	0.016	0.035
2011..................	2,275	666,041	2,704,816	917,519		45	0.038	0.155
2012	840	385,091	812,827	457,353		45	0.044	0.093
2013	365	299,497	1,061,314	616,044		45	0.025	0.090
2014	555	324,717	896,246	838,929		45	0.020	0.055
2015	408	272,509	893,731	303,580		45	0.046	0.152

Program/Year	Participants	Total Costs: Utility Cost [b]	Total Costs: Resource Cost [c]	Savings and Demand Reductions: Annual Energy (kWh)	Savings and Demand Reductions: Peak Demand [d] (MW)	Measure Life (Years)	Levelized Costs [a]: Total Utility ($/kWh)	Levelized Costs [a]: Total Resource ($/kWh)
2016	482	324,024	1,685,301	500,280		45	0.034	0.177
2017	355	166,830	1,345,002	415,824		45	0.021	0.167
2018		2,926	2,926					
Total	**10,287**	**$ 3,830,946**	**$ 12,222,915**	**9,692,418**		**45**	**$ 0.025**	**$ 0.079**
Multifamily Energy Savings Program								
2016	3	59,046	59,046	149,760		10	0.040	0.040
2017	12	168,216	168,216	617,542		11	0.026	0.026
2018	25	205,131	205,131	655,953		11	0.030	0.030
Total	**40**	**$ 432,394**	**$ 432,394**	**1,423,255**		**11**	**$ 0.035**	**$ 0.035**
Oregon Residential Weatherization								
2002	24	-662	23,971	4,580		25	0.010	0.389
2003		-943						
2004	4	1,057	1,057					
2005	4	612	3,608	7,927		25	0.006	0.034
2006		4,126	4,126					
2007	1	3,781	5,589	9,971		25	0.028	0.042
2008	3	7,417	28,752	22,196		25	0.025	0.096
2009	1	7,645	8,410	2,907		25	0.203	0.223
2010	1	6,050	6,275	320		30	0.011	0.062
2011....................	8	7,926	10,208	21,908		30	0.021	0.027
2012	5	4,516	11,657	11,985		30	0.022	0.056
2013	14	9,017	14,369	14,907		30	0.035	0.055
2014	13	5,462	9,723	11,032		30	0.028	0.050
2015	4	5,808	10,388	11,910		30	0.028	0.050
2016	7	3,930	5,900	2,847		30	0.079	0.118
2017	7	2,384	3,755	2,154		30	0.063	0.099
2018	5	5,507	5,507					
Total	**101**	**$ 73,633**	**$ 153,295**	**124,644**		**30**	**$ 0.041**	**$ 0.085**
Rebate Advantage								
2003	73	27,372	79,399	227,434		45	0.008	0.022
2004	105	52,187	178,712	332,587		45	0.010	0.034

		Total Costs			Savings and Demand Reductions				Levelized Costs [a]		
Program/Year	Participants		Utility Cost [b]		Resource Cost [c]	Annual Energy (kWh)	Peak Demand [d] (MW)	Measure Life (Years)		Total Utility ($/kWh)		Total Resource ($/kWh)
2005	98		46,173		158,462	312,311		45		0.009		0.032
2006	102		52,673		140,289	333,494		45		0.010		0.027
2007	123		89,269		182,152	554,018		45		0.010		0.021
2008	107		90,888		179,868	463,401		45		0.012		0.025
2009	57		49,525		93,073	247,348		25		0.015		0.029
2010	35		39,402		66,142	164,894		25		0.018		0.031
2011	25		63,469		85,044	159,325		25		0.024		0.033
2012	35		37,241		71,911	187,108		25		0.012		0.024
2013	42		60,770		92,690	269,891		25		0.014		0.021
2014	44		63,231		89,699	269,643		25		0.014		0.020
2015	58		85,438		117,322	358,683		25		0.014		0.020
2016	67		111,050		148,142	411,272		25		0.016		0.022
2017	66		104,996		229,104	214,479		45		0.025		0.055
2018	107		147,483		355,115	284,559		45		0.027		0.064
Total	**1,143**	**$**	**1,121,168**	**$**	**2,267,124**	**4,790,447**		**45**	**$**	**0.015**	**$**	**0.030**
Residential New Construction Pilot Program (ENERGY STAR® Homes Northwest)												
2003			13,597		13,597	0						
2004	44		140,165		335,437	101,200		25		0.103		0.246
2005	200		253,105		315,311	415,600		25		0.045		0.056
2006	439		469,609		602,651	912,242		25		0.038		0.049
2007	303		475,044		400,637	629,634		25		0.056		0.047
2008	254		302,061		375,007	468,958		25		0.048		0.059
2009	474		355,623		498,622	705,784		25		0.039		0.055
2010	630		375,605		579,495	883,260		25		0.033		0.051
2011	308		259,762		651,249	728,030		32		0.020		0.051
2012	410		453,186		871,310	537,447		35		0.046		0.089
2013	267		352,882		697,682	365,370		36		0.053		0.104
2014	243		343,277		689,021	332,682		36		0.057		0.114
2015	598		653,674		1,412,126	773,812		36		0.046		0.099
2016	110		142,158		297,518	150,282		36		0.051		0.107
2017	277		323,520		603,420	608,292		45		0.029		0.054
2018	307		400,912		926,958	777,369		36		0.027		0.061
Total	**4,864**	**$**	**5,314,179**	**$**	**9,270,041**	**8,389,962**		**36**	**$**	**0.042**	**$**	**0.073**

		Total Costs				Savings and Demand Reductions				Levelized Costs [a]		
Program/Year	Participants		Utility Cost [b]		Resource Cost [c]	Annual Energy (kWh)	Peak Demand [d] (MW)	Measure Life (Years)		Total Utility ($/kWh)		Total Resource ($/kWh)
Simple Steps, Smart Savings												
2007			9,275		9,275	0						
2008	3,034		250,860		468,056	541,615		15		0.044		0.082
2009	9,499		511,313		844,811	1,638,038		15		0.031		0.051
2010	16,322		832,161		1,025,151	1,443,580		15		0.057		0.070
2011..................	15,896		638,323		1,520,977	1,485,326		15		0.034		0.080
2012	16,675		659,032		817,924	887,222		14		0.061		0.075
2013	13,792		405,515		702,536	885,980		12		0.041		0.071
2014	10,061		227,176		302,289	652,129		12		0.031		0.041
2015	9,343		139,096		397,898	770,822		10		0.018		0.053
2016	7,880		153,784		379,752	577,320		11		0.025		0.063
2017	12,556		191,621		484,380	900,171		11		0.020		0.051
2018	7,377		90,484		133,101	241,215		12		0.034		0.050
Total	**122,435**	**$**	**4,108,640**	**$**	**7,086,150**	**10,023,419**		**11**	**$**	**0.045**	**$**	**0.078**
Weatherization Solutions for Eligible Customers												
2008	16		52,807		52,807	71,680		25		0.057		0.057
2009	41		162,995		162,995	211,719		25		0.059		0.059
2010	47		228,425		228,425	313,309		25		0.056		0.056
2011..................	117		788,148		788,148	1,141,194		25		0.042		0.042
2012	141		1,070,556		1,070,556	257,466		25		0.254		0.254
2013	166		1,267,791		1,267,791	303,116		25		0.240		0.240
2014	118		791,344		791,344	290,926		25		0.163		0.163
2015	171		1,243,269		1,243,269	432,958		25		0.175		0.175
2016	147		1,323,793		1,323,793	621,653		25		0.130		0.130
2017	164		1,108,862		1,121,071	604,733		23		0.115		0.117
2018	141		1,022,471		1,022,471	571,741		25		0.112		0.112
Total	**1,269**	**$**	**9,060,460**	**$**	**9,072,669**	**4,820,495**		**25**	**$**	**0.139**	**$**	**0.139**
Window AC Trade Up Pilot												
2003	99		6,687		10,492	14,454		12		0.051		0.079
Total	**99**	**$**	**6,687**	**$**	**10,492**	**14,454**		**12**	**$**	**0.051**	**$**	**0.079**

		Total Costs		Savings and Demand Reductions			Levelized Costs [a]	
Program/Year	Participants	Utility Cost [b]	Resource Cost [c]	Annual Energy (kWh)	Peak Demand [d] (MW)	Measure Life (Years)	Total Utility ($/kWh)	Total Resource ($/kWh)
Residential—Weatherization Assistance for Qualified Customers (WAQC)								
WAQC—Idaho								
2002	197	235,048	492,139					
2003	208	228,134	483,369					
2004	269	498,474	859,482	1,271,677		25	0.029	0.050
2005	570	1,402,487	1,927,424	3,179,311		25	0.033	0.045
2006	540	1,455,373	2,231,086	2,958,024		25	0.037	0.056
2007	397	1,292,930	1,757,105	3,296,019		25	0.029	0.040
2008	439	1,375,632	1,755,749	4,064,301		25	0.025	0.032
2009	427	1,260,922	1,937,578	4,563,832		25	0.021	0.033
2010	373	1,205,446	2,782,597	3,452,025		25	0.026	0.060
2011..................	273	1,278,112	1,861,836	2,648,676		25	0.036	0.052
2012	228	1,321,927	1,743,863	621,464		25	0.157	0.208
2013	245	1,336,742	1,984,173	657,580		25	0.150	0.223
2014	244	1,267,212	1,902,615	509,620		25	0.184	0.276
2015	233	1,278,159	2,072,901	529,426		25	0.179	0.290
2016	234	1,254,338	1,870,481	722,430		25	0.129	0.192
2017	196	1,269,507	1,721,632	654,464		30	0.134	0.182
2018	190	1,254,630	1,795,301	641,619		30	0.136	0.194
Total	**5,263**	**$ 19,215,073**	**$ 29,179,331**	**29,770,469**		**30**	**$ 0.045**	**$ 0.068**
WAQC—Oregon								
2002	31	24,773	47,221	68,323		25	0.027	0.051
2003	29	22,255	42,335	102,643		25	0.016	0.031
2004	17	13,469	25,452	28,436		25	0.035	0.067
2005	28	44,348	59,443	94,279		25	0.035	0.047
2006						25		
2007	11	30,694	41,700	42,108		25	0.054	0.074
2008	14	43,843	74,048	73,841		25	0.040	0.068
2009	10	33,940	46,513	114,982		25	0.023	0.031
2010	27	115,686	147,712	289,627		25	0.030	0.038
2011..................	14	46,303	63,981	134,972		25	0.025	0.035
2012	10	48,214	76,083	26,840		25	0.133	0.210
2013	9	54,935	67,847	24,156		25	0.168	0.208

		Total Costs		Savings and Demand Reductions			Levelized Costs[a]	
Program/Year	Participants	Utility Cost[b]	Resource Cost[c]	Annual Energy (kWh)	Peak Demand[d] (MW)	Measure Life (Years)	Total Utility ($/kWh)	Total Resource ($/kWh)
2014	11	52,900	94,493	24,180		25	0.162	0.289
2015	10	36,873	46,900	20,595		25	0.133	0.169
2016	12	35,471	63,934	23,732		25	0.111	0.199
2017	7	37,978	61,052	15,074		30	0.175	0.281
2018	3	18,344	24,191	7,886		30	0.161	0.213
Total	**243**	**$ 660,025**	**$ 982,905**	**1,091,674**		**30**	**$ 0.042**	**$ 0.062**
WAQC—BPA Supplemental								
2002	75	55,966	118,255	311,347		25	0.013	0.028
2003	57	49,895	106,915	223,591		25	0.017	0.036
2004	40	69,409	105,021	125,919		25	0.041	0.062
Total	**172**	**$ 175,270**	**$ 330,191**	**660,857**		**25**	**$ 0.020**	**$ 0.037**
WAQC Total		**$ 20,050,368**	**$ 30,492,426**	**31,523,000**		**25**	**$ 0.047**	**$ 0.072**
Commercial								
Air Care Plus Pilot								
2003	4	5,764	9,061	33,976		10	0.021	0.033
2004		344	344					
Total	**4**	**$ 6,108**	**$ 9,405**	**33,976**		**10**	**$ 0.022**	**$ 0.034**
New Construction								
2004		28,821	28,821					
2005	12	194,066	233,149	494,239		12	0.043	0.052
2006	40	374,008	463,770	704,541		12	0.058	0.072
2007	22	669,032	802,839	2,817,248		12	0.015	0.040
2008	60	1,055,009	1,671,375	6,598,123		12	0.017	0.028
2009	72	1,327,127	2,356,434	6,146,139		12	0.024	0.043
2010	70	1,509,682	3,312,963	10,819,598		12	0.016	0.035
2011....................	63	1,291,425	3,320,015	11,514,641		12	0.010	0.026
2012	84	1,592,572	8,204,883	20,450,037		12	0.007	0.036
2013	59	1,507,035	3,942,880	10,988,934		12	0.012	0.032
2014	69	1,258,273	3,972,822	9,458,059		12	0.012	0.037
2015	81	2,162,001	6,293,071	23,232,017		12	0.008	0.024
2016	116	1,931,222	4,560,826	12,393,249		12	0.014	0.033

		Total Costs		Savings and Demand Reductions			Levelized Costs[a]	
Program/Year	Participants	Utility Cost[b]	Resource Cost[c]	Annual Energy (kWh)	Peak Demand[d] (MW)	Measure Life (Years)	Total Utility ($/kWh)	Total Resource ($/kWh)
2017	121	2,433,596	4,265,056	17,353,820		12	0.013	0.022
2018	104	2,069,645	5,054,215	13,378,315		12	0.014	0.034
Total	**973**	**$ 19,403,515**	**$ 48,483,120**	**146,348,960**		**12**	**$ 0.015**	**$ 0.036**
Retrofits								
2006		31,819	31,819					
2007	104	711,494	1,882,035	5,183,640	0.8	12	0.015	0.040
2008	666	2,992,261	10,096,627	25,928,391	4.5	12	0.013	0.043
2009	1,224	3,325,505	10,076,237	35,171,627	6.1	12	0.011	0.032
2010	1,535	3,974,410	7,655,397	35,824,463	7.8	12	0.013	0.024
2011....................	1,732	4,719,466	9,519,364	38,723,073		12	0.011	0.022
2012	1,838	5,349,753	9,245,297	41,568,672		12	0.012	0.020
2013	1,392	3,359,790	6,738,645	21,061,946		12	0.014	0.029
2014	1,095	3,150,942	5,453,380	19,118,494		12	0.015	0.025
2015	1,222	4,350,865	7,604,200	23,594,701		12	0.017	0.029
2016	1,577	5,040,190	8,038,791	28,124,779		12	0.016	0.026
2017	1,137	4,343,835	12,500,303	23,161,877		12	0.017	0.049
2018	1,358	5,990,179	16,253,716	34,910,707		12	0.015	0.042
Total	**14,880**	**$ 47,340,509**	**$ 105,095,811**	**332,372,370**		**12**	**$ 0.016**	**$ 0.035**
Holiday Lighting								
2008	14	28,782	73,108	259,092		10	0.014	0.035
2009	32	33,930	72,874	142,109		10	0.031	0.066
2010	25	46,132	65,308	248,865		10	0.024	0.034
2011....................	6	2,568	2,990	66,189		10	0.004	0.005
Total	**77**	**$ 111,412**	**$ 214,280**	**716,255**		**10**	**$ 0.019**	**$ 0.037**
Oregon Commercial Audit								
2002	24	5,200	5,200					
2003	21	4,000	4,000					
2004	7	0	0					
2005	7	5,450	5,450					
2006	6							
2007		1,981	1,981					
2008		58	58					

		Total Costs		Savings and Demand Reductions			Levelized Costs [a]	
Program/Year	Participants	Utility Cost [b]	Resource Cost [c]	Annual Energy (kWh)	Peak Demand [d] (MW)	Measure Life (Years)	Total Utility ($/kWh)	Total Resource ($/kWh)
2009	41	20,732	20,732					
2010	22	5,049	5,049					
2011	12	13,597	13,597					
2012	14	12,470	12,470					
2013	18	5,090	5,090					
2014	16	9,464	9,464					
2015	17	4,251	4,251					
2016	7	7,717	7,717					
2017	13	8,102	8,102					
2018	0	1,473	1,473					
Total	**225**	**$ 104,634**	**$ 104,634**					
Oregon School Efficiency								
2005		86	86					
2006	6	24,379	89,771	223,368		12	0.012	0.044
Total	**6**	**$ 24,465**	**$ 89,857**	**223,368**		**12**	**$ 0.012**	**$ 0.044**
Industrial								
Custom Projects								
2003		1,303	1,303					
2004	1	112,311	133,441	211,295		12	0.058	0.069
2005	24	1,128,076	3,653,152	12,016,678		12	0.010	0.033
2006	40	1,625,216	4,273,885	19,211,605		12	0.009	0.024
2007	49	3,161,866	7,012,686	29,789,304	3.6	12	0.012	0.026
2008	101	4,045,671	16,312,379	41,058,639	4.8	12	0.011	0.044
2009	132	6,061,467	10,848,123	51,835,612	6.7	12	0.013	0.024
2010	223	8,778,125	17,172,176	71,580,075	9.5	12	0.014	0.027
2011	166	8,783,811	19,830,834	67,979,157	7.8	12	0.012	0.026
2012	126	7,092,581	12,975,629	54,253,106	7.6	12	0.012	0.021
2013	73	2,466,225	5,771,640	21,370,350	2.4	12	0.010	0.024
2014	131	7,173,054	13,409,922	50,363,052	5.6	12	0.013	0.024
2015	160	9,012,628	20,533,742	55,247,192	6.3	11	0.016	0.035
2016	196	7,982,624	16,123,619	47,518,871		16	0.013	0.026

		Total Costs		Savings and Demand Reductions			Levelized Costs[a]	
Program/Year	Participants	Utility Cost[b]	Resource Cost[c]	Annual Energy (kWh)	Peak Demand[d] (MW)	Measure Life (Years)	Total Utility ($/kWh)	Total Resource ($/kWh)
2017	170	8,679,919	17,279,117	44,765,354		16	0.015	0.029
2018	248	8,808,512	16,112,540	46,963,690		16	0.014	0.026
Total	**1,840**	**$ 84,913,388**	**$ 181,444,188**	**614,163,980**		**12**	**$ 0.015**	**$ 0.032**
Irrigation								
Irrigation Efficiency Rewards								
2003	2	41,089	54,609	36,792	0.0	15	0.106	0.141
2004	33	120,808	402,978	802,812	0.4	15	0.014	0.048
2005	38	150,577	657,460	1,012,883	0.4	15	0.014	0.062
2006	559	2,779,620	8,514,231	16,986,008	5.1	8	0.024	0.073
2007	816	2,001,961	8,694,772	12,304,073	3.4	8	0.024	0.103
2008	961	2,103,702	5,850,778	11,746,395	3.5	8	0.026	0.073
2009	887	2,293,896	6,732,268	13,157,619	3.4	8	0.026	0.077
2010	753	2,200,814	6,968,598	10,968,430	3.3	8	0.030	0.096
2011..................	880	2,360,304	13,281,492	13,979,833	3.8	8	0.020	0.113
2012	908	2,373,201	11,598,185	12,617,164	3.1	8	0.022	0.110
2013	995	2,441,386	15,223,928	18,511,221	3.0	8	0.016	0.098
2014	1,128	2,446,507	18,459,781	18,463,611	4.6	8	0.016	0.119
2015	902	1,835,711	9,939,842	14,027,411	1.6	8	0.016	0.085
2016	851	2,372,352	8,162,206	15,673,513		8	0.018	0.063
2017	801	2,475,677	8,382,962	16,824,266		8	0.018	0.060
2018	1,022	2,953,706	11,948,469	18,933,831		8	0.019	0.076
Total	**11,536**	**$ 30,951,311**	**$ 134,872,559**	**196,045,862**		**8**	**$ 0.023**	**$ 0.101**
Other Programs								
Building Operator Training								
2003	71	48,853	48,853	1,825,000		5	0.006	0.006
2004	26	43,969	43,969	650,000		5	0.014	0.014
2005	7	1,750	4,480	434,167		5	0.001	0.002
Total	**104**	**94,572**	**97,302**	**2,909,167**		**5**	**0.007**	**0.007**
Commercial Education Initiative								
2005		3,497	3,497					
2006		4,663	4,663					
2007		26,823	26,823					
2008		72,738	72,738					

		Total Costs		Savings and Demand Reductions			Levelized Costs [a]	
Program/Year	**Participants**	**Utility Cost [b]**	**Resource Cost [c]**	**Annual Energy (kWh)**	**Peak Demand [d] (MW)**	**Measure Life (Years)**	**Total Utility ($/kWh)**	**Total Resource ($/kWh)**
2009		120,584	120,584					
2010		68,765	68,765					
2011..................		89,856	89,856					
2012		73,788	73,788					
2013		66,790	66,790					
2014		76,606	76,606					
2015		65,250	65,250					
2016								
2017								
2018		146,174	146,174	442,170				
Total		**$ 815,533**	**$ 815,533**	**442,170**				
Comprehensive Lighting								
2011..................		2,404	2,404					
2012		64,094	64,094					
Total		**$ 66,498**	**$ 66,498**					
Distribution Efficiency Initiative								
2005		21,552	43,969					
2006		24,306	24,306					
2007		8,987	8,987					
2008		-1,913	-1,913					
Total		**$ 52,932**	**$ 75,349**					
DSM Direct Program Overhead								
2007		56,909	56,909					
2008		169,911	169,911					
2009		164,957	164,957					
2010		117,874	117,874					
2011..................		210,477	210,477					
2012		285,951	285,951					
2013		380,957	380,957					
2014		478,658	478,658					
2015		272,858	272,858					
2016		293,039	293,039					

		Total Costs		Savings and Demand Reductions			Levelized Costs [a]	
Program/Year	Participants	Utility Cost [b]	Resource Cost [c]	Annual Energy (kWh)	Peak Demand [d] (MW)	Measure Life (Years)	Total Utility ($/kWh)	Total Resource ($/kWh)
2017		1,759,352	1,759,352					
2018		1,801,955	1,801,955					
Total		**$ 5,992,899**	**$ 5,992,899**					
Green Motors Rewind—Industrial								
2016				123,700		7		
2017				143,976		7		
2018				64,167		7		
Total				**331,843**		**7**		
Green Motors Rewind—Irrigation								
2016				73,617		19		
2017				63,783		19		
2018				67,676		19		
Total				**205,076**		**19**		
Local Energy Efficiency Fund								
2003	56	5,100	5,100					
2004		23,449	23,449					
2005	2	14,896	26,756	78,000		10	0.024	0.042
2006	480	3,459	3,459	19,027		7	0.009	0.009
2007	1	7,520	7,520	9,000		7	0.135	0.135
2008	2	22,714	60,100	115,931	0.0	15	0.019	0.049
2009	1	5,870	4,274	10,340	0.0	12	0.064	0.047
2010	1	251	251		0.0			
2011....................	1	1,026	2,052	2,028		30	0.035	0.070
2012								
2013								
2014	1	9,100	9,100	95,834		18		
Total	**545**	**$ 93,385**	**$ 142,061**	**330,160**		**14**	**$ 0.028**	**$ 0.043**
Other C&RD and CRC BPA								
2002		55,722	55,722					
2003		67,012	67,012					
2004		108,191	108,191					
2005		101,177	101,177					
2006		124,956	124,956					

		Total Costs		Savings and Demand Reductions			Levelized Costs [a]	
Program/Year	Participants	Utility Cost [b]	Resource Cost [c]	Annual Energy (kWh)	Peak Demand [d] (MW)	Measure Life (Years)	Total Utility ($/kWh)	Total Resource ($/kWh)
2007		31,645	31,645					
2008		6,950	6,950					
Total		**$ 495,654**	**$ 495,654**					
Residential Economizer Pilot								
2011		101,713	101,713					
2012		93,491	93,491					
2013		74,901	74,901					
Total		**$ 270,105**	**$ 270,105**					
Residential Education Initiative								
2005		7,498	7,498					
2006		56,727	56,727					
2007								
2008		150,917	150,917					
2009		193,653	193,653					
2010		222,092	222,092					
2011		159,645	159,645					
2012		174,738	174,738					
2013		416,166	416,166					
2014	6,312	423,091	423,091	1,491,225		11		
2015		149,903	149,903					
2016		290,179	290,179					
2017		223,880	223,880					
2018		172,215	172,215					
Total		**$ 2,640,704**	**$ 2,640,704**	**1,491,225**				
Shade Tree Project								
2014	2,041	147,290	147,290					
2015	1,925	105,392	105,392					
2016	2,070	76,642	76,642					
2017	2,711	195,817	195,817					
2018	2,093	162,995	162,995	35,571				
Total	**3,966**	**$ 688,136**	**$ 688,136**	**35,571**				

		Total Costs		Savings and Demand Reductions			Levelized Costs [a]	
Program/Year	**Participants**	**Utility Cost [b]**	**Resource Cost [c]**	**Annual Energy (kWh)**	**Peak Demand [d] (MW)**	**Measure Life (Years)**	**Total Utility ($/kWh)**	**Total Resource ($/kWh)**
Solar 4R Schools								
2009		45,522	45,522					
Total		**$ 45,522**	**$ 45,522**					
Market Transformation								
Consumer Electronic Initiative								
2009		160,762	160,762					
Total		**$ 160,762**	**$ 160,762**					
NEEA								
2002		1,286,632	1,286,632	12,925,450				
2003		1,292,748	1,292,748	11,991,580				
2004		1,256,611	1,256,611	13,329,071				
2005		476,891	476,891	16,422,224				
2006		930,455	930,455	18,597,955				
2007		893,340	893,340	28,601,410				
2008		942,014	942,014	21,024,279				
2009		968,263	968,263	10,702,998				
2010		2,391,217	2,391,217	21,300,366				
2011		3,108,393	3,108,393	20,161,728				
2012		3,379,756	3,379,756	19,567,984				
2013		3,313,058	3,313,058	20,567,965				
2014		3,305,917	3,305,917	26,805,600				
2015		2,582,919	2,582,919	21,900,000				
2016		2,676,387	2,676,387	24,615,600				
2017		2,698,756	2,698,756	23,652,000				
2018		2,500,165	2,500,165	24,966,000				
Total		**$ 34,003,521**	**$ 34,003,521**	**337,920,611**				
Annual Totals								
2002		1,932,520	2,366,591	16,791,100	0.0			
2003		2,566,228	3,125,572	18,654,343	0.0			
2004		3,827,213	4,860,912	19,202,780	6.5			
2005		6,523,348	10,383,577	37,978,035	43.9			
2006		11,174,181	20,950,110	67,026,303	43.6			

		Total Costs		Savings and Demand Reductions			Levelized Costs [a]	
Program/Year	Participants	Utility Cost [b]	Resource Cost [c]	Annual Energy (kWh)	Peak Demand [d] (MW)	Measure Life (Years)	Total Utility ($/kWh)	Total Resource ($/kWh)
2007		14,896,816	27,123,018	91,145,357	57.9			
2008		20,213,216	44,775,829	128,508,579	74.3			
2009		33,821,062	53,090,852	143,146,365	235.5			
2010		44,643,541	68,981,324	193,592,637	357.7			
2011		44,877,117	79,436,532	183,476,312	415.2			
2012		47,991,350	77,336,341	172,054,327	448.8			
2013		26,100,091	54,803,353	109,505,690	54.5			
2014		35,648,260	71,372,414	145,475,713	389.7			
2015		37,149,893	70,467,082	162,533,155	374.5			
2016		40,499,570	70,984,604	170,792,152	379.0			
2017		44,828,089	78,799,054	191,471,395	383.0			
2018		42,926,872	75,797,483	183,377,834	358.7			
Total Direct Program		**$ 459,623,368**	**$ 814,654,650**	**2,035,663,138**				
Indirect Program Expenses								
DSM Overhead and Other Indirect								
2002		128,855						
2003		-41,543						
2004		142,337						
2005		177,624						
2006		309,832						
2007		765,561						
2008		980,305						
2009		1,025,704						
2010		1,189,310						
2011		1,389,135						
2012		1,335,509						
2013		$741,287						
2014		1,065,072						
2015		1,891,042						
2016		2,263,893						
2017		2,929,407						
2018		1,335,208						
Total		**$ 17,628,538**						

		Total Costs		Savings and Demand Reductions			Levelized Costs [a]	
Program/Year	Participants	Utility Cost [b]	Resource Cost [c]	Annual Energy (kWh)	Peak Demand [d] (MW)	Measure Life (Years)	Total Utility ($/kWh)	Total Resource ($/kWh)
Total Expenses								
2002		2,061,375						
2003		2,528,685						
2004		3,969,550						
2005		6,700,972						
2006		11,484,013						
2007		15,662,377						
2008		21,193,521						
2009		34,846,766						
2010		45,832,851						
2011...................		46,266,252						
2012		49,326,859						
2013		26,841,378						
2014		36,713,333						
2015		39,040,935						
2016		42,763,463						
2017		47,757,496						
2018		44,262,080						
Total 2002–2018		**$ 477,251,906**						

[a] Levelized Costs are based on financial inputs from Idaho Power's *2015 Integrated Resource Plan* and calculations include line loss adjusted energy savings.
[b] The Total Utility Cost is all cost incurred by Idaho Power to implement and manage a DSM program.
[c] The Total Resource Cost is the total expenditures for a DSM program from the point of view of Idaho Power and its customers as a whole.
[d] Peak Demand is reported for programs that directly reduce load or measure demand reductions during summer peak season. Peak demand reduction for demand response programs is reported at the generation level assuming 13 percent peak line losses.

ACLARA ACE™

Adaptive Consumer Engagement

Idaho Power Corporation
Home Energy Report Year 1
Public Program Summary

Version 1.3
Updated: 3/1/2019

Aclara™

TABLE OF CONTENTS

REVISION HISTORY

Date	Version	Description	Author/Editor
8/29/18	1.0	Initial Report Created	Trudeau
11/4/18	1.1	Revised from Requirement Meeting	O'Keefe
02/20/21	1.2	Revised based on IPC edits	Cornish
02/20/28	1.3	Additional revisions requested by IPC	Cornish

DOCUMENT APPROVAL

The purpose of this section is to acknowledge approval of the information presented within. Please use the track changes features to indicate any changes necessary before approval of the plan can be made. When ready to approve, please indicate the version number being approved, and complete the fields below.

This {insert document name}, version xx approved by:

Client Name: ______________________

Name, Title: ______________________

Signature: ______________________

Date: ______________________

Client Name: ______________________

Name, Title: ______________________

Signature: ______________________

Date: ______________________

For Aclara: ______________________

Signature: ______________________

Date: ______________________

1. EXECUTIVE SUMMARY

Aclara delivered a Home Energy Report program for Idaho Power Corporation from July 2017 to July 2018. Aclara's Home Energy Reports (HER) program is a turnkey behavioral program designed to combine feedback on energy use with contextual information that helps to educate and motivate customers to reduce their energy use and increase customer satisfaction and engagement. The visual design of the report includes varying analytical modules, like smart meter disaggregation, along with targeted messaging that provides insights into customer energy use and encourages customers to take action and become more energy efficient and save.

The program was optimized to drive measurable results across all of Idaho Power's program objectives following the Appendix A - NREL Residential Behavior standard attached hereto.

In line with these goals, 27,000 customers were initially selected to receive paper Home Energy Reports. These households were split into four treatment groups:

Table 1 - Treatment Group Summary

	Cohort	Definition	Number in initial treatment group	Number of customers receiving 1st Report	Number of customers receiving Last Report
T1	Winter Heating Group	High electric heating	7,900	7,092	6,849
T3	Year-Round Group	High User - Use > Average kWh/yr.	8,500	8,295	7,330
T4	Year-Round Group	Medium User - Use Average kWh/yr.	4,100	3,985	3,488
T5	Year-Round Group	Low User - Use < Average kWh/yr.	6,500	6,305	5,411
		TOTAL	27,000	25,677	23,078

The Winter Heating Group were sent four reports: one in November 2017 (along with a welcome letter), one in December 2017, one in January 2018 and one in February 2018. The Year-Round Group received a welcome letter and report in July 2017, and bi-monthly reports starting in August 2017 and ending in June 2018.

Figure 1 - Report Delivery Schedule

Each report included varying modules and messages to provide clear value propositions and calls to action. The paper reports contained a combination of the following elements:

- Customer information – including name, address and account number.

- Smart Meter Disaggregation – Providing targeted groups of residential customers with personalized appliance level usage insights.
- Targeted Message(s) – Calls to action with customized messages for each customer segment based on past program participation. These messages were used throughout the report to drive customers to the My Account portal and to relevant program pages at the direction of IPC relative to sales and marketing initiatives.
- Peer Comparison – normative messaging designed to motivate people to save by comparing the customer's energy use to both typical homes and those homes that are highly efficient. The customer's peer group is derived by taking into account important characteristics of the home.
- Personalized savings measures –The collection of tips to be used for any given individual in the campaign is created based on home profile attributes (obtained or assumed) and customer segmentation.

The attrition rate for the Year-Round Group was 12%. The attrition rate for the Winter Heating Group was 3.5% from first report to last. 94% of the attrition for the Year-Round Group was caused by move-outs and National Change of Address nondeliverables. After the first report, 86% of the attrition was caused by move-outs and National Change of Address nondeliverables in the Winter Heating Group.

1.1 PROGRAM ACHIEVEMENTS

Program achievements include:

- 149,546 total reports sent from July 2017 to June 2018 date affecting 25,677 total customers within the Counties of Ada, Bannock, Bingham, Canyon, Cassia, Gem, Gooding, Jerome, Lemhi, Payette, Twin Falls, Valley, and Washington.
- 172 customers opted out—representing a low opt out rate of 0.64 percent when compared with an average 1 percent in typical Home Energy Report programs.
- Year 1 of the of the program achieved statistically significant energy savings with a 95% confidence interval in 3 out of the 4 treatment groups. The percent saved ranged from 0.5% to 1.7%, and the average energy savings per customer ranged from 28 kWh to 207 kWh.

Customer Satisfaction was measured through a customer survey and calls into the CSRs. Call volume was low overall with 411 total calls to the call center during the report period. The full Customer Satisfaction Survey report is included as Appendix C of this report. Highlights of the customer survey include:

- 90% of survey respondents indicated they want to continue receiving the report.
- 83% of survey respondents felt their utility helps them understand their usage.
- 74% of survey respondents indicated they were motivated to save energy.

2. PROGRAM OVERVIEW

The Winter Heating Group was selected based on their high electric heating usage in the winter. They received four reports from November 2017 – February 2018 that focused on their electric heating usage and tips to save on electric heating.

Table 2 – Winter Heating Group (T1) Report Schedule for Year 1

Report	Date Mailed	Reporting Period
1	November 17, 2017	2016/11/1 – 2017/3/31
2	December 6, 2017	2016/11/1 – 2017/3/31
3	January 23, 2018	2017/11/1 – 2017/12/31
4	February 22, 2018	2017/11/1 – 2018/1/31

The Year Round received four reports from July 2017 to July 2018 that focused on their electric usage related to appliances and lights, always on and air conditioning and associated tips to save.

Table 3 – Year Round Groups (T3, T4 and T5) Report Schedule for Year 1

Report	Date Mailed	Reporting Period
1	July 24, 2017	2016/6/1 – 2017/5/31
		2016/6/1 – 2016/8/31
2	August 22, 2017	2017/6/1 – 2017/7/31
3	October 27, 2017	2017/8/1 – 2017/9/30
4	December 27, 2017	2017/10/1 – 2017/11/30
5	February 27, 2018	2017/12/1 – 2018/1/31
6	April 24, 2018	2018/2/1 – 2018/3/31
7	July 2, 2018	2018/4/1 – 2018/5/31

2.1 OBJECTIVES

Idaho Power identified the following primary objectives for the HER program pilot:

- Provide average annual savings of 1-3% across the participant group.
- Maintain or enhance the current customer satisfaction levels.
- Encourage customer engagement with electric usage, including utilization of online tools and lift for other EE programs.
- Meet cost-effectiveness guidelines from a Total Resource Cost (TRC) perspective.

Further objectives of the pilot included:

- Following industry best practices/protocols for all segments to ensure lessons learned from the pilot appropriately inform program decisions going forward.
- Ensuring program design will stand up to the rigors of a 3rd party evaluation on the back end, i.e., sample sizes adequate to detect and claim expected savings, control and treatment group assignments clean and accurate, etc.
- Obtaining information to provide insights for the future of the program:
  - Scalability
  - Anticipated savings for various customer segments
  - Best target audiences (energy use, geography, etc.)
  - Audiences to exclude, etc.
  - Ability to measure savings

2.2 INTEGRATION AND IMPLEMENTATION

Aclara utilizes a phased implementation methodology to include:

- Phase 1: Project Initiation & Kickoff
- Phase 2: Program Design & Requirements Gathering
- Phase 3: Data Acquisition & Analytics
- Phase 4: Implementation & Configuration
- Phase 5: Report Testing & Approval
- Phase 6: Report Preparation & Fulfillment
- Phase 7: Program Monitoring
- Phase 8: Savings Quantification and Program Summary Report

The Aclara methodology has been developed to help reach the following goals:

- Overall client satisfaction
- Ensure first time implementation success
- Clearly set expectations
- Ensure buy-in at all levels of the client organization
- Enable client's change request process
- Provide avenues for feedback and refinement of the product and process

Fundamentals used to develop methodology and meet implementation goals:

- Include client feedback throughout the process
- Ensure client involvement at all levels (executive to end user)
- Ensure timely delivery of the application

Aclara worked with Idaho Power to acquire the data needed to support the program and analyzed the data to ensure that there were no quality issues. Aclara leveraged existing and/or purchased third party demographic and property data for Idaho Power electric customer records. The household-level data sources will allow for the creation of more robust control and peer groups for driving behavior change and evaluating program performance. Where gaps occurred in third-party property data, Aclara leveraged its consumption analytics model (ACE) leveraging monthly consumption data to determine the property's likely fuel use for heating, cooling and water heating to better validate peer group assignment and segmentation.

Table 4- Program Data Integration

Integration Point	Description	Integration Format	Frequency	Responsible Party Initiator	Responsible Party - Receiver
Electric Customer Billing Data	Idaho Power will provide electric customer billing data to Aclara incrementally each month as each bill cycle is completed for treatment group customers, selected control customers, and random sample for benchmarking.	CSV	Batch – one-time Historical & Reoccurring Weekly	Idaho Power	Aclara
Electric Customer AMI Data	Idaho Power to provide recurring daily AMI updates of electric AMI data for treatment group customers, selected control customers, and random sample for benchmarking.	CSV	Batch– one-time Historical & Reoccurring Weekly	Idaho Power	Aclara
Public Record Data	Aclara calls Melissa Data for latest property records for treatment group customers, selected control customers, and random sample for benchmarking.	CSV	Batch– one-time Historical	Aclara	Aclara
Action and Profile Data	Aclara extracts customer action and profile data from My Account tools (EnergyPrism) for treatment group customers, selected control customers, and random sample for benchmarking.	CSV	Batch – one-time Historical & Reoccurring Weekly	Aclara	Aclara
Opt-Outs	Idaho Power delivery a weekly opt out report to Aclara for removal of customer prior to next program report.	CSV	Reoccurring Weekly	Idaho Power	Aclara

Aclara conducted an eligibility screening of potential participants prior to allocating participants to either a treatment group or a corresponding control group. Criteria for removing customers from eligibility included (but were not limited to):

Table 5 - Criteria and Rationale for Elibility Screening

Criteria	Rationale
Multi-family	Removed multi-family accounts due to difficulty of providing appropriate benchmarking comparisons due to lack of available housing details.
Tenant billing mismatch	Removing accounts where the landlords might be receiving reports relating to tenants.
<1 year of AMI data available	More than 1 year of energy data is needed to provide a baseline for EM&V purposes.
Oregon Accounts	For the pilot period, participation was limited to Idaho customers.
Net Metering Accounts	Households on a net metering rate would receive an HER that does not accurately reflect their household energy use, so they were not eligible for the HER program.
County	Regions that did not have sufficient eligible accounts to create robust benchmarks were removed from eligibility to ensure that all customers were compared to robust benchmarks.

Once customer segmentation had been identified, Aclara worked with Idaho Power to define the campaign strategy to customize key messaging in the report. Customer segmentation was leveraged to refine savings tips selections and promotions based on targeting offers that would be both the most relevant and have the highest likelihood of adoption.

Aclara, in collaboration with Idaho Power, implemented an iterative report configuration that enables Idaho Power to update the content of the report to ensure the design meets Idaho Power's program objectives.

2.3 TEAM STRUCTURE

Aclara and Ecotagious have been partnering since 2016 to deliver greater value to our customers. We have been successfully integrating our two technologies and have already delivered results exceeding expectations to all our clients. Ecotagious' ability to segment residential customers on their appliance use plays a key role in Aclara's behavioral efficiency programs to drive energy savings for gas and electric utilities.

Ecotagious and Aclara were pleased partner with Idaho Power Corporation to deliver this Home Energy Report Program.

3. METHODOLOGY

In this pilot, the energy savings from different customer segments were tested. Treatment groups of High-users (T3: > Average kWh/year), Medium-users (T4: ~Average kWh/year)) and Low-users (T5: < Average kWh/year) were created to measure the difference in energy savings between them. The savings results are provided in section 5. A Winter Heating Group was also created that included customers with high electricity use for heating in the winter. This group received 4 reports during the heating season.

Idaho Power has strong summer and winter periods of high electricity use for A/C & Heating, representing 23% of average residential electricity use. Analyzing the electricity consumption per home per year allowed for identifying Year Round program candidates as well as winter heating and summer AC candidates.

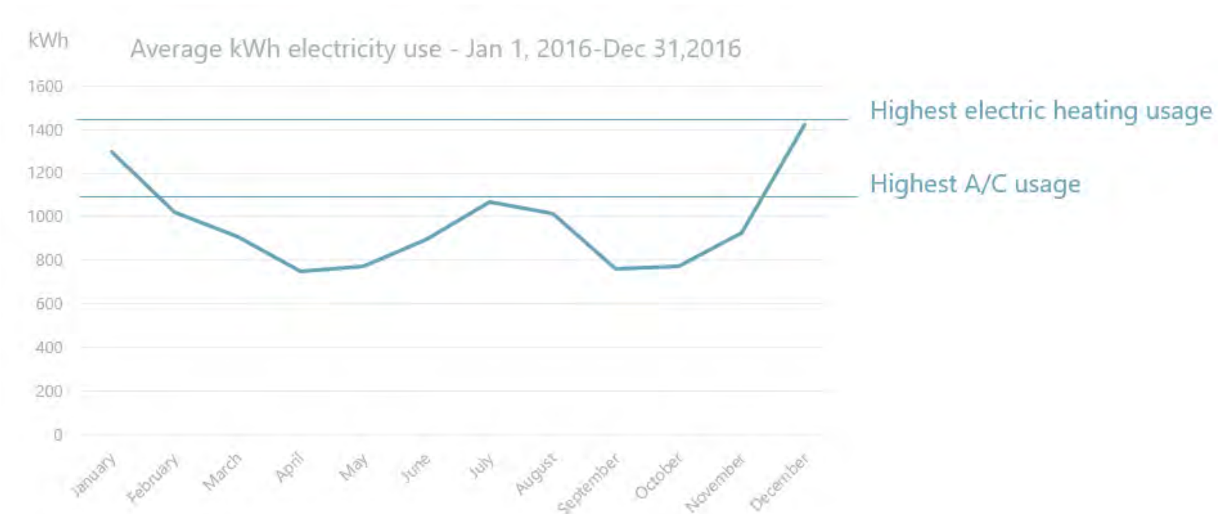
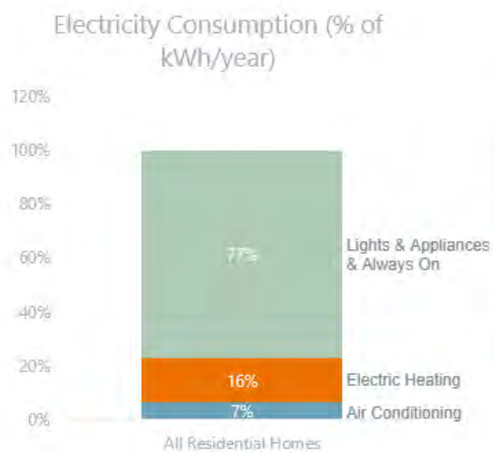


Figure 2 - Average kWh electricity use - Jan1, 2016 - Dec 31, 2016



Average Home's Electricity Use by Major Appliance (kWh/yr)	kWh/yr	% of Total
Lights & Appliances & Always On	8,511	77%
Electric Heating	1,791	16%
Air Conditioning	752	7%
Total	11,055	100%

Figure 3 - Electricity Consumption (% of kWh/year)

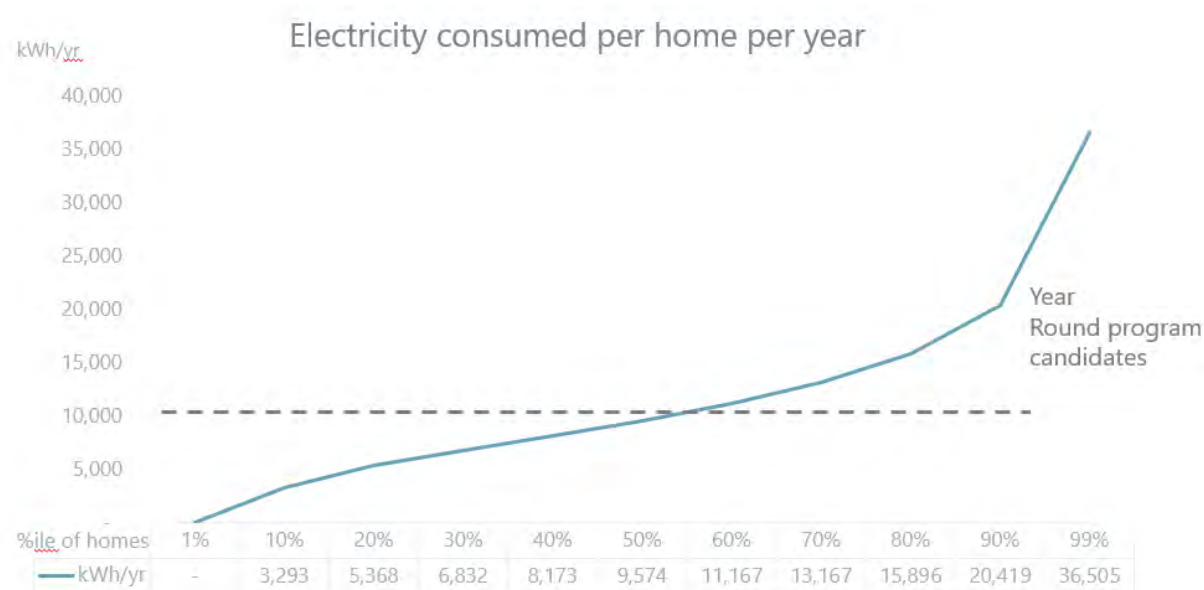


Figure 4 - Electrcicity consumed per home per year

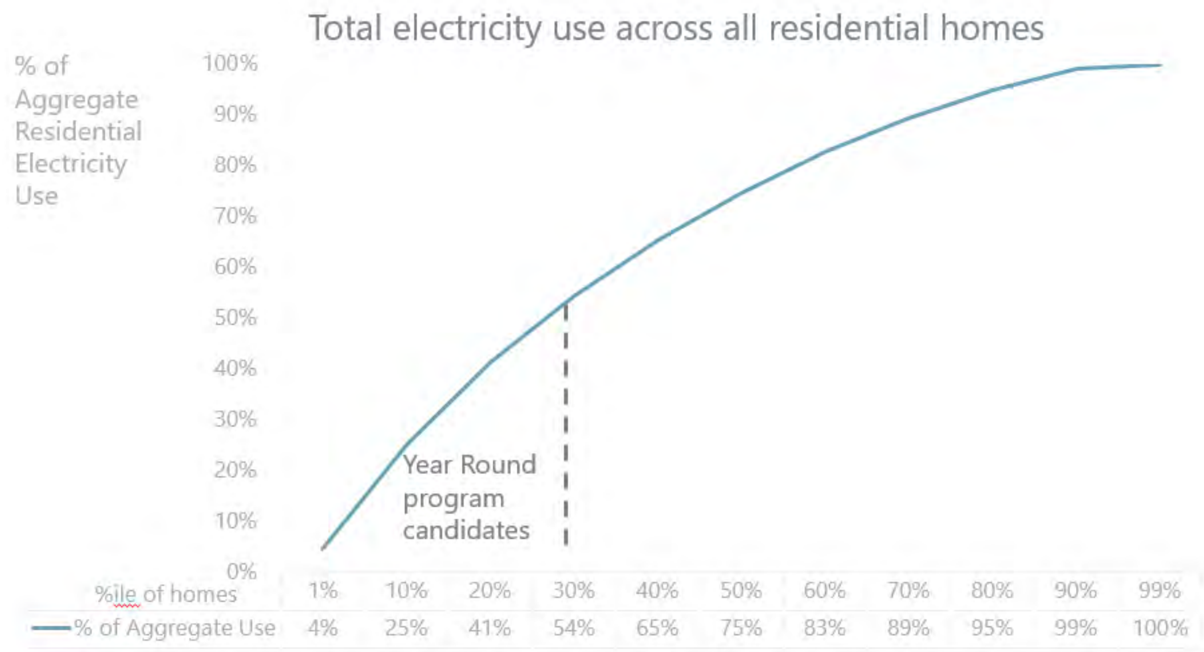


Figure 5 - Total electricity load across all residential homes

3.1 PROGRAM DESIGN

The energy savings from these groups were evaluated following standard industry-accepted evaluation practices. The program was set up as a Randomized Control Trial (RCT) where a third party created the treatment and control groups. 27,000 customers were identified as initial program participants.

After taking into consideration exclusionary factors such as move-ins and move-outs, as well as removing a number of the T-1 potential participants due to the lack of adequate county benchmarks, the sample sizes at the time first reports were delivered were:

Table 6 – Treatment and Control Group Size at First Report

	Treatment	Control
Winter Heating – T1	7,092	14,995
Year-Round – T3	8,295	44,232
Year-Round – T4	3,985	40,830
Year-Round – T5	6,305	66,783
TOTAL	25,677	166,840

The evaluation employed a ‘difference-in-differences’ approach to allow for accurate evaluation of program driven energy savings. Appropriate-sized treatment and control groups were created for each cohort, accounting for an attrition rate of 10 percent and allowing for statistically significant detection of energy savings in excess of 1.2% in the treatment groups. To achieve this objective, all eligible customers were placed in either the treatment group or the control group.

Households that moved-out during the evaluation period were taken out of both the treatment and control groups. Customers who opted out or were removed due to being marked nondeliverable by the National Change of Address database were left in both the treatment and control groups.

4. CUSTOMER SATISFACTION

4.1 CUSTOMER SATISFACTION SURVEY

The primary goal of the customer satisfaction survey was to measure customer satisfaction. Oraclepoll Research Limited was commissioned to conduct survey research with Idaho Power customers to assess impact of the Home Energy Reports. A total of 400 customers were interviewed, broken down as follows:

- N=200 completed interviews for the control group
- N=200 completed interviews for the treatment sample, with:
  - N=100 interviews among the winter heating group (T1)
  - N=100 interviews among the year-round group (T3, T4 & T5)

The survey was conducted by telephone using live person researchers at the Oraclepoll call center. The survey questions are included in Appendix C.

The survey was completed between April 15th – April 24th, 2018. The margin of error for the total N=400 sample is ± 4.8%, 19/20 times. The error rates for each of the two N=200 sub-samples are ± 6.9%, 19/20 times.

Based on the survey respondents' answers to the questions posed:

a) The Home Energy Reports have not had a negative effect on customer satisfaction.
b) Households who received Home Energy Reports perceived that Idaho Power was trying to help them manage their energy use.
c) Households who received Home Energy Reports remembered receiving them and said they read "all or most" of them.
d) Households who received Home Energy Reports said they acted to save money and electricity.
e) Households who received Home Energy Reports would like to continue receiving them.

Details of the customer satisfaction survey results are provided in Appendix C.

Interestingly, the results of the customer survey suggest that the T5 group is the most interested in continuing to receive reports. 87% of customers in group T5 answered yes to the question "If the program remains in place, would you like to continue receiving Home Energy Reports at no charge?"

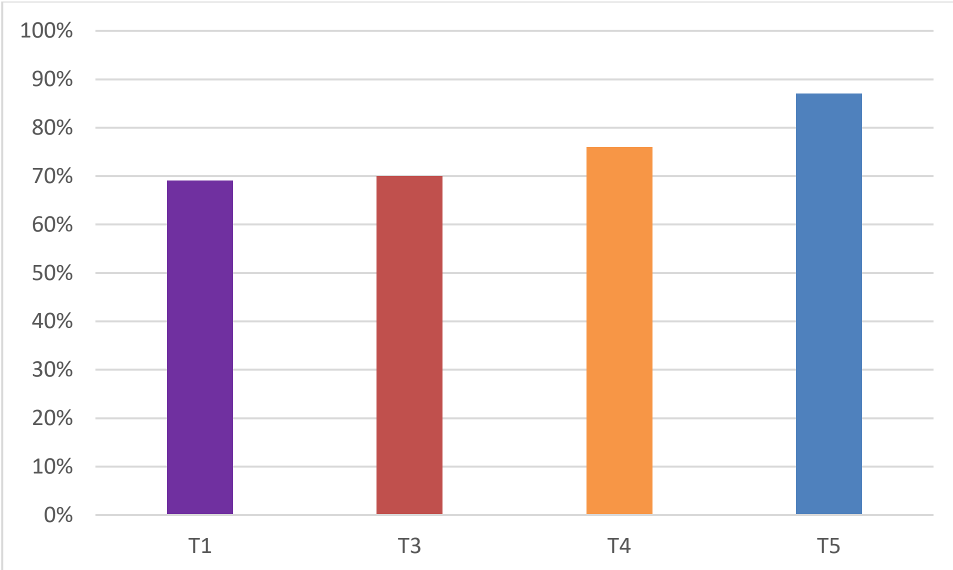


Figure 6 - Percentage of each treatment group who answered "yes" to "If the program remains in place, would you like to continue receiving Home Energy Reports at no charge?"

A further breakout of the survey results is provided in Appendix D.

4.2 CSA RESULTS & OPT-OUTS

IPC Customer Service Agents received a total of 411 calls, which is 1.5% percent of treated customers. This is a low call-in rate.

The opt-rate for the program was 0.64%, below the industry average of 1%.

CSAs reported excellent feedback on the program, summarized here:

- Reports driving customers to update their profiles online
- Reports driving customers to have conversations about IPC energy saving programs
- Customers calling to say they like the program

Few customers were reporting negative feedback.

- Customers calling to say they don't like the report

Table 7 - CSA Results & Opt-Outs

Call Reason	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Total
General	30	3	1	13	18	10	8	17	3	3	1	4	110
Profile Update	34	9	1	4	13	20	4	2	2	2	0	3	94
Opt-Out	101	11	0	7	23	9	0	2	1	12	0	6	172
Escalation	1	0	0	0	0	0	0	0	0	0	0	0	1
Non-Prog Related	9	0	1	1	2	2	1	6	1	1	0	0	24
Other	10	1	0	3	9	1	2	4	1	1	0	3	35

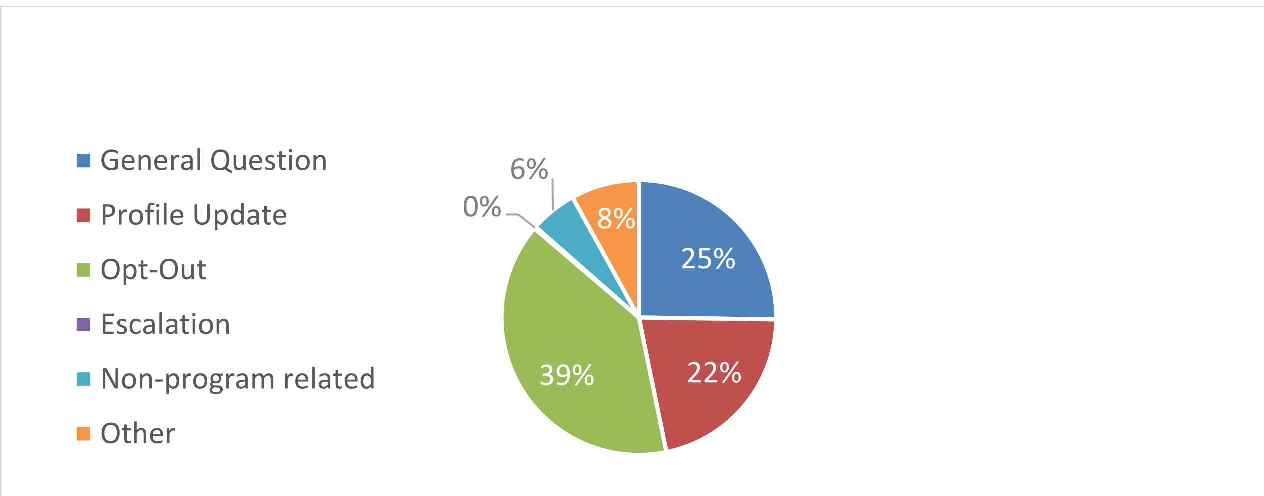


Figure 7 - CSA Dispositions

4.3 MICROSITE ENGAGEMENT

Table 8 - Microsite Activity by Month

Microsite Activity	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Total Program to Date
Unique Clicks	24	10	11	11	7	9	3	6	2	1	0	31	115
Total Clicks	25	10	12	14	7	10	3	9	2	1	0	32	125

The microsite usage is low, as expected. In programs where there is no ability to opt-out or update home profile on the microsite, we expect the usage to be low. The intent of the microsite in this pilot is to help reduce call volumes by providing answers to frequently asked questions.

5. PROGRAM SAVINGS

The Winter Heating Group has the highest cumulative aggregate savings due to the intensity of electric heating, even though they only received four reports. Energy savings for the treatment period were statistically significant during this treatment period for T1, T3 and T4, but not T5.

Table 9 - Cumulative Savings by Cohort

Cohort	Avg Energy Savings in kWh per Customer in the Treatment Period	95% Confidence Margin of Error	One-Sided Null Hypothesis	~Cumulative Aggregate Savings (kWh)	Treatment Period
Winter Heating – T1	207	101	3.13E-05	1462, 412	Dec 01, 2017 to July 31, 2018
Year-Round - T3	151	54	2.86E-08	1125, 930	Aug 01, 2017 to July 31, 2018
Year-Round - T4	149	51	7.59E-09	534, 536	Aug 01, 2017 to July 31, 2018
Year-Round - T5	28	35	0.0563	158, 902	Aug 01, 2017 to July 31, 2018

5.1 WINTER HEATING GROUP M&V RESULTS

Table 10 - Winter Heating Group Percentage Annualized Savings

Winter Heating – T1	1.5%

*excludes initial 3 month ramp-up period from Dec 2017-Feb 2018

The chart below shows the monthly reduction in energy use for the Winter Heating Group (negative values are energy savings).

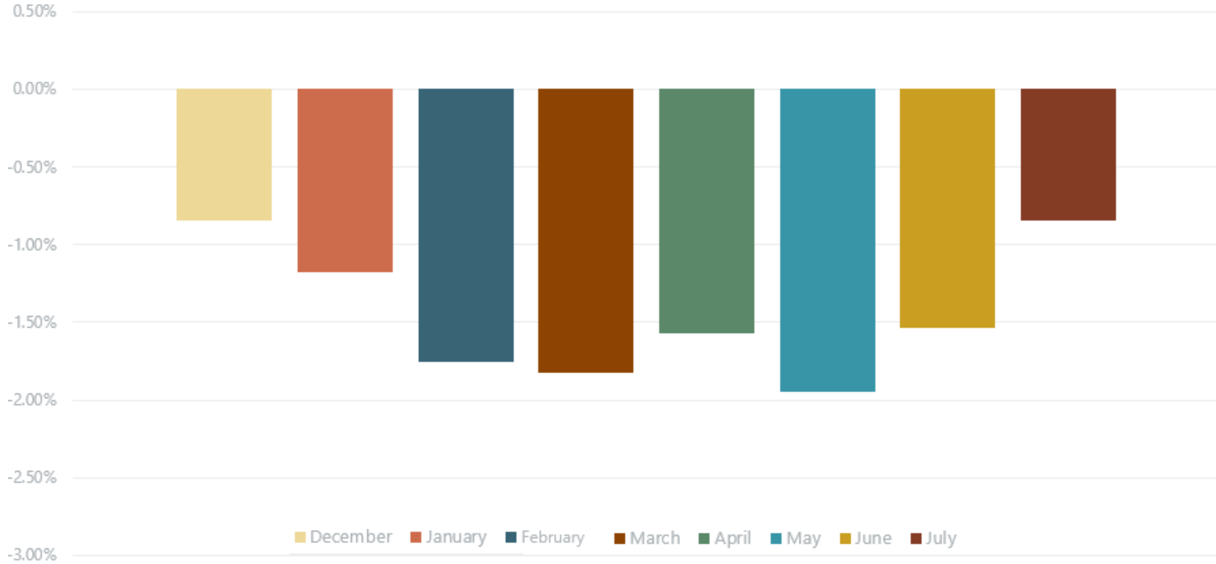


Figure 8 - Winter Heating Monthly Energy Use Reduction in %

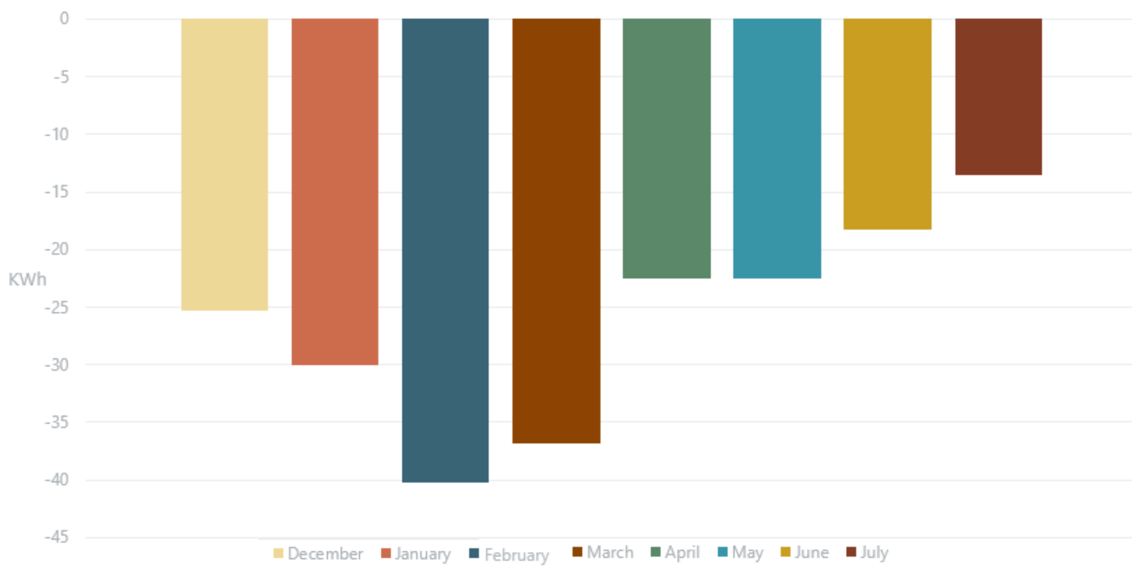


Figure 9 - Winter Heating Group Monthly Average Reduction in Energy Use by kWh per Household

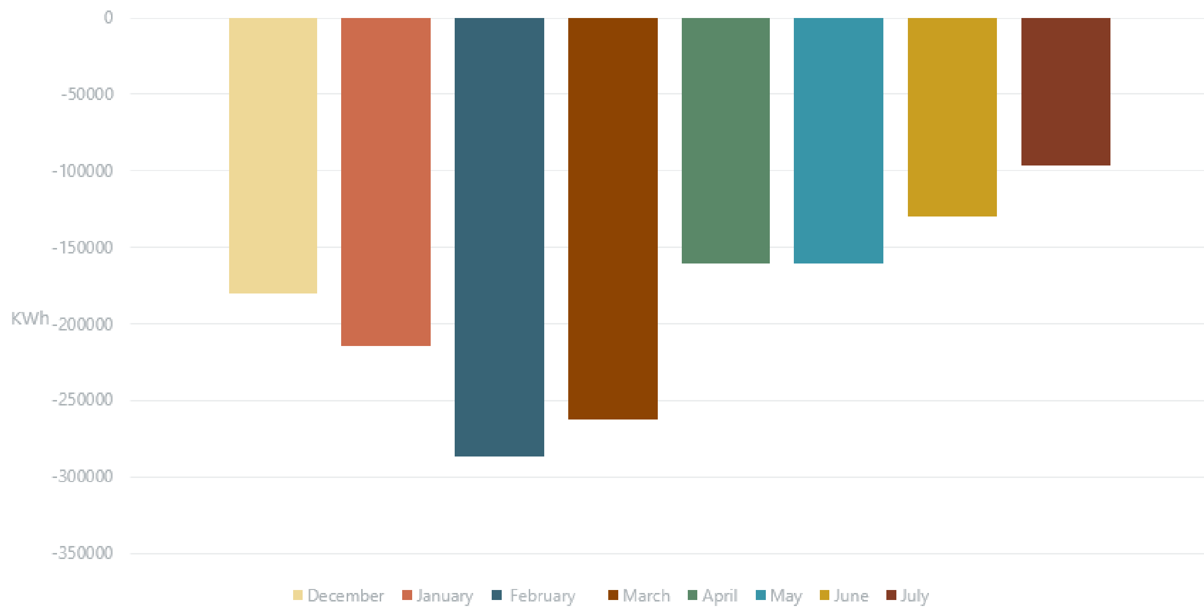


Figure 10 - Winter Heating Group Approximate Aggregate Energy Use Reduction by Month, kWh

Figure 11 - Winter Heating Energy Use Reduction by Month with 95% Confidence Bounds

5.2 YEAR-ROUND GROUP M&V RESULTS

Table 11 – Year-Round Group Percentage Annualized Savings

Year-Round - T3	1.3%
Year-Round - T4	1.7%
Year-Round - T5	0.5%

*excludes 3 month ramp-up period from Aug-Oct 2017

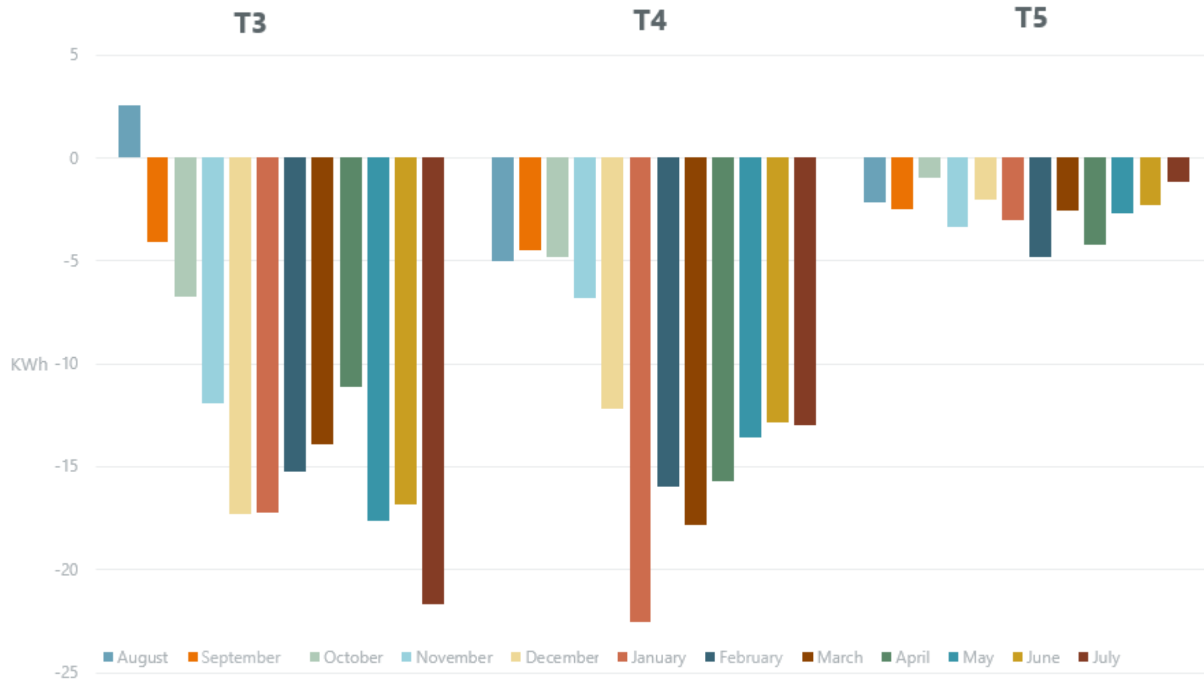


Figure 12 - Year-Round Group Monthly Energy Use Reduction in %

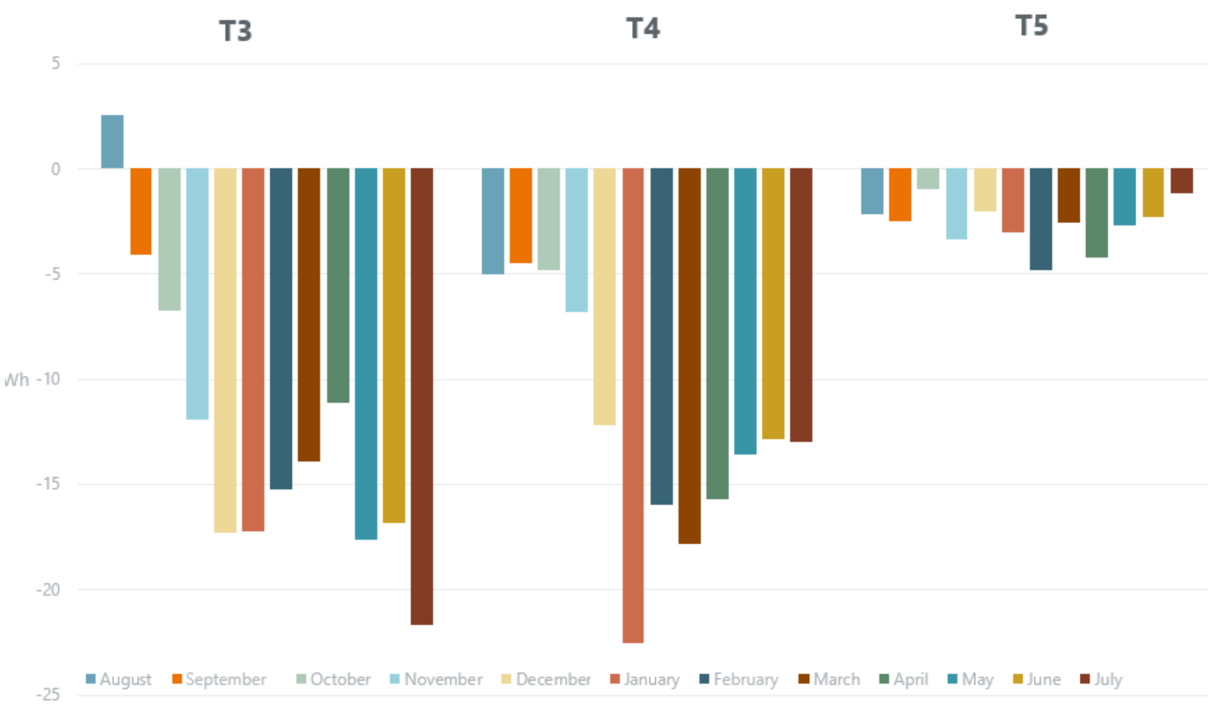


Figure 83 - Year-Round Group Monthly Average Reduction in Energy Use by kWh per Household

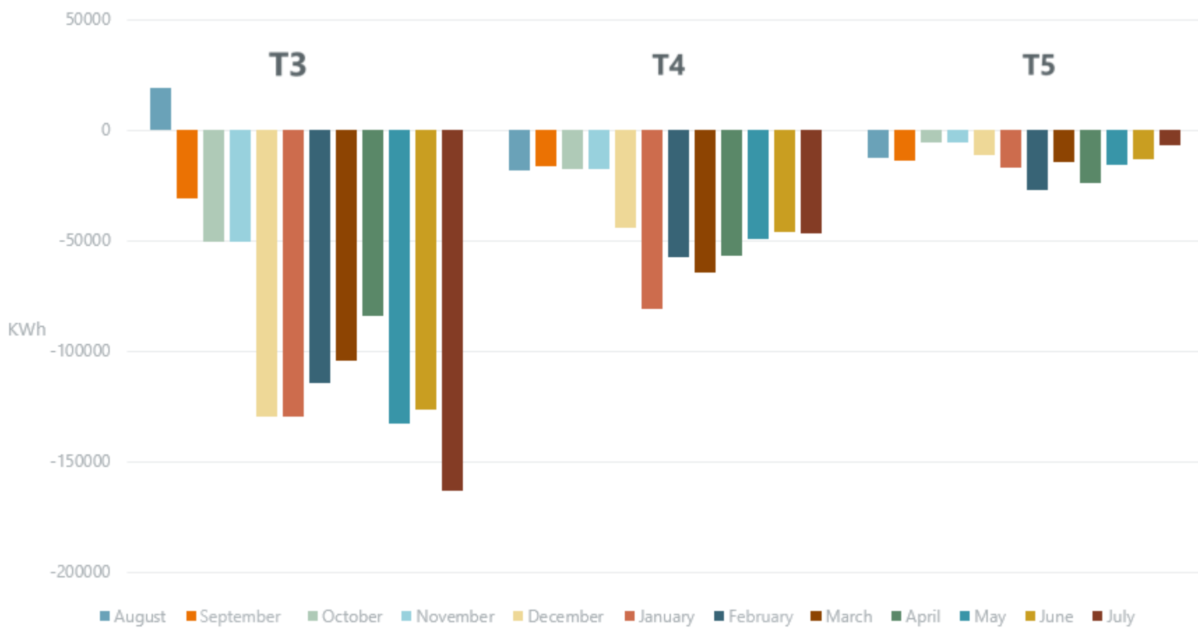


Figure 14 - Year-Round Group Approximate Aggregate Energy Use Reduction by Month, kWh

Figure 15 - T3 Energy Use Reduction by Month with 95% Confidence Bounds

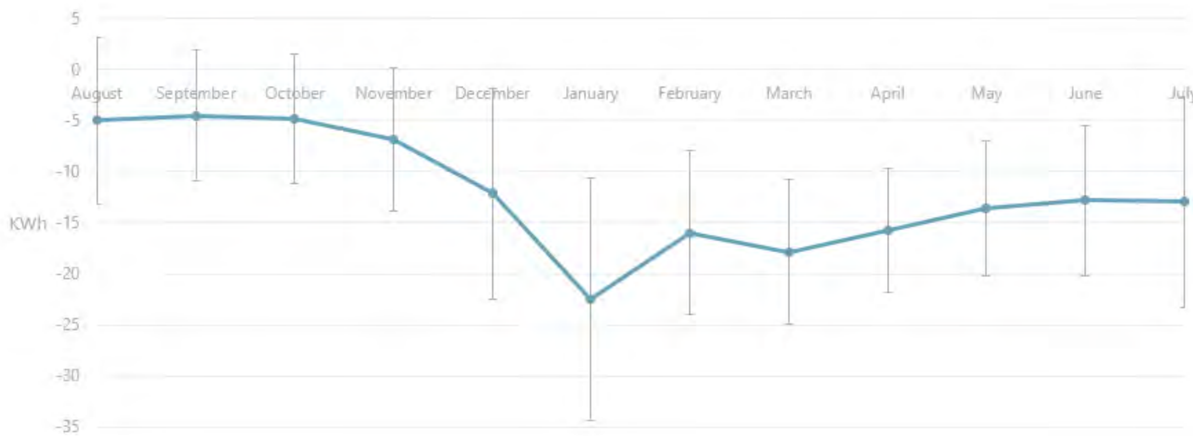


Figure 16 - T4 Energy Use Reduction by Month with 95% Confidence Bounds

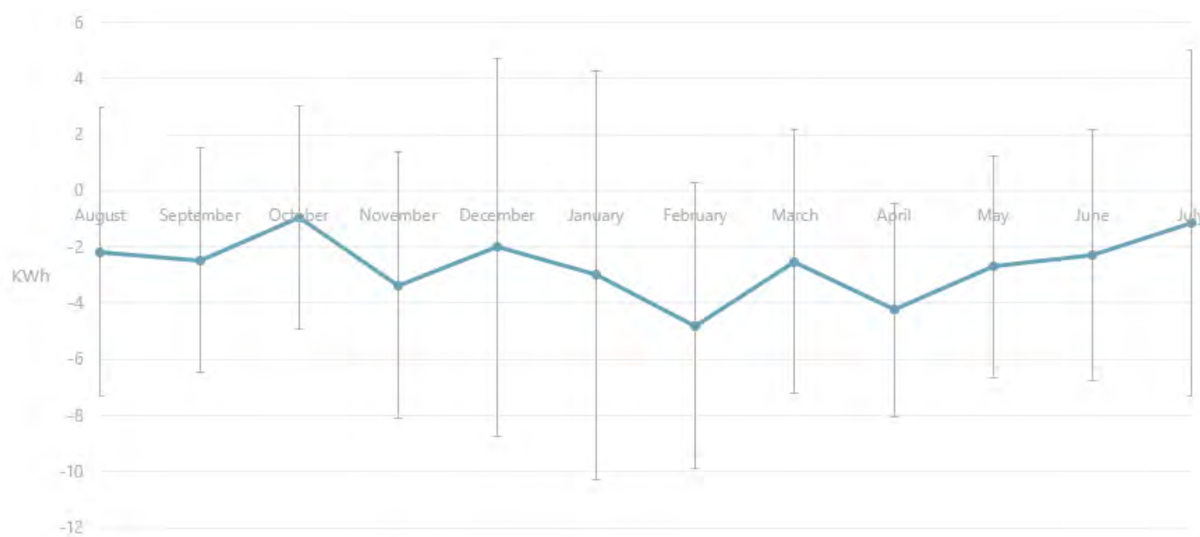


Figure 97 - T5 Energy Use Reduction by Month with 95% Confidence Bounds

6. LESSONS LEARNED

During Year One of the pilot there were a number of lesson learned and process improvements, detailed below.

6.1.1 OBJECTIVES

There were a number of learnings related to the objectives of the pilot (detailed in 2.1). This included:

- Electric heating households (the Winter Heating group) delivered the highest kWh savings by a significant margin, due to the kWh intensity of electric heating.
- The low user group (T5) had the lowest kWh savings and did not achieve statistically significant savings.
- The program did not have a negative impact on customer satisfaction levels.
- In the Customer Satisfaction Survey, despite not having high savings results, the lower user group (T5) did indicate they enjoyed receiving the reports.

- Data analysis found that approximately 13% of accounts in T3, T4, and T5 were under-performing in terms of saving energy.
- Evidence from the CSA results suggests that the results do prompt customers to inquire about the Idaho Power energy efficiency programs promoted in the reports.
- Based on feedback from the Customer Solutions Advisors, the reports appeared to have encouraged customer engagement with electric usage, including utilization of online tools and lift for other EE programs.

6.1.1.1 HER PROGRAM ELIGIBILITY

The ability to include customers identified as high electric heating and potential candidates for the Winter Heating Group was impacted by a lack of the necessary publicly available building data. This is a requirement for accurate benchmarking for inclusion in the Winter Heating program. The Winter Heating program was therefore smaller than it otherwise could have been.

In addition, an issue with location data caused 355 accounts to be removed from the Winter Heating Group after eligibility was complete and before the first report went out. Location data is required to benchmark accounts against other households in the same region for an effective benchmark.

6.1.1.2 REPORT TERMINOLOGY

There were a number of learnings during Year 1 that lead to improvements in the terminology used in the HER. These include:

- Feedback from the CSA results suggested that the inclusion of the word “Space” in Electric Space Heating was confusing. This was updated to “Electric Heating.”
- Feedback was received from an account where the household had done a large lighting retrofit and did not notice a large difference in their Lights & Appliance usage. The suggestion was to rename the end-use breakdown to Appliances & Lights to make the relative intensity of the two end uses clearer.
- Feedback from the CSA results suggested that the HER could be clearer about what energy use period the HER report referred to.

6.1.1.3 TIMING AND CONTENT OF BIMONTHLY REPORTS

A couple issues came up during Year 1 related to sending bimonthly reports where the report period for energy usage was the previous 2 months.

- Low users (T5) had very low usage data in some of the 2 month periods. Idaho Power called these customers before they received their reports to explain why their reports did not have a motivational narrative.

6.1.1.4 ATTRITION RATE

The program had an overall attrition rate of 12 percent. This is slightly higher than the 10 percent accounted for in the initial program design, but within the range expected for similar programs. In a full program roll-out, the treatment and control groups should be sized to accommodate a minimum attrition of 12 percent and a maximum attrition of 14%.

6.1.1.5 REPORT DELIVERY TIMELINE

In an investigation into how to make the reports received by customers arrive more closely after the end of the report period revealed the major limitation was the weekly AMI files. The weekly AMI files received every Sunday only have data up to Tuesday night, so in some months, depending on how the dates fall in the week, all the data needed to begin report generation is not received until the 2nd Monday of the month.

7. PROGRAM RECOMMENDATIONS AND DECISIONS FOR YEAR 2

Based on the findings from year 1 of the pilot, to enhance the program for Year 2 and beyond, Aclara has the following recommendations:

1. Expand to new customers
    - To maximize 2019 savings and create a good customer experience, launch an expanded winter-heating group in time for winter – sending two reports at end of 2018. An expanded winter heating group could be made by sourcing additional building data through primary survey techniques.
2. Further enhance cost-effectiveness
    - Cull existing customers from T3, T4 and T5 to remove sub-optimal customers.
    - Continue sending reports to T1, and optimized T3, T4 & T5 customers.
3. Continue to include the promotion of Idaho Power energy efficiency programs in the HER to drive uptake in these programs.
4. Improve the clarity of the HER reports by:
    - Renaming Lights & Appliances to Appliances & Lights and updating the detailed description of this end-use to a descending order of the most energy-intensive appliances: water heaters, dryers, stoves, washers, TV’s, and dishwashers
    - Increasing the prominence of the period of energy use that the report covers and including it in more places on the report.
5. Consider alternative report content strategies for the spring and fall for focusing on A/C and heating energy use.
6. Align delivery schedules
    - Place all customers on a year-round bimonthly schedule
    - Turn the Winter Heating Group into a year-round group to align program delivery schedule
        - High winter heating users should receive an extra seasonal report in the winter (i.e. T1 and T2)
        - High summer AC users should receive an extra seasonal report in the summer (all T groups)
    - Evaluate option of reducing to quarterly reports + 1 seasonal after first year
7. Ensure customer satisfaction continues
    - Try opt-in approach to allow customers to toggle channel from paper to email

APPENDIX A – NREL RESIDENTIAL BEHAVIORAL STANDARD

UMPChapter17-residential-behavior.pdf

APPENDIX B – REPORT & MICROSITE SAMPLES

Year Round Group – Report 1 Welcome Letter (Delivered July 2017)

IDAHO POWER.
An IDACORP Company

******************************SNGLP 1-1 ## 0000032671 11
Jim Brown
123 Cherry Street
Boise, ID 83702-1234

Dear <Customer Name>,

Idaho Power is committed to offering programs to help you use energy wisely. As part of this commitment, we are introducing a new Home Energy Report. We created these reports because many of our customers told us a personalized report, separate from their power bill, would be useful and informative in helping them manage their electricity use.

For the next 12 months, we will test these reports with a limited number of customers to determine the value of the information provided. Each report will include:

- A comparison of your household's electricity use to homes in your community of similar type, size and heating source
- A breakdown of your home's electricity use by major appliance to highlight areas where you can save
- Personalized tips and recommendations for ways to help you save energy

Your first report is enclosed with this letter and provides insights on your electricity use from the previous year. Beginning next month, you will receive bimonthly reports containing information about the most recent two-month period.

At the end of the year, you will be asked to participate in a follow-up survey to provide feedback about your experience. If you do not wish to receive reports, you may opt out by calling 1 800 632 6605.

Even though Idaho Power has some of the lowest rates in the nation, we continue to look for ways to help our customers save on their electric bills. We hope you find your personalized Home Energy Report valuable and welcome your feedback.

Sincerely,

Denise C Humphreys

Denise C. Humphreys
Program Specialist
208-388-5986
dhumphreys@idahopower.com

1221 W. Idaho St. (83702)
P.O. Box 70
Boise, ID 83707

Frequently Asked Questions

What is a Home Energy Report?

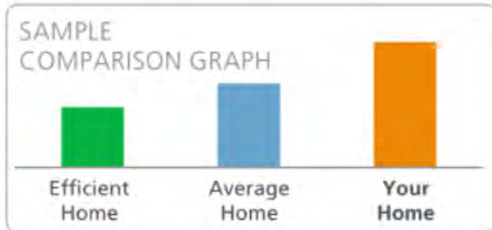
A Home Energy Report is a personalized report showing your home's monthly energy performance and ways to save.

How was I selected to receive Home Energy Reports?

Participants were selected based on historical energy use and energy-savings potential.

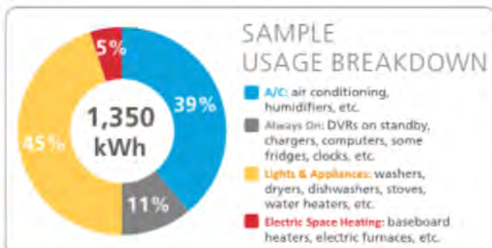
Who am I being compared to?

Your energy use is compared to more than 100 other homes in your county that have similar characteristics. These include home type (e.g., manufactured home, single family dwelling), primary heat source and home size, if available. Your home's usage will be shown in orange.



How accurate is the usage breakdown?

The breakdown of your electricity use is based on an algorithm that takes into account a number of factors, including the changes in your home's electricity consumption as the outside temperature changes. The estimates are typically within 10 percent of the actual use.



What if the home profile information in the report appears to be incorrect?

To get more accurate reports, update information about your home (e.g., home type, primary heat source, home size) by visiting myAccount at **idahopower.com** or by calling **1-800-632-6605**.

How can the report help me save energy?

Saving energy and money begins with an increased awareness of how and when you use energy at home. Your personalized Home Energy Report gives you a benchmark so you can get a sense of your savings potential. Then if you decide you want to make a change, your electricity use breakdown highlights where to focus — and the customized tips on the back suggest what actions to take first.

How do I stop receiving reports? Call **1-800-632-6605**.

What if I have other questions?

For more information about your Home Energy Report, visit **idahopower.com/HomeEnergyReport**, or call **1-800-632-6605**, Mon – Fri, 7:30 a.m. to 6:30 p.m. MT.

Year Round Group – Report 1a (Delivered July 2017)

Last Year (Jun 2016 – May 2017)

Home Energy Report

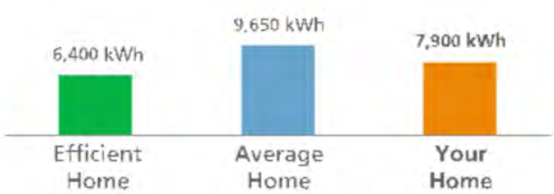
For: 124 Cherry Street
Account Number: 2203206137

IDAHO POWER
An IDACORP Company

We're here to help.
Call 1-800-632-6605, Mon – Fri.,
7:30 a.m. to 6:30 p.m. MT, or visit
idahopower.com/HomeEnergyReport

*************AUTO**5-DIGIT 06484 1-11 001284 238494 17
Jim Brown
124 CHERRY STREET Unit 222
Ada, Idaho 12345

Here's how your home compares:



Average Homes: Average of 1,000 – 2,000 sq. ft. single family homes in Ada County whose primary heat source is electricity.

Efficient Homes: Top 25 percent of those homes.

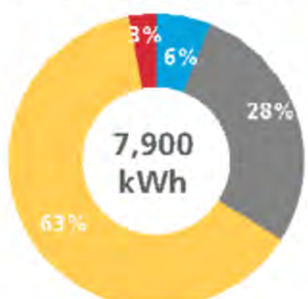
1 kWh = a typical refrigerator running 10 hours

23% MORE ELECTRICITY

Your home used about 23% more electricity than efficient 1,000 – 2,000 sq. ft. single family homes in your community.

This costs you an extra $160 per year.

Your electricity use breakdown:



- **A/C:** air conditioning, humidifiers, etc.
- **Always On:** DVRs on standby, chargers, computers, some fridges, clocks, etc.
- **Lights & Appliances:** washers, dryers, dishwashers, stoves, water heaters, etc.
- **Electric Space Heating:** baseboard heaters, electric furnaces, etc.

Calculated estimates based on an analysis of your electricity consumption data.

Last year:

63% of your electricity use was for

Lights & Appliances

This costs you approximately **$520** per year.

Want to save?

Lights and Appliances Tips To Help You Save

Use a clothesline.

SAVE UP TO **$80** PER YEAR

Reduce your electricity costs by hanging your clothes and letting them air dry. In addition to saving money and energy, your clothes will last longer.

Indoor clothes racks allow for air drying year-round, even on rainy days!

Dry full loads in your clothes dryer.

SAVE UP TO **$35** PER YEAR

A clothes dryer is typically the second most energy-hungry appliance in your home. To reduce the energy your dryer uses:

Run your clothes through an extra spin cycle to remove more water.
- Clean your dryer's lint filter regularly to reduce drying time.
Line dry laundry whenever possible (it's better for your clothing too!)
- Use your dryer's sensor to prevent over-drying.

Get an incentive when you upgrade to more efficient heating and cooling equipment.

SAVE UP TO **$170** PER YEAR

Did you know that up to 50 percent of your home's energy costs may be going to heating and cooling? Energy efficient heating and cooling equipment can keep your home more comfortable and may save you money.

Idaho Power offers cash incentives on ducted air and water-source heat pumps, ductless heat pumps, evaporative coolers, duct sealing, whole-house fans, electronically commutated motors and smart thermostats.

Visit **idahopower.com/heatingcooling** for details.

This report is based on estimates and projections and is provided for informational purposes only with no warranty. Actual results will vary.

Year Round Group – Report 6 (Delivered April 2018)

Report Period:
Feb 1 - Mar 31, 2018

Home Energy Report

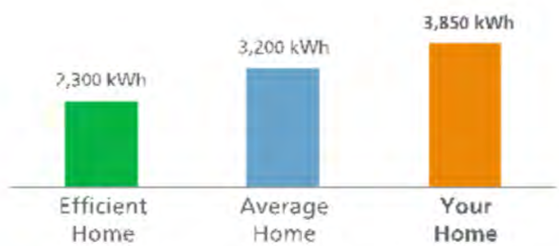
For: 12 MAIN ST
Account Number: 1111111111

**********AUTO**5-DIGIT 12345 008510 1782019 33
ALBERT SMITH
12 MAIN ST
BOISE, ID 12345-1234

IDAHO POWER
An IDACORP Company

We're here to help.
Call **1-800-632-6605**, Mon. - Fri., 7:30 a.m. to 6:30 p.m. MT, or visit **idahopower.com/HomeEnergyReport**

Here's how your home compares:



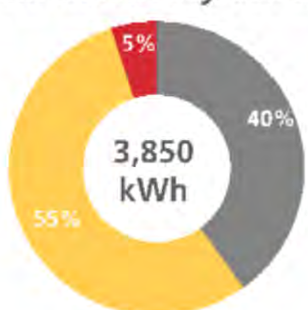
Average Homes: Average of 2,000 – 3,000 sq. ft. single family homes in Canyon County.
Efficient Homes: Top 25 percent of those homes.
1 kWh = a typical refrigerator running 10 hours

20% MORE ELECTRICITY

Your home used about 20 percent more electricity than average 2,000 – 3,000 sq. ft. single family homes in your community.

This costs you an extra $350 per year.

Your electricity use breakdown:



- **A/C:** air conditioning, humidifiers, etc.
- **Always On:** DVRs on standby, chargers, computers, some fridges, clocks, etc.
- **Lights & Appliances:** washers, dryers, dishwashers, stoves, water heaters, etc.
- **Electric Heating:** baseboard heaters, electric furnaces, etc.

Over the last two months:

40% of your electricity use was for **Always On**

This costs you approximately **$830** per year.

Calculated estimates based on an analysis of your electricity consumption data.

Want to save?

Clean up your energy use this spring and save all year.

Let a smart power strip do the work for you.

SAVE UP TO **$100** PER YEAR

Up to 10 percent of a typical home's energy use goes to powering electronics and appliances while in standby mode. A smart power strip can help combat these phantom loads.

A smart power strip senses when the primary device is turned off or goes into standby mode (think TV or PC). When this happens, it automatically shuts off the power to all of the other devices plugged into the strip. Use it with your TV to turn off your DVD player, speakers, etc. Also use it with your computer to turn off your monitor and printer when your desktop goes into sleep mode - push a button to turn on your computer and it all turns back on again!

Unplug that unused extra fridge.

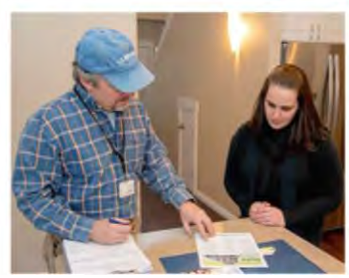
SAVE UP TO **$50** PER YEAR

Refrigerators, which run 24 hours a day, are some of the most energy-hungry appliances. Did you know a 10-year-old fridge can use up to twice as much energy as a newer, more efficient model?

If you have an extra fridge or freezer you aren't using, unplug it, and enjoy the energy savings.

See where your energy is going with a discounted Home Energy Audit.

SAVE UP TO **$346** ON AUDIT



An energy-efficient home is a comfortable home, and Idaho Power's Home Energy Audit program can help you with both. A certified Home Performance Specialist can evaluate your home and provide suggestions to make it more comfortable and use less energy.

The audit is valued at $445 and costs only $99 for all-electric homes and $149 for gas, propane or other fuel sources. Visit idahopower.com/HomeEnergyAudit for program terms and conditions.

This report is based on estimates and projections and is provided for informational purposes only with no warranty. Actual results will vary.

APPENDIX C – CUSTOMER SATISFACTION SURVEY REPORT

ECOTAGIOUS
Energy conservation. Worth spreading.

Idaho Power
Survey Report 2018

oraclepoll
RESEARCH

Table of contents

Methodology & Logistics

Background

- Oraclepoll Research Limited was commissioned by Ecotagious to conduct survey research among Idaho Power customers. The purpose of the research was to assess receipt and the impact of Home Energy Reports sent to Idaho Power customers.
- Within this context, we interviewed a treatment sample of respondents from a "winter heating" that started receiving reports in December 2017 and a "year-round" cohort that first got theirs in July 2017. In addition, a control sample of those that did not receive the report were interviewed – this to look for any variances of option between the groups.

Study Sample

- Idaho Power made a database of its customers available for interviewing.
- Quotas were set and for each client category, with the completed sample breakdown being as follows.

- N=200 completed interviews for the control group (C1, C3, C4 & C5)
- N=200 completed interviews for the treatment sample, with:
    - *N=100 interviews among the winter heating group (T1)*
    - *N=100 interviews among the year-round group (T3, T4 & T5)*

Survey Method

- The survey was conducted using computer-assisted techniques of telephone interviewing (CATI) using live person to person researchers at the Oraclepoll call centre.
- An initial call was made to contact respondents, or if requested to set up a suitable call back time to complete the interview.
- Respondents were screened to ensure they were 18 years of age or older and responsible for making energy related decisions in their home.

Logistics

- Surveys were completed between the days of April 15th and April 24th, 2018.

Confidence

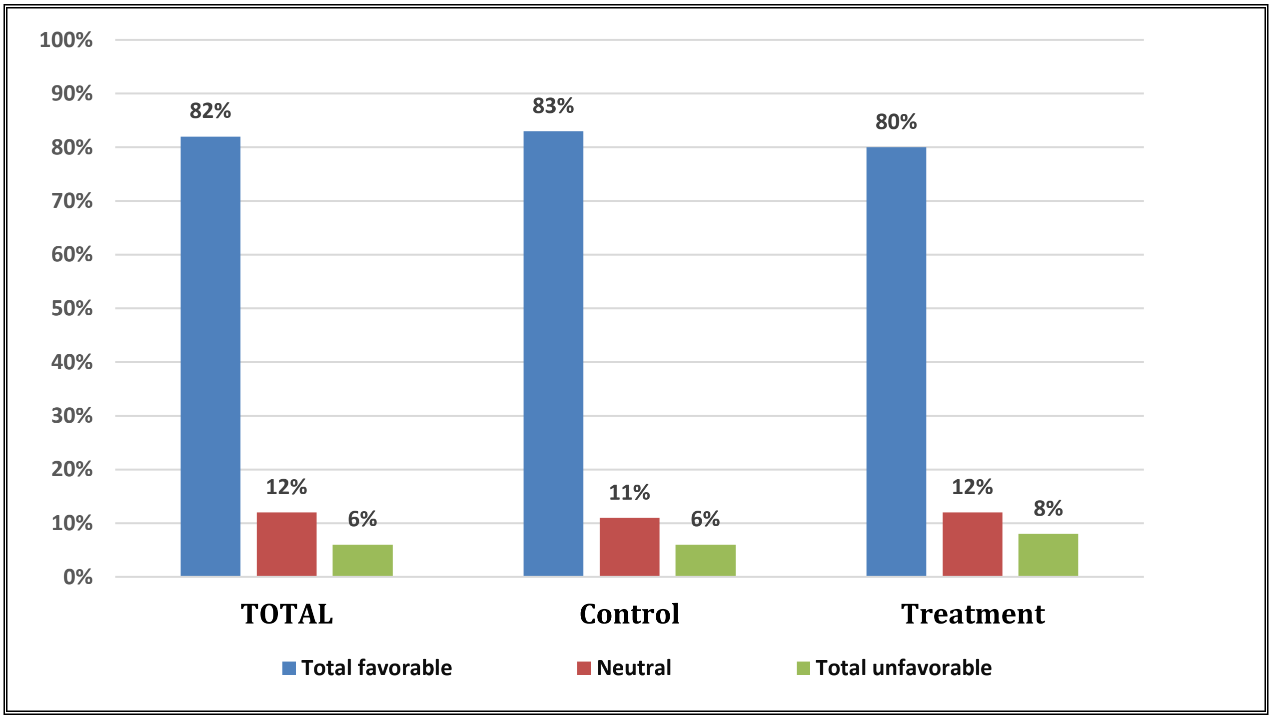
- The margin of error for the total N=400 sample is ± 4.8%, 19/20 times. The error rates for each of the two N=200 sub-samples are ± 6.9%, 19/20 times.

Executive RESULTS – ALL RESPONDENTS

Favorability

All N=400 respondents were first asked to rate their opinion of Idaho Power using a five-point favorability scale. The graph below combines the total favorable (5-very favorable & 4-favorable) as well a total unfavorable (1-very unfavorable & 2-unfavorable) results.

Q1." Using a scale from one to five where one is very unfavorable and five is very favorable, how would you rate your overall opinion of Idaho Power?"



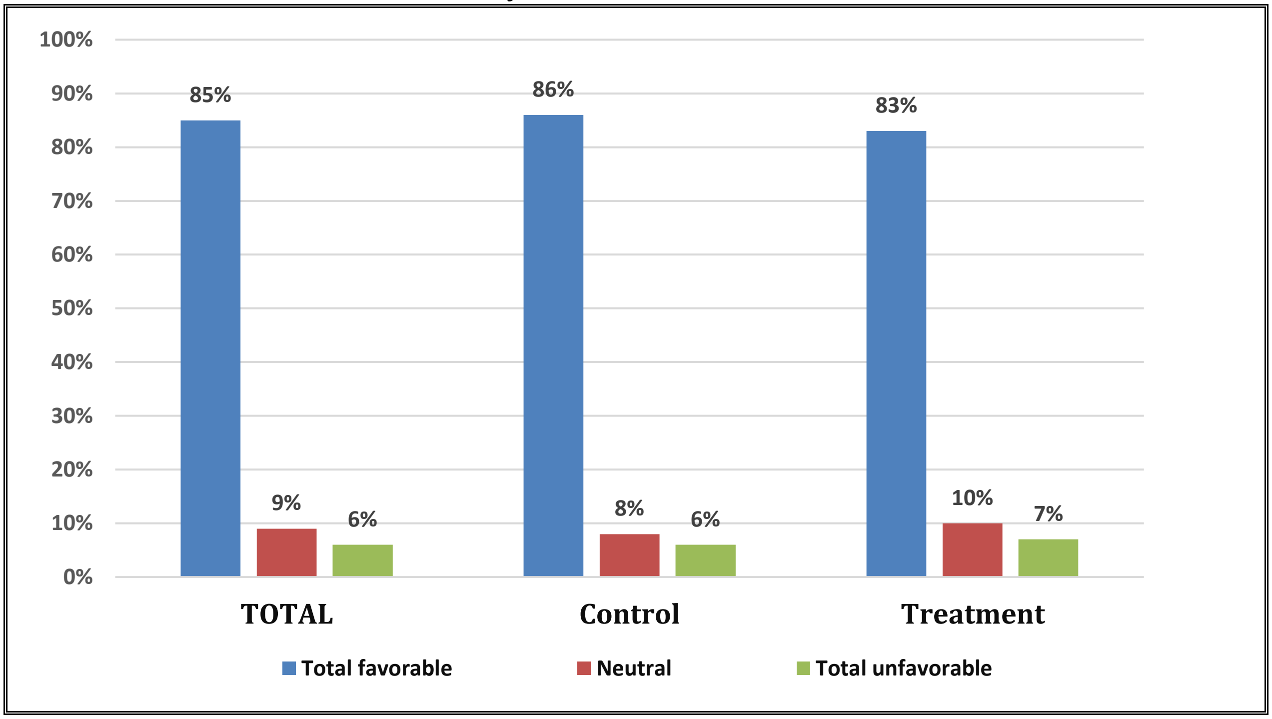
Idaho Power rates high in terms of favorability among eight in ten customers or 82% of all customers (59% very favorable & 24% favorable), compared to only 6% that accorded an unfavorable score (3% very unfavorable & 3% unfavorable), while 12% provided a mid-point "3" neutral rating of neither poor nor good.

Results were consistent across the control (83%) and treatment groups (80%).

Satisfaction

Next, all respondents rated their level of **satisfaction with Idaho Power** using a five-point scale. The graph below combines the total satisfied (5-very satisfied & 4-satisfied) as well a total dissatisfied (1-very dissatisfied & 2-dissatisfied) results.

Q2. "Using a scale from one to five where one is very dissatisfied and five is very satisfied, what is your overall satisfaction with Idaho Power?"

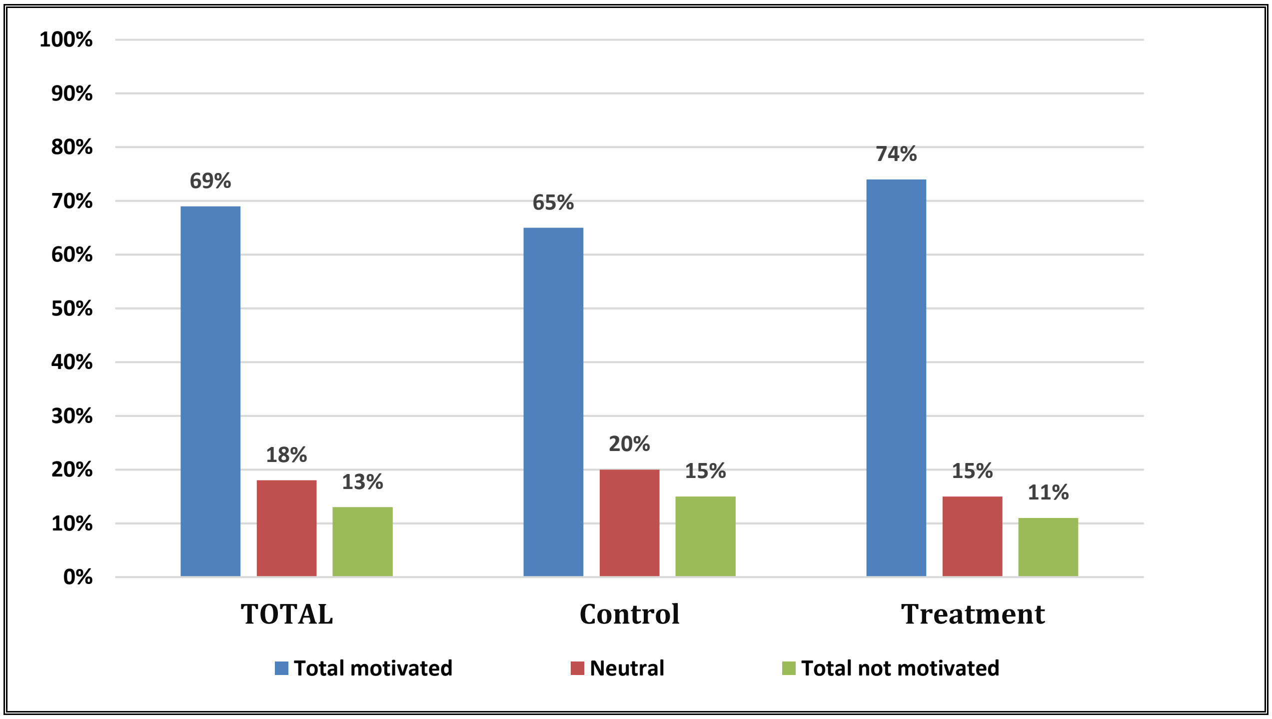


There is a strong sense of satisfaction among customers at 85% (60% very satisfied & 25% satisfied) including a similar 86% from the control group (56% very satisfied & 30% satisfied) and 83% from the treatment cohort (63% very satisfied & 20% satisfied).

Motivation to Reduce Consumption

Customers (N=400) were questioned about **how motivated they are to reduce the amount of electricity consumed at their residence**. Results from total motivated (5-very motivated & 4-motivated) and total not motivated (1-not at all motivated & 2-not motivated) scores are combined below.

Q3. "How motivated are you to reduce the amount of electricity you use in your home? Please respond using a scale from one to five where one is not at all motivated and five is very motivated."



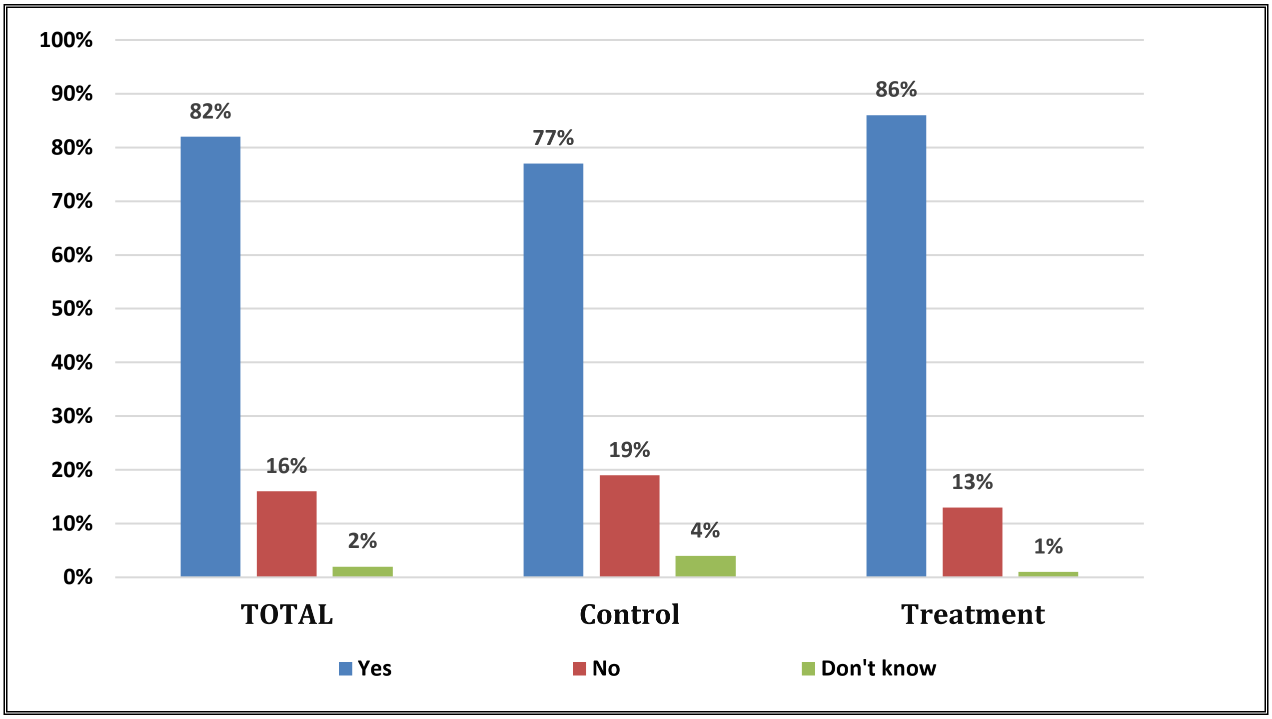
While almost seven in ten (69%) of all customers said they are motivated (27%) or very motivated (42%), there was a significant variance in the findings between the control and treatment groups. Almost three-quarters of the treatment sample or 74% said they were motivated (51% very motivated & 23% motivated) compared to the control group where 65% were motivated (31%) or very motivated (34%).

Among those in the treatment group (N=200), 81% of the year-round sample were motivated (25%) or very motivated (56%), in relation to the winter component where 66% were motivated (21%) or very motivated (45%).

Efforts to Reduce Use

All N=400 respondents were then specifically asked **if they make efforts to reduce the electricity that they use**.

Q4." Do you make any efforts to reduce your electricity use?"



Eighty-two percent (N=326) of all customers claimed that they make efforts to reduce their use of electricity. There was a significant difference among the two cohorts, with 77% of the control group and a +9% higher 86% of the treatment sample saying that they conserve in this area.

More of the year-round component of the treatment group (89%) reduce their usage than those from the winter sample (83%).

Reasons for Reducing

The N=326 of respondents that said in Q4 that they make efforts to reduce their electricity consumption, were then asked if a series of five areas are **contributing factors as to why they conserve**.

Q5. "Please tell me if each of the following are reasons why you make efforts to reduce your electricity use."

REASONS TO REDUCE	TOTAL SAMPLE "YES"	CONTROL SAMPLE "YES"	TREATMENT SAMPLE "YES"
a. Save money	98%	97%	98%
b. Reduce waste	86%	83%	88%
c. Make your home more comfortable	73%	64%	81%
d. Help preserve the environment	76%	69%	83%
e. Reduce your dependence on fossil fuels	67%	60%	73%

Saving money was named by almost all or 98% and reducing waste by 86%. The next most named areas were helping to preserve the environment by 76% and making their home more comfortable by 73%, while lower mentioned was reducing dependence on fossil fuels (67%). Across all five indicators treatment sample results were higher than those from the control group.

Agreement Statements

All N=400 respondents were read and asked to **rate their level of agreement with each of nine statements** using a five-point rating scale. Figures in the following table include the total agree answers (5-strongly agree & 4-agree) for each indicator.

Q6. "I am now going to ask you to rate your level of agreement with a series of statements related to Idaho Power. For each one, please respond using a scale from one to five where one means you strongly disagree and five means you strongly agree."

AGREEMENT STATEMENTS – TOTAL AGREE RESULTS	TOTAL SAMPLE	CONTROL SAMPLE	TREATMENT SAMPLE
a. Idaho Power provides excellent customer service	84%	84%	83%
b. Idaho Power provides service at a reasonable cost	74%	75%	74%
c. Idaho Power cares about its customers	69%	70%	68%
d. Idaho Power helps me understand how I'm using energy	71%	59%	83%
e. Idaho Power provides helpful tools to help me save money	68%	61%	75%
f. Idaho Power is a trusted resource for information on how to save energy	65%	60%	70%
g. Idaho Power helps me manage my energy usage	58%	45%	71%
h. Idaho Power helps me save electricity by providing useful energy-saving recommendations and programs	62%	53%	72%
I. I feel like my smart meter is providing valuable information	45%	39%	52%

Idaho Power rated highest in terms of agreement for providing excellent service at 84% and then for providing service at a reasonable cost (74%), with consistent results from both the control and treatment samples.

While 68% agreed Idaho Power provides tools to help them save money, +24% more in the treatment sample agreed with this statement than those in the control sample. Caring for customers rated next at 69% (no variance among the sub-samples), followed by proving tools to help save money (68%) with 75% in the treatment group agreeing compared to 61% in the control cohort.

In the three areas that next followed, the treatment sample results were significantly higher in relation to the control group. This included, being a trusted resource to save money (65%-total, 70%-treatment & 60%-control), providing useful energy-saving recommendations and programs (62%-total, 72% treatment & 53% control) and helping to manage energy use (58%-total, 71% treatment & 45% control).

Only 45% agreed that with the smart meter statement related to providing them valuable information, but findings were higher among the treatment sample at 52% (39% control).

Actions to Save

Next, all N=400 respondents were asked if they have **completed a series of nine conservation actions**.

Q7. "Please indicate if you have completed or done any of the following actions at your residence within the last 6 months to save energy."

ACTIONS TAKEN TO SAVE ENERGY	TOTAL SAMPLE "YES"	CONTROL SAMPLE "YES"	TREATMENT SAMPLE "YES"
a. Set your thermostat to a lower or higher temperature	74%	75%	72%
b. Avoided heating unused rooms	84%	81%	88%
c. Installed a high efficiency showerhead	41%	37%	44%
d. Added insulation to your home	21%	13%	29%
e. Used a clothesline to dry clothing	25%	20%	31%
f. Only used dryer when it's full	85%	83%	87%
g. Washed clothes in cold water	71%	67%	76%
h. Checked air ducts for leaks	37%	38%	37%
i. Purchased LEDs to install in your home	83%	82%	83%

Customers were most likely to have used their dryer when full (85%), avoided heating unused rooms (84%) and purchased LEDs (83%) and washing clothes in cold water (71%). Fewer said they took the remaining actions, but results were higher for installing an efficient showerhead (41%) and checking air ducts for leaks (37%). They were lowest for using a clothesline (25%) and adding insulation (21%).

The 83% or N=330 of those that said they purchased LEDs were asked a follow-up question about how many they acquired. Sixteen percent said 1-3 LEDs, 21% 4-6, 13% 7-9 and most or 50% named 10 or more.

The final question asked to all N=400 customers probed about any other actions they have done at their residence to help save electricity.

"Q8. Did you do anything else to save electricity at your residence within the last 6 months?"

No	*N=257*	*64.3*
Turned off lights	*N=83*	*20.8*
Unplugged items	*N=20*	*5.0*
Reduced shower time	*N=15*	*3.8*
Upgraded furnace / air	*N=7*	*1.8*
Changed appliances	*N=6*	*1.5*
Changed windows / doors	*N=6*	*1.5*
Solar panels	*N=3*	*.8*
Burn wood / pellets	*N=3*	*.8*

While a majority said no other actions were taken, the most named by those providing a mention was turning off lights, next followed by unplugging items and reducing shower time.

Executive RESULTS – TREATMENT GROUP

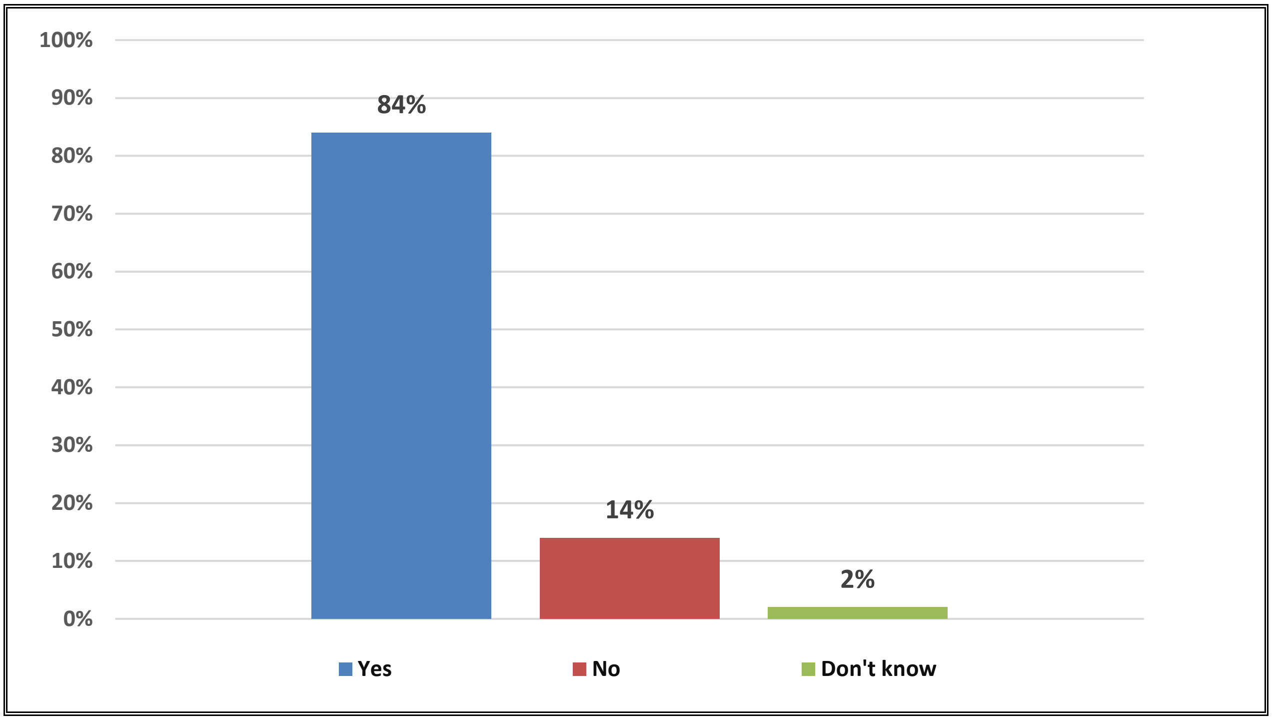
The N=200 treatment group was then asked a series of question relating specifically to the Home Energy Reports. They were first read the following short introductory statement.

"Next, we have some questions about the Home Energy Reports you receive from Idaho Power. Over the last couple months, Idaho Power sent Home Energy Reports to select customers in the mail. These reports provide a breakdown of your electricity use by major appliance, a comparison of your electricity use in relation to other homes similar to yours and recommendations on how you can save electricity."

Receipt of Report

They were then asked if they **recalled receiving a Home Energy Report**.

T1. "Do you recall receiving a Home Energy report?"



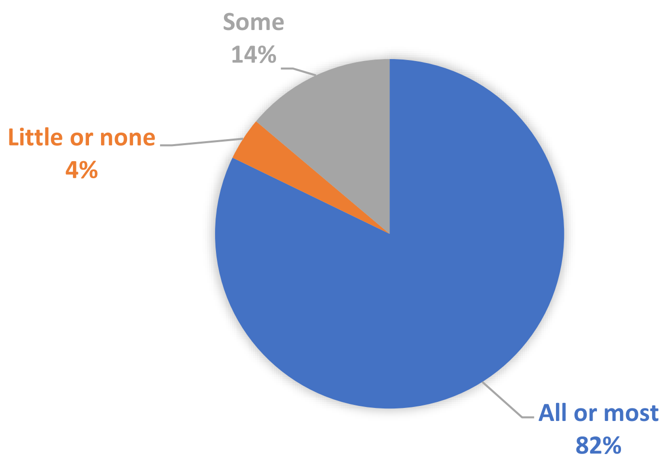
An 84% majority or N=168 said they remember receiving a Home Energy Report, including 85% from the year round and 83% from the winter sample.

The N=168 that answered yes were then asked a follow-up question, while those that said no (14%, N=27) or don't know (2%, N=5) skipped the remaining questions asked to the treatment sample.

Reading the Report

The N=168 that recalled receiving the Report were then asked about **<u>how thoroughly they read them</u>**.

"T2. How thoroughly did you read the Reports you received? Did you read…"



More than eight in ten or 82% (N=139) said they read all or most of the report, 14% (N=23%) some of it and 4% (N=6) little or none.

The N=6 that stated they read little or none of the report skipped the remaining questions asked to the treatment sample.

Experience with the Report

N=162 respondents (that received the Report & read some or all it) were asked to **rate their level of agreement with each of three statements** using a five-point rating scale. Figures in the following table include the total agree answers (5-strongly agree & 4-agree) for each indicator.

T3. "I am now going to read three statements related to your experience with the Reports. Please rate your level of agreement with each one using a scale from one to five where one means you strongly disagree and five means you strongly agree."

AGREEMENT STATEMENTS – TOTAL AGREE RESULTS	TOTAL SAMPLE	WINTER SAMPLE	YEAR-ROUND SAMPLE
a. The information presented in my Home Energy Report was easy to understand	85%	82%	87%
b. The information presented in my Home Energy Report seemed accurate	61%	57%	66%
c. The recommendations and tips on how to conserve were useful	64%	66%	63%

Those in the treatment sample surveyed most agreed that the information in the Report was easy to understand (85%) with a higher percentage of the year-round sample agreeing at 87%, compared to 82% for the winter group. Sixty-four percent agreed the recommendations and tips were useful (rough equal distribution) and slightly more than six in ten or 61% agreed the information appeared accurate – 66% for year-round versus 57% for the winter group.

Features Seen

Next, the N=162 respondents (that received the Report & read some or all it) were asked **if they saw three features**.

T4. "Do you recall seeing each of the following features of the Home Energy Report?"

FEATURES SEEN IN HOME ENERGY REPORT	TOTAL SAMPLE "YES"	WINTER SAMPLE "YES"	YEAR-ROUND SAMPLE "YES"
a. The comparison of your electricity uses in relationship to homes of similar type and size in your area	91%	87%	94%
b. The breakdown of your electricity use providing insights into how much your electricity uses	88%	85%	92%
c. Saving tips including personalized savings tips just for you	78%	73%	83%

There was strong recall for all three areas, with results overall being higher among the year-round sample. Most seen by 91% was the comparison of electricity uses in relation to other similar sized homes, closely followed by the breakdown of electricity use by 88%. Seventy-eight percent said they saw personalized savings tips.

There were N=146 customers that named more than one feature in T4 and these respondents were then asked to state **which one they found most useful**.

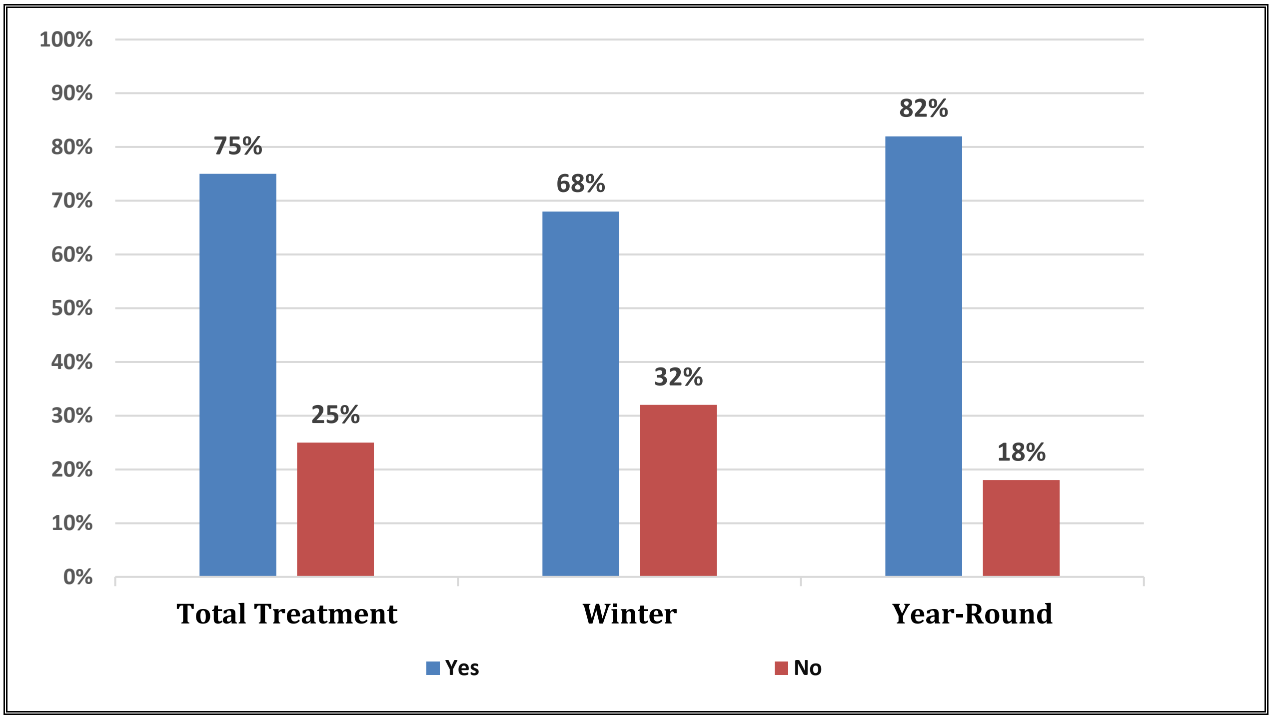
T5. "Which one of the features you named did you find the most useful?"

- *Savings tips were most mentioned by **49%** (Winter – 43% & Year-Round – 54%)*
- *Comparison of electricity use to other homes was next named by **27%** (Winter – 28% & Year-Round – 27%)*
- *The breakdown of your electricity use followed at **24%** (Winter – 28% & Year-Round – 19%)*

Acted on Report

Those that that received the Report & read some or all it (N=162) were questioned **if they acted on any of the money and electricity suggestions or information provided**.

T6. "Have you acted on any of the information and suggestions to save money and electricity that were included in the report?"

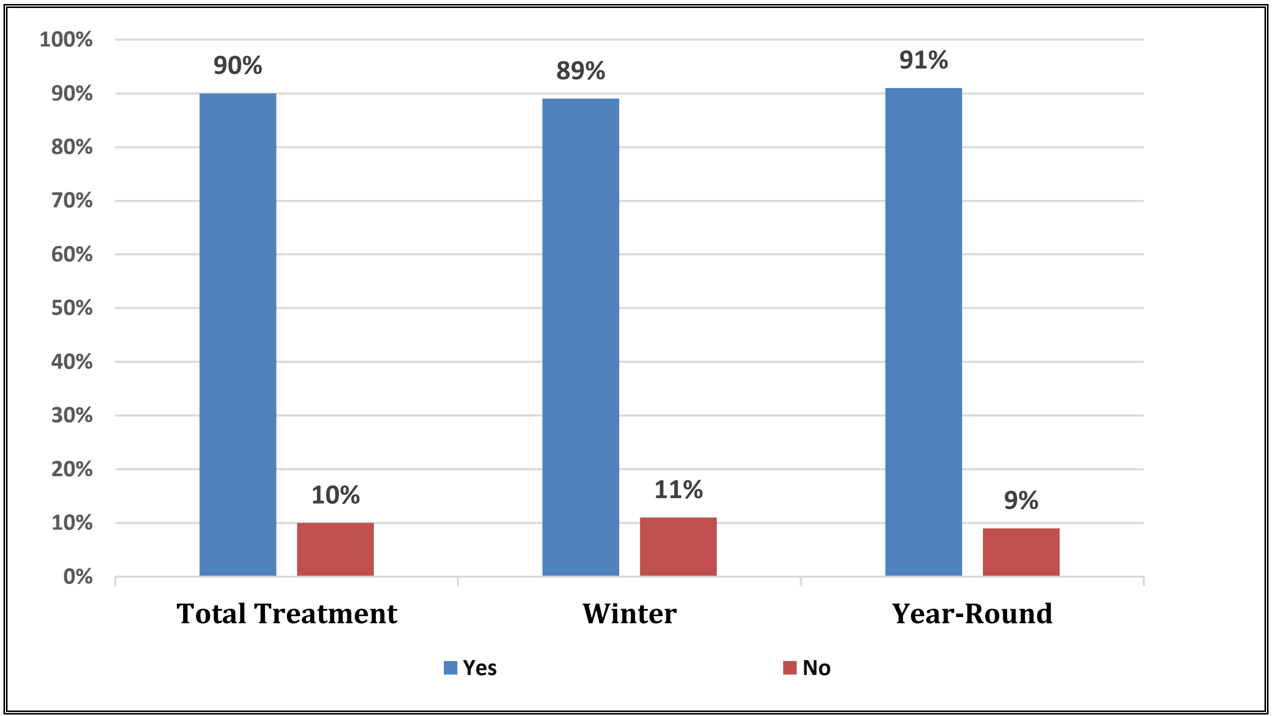


Three-quarters (75%) of all asked said that they took actions to save money or electricity. This included a very high 82% of the year-round sample and a lesser but still strong 68% of the winter group.

Continued Receipt

The N=162 respondents (that received the Report & read some or all it) were probed about their **interest in continuing to receive the Report**.

T7. "If the program remains in place, would you like to continue receiving Home Energy Reports at no charge?"



There is very strong interest among nine in ten or 90% (N=145) for continuing to receive the Reports with no significant variance among the sub-samples.

Those interested in wanting to continue to receive the Report (N=145) were then asked about **<u>how often they want to receive it</u>**.

T8. "At what frequency would you prefer to receive the Report?"

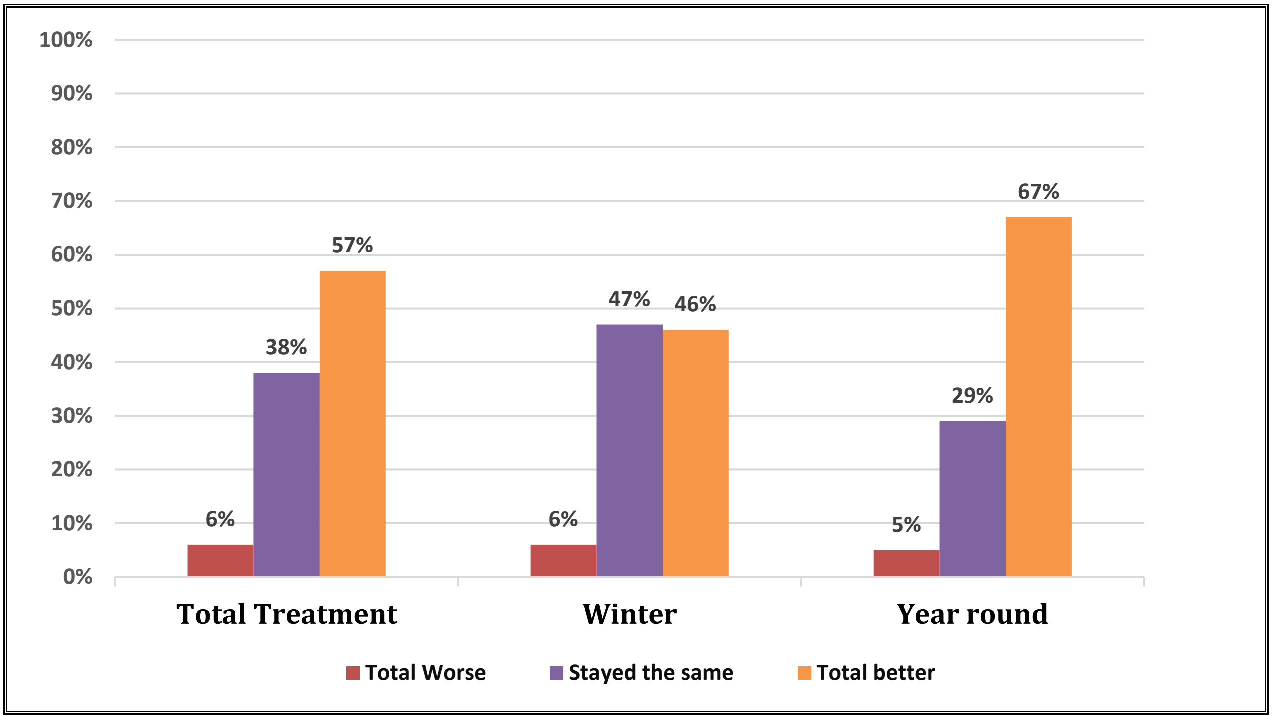
FREQUENCY	TOTAL SAMPLE	WINTER SAMPLE	YEAR-ROUND SAMPLE
Monthly	35%	46%	25%
Bi-Monthly	8%	4%	11%
Quarterly	26%	22%	29%
Twice a year	32%	28%	36%

Among all respondents there was a split between monthly (35%) and twice a year (32%), with more than a quarter or 26% naming quarterly – only 8% favor a bi-monthly schedule. Winter sample participants were most inclined to name monthly, while those from the year-round group had a higher preference for a longer time frame such as twice a year (36%) or quarterly (29%).

Impact of Report

The N=162 respondents that received and read the Report were asked **how if at all it changed their opinion of Idaho Power**. A five-point rating scale was used, and the graph below combines the total worse (1-much worse & 2-somewhat worse) as well as the total better (5-much better & 4-somewhat better) results.

T9. "How, if at all, has your opinion of Idaho Power changed since receiving the Home Energy Reports? Would you say it is: READ"?
(1=much worse, 2=somewhat worse, 3=stayed the same, 4=somewhat better, 5= much better)



The Report has had a positive impact on perceptions of Idaho Power with 57% saying they now have a better opinion of the utility, this especially among the year-round group (67%). Almost four in ten or 38% said their opinion has stayed the same, higher among the winter sample (47%) and only 6% stated their opinion is worse.

Most Useful Elements & Improvements

In an open-ended or unaided question, the N=162 respondents that received and read the Report were asked **to name what they felt was its most useful element.**

T10. "What was the most useful element in the Home Energy Reports received?"

Breakdown of usage & savings tips / how to save	*N=71*	*44%*
Amount used	*N=24*	*15%*
Comparison with other homes	*N=19*	*12%*
Comparison of use over time	*N=16*	*10%*
Information (in general)	*N=14*	*9%*
Don't know	*N=11*	*7%*
Everything	*N=7*	*4%*

Respondents find areas such as their consumption as well as comparisons and how to save most useful.

In another open-ended or unaided question, the N=162 respondents that received and read the Report were asked **what aspects could be improved.**

T11. "What aspect of the Reports could be improved?"

Nothing else	*N=58*	*36%*
Don't know	*N=55*	*34%*
More information / detail (in general)	*N=12*	*7%*
Clearer to read / understand	*N=11*	*7%*
Digital / electronic reports	*N=9*	*6%*
Explain why bill is still high (even after conserving)	*N=8*	*5%*
More info / details about other homes being compared	*N=7*	*4%*
Have month by month breakdown over time	*N=1*	*1%*
Send to different areas at different times	*N=1*	*1%*

Most claimed that nothing needed to be improved or did not know, while those with opinions provided varied answers from having more detail to explaining why their bill is still high.

Future Receipt

In a final question, respondents were asked **how else that they would like to receive the Report in addition to the paper copy in the mail**.

T12. "You are currently receiving the paper Home Energy Reports in the mail. Which other ways would you be interested in receiving the report?"

Responses	TOTAL SAMPLE	WINTER SAMPLE	YEAR-ROUND SAMPLE
Email	48%	53%	43%
My account Online	21%	17%	25%
Continue receiving them in the mail only	32%	31%	32%

Email was most named by almost half (48%), almost one-third (32%) prefer to maintain the hard copy format and 21% said their online account.

APPENDIX D – CUSTOMER SATISFACTION SURVEY

HOME ENERGY REPORT CUSTOMER SURVEY

Goals:

- Measure change in customer satisfaction with IPC between treatment and control
- Solicit feedback on reports

Methodology: Telephone survey – requires 7 to 10 days
Population: 200 Treatment and 200 Control
Timing: 5-7min
Number of questions: 20-25

Survey introduction: Hello, my name is [Interviewer] and I'm calling from the research firm Oraclepoll on behalf of Idaho Power. We're conducting a brief survey to evaluate customer feedback on communications from Idaho Power. The survey should take less than 7 minutes to complete and your input will help us improve our communications to customers regarding their energy use. Please be assured that this call is for research and all individual responses from participants will be kept in strict confidence.

May I please speak to <NAME>? (IF NOT AVAILABLE: Or may I speak with someone in your household who is responsible for making energy related decisions in your home?

[Screening Questions]

Are you a customer of Idaho Power that is 18 years of age or older?
(TERMINATE IF AGE IS LESS THAN 18]

- Yes **[CONTINUE]**
- No **[TERMINATE]**
- (Don't know) **[TERMINATE]**
- (Refused) **[TERMINATE]**

[If terminated]: Currently, we are looking for customers who meet a specific set of criteria to complete this survey. Thank you for your time and interest. Have a great day!

[SECTION 1. ALL RESPONDENTS]
Q1. Using a scale from one to five where one is very unfavorable and five is very favorable, how would you rate your overall opinion of Idaho Power?

Q2. Using a scale from one to five where one is very dissatisfied and five is very satisfied, what is your overall satisfaction with Idaho Power?

Q3. How motivated are you to reduce the amount of electricity you use in your home? Please respond using a scale from one to five where one is not at all motivated and five is very motivated.

Q4. Do you make any efforts to reduce your electricity use?

- Yes ASK Q5
- No SKIP TO Q6
- (Don't know) SKIP TO Q6
- Refused SKIP TO Q6
-

Q5. Please tell me if each of the following are reasons why you make efforts to reduce your electricity use.
[READ - LIST TO BE ROTATED] [Yes, No, (Don't know), (Refused) for each option]
a. Save money
b. Reduce waste
c. Make your home more comfortable
d. Help preserve the environment
e. Reduce your dependence on fossil fuels (propane, coal, wood, etc.)

Q6. I am now going to ask you to rate your level of agreement with a series of statements related to Idaho Power. For each one, please respond using a scale from one to five where one means you strongly disagree and five means you strongly agree.
[IF NEEDED READ: **[1-Strongly Disagree, 2-Somewhat Disagree, 3-Neither Agree nor Disagree, 4-Somewhat Agree, 5-Strongly Agree] 8-(Don't know), 9-(Refused)]**
a. Idaho Power provides excellent customer service.

b. Idaho Power provides service at a reasonable cost.

c. Idaho Power cares about its customers.

d. Idaho Power helps me understand how I'm using energy.

e. Idaho Power provides helpful tools to help me save money.

f. Idaho Power is a trusted resource for information on how to save energy.

g. Idaho Power helps me manage my energy usage.

h. Idaho Power helps me save electricity by providing useful energy-saving recommendations and programs.

i. I feel like my smart meter is providing valuable information.

Q7 Please indicate if you have completed or done any of the following actions at your residence within the last 6 months to save energy. (YES / NO ACCEPTED)

- ☐ A. Set your thermostat to a lower or higher temperature
- ☐ B. Avoided heating unused rooms
- ☐ C. Installed a high efficiency showerhead
- ☐ D. Added insulation to your home
- ☐ E. Used a clothesline to dry clothing
- ☐ F. Only used dryer when it's full
- ☐ G. Washed clothes in cold water
- ☐ H. Checked air ducts for leaks
- ☐ I. Purchased LEDs to install in your home
  [YES] How many?
  a) 1-3
  b) 4-6
  c) 7-9
  d) 10 or more
  [NO] GO TO T8

Q8. Did you do anything else to save electricity at your residence within the last 6 months? **[OPEN ENDED] [SECTION 2. TREATMENT GROUP ONLY]**

Next, we have some questions about the Home Energy Reports you receive from Idaho Power.

T1. Over the last couple months, Idaho Power sent Home Energy Reports to select customers in the mail. These reports provide a breakdown of your electricity use by major appliance, a comparison of your electricity use in relation to other homes similar to yours and recommendations on how you can save electricity. Do you recall receiving a Home Energy report?

1 Yes **[Go to T2]**
2 No **[Go to D1]**
8 (Don't know) **[Go to D1]**
9 (Refused) **[Go to D1]**

T2. How thoroughly did you read the Reports you received? Did you read…

1 All or most of them
2 Some of them or
3 Little to none of them? **[SKIP to D1]**
8 (Don't know)
9 (Refused)

T3. I am now going to read three statements related to your experience with the Reports. Please rate your level of agreement with each one using a scale from one to five where one means you strongly disagree and five means you strongly agree.

[IF NEEDED READ: **[1-Strongly Disagree, 2-Somewhat Disagree, 3-Neither Agree nor Disagree, 4-Somewhat Agree, 5-Strongly Agree] 8-(Don't know), 9-(Refused)]**

[Prompt with scale if needed]

a. The information presented in my Home Energy Report was easy to understand.

b. The information presented in my Home Energy Report seemed accurate.

c. The recommendations and tips on how to conserve were useful

T4. Do you recall seeing each of the following features of the Home Energy Report?
[YES / NO ACCEPTED] [READ / ROTATE]
a. The comparison of your electricity use in relationship to homes of similar type and size in your area
b. The breakdown of your electricity use providing insights into how much your electricity use goes towards the different major appliance categories in your home
c. Saving tips including personalized savings tips just for you
IF MORE THAN ONE FEATURE NAMED ASK T5 / OTHERS SKIP TO T6

T5. Which one of the features you named did you find the most useful?
CATI WILL DISPLAY ONLY MENTIONS PROVIDED IN T5 (TO INTERVIEWER) AND THEY WILL BE READ BACK TO RESPONDENT – ONE RESPONSE ACCEPTED
a. The comparison of your electricity use in relationship to homes of similar type and size in your area
b. The breakdown of your electricity use providing insights into how much your electricity use goes towards the different major appliance categories in your home
c. Saving tips including personalized savings tips just for you

T6 Have you acted on any of the information and suggestions to save money and electricity that were included in the report?
1 Yes
2 No

T7 If the program remains in place, would you like to continue receiving Home Energy Reports at no charge?
1 Yes
2 No [SKIP TO T9]

T8 At what frequency would you prefer to receive the report:
1 Monthly
2 Bi-monthly
3 Quarterly,
4 Twice a year
5 other?

T9 How, if at all, has your opinion of Idaho Power changed since receiving the Home Energy Reports? Would you say it is: READ
(1=much worse, 2=somewhat worse, 3=stayed the same, 4=somewhat better, 5= much better)
T10 What was the most useful element in the Home Energy Reports received? **[OPEN ENDED]**

T11. What aspect of the Reports could be improved? **[OPEN ENDED]**
(Interviewer Note: Probe for additional detail. Ask “is there anything else?”)

T12 You are currently receiving the paper Home Energy Reports in the mail. Which other ways would you be interested in receiving the report? **ACCEPT MULTIPLE RESPONSES**
1 Email
2 My Account online
3 Continue receiving them in the mail only
4 Other RECORD

(Optional Demographic Questions (ALL))

The final few questions are of a personal nature and involve collecting demographic information. Please be assured that this information will remain strictly confidential and will be used for statistical purposes only.

D1. Which of the following age groups may I place you in?
READ / STOP WHEN REACHED
1 18-24
2 25-34
3 35-44
4 45-54
5 55-64
6 65-74
7 75 or older
9 Prefer not to answer (Refused) [SHOW ON WEB]

D3. What is the highest level of education that you have completed?
READ / STOP WHEN REACHED
1 Some high school or less
2 Graduated high school or GED
3 Some college or technical school
4 Associate Degree
5 Bachelor’s Degree (4 year)
6 Some graduate school
7 Graduate Degree
9 Prefer not to answer (Refused)

D5. Including yourself, how many people live in your home? **[Numeric Open End]**

D7. (Interviewer to record gender)
1 Male
2 Female
[Those are all the questions I have. Thank you for your time and help with this study

APPENDIX E – ADDITIONAL ANALYSIS OF KEY CUSTOMER SATISFACTION SURVEY QUESTIONS

7.1 QUESTION 1 RESULTS ANALYSIS

If the program remains in place, would you like to continue receiving Home Energy Reports at no charge?

7.1.1.1 BY TREATMENT GROUP

Treatment	1-Very unfavourable	2-Unfavourable	3-Neither favourable nor unfavourable	4-Favourable	5-Very favourable	Grand Total
No treatment group indicated	4	8	22	46	120	200
T1	6	4	8	26	56	100
T3	4	1	6	10	23	44
T4	1		7	6	19	33
T5			3	6	14	23
Grand Total	15	13	46	94	232	400

7.1.1.2 BY GENDER

	1-Very unfavourable	2-Unfavourable	3-Neither favourable nor unfavourable	4-Favourable	5-Very favourable	Grand Total
Female	5	6	14	47	120	192
Male	10	7	32	47	112	208
Grand Total	15	13	46	94	232	400

7.1.1.3 BY AGE

	1-Very unfavourable	2-Unfavourable	3-Neither favourable nor unfavourable	4-Favourable	5-Very favourable	Grand Total
18-24				1	7	8
25-34	2	2	2	7	50	63
35-44	10	4	12	16	52	94
45-54			7	24	46	77
55-64	2	5	14	15	26	62
65-74		1	7	6	29	43
75 or older			3	19	9	31
Prefer not to answer (Refused)	1	1	1	6	13	22
Grand Total	15	13	46	94	232	400

7.1.1.4 BY EDUCATION

	1-Very unfavourable	2-Unfavourable	3-Neither favourable nor unfavourable	4-Favourable	5-Very favourable	Grand Total
Associate Degree	1			7	28	36
Bachelor's Degree (4 year)	4	4	21	21	48	98
Graduate Degree	4	2	1	1	24	32
Graduated high school or GED	2	5	15	29	68	119
Prefer not to answer (Refused)	1	1	2	9	15	28
Some college or technical school	1	1	1	23	34	60
Some graduate school	2		6	1	5	14
Some high school or less				3	10	13

Grand Total	15	13	46	94	232	400

7.2 QUESTION 2 RESULTS ANALYSIS

Using a scale from one to five where one is very dissatisfied and five is very satisfied, what is your overall satisfaction with Idaho Power?

7.2.1.1 BY TREATMENT GROUP

Treatment	1-Very dissatisfied	2-Dissatisfied	3-Neither satisfied nor dissatisfied	4-Satisfied	5-Very satisfied	Grand Total
No treatment group indicated	6	6	16	60	112	200
T1	1	9	5	21	64	100
T3	1	2	9	9	23	44
T4		1	5	6	21	33
T5			1	4	18	23
Grand Total	8	18	36	100	238	400

7.2.1.2 BY GENDER

	1-Very dissatisfied	2-Dissatisfied	3-Neither satisfied nor dissatisfied	4-Satisfied	5-Very satisfied	Grand Total
Female	6	4	16	34	132	192
Male	2	14	20	66	106	208
Grand Total	8	18	36	100	238	400

7.2.1.3 BY AGE

	1-Very dissatisfied	2-Dissatisfied	3-Neither satisfied nor dissatisfied	4-Satisfied	5-Very satisfied	Grand Total
18-24				1	7	8
25-34	2	2	1	13	45	63
35-44	2	10	11	19	52	94
45-54				14	63	77
55-64	3	4	16	18	21	62
65-74	1		5	12	25	43
75 or older		1	2	18	10	31
Prefer not to answer (Refused)		1	1	5	15	22
Grand Total	8	18	36	100	238	400

7.2.1.4 BY EDUCATION

	1-Very dissatisfied	2-Dissatisfied	3-Neither satisfied nor dissatisfied	4-Satisfied	5-Very satisfied	Grand Total
Associate Degree		1	1	8	26	36
Bachelor's Degree (4 year)	2	5	17	22	52	98
Graduate Degree	3	3		5	21	32
Graduated high school or GED	3	4	11	28	73	119
Prefer not to answer (Refused)		1	2	9	16	28
Some college or technical school		1	3	23	33	60
Some graduate school		3	2	4	5	14
Some high school or less				1	12	13
Grand Total	8	18	36	100	238	400

7.3 TREATMENT GROUP QUESTION 7 RESULTS ANALYSIS

If the program remains in place, would you like to continue receiving Home Energy Reports at no charge?

7.3.1.1 BY TREATMENT GROUP

Treatment	No response	No	Yes	Grand Total	Percentage Yes
	200			200	
T1	22	9	69	100	69%
T3	8	5	31	44	70%
T4	7	1	25	33	76%
T5	1	2	20	23	87%
Grand Total	238	17	145	400	

7.3.1.2 BY GENDER

	No response	No	Yes	Grand Total	Percentage Yes
Female	98	13	81	192	42%
Male	140	4	64	208	31%
Grand Total	238	17	145	400	

7.3.1.3 BY AGE

	No response	No	Yes	Grand Total	Percentage Yes
18-24	2	1	5	8	63%
25-34	37	1	25	63	40%
35-44	50	2	42	94	45%
45-54	31	1	45	77	58%
55-64	58	1	3	62	5%
65-74	32	4	7	43	16%
75 or older	13	6	12	31	39%
Prefer not to answer (Refused)	15	1	6	22	27%
Grand Total	238	17	145	400	

7.3.1.4 BY EDUCATION

	No response	No	Yes	Grand Total	Percentage Yes
Associate Degree	20		16	36	44%
Bachelor's Degree (4 year)	60	2	36	98	37%
Graduate Degree	17	3	12	32	38%
Graduated high school or GED	63	4	52	119	44%
Prefer not to answer (Refused)	21	1	6	28	21%
Some college or technical school	38	7	15	60	25%
Some graduate school	13		1	14	7%
Some high school or less	6		7	13	54%
Grand Total	238	17	145	400	

7.4 TREATMENT GROUP QUESTION 9 RESULTS ANALYSIS

How, if at all, has your opinion of Idaho Power changed since receiving the Home Energy Reports?

7.4.1.1 BY TREATMENT GROUP

Treatment	No response	Much better	Much worse	Somewhat better	Somewhat worse	Stayed the same	Grand Total
No treatment group indicated	200						200
T1	22	18	2	18	3	37	100
T3	8	12	1	9	1	13	44
T4	7	14		7		5	33
T5	1	5	1	9	1	6	23
Grand Total	238	49	4	43	5	61	400

7.4.1.2 BY GENDER

Gender	No response	Much better	Much worse	Somewhat better	Somewhat worse	Stayed the same	Grand Total
Female	98	41	2	21	2	28	192
Male	140	8	2	22	3	33	208
Grand Total	238	49	4	43	5	61	400

7.4.1.3 BY AGE

	No response	Much better	Much worse	Somewhat better	Somewhat worse	Stayed the same	Grand Total
18-24	2	2		2		2	8
25-34	37	7	1	10	1	7	63
35-44	50	17	1	10	2	14	94
45-54	31	16	1	13	1	15	77
55-64	58	1		1		2	62
65-74	32	5		3		3	43
75 or older	13	1	1	3	1	12	31
Prefer not to answer (Refused)	15			1		6	22
Grand Total	238	49	4	43	5	61	400

7.4.1.4 BY EDUCATION

	No response	Much better	Much worse	Somewhat better	Somewhat worse	Stayed the same	Grand Total
Associate Degree	20	13		1		2	36
Bachelor's Degree (4 year)	60	6		14	3	15	98
Graduate Degree	17	1		6		8	32
Graduated high school or GED	63	22	2	15		17	119
Prefer not to answer (Refused)	21			1		6	28
Some college or technical school	38	4	1	5	2	10	60
Some graduate school	13		1				14
Some high school or less	6	3		1		3	13
Grand Total	238	49	4	43	5	61	400

APPENDIX F – QUARTERLY PROGRAM MONITORING SCHEDULE

Report #	Date Presented	Report Period
Q1	Nov 16, 2017	July 24, 2017 – September 30, 2017
Q2	Feb 7, 2018	July 24, 2017 – December 31, 2017
Q3	April 26, 2018	July 24, 2017 – March 31, 2018
Q4	July 31, 2018	July 24, 2017 – June 30, 2018

IDAHO POWER ENERGY WISE®
PROGRAM SUMMARY REPORT

2017-2018

SUBMITTED BY:

RESOURCE ACTION PROGRAMS

A FRANKLIN ENERGY COMPANY

Idaho Power Energy Wise®
Program Summary Report
2017-2018

Made possible by:

IDAHO POWER®

An IDACORP Company

Submitted by:

RESOURCEACTION
PROGRAMS

July 2018

"The students loved being able to make a difference. This is something tangible they can do to make a difference in their homes and in the community."

Heather Mueller, Teacher
Washington Elementary School

Table of Contents

"This is my second child that has gone through the program and both of them were really eager about installing the kit and saving money."

[redacted], Parent

Hunter Elementary School

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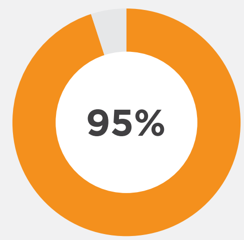
Executive Summary

Resource Action Programs® (RAP) is pleased to present this Program Summary Report to Idaho Power, which summarizes the 2017-2018 Idaho Power Energy Wise® Program. The program was implemented in the Idaho Power service area in the state of Idaho by 9,439 teachers, students, and their families.

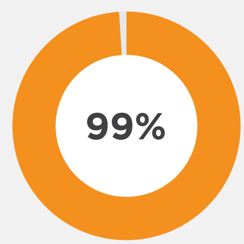
The following pages provide an overview of the program and materials, outline of program implementation, introduction to the program team, description of program enhancements, impact of the program, and summary of results from the home activities. In addition to this information, evaluations, letters, and comments are provided for a glimpse into actual participant feedback. Lastly, projected savings from the individual measures found within the Energy Wise Kit are also included.

Participant Satisfaction

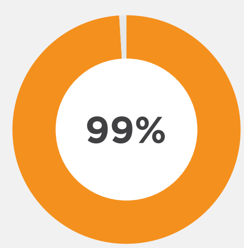
A successful program excites and engages participants. Students, parents, and teachers are asked to evaluate the program and provide personal comments. A sample of the feedback is given in the margin. ›



Teachers who indicated parents supported the program.

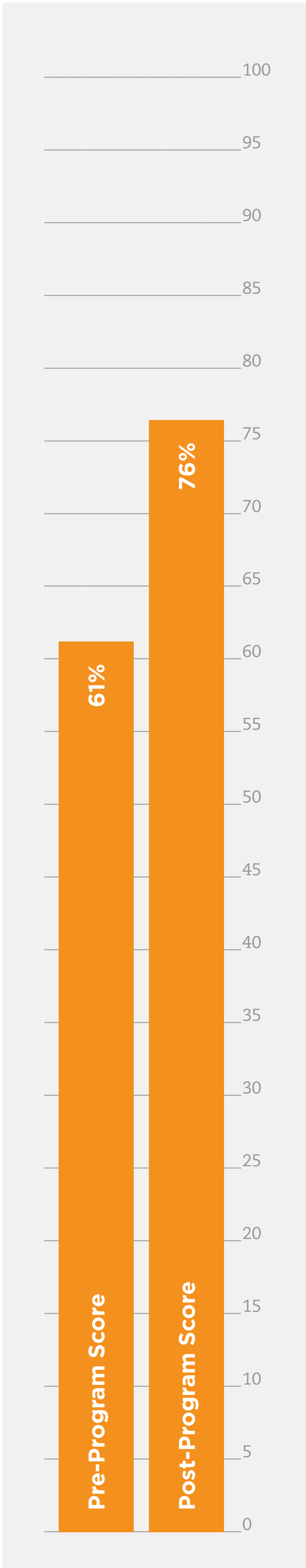


Teachers who indicated they would recommend this program to other colleagues.



Teachers who indicated they would conduct this program again.

A summary of responses can be found in Appendix D.



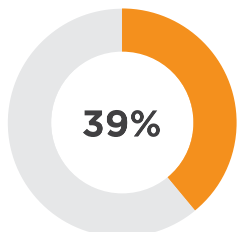
Knowledge Gained

Identical tests were administered to the students prior to the program and again upon program completion to measure knowledge gained. Scores and subject knowledge improved from **61%** to **76%**.

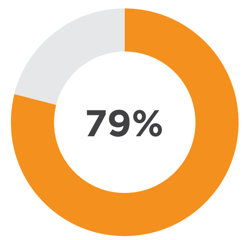
Measures Installed

Students completed take-home activities as part of the program and reported on the kit measures they installed in their homes.

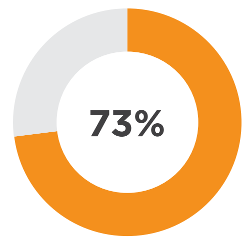
A summary of responses can be found in Appendix B.



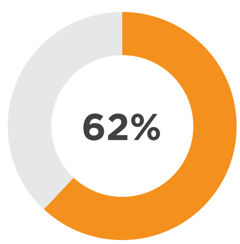
Students who reported they installed the High-Efficiency Showerhead.



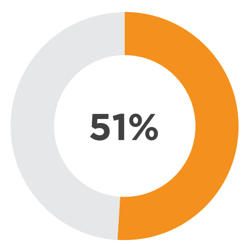
Students who indicated they installed the LED Night Light.



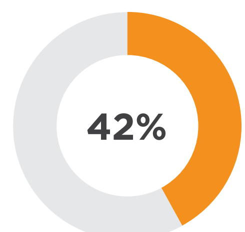
Students who reported they used the Shower Timer.



Students who reported they installed the first 9-watt LED.



Students who reported they installed the second 9-watt LED.



Students who reported they installed the third 9-watt LED.

Student Survey Response by Region

	Total	Capital	Canyon	Eastern	Southern	Western
Total Participants	9,439	2,678	3,067	1,212	1,408	1,074
Students	9,107	2,585	2,965	1,168	1,358	1,031
Surveys Received	5,252	1,133	2,139	737	766	477
Percent Response	56%	42%	70%	61%	54%	44%

Energy and Water Savings Results

In addition to educating students and their parents, a primary program goal is to generate cost-effective energy and water savings. Student home surveys not only provided the data used in the savings projections, but also reinforced the learning benefits.

Projected Resource Savings

A list of assumptions and formulas used for these calculations can be found in Appendix A.

PROJECTED ANNUAL SAVINGS	
13,069,285	gallons of water saved
1,993,950	kWh of electricity saved
51,442	therms of gas saved
13,069,285	gallons of wastewater saved

PROJECTED LIFETIME SAVINGS	
130,692,848	gallons of water saved
21,415,686	kWh of electricity saved
514,415	therms of gas saved
130,692,848	gallons of wastewater saved

PROJECTED ANNUAL SAVINGS PER HOME	
1,385	gallons of water saved
211	kWh of electricity saved
5	therms of gas saved
1,385	gallons of wastewater saved

PROJECTED LIFETIME SAVINGS PER HOME	
13,846	gallons of water saved
2,269	kWh of electricity saved
54	therms of gas saved
13,846	gallons of wastewater saved

"I would like to say thank you. My child learned a lot from this program and I am also learning some great information about energy, etc."

[redacted], Parent
Sherman Elementary School

Program Overview

The Idaho Power Energy Wise® Program, a school-based energy efficiency education program, is designed to generate immediate and long-term resource savings by bringing interactive, real-world education home to students and their families. The 2017-2018 program was taught in grades 3-6 throughout the Idaho Power service area.

The Idaho Power Community Education Representative program team identifies and enrolls students and teachers within the designated service area. The program physically begins with classroom discussions in a Student Guide that provide the foundations of using energy and water efficiently, followed by hands-on, creative, problem solving activities led by the classroom teacher.

All program materials support state and national academic standards to allow the program to fit easily into a teacher's existing curriculum and requirements. The participating classroom teachers follow the Teacher Book and lesson plan. Information is given to guide lessons throughout the program in order to satisfy each student's individual needs, whether they are visual, auditory, or kinesthetic learners.

The Energy Wise Kit and Student Workbook comprise the take-home portion of the program. Students receive a kit containing high-efficiency measures they use to install within their homes. With the help of their parents/guardians, students install the kit measures and complete a home survey. The act of installing and monitoring new energy efficiency devices in their homes allows students to put their learning into practice. Here, participants and their parents/guardians realize actual water and energy savings within their home, benefitting two generations.

A critical element of RAP program design is the use of new knowledge through reporting. At the end of the program, the Idaho Power Energy Wise program team tabulates all participant responses—including home survey information, teacher responses, student letters, and parent feedback—and generates this Program Summary Report.

“This made my child aware of the dangers of electricity and that the power we use comes at some kind of cost. The timer was especially a point of interest.”

[redacted], Parent
Desert Sage Elementary

Program Materials

Each participant in the Idaho Power Energy Wise® Program receives classroom materials and energy efficiency kits containing high-efficiency measures to perform the program's take-home activities. Program materials for students, parents/guardians, and teachers are outlined below.

Each Student & Teacher Receives

Student Guide

Student Workbook

Parent Letter/Pledge Form

Student Survey Form

Certificate of Achievement

Energy Wise Kit Containing:

- High-Efficiency Showerhead
- Shower Timer
- LED Night Light
- (3) 9-watt LED Light Bulbs
- FilterTone® Alarm
- Digital Thermometer
- Reminder Stickers and Magnet Pack
- Flow Rate Test Bag
- Natural Resource Fact Chart
- Parent/Guardian Program Evaluation
- Illustrated Instruction Guide

Idaho Power Energy Wise Wristband

Website Access at:
http://www.idahopower.com/wise

Toll-Free HELP Line

Each Teacher/Classroom Receives

Teacher Book

Idaho Power Custom Introduction Video Flash Drive

Step-by-Step Program Checklist

Lesson Plans

Idaho State and National Academic Standards Chart

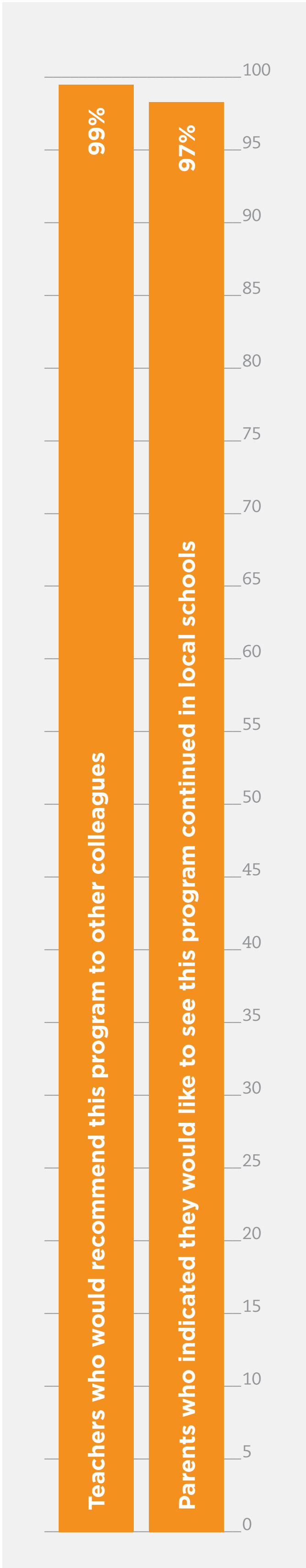
Extra Activities Booket

Teacher Survey Form

Pre/Post Student Survey Answer Keys

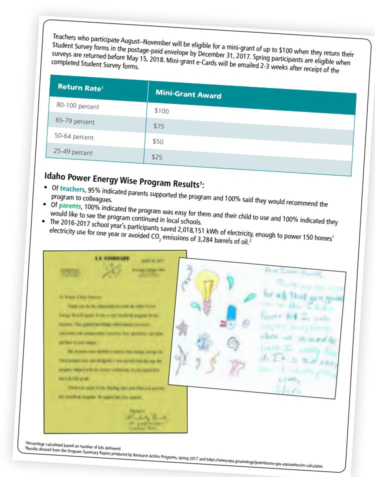
Electricity Poster

Self-Addressed Postage-Paid Envelope

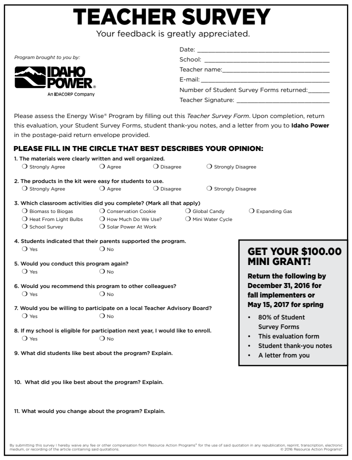


Custom Branding

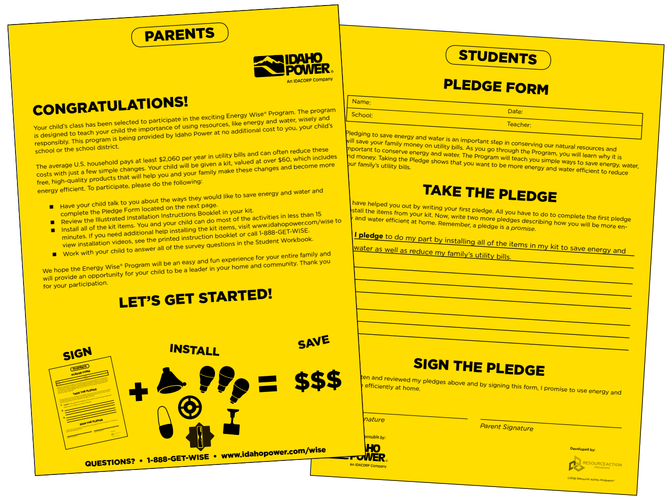
In addition to increasing resource awareness and efficiency, the program has been designed to strengthen bonds between Idaho Power and the community. One of the steps taken to ensure the greatest possible exposure is to feature the Idaho Power logo throughout each Energy Wise Kit. In addition to the kit, the Teacher Survey Form, Parent Letter/Pledge Form, Student Guide, Student Workbook, Teacher Book, and Idaho Power exclusive Introduction Video (flash drive) also feature Idaho Power branding. Further, a custom Teacher Solicitation Flyer was created for Community Education Representatives' program promotion.



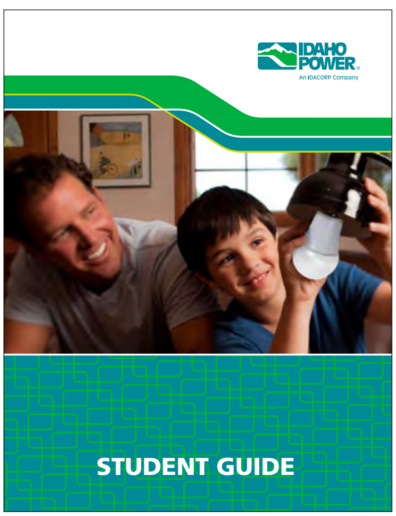
Program Materials



Teacher Evaluation Form

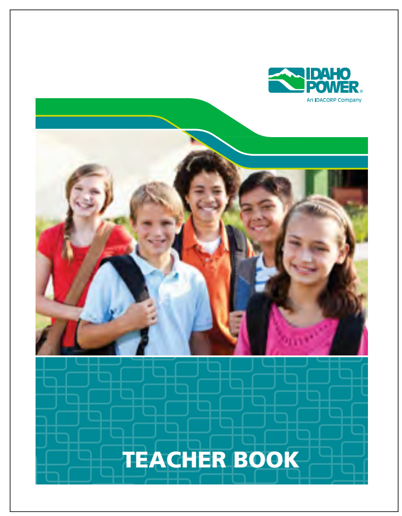


Parent Letter/Pledge Form



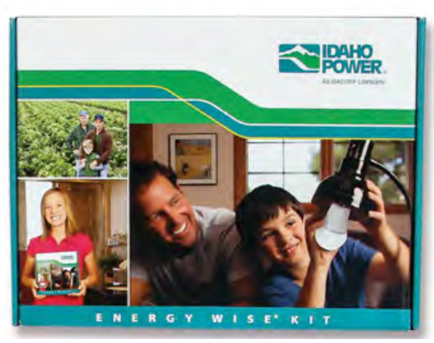
Student Guide

Student Take-Home Workbook



Teacher Book

Certificate of Achievement



Kit Box


Introduction Video (flash drive) Pen

"The students really liked that it was a project they could share with their families. They talked about the discussions they had with their parents."

Debbie Peterson, Teacher

Wilson Elementary School

Program Implementation

The 2017-2018 Idaho Power Energy Wise® Program followed this comprehensive implementation schedule:

1. Identification of Idaho state and national academic standards & benchmarks
2. Curriculum development and refinement (completed annually)
3. Curriculum correlation to Idaho state and national academic standards & benchmarks
4. Materials modification to incorporate Idaho Power branding
5. Incentive program development
6. Teacher outreach and program introduction by Idaho Power CERs
7. Teachers enrolled in the program individually by Idaho Power CERs
8. Implementation dates scheduled with teachers by Idaho Power CERs
9. Program material delivered to coincide with desired implementation date
10. Delivery confirmation
11. Periodic contact to ensure implementation and teacher satisfaction
12. Program completion incentive offered
13. Results collection
14. Program completion incentive delivered to qualifying teachers
15. Thank you cards sent to participating teachers
16. Data analysis
17. Program Summary Report generated and distributed

Participating teachers are free to implement the program to coincide with their lesson plans and class schedules. Appendix C provides a comprehensive list of classrooms in grades 3-6 that participated during the 2017-2018 school year.

For more than 25 years, Resource Action Programs (RAP) has designed and implemented Measure-Based Education® programs that inspire change in household energy and water use while delivering significant, measurable resource savings. All RAP programs feature a proven blend of innovative education, comprehensive implementation services, and hands-on activities to put efficiency knowledge to work in students' homes.

RAP has a strong reputation for providing a high level of client service as part of a wide range of energy efficiency education solutions for utilities, municipalities, states, community agencies, corporations, and more. In 2013, RAP was the only conservation services provider honored by the American Council for an Energy-Efficient Economy (ACEEE) and the Alliance for Water Efficiency (AWE) as one of 12 top programs that provides sustained achievement. RAP was honored for market penetration, innovative design, and its ability to achieve substantial/sustained energy and water savings.

ACEEE
American Council for an Energy-Efficient Economy

Alliance *for* Water Efficiency

Program Team

RAP implements nearly 300 individual programs that serve more than 650,000 households each year. All-inclusive program delivery occurs in its 80,000 square-foot Nevada Program Center where implementation teams and support departments work together to provide:

- 1:1 teacher support
- Curriculum development
- Customized materials
- Data tracking and reporting
- Energy and water efficiency measures
- Graphic and web design
- Kit assembly
- Marketing communications
- Shipping
- Printing
- Program management
- Participant enrollment
- Warehousing

The Implementation Team

For the Idaho Power Energy Wise® Program, RAP assigned a specific implementation team to Idaho Power made up of a PMP®-designated Program Manager, CEM®-designated energy analyst, graphic designer, outreach personnel, educator, and administrative staff. This team immersed themselves into the Idaho Power brand, and handled all program implementation for Idaho Power. Idaho Power also received the benefit of fully staffed support departments, which worked with the implementation team to define success for Idaho Power. These departments include education, marketing, information technology, and warehouse/logistics.

Continuous Improvement

In addition to successful implementation of the Idaho Power Energy Wise Program, RAP engages in continuous program improvement, as well as enhancements to educational materials, with modifications based on emerging technology, industry trends, and EM&V findings.

As part of this plan, RAP utilizes an extensive network of educators for program feedback. This feedback ensures that educational components meet the changing needs of educators, keep information relevant to students, and, in turn, provide increased water and energy literacy amongst program participants.

"The kit was very exciting for the students. The students asked several times if it was free. I believe the kit gave ownership to the students to conserve energy."

Marie Rockwood, Teacher
Melba Elementary

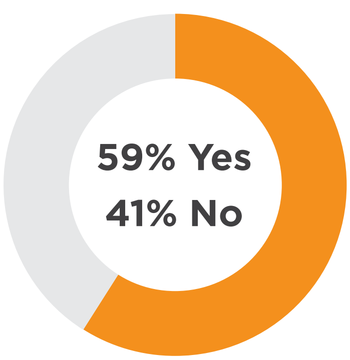
Program Impact

The Idaho Power Energy Wise® Program has had a significant impact within the community. As illustrated below, the program successfully educated participants about energy and water efficiency while generating resource savings through the installation of efficiency measures in homes. Home survey information was collected to track projected savings and provide household consumption and demographic data. Program evaluations and comments were collected from teachers, students, and parents. The following program elements were used to collect this data:

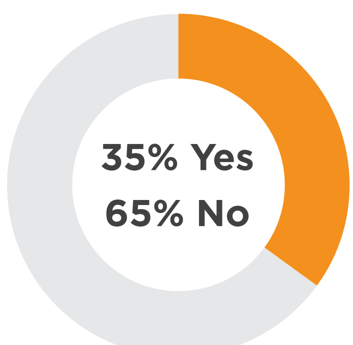
A. Home Survey for Capital Region

Participating teachers were asked to return their students' completed home check-up and home activities results. Of the 93 participating teachers in the Capital region, 34 (37%) returned survey results for the program. Parents and students were asked to install the kit measures and complete the home activities. Of the 2,585 participating children in the Capital region, 1,133 (42%) returned completed surveys.

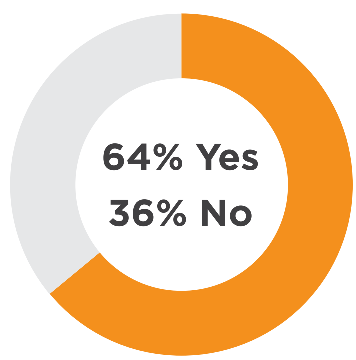
Did your family install the first 9-watt LED Light Bulb?	**Yes - 59%**
Did your family install the new High-Efficiency Showerhead?	**Yes - 35%**
Did your family change the way they use energy?	**Yes - 64%**



Students who indicated they installed the first 9-watt LED Light Bulb.



Students who indicated they installed the High-Efficiency Showerhead.

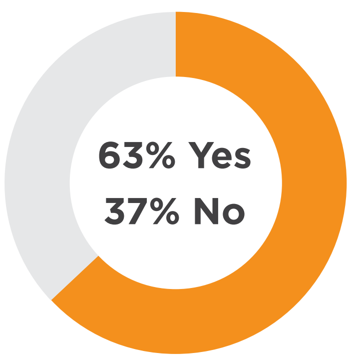


Students who indicated their family changed the way they use energy.

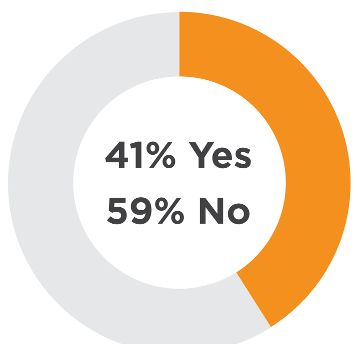
Home Survey for Canyon Region

Participating teachers were asked to return their students' completed home check-up and home activities results. Of the 102 participating teachers in the Canyon region, 64 (63%) returned survey results for the program. Parents and students were asked to install the kit measures and complete the home activities. Of the 2,965 participating children in the Canyon region, 2,139 (70%) returned completed surveys.

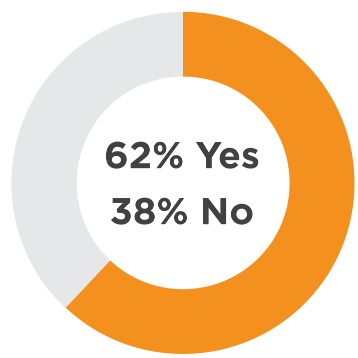
Did your family install the first 9-watt LED Light Bulb?	**Yes - 63%**
Did your family install the new High-Efficiency Showerhead?	**Yes - 41%**
Did your family change the way they use energy?	**Yes - 62%**



Students who indicated they installed the first 9-watt LED Light Bulb.



Students who indicated they installed the High-Efficiency Showerhead.

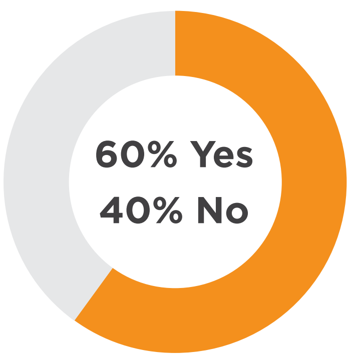


Students who indicated their family changed the way they use energy.

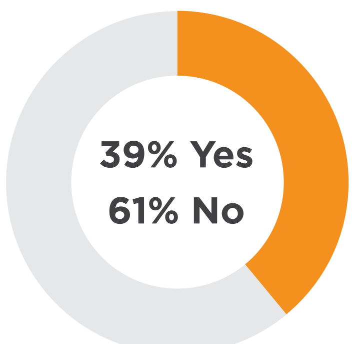
Home Survey for Eastern Region

Participating teachers were asked to return their students' completed home check-up and home activities results. Of the 44 participating teachers in the Eastern region, 25 (57%) returned survey results for the program. Parents and students were asked to install the kit measures and complete the home activities. Of the 1,168 participating children in the Eastern region, 737 (61%) returned completed surveys.

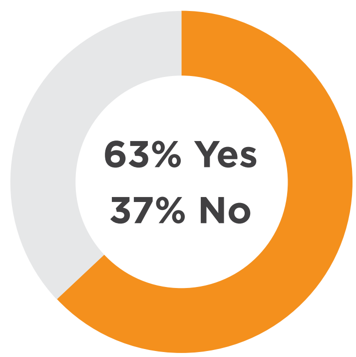
Did your family install the first 9-watt LED Light Bulb?	**Yes - 60%**
Did your family install the new High-Efficiency Showerhead?	**Yes - 39%**
Did your family change the way they use energy?	**Yes - 63%**



Students who indicated they installed the first 9-watt LED Light Bulb.



Students who indicated they installed the High-Efficiency Showerhead.

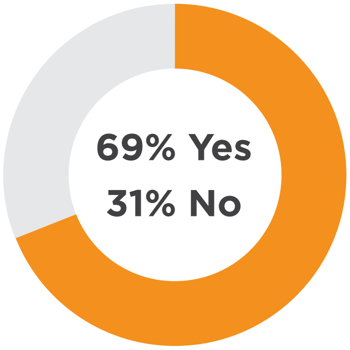


Students who indicated their family changed the way they use energy.

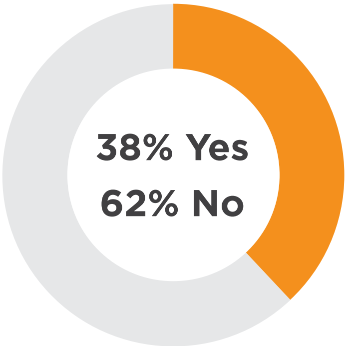
Home Survey for Southern Region

Participating teachers were asked to return their students' completed home check-up and home activities results. Of the 50 participating teachers in the Southern region, 20 (40%) returned survey results for the program. Parents and students were asked to install the kit measures and complete the home activities. Of the 1,358 participating children in the Southern region, 766 (54%) returned completed surveys.

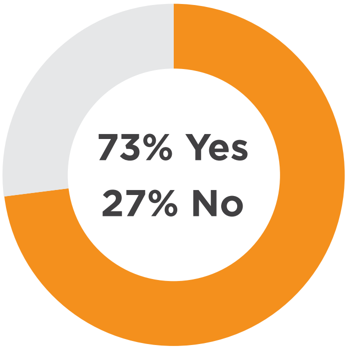
Did your family install the first 9-watt LED Light Bulb?	**Yes - 69%**
Did your family install the new High-Efficiency Showerhead?	**Yes - 38%**
Did your family change the way they use energy?	**Yes - 73%**



Students who indicated they installed the first 9-watt LED Light Bulb.



Students who indicated they installed the High-Efficiency Showerhead.

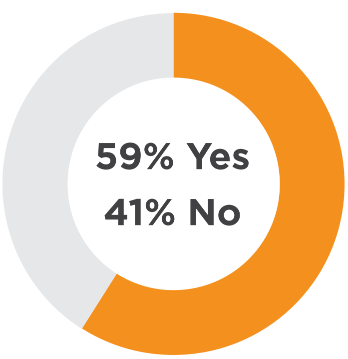


Students who indicated their family changed the way they use energy.

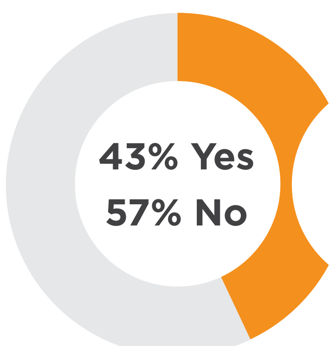
Home Survey for Western Region

Participating teachers were asked to return their students' completed home check-up and home activities results. Of the 43 participating teachers in the Western region, 16 (37%) returned survey results for the program. Parents and students were asked to install the kit measures and complete the home activities. Of the 1,031 participating children in the Western region, 477 (44%) returned completed surveys.

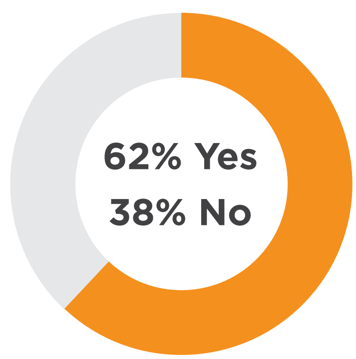
Did your family install the first 9-watt LED Light Bulb?	**Yes - 59%**
Did your family install the new High-Efficiency Showerhead?	**Yes - 43%**
Did your family change the way they use energy?	**Yes - 62%**



Students who indicated they installed the first 9-watt LED Light Bulb.



Students who indicated they installed the High-Efficiency Showerhead.

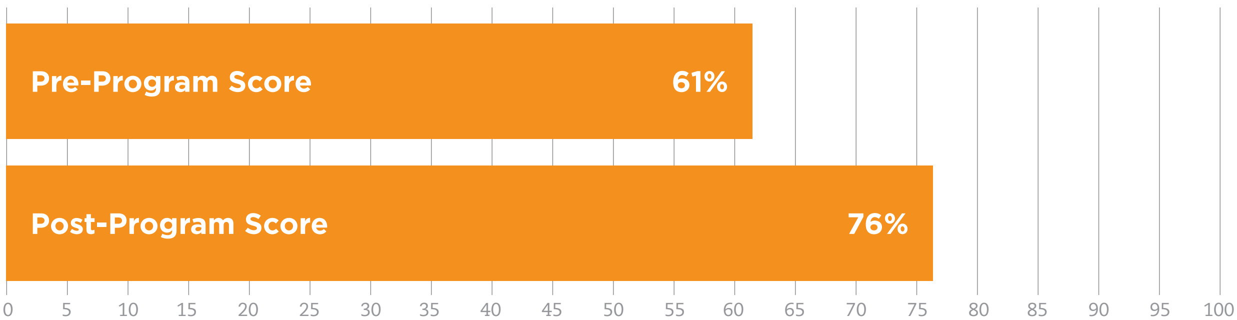


Students who indicated their family changed the way they use energy.

B. Pre-Program and Post-Program Tests

Students were asked to complete a 10-question test before the program was introduced and then again after it was completed to determine the knowledge gained through the program. The average student answered **6.1** questions correctly prior to being involved in the program and then improved to answer **7.6** questions correctly following participation. Of the 9,107 student households participating, 5,252 returned survey responses.

Scores improved from 61% to 76%.



Pre-Program and Post-Program Test Questions

		Pre	Post
1	Which layer of Earth do we live on?		
	Crust	70%	87%
	Mantle	7%	3%
	Inner Core	7%	2%
	Outer Core	17%	7%
2	Non-Potable water is safe to drink.		
	True	23%	13%
	False	77%	87%
3	Which of these is not a renewable resource?		
	Wind	19%	8%
	Plants	5%	3%
	Gold	59%	80%
	Animals	17%	8%
4	Saving water saves energy.		
	True	86%	94%
	False	14%	6%

Pre-Program and Post-Program Test Questions

		Pre	Post
5	Which are fossil fuels?		
	Coal	22%	14%
	Oil	12%	6%
	Natural Gas	13%	6%
	All of the above	54%	74%
6	Which type of energy is created in the process of Photosynthesis?		
	Nuclear Energy	19%	13%
	Thermal Energy	26%	22%
	Chemical Energy	30%	53%
	Electric Energy	24%	11%
7	Which Kit item will save the most natural resources?		
	Compact Fluorescent Lamp	39%	37%
	High-Efficiency Showerhead	31%	48%
	FilterTone® Alarm	15%	7%
	LED Night Light	15%	8%
8	Which major appliance uses the most energy?		
	Dishwasher	19%	13%
	Refrigerator	61%	67%
	Dryer	20%	20%
9	An LED (light emiting diode) light bulb uses more energy than an incandescent bulb.		
	True	32%	17%
	False	68%	83%
10	On-peak time is the best time to play video games.		
	True	28%	16%
	False	72%	84%

C. Home Activities—Summary

As part of the program, parents and students installed resource efficiency measures in their homes. They also measured the pre-existing devices to calculate savings that they generated. Using the family habits collected from the home survey as the basis for this calculation, 9,439 households are expected to save the following resource totals. Savings from these actions and new behaviors will continue for many years to come. Of the 9,107 student households participating, 5,252 returned survey responses.

Projected Resource Savings

A list of assumptions and formulas used for these calculations can be found in Appendix A.

Number of Participants:	**9,439**		
	Annual	**Lifetime**	
Projected reduction from Showerhead retrofit:	**13,069,285**	**130,692,848**	gallons
Product Life: **10 years**	**865,119**	**8,651,186**	kWh
	42,609	**426,093**	therms
Projected reduction from first **9**-watt LED Light Bulb:	**295,924**	**3,551,092**	kWh
Product Life: **25,000 hours** (**12** years)			
Projected reduction from second **9**-watt LED Light Bulb:	**243,629**	**2,923,553**	kWh
Product Life: **25,000 hours** (**12** years)			
Projected reduction from third **9**-watt LED Light Bulb:	**198,541**	**2,382,496**	kWh
Product Life: **25,000 hours** (**12** years)			
Projected reduction from LED Night Light retrofit:	**212,475**	**2,124,751**	kWh
Product Life: **10,000 hours**			
Projected reduction from FilterTone® installation:	**178,261**	**1,782,608**	kWh
Product Life: **10 years**	**8,832**	**88,323**	therms
Projected reduction from Shower Timer installation:	**8,613,793**	**17,227,586**	gallons
Estimated Life: **2 years**	**28,083**	**56,166**	therms
	570,188	**1,140,376**	kWh
TOTAL PROGRAM SAVINGS:	**13,069,285**	**130,692,848**	gallons
	1,993,950	**21,415,686**	kWh
	51,442	**514,415**	therms
TOTAL PROGRAM SAVINGS PER HOUSEHOLD:	**1,385**	**13,846**	gallons
	211	**2,269**	kWh
	5	**54**	therms

**Projected reduction from Shower Timer installation not included in Total Program Savings.*

D. Teacher Program Evaluation

Program improvements are based on participant feedback received. One of the types of feedback obtained is from participating teachers via a Teacher Program Evaluation Form. They are asked to evaluate relevant aspects of the program and each response is reviewed for pertinent information. The following is feedback from the Teacher Program Evaluation for the Idaho Power Energy Wise Program. Of the 332 participating teachers, 159 returned teacher program evaluation surveys.

Teacher Response

(A summary of responses and regional data can be found in Appendix D)

99% of participating teachers indicated they would conduct the program again given the opportunity.

99% of participating teachers indicated they would recommend the program to their colleagues.

What did students like best about the program? Explain.

"They honestly loved the ability to take new things home. Some loved that they even got a new night light. They also enjoyed teaching their parents about easy ways to save money at home."
Tyler Keefe, Sherman Elementary School

"Students were very excited about the kits. Several of them indicated installing the light bulbs and other items immediately."
Octavio Dario, West Canyon Elementary

"The presentation and the at home kits."
Lauren Denny, Mill Creek Elementary School

"The students enjoyed the energy saving wise kit items the most because they got to help install them."
Brittany Woodworth, West Canyon Elementary

"They enjoyed the presentation and the hands-on activities."
Eva Filas, Pillar Falls Elementary School

"They loved the kits and getting to install the items using the instruction book."
Laura VanDerschaaf, Lake Ridge Elementary School

"The students enjoyed the take home kits and being able to teach their families at home."
Nicole Gibbs, Willow Creek Elementary School

"The free home kits are a great way to hook the students interest into their personal energy consumption."
Nick Channer, Willow Creek Elementary School

"The student interest was genuine, they were excited."
Judy Swain, Trail Wind Elementary School

"They liked the vocabulary activities, they also liked reading about how much energy appliances use."
Tanya Scheibe, Lake Ridge Elementary School

Teacher Response

(A summary of responses and regional data can be found in Appendix D)

"The kits were a hit! They loved having something tangible to work with."
Robyn Flint, Filer Intermediate School

"They liked the activities best, specifically the "how much do we use." They were amazed by what they learned."
Becki Wheeler, Owyhee Elementary

What did you like best about the program? Explain.

"I liked that everything was there to teach it. Even connecting it to the standards."
Debbie Peterson, Wilson Elementary School

"I loved that my students had the opportunity to take learning home and share it with their families."
Kayden Tague, Whitney Elementary School

"I liked how informational the student workbooks are. We easily read all of the materials I swear. I enjoyed receiving a kit for each student."
Jennifer Zamora, Filer Intermediate School

"I liked the presentation before I started teaching the program. I also liked the ease of the program."
Zachary Dwello, Nampa Christian School

"I loved the energy wise kits! My kids were so excited to change their light bulbs and put in their new showerheads and the timer!"
Sue Weber, Meadows Valley School

"I liked the vocabulary, pictures, and diagrams. Students need to expand their vocabulary. Also, students need to be able to interpret the materials."
Julie Rider, Groveland Elementary

What would you change about the program? Explain.

"Nothing! I love it!"
Carol Briggs, Birch Elementary School

"I wish the lessons were a little easier. The students book is a little challenging."
Sara Walsh, Owyhee Elementary School

"Put the post-test on a different page."
Judie Bradburn, Gateway School of Language

"Nothing! I would love to start the year with the kits. I will request them in August next year."
Laurie Harvey, Gateway School of Language

E. Parent/Guardian Program Evaluation

Parent involvement with program activities and their children is of paramount interest to both Idaho Power and teachers in the program. When parents take an active role in their child's education it helps the schools and strengthens the educational process considerably. When students successfully engage their families in retrofit, installation, and home energy efficiency projects, efficiency messages are powerfully delivered to two generations in the same household. The program is a catalyst for this family interaction, which is demonstrated by feedback from Parent/Guardian Program Evaluations. The following is feedback from the Parent/Guardian Program Evaluations for the Idaho Power Energy Wise Program. Of the 9,107 participating families, 92 parents returned program evaluation surveys.

Parent Response

(A summary of responses and regional data can be found in Appendix E)

100% of participating parents indicated that the program was easy to use.

99% of participating parents indicated they would continue to use the kit items after the completion of the program.

97% of participating parents indicated they would like to see this program continued in local schools.

As a parent, which aspect of the program did you like best?

"That my son got to bring home items that we use everyday. He was so excited to help install them."
[redacted], **Blackfoot Charter Community Learning Center**

"Checklist for children and parents — doing it together. Light bulbs, signs, and night light."
[redacted] **Edahow Elementary School**

"Water saver items. Items were a cool variety and peaked interest. He read the entire handout!"
[redacted], **Grace Jordan Elementary School**

"I liked the high efficiency shower head it will help save water and energy with all the showers we take."
[redacted], **Greenhurst Elementary School**

"The fact it brought awareness to my son about waste and the need to help the world."
[redacted], **Indian Creek & Ross Elementary School**

"I like the work book and the kit. The combo shows kids items, hands-on, that help save and the math that gives numbers to compare."
[redacted], **Prospect Elementary**

"The math exercises to find cost savings was really eye-opening. We loved the hands-on learning that took place."
[redacted], **Prospect Elementary**

Parent Response

(A summary of responses and regional data can be found in Appendix E)

Are there any comments you would like to express to your child's program sponsor?

"Thank you for making our children aware that energy is important to save. Turning off the lights, shorter showers, etc... My child immediately had ideas for the items in the kit and went right to 'work'."
[redacted], **Desert Sage Elementary**

"This is a great efficiency program to get the kids involved at home. Everything could be completed easily. Great interactive project."
[redacted], **Fruitland Elementary School**

"This was a fun, educational, and interesting activity. It's a great way to teach children about effects of our resource usage and ways we can effect change. Thanks!"
[redacted], **Grace Jordan Elementary School**

"Great program! We are always trying to teach our kids to not leave lights on and not take very long showers was very helpful to have it taught elsewhere and not just from nagging parents."
[redacted] **Homedale Elementary**

"Thank you for helping to teach children as well as helping parents conserve energy and save. Keep this program going. Thank you!"
[redacted], **Hunter Elementary School**

"Two of my kids have done this. They both came home very excited about checking our energy consumption. I think it is a wonderful concept to introduce and the kit. Tools are great!"
[redacted], **Lakevue Elementary School**

"This was a wonderful alternative to the weekly homework assignment. The real world application of math skills and environmental lessons of conservation were fantastic!!"
[redacted], **Prospect Elementary**

"This is a great program. I encourage you to keep engaging kids to help build a better tomorrow."
[redacted], **Prospect Elementary**

"I hope to see this program continue. The kids need this education. Thank you."
[redacted], **West Middle School**

"Thank you for taking time to show your students these valuable lessons."
[redacted], **William Thomas Middle School**

"A list of where to purchase the items would be good and cost of them."
[redacted]., **West Canyon Elementary**

F. Teacher Letters

Valley View Elementary School
3555 N. Milwaukee St., Boise, ID 83704 Phone# (208) 854-6370 Fax # (208) 854-6371

May 1, 2018

Dear Idaho Power,

Valley View Elementary fifth grade has been fortunate to participate in the Idaho Power Energy Wise Program. We volunteer to participate in this program each year because we clearly see the benefit of educating students on the importance of energy awareness and understanding.

Thank you for allowing us to be a part of a comprehensive program that provides useful resources and materials. The lessons are easy to understand and the home support materials are a nice extension to the lessons.

Parents appreciate the materials kit and information. Many students have commented on how they use the energy saving tools and their parents have saved money. Students have also reported family discussions regarding energy and power.

Once again, we are grateful for the opportunity to share this program with our students. As you know, they are our future and as such, we want to give them the best knowledge we can so they can positively contribute to helping our community and environment.

Sincerely,

Shawna Hiller + Meko Myers

Meko Myers & Shawna Hiller
Valley View Elementary

April 18, 2018

To Whom it May Concern,

My classroom participated in your 'Living Wise Program'. I have used this program over the last few years and I truly love it! My students learned quite a bit about energy and it went right along with what we have been learning in Science. The different types of energy lessons were very helpful and right at grade level. The kits were great! There were a few students that mentioned that their parents wouldn't let them install the shower head, but overall, the students used all of the items in the kit and parents responded well to the program.

I also loved that there were math concepts integrated into the lessons. I think the more you can include "everyday" math problems into your lessons, the better it would be.

This is a great program and my students benefited from your generosity. They came away knowing the value of conserving power and other natural resources.

Thank you again for providing our classroom with this valuable program.

Sherry VanEvery
5th Grade
Ellis Elementary

Sherry VanEvery

Dear Idaho Power,

Thank you so much for the opportunity to participate in this program! It was a great chance for the students to experience hands on how they can conserve energy and make our city a cleaner and better place to live.

The students really enjoyed receiving their kits and completing the activities at home. I know that many were excited about the simple ways that they can conserve such as using the shower timer, switching out light bulbs, and simply plugging in an LED night light. The ease of the Energy Kits was great for the students and teacher.

It was such a simple process to go through the text with the students. I loved how organized the materials were and how meaningful the activities were. As a whole, the program is organized extremely well. In fact, I recently sent in a request for an energy kit for my home through Idaho Power.

The students learned a lot about conservation through this program. In fact, during our Passion Project Time (a time students get to research and learn about a topic of their choice) many students were interested in related topics and what they could do to conserve energy and help the environment. It was great to see students take a real interest and dip deeper into a topic that was interesting to them.

I am excited to participate in this program again next year. I hope to be able to spend more time on activities to make the program even more meaningful for the students.

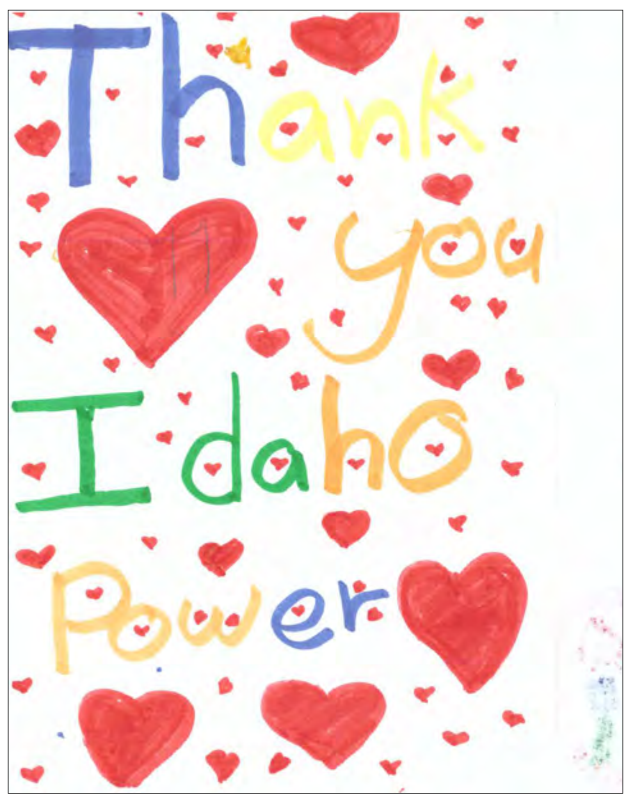
Thank you again for providing schools and students with such a simple, well organized, and meaningful way for students to learn about conservation and energy. It is a great experience for all students!

With much appreciation,

Laura VanDerschaaf

Laura VanDerschaaf
5th Grade – Lake Ridge Elementary

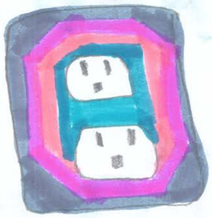
G. Student Letters



Student Letters

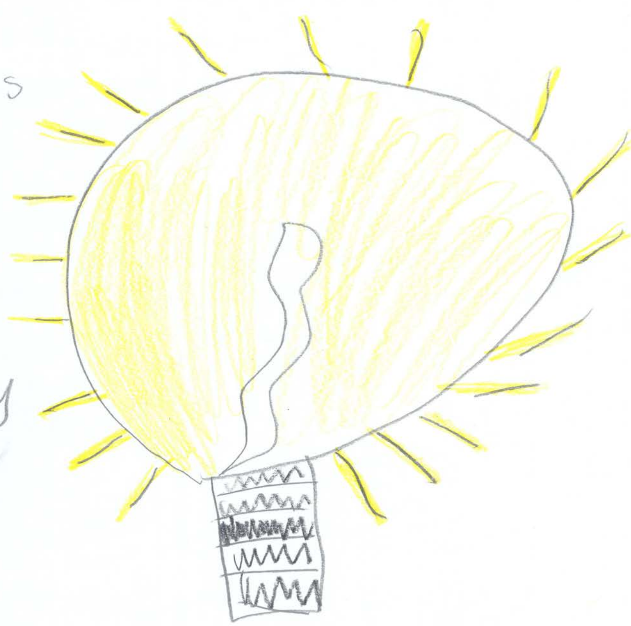
(continued)

You have the Power to make a Difference



Dear Mr. Weedon I am very glad you showed us how to save energy because my power bill has gone down a lot. Also I'm thankful for Power, the energy wise Kit, the presentations, and helping our comunity. Thank you, really appreciate it!

Thank you Mr. Weedon for teaching the classes in 4th grade. Frist, You teached 4th grade to Safe energy and Power. Second, You gafe 4th grade energy wise Kits and the 5 min ~~shawer~~ timer is Awesome!!!!!! Thrid, You were willing to come to Hilldale.



Student Letters

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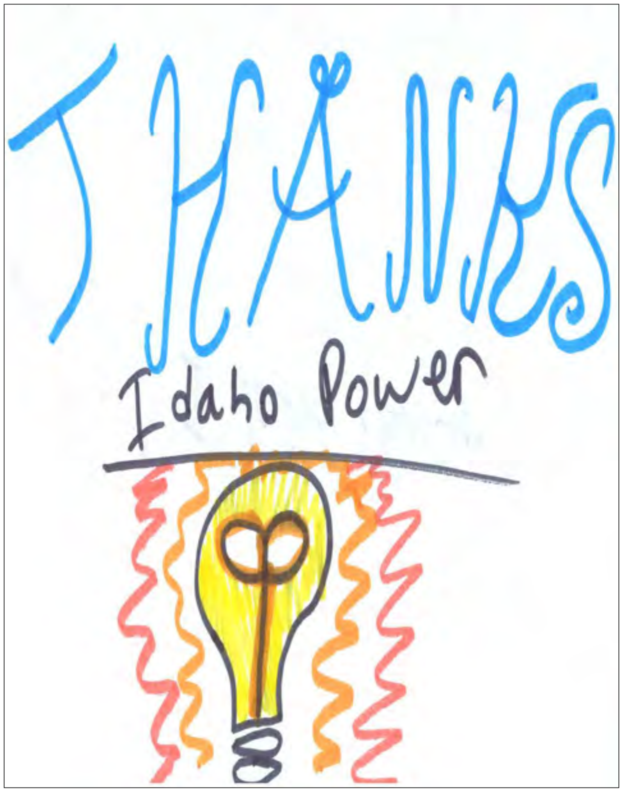

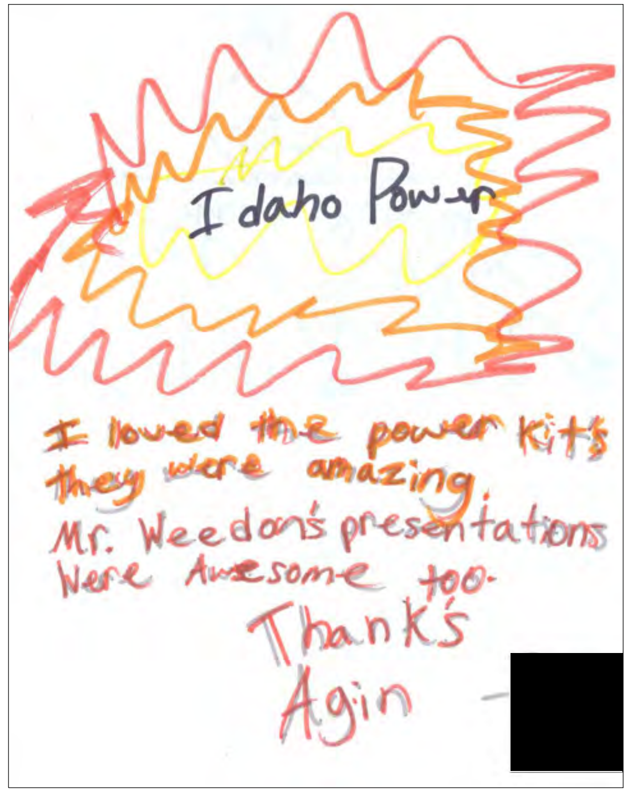

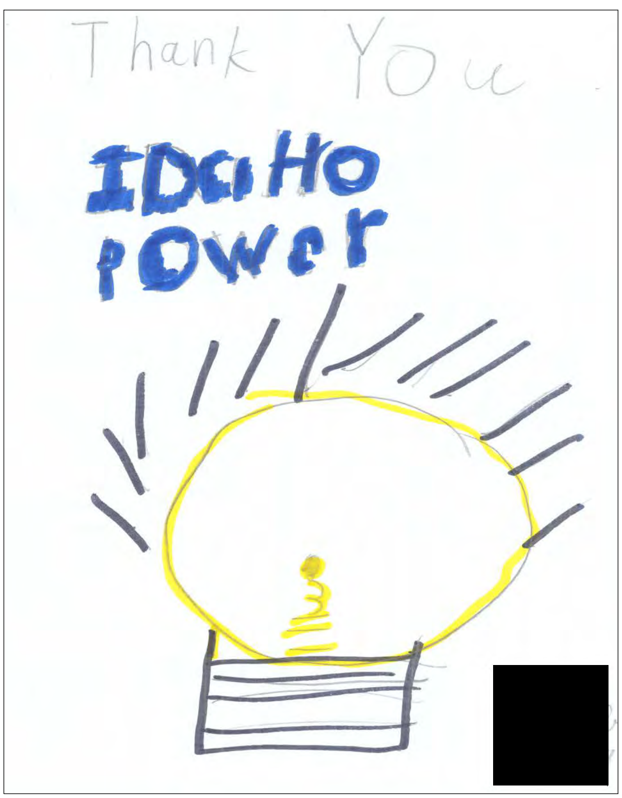

Student Letters

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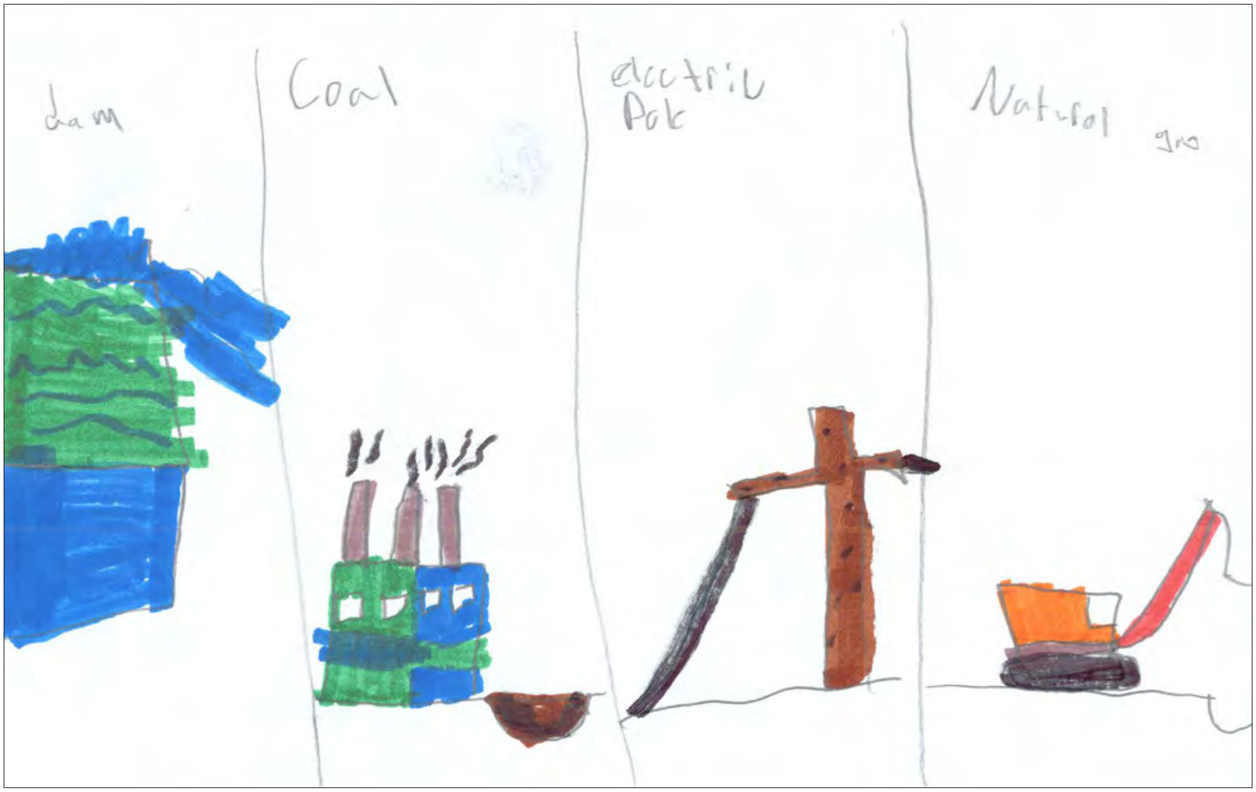

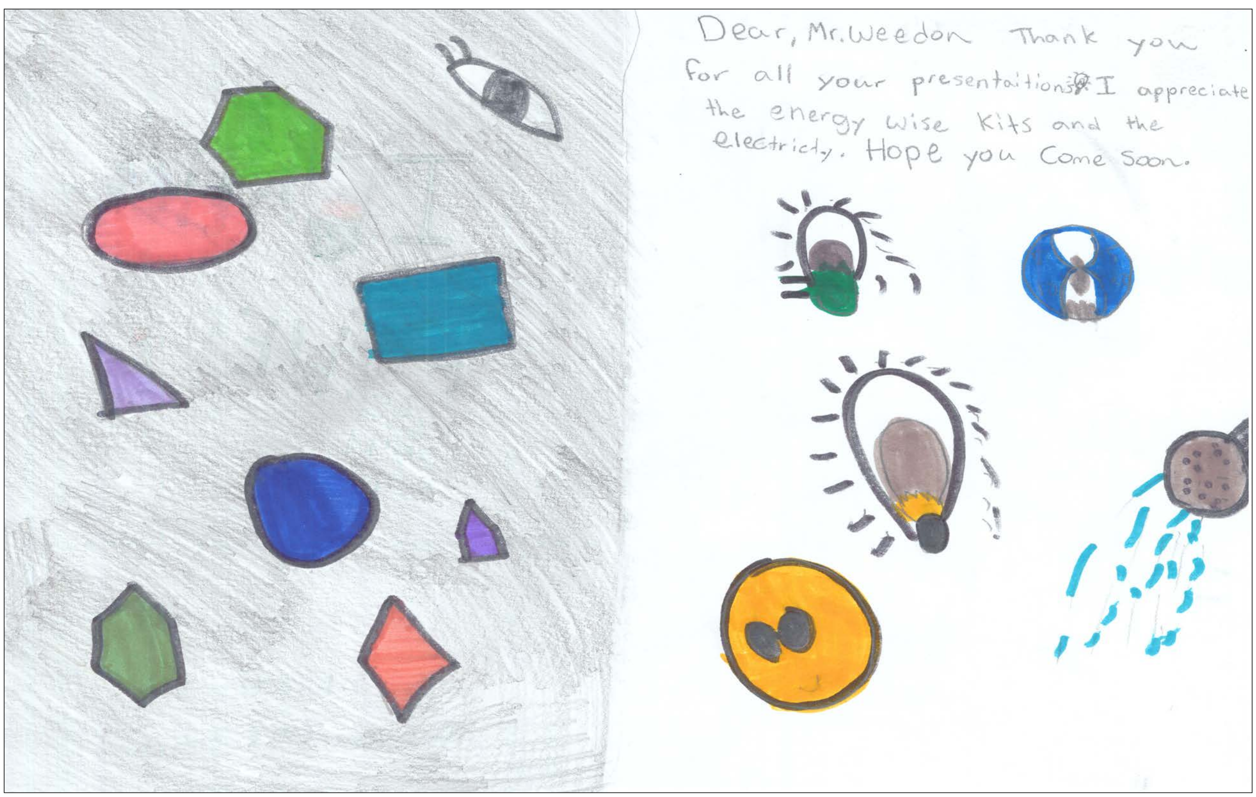

Student Letters

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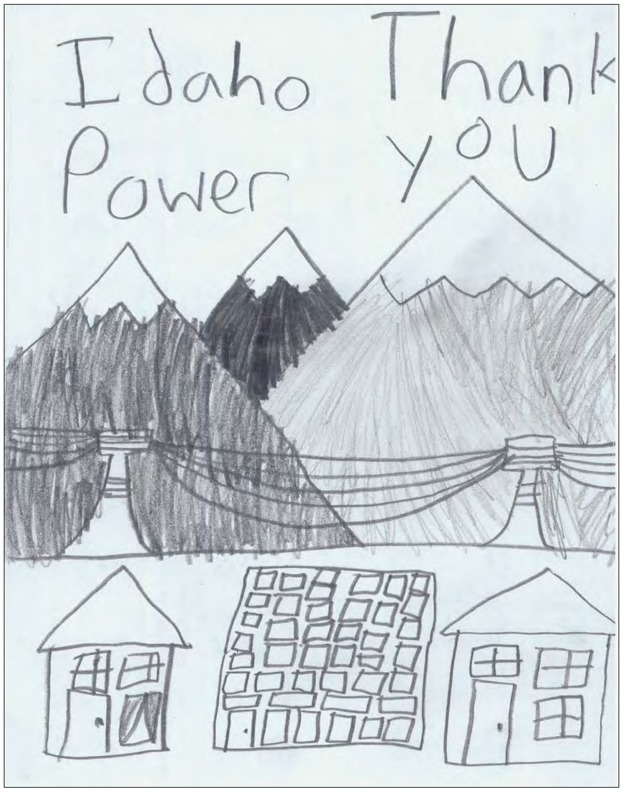
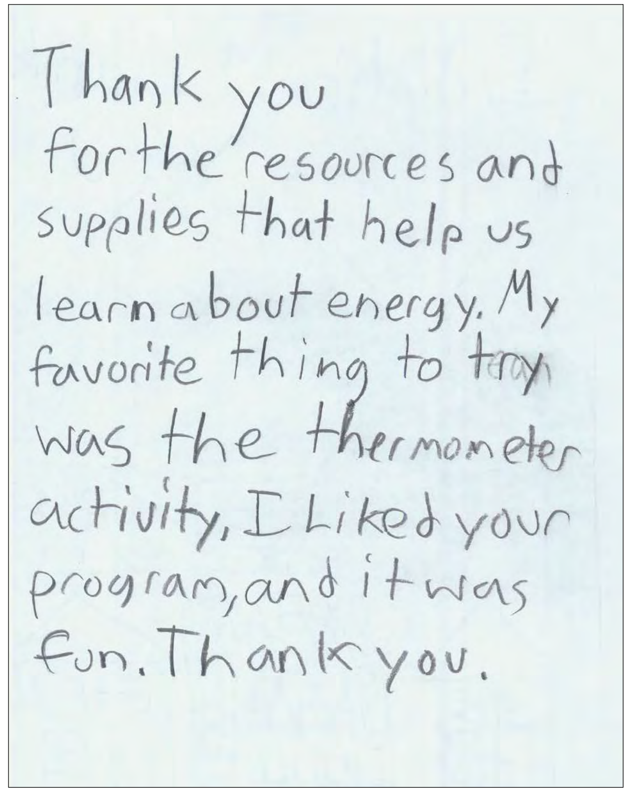
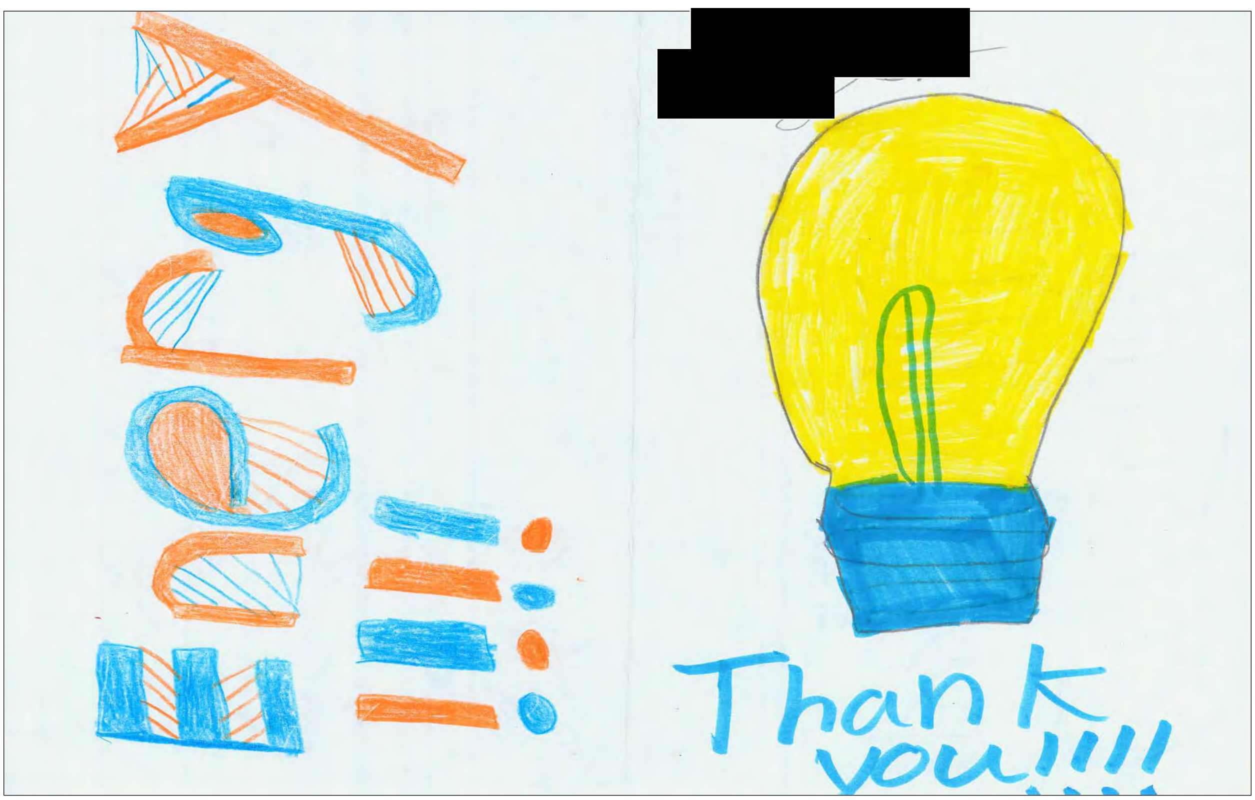



Thank you for the resources and supplies that help us learn about energy. My favorite thing to try was the thermometer activity, I Liked your program, and it was fun. Thank you.



Student Letters

(continued)

4/19/18

Dear Idaho Power,

Thank you for the kits I loved them very much.

I used the shower head for my shower because my old shower head was rusty, never squirted out a bathtubs worth of water, and took forever to get hair wet. I used the shower timer for my shower because I used to take a 20-40 minutes in the shower and because of the timer I only can take a 5 min shower. Thank you for the shower timer and shower.

The other things I used were the room themonitor thingy and night light and the light bulbs. I use the night light for my room light its that good. I use the room thamonitorto yell at my mom when my room is 30 degrees Fahrenheit. Finally the light bulbs I haven't got to yet but I'm guessing that there as good as the LED night light. Thank you Idaho Power for the LED night light, the LED bulbs, and the room themonitor.

In conclusion I personally thank Idaho Power for the kits and the amazing things in them. Like the light bulbs, night light, room themonitor, shower head, and shower timer. Thank you so much Idaho Power for the gs.

Sincerely, [redacted]

Dear, Idaho Power 4/19/18

Thank you so much for all you have taught us about this year. Thank you for bringing us the Kit's, the work books, and Mrs. Boyd. Thank you for teaching us the importance of saving energy, water, and plenty of other stuff. I also want to say thanks for bringing Mrs. Boyd to this school. She was really helpful, and made me understand why all this was going to be so important in my life. It's going to be important to me my family my kids. These lessons are going to help me with life in general.

Let me just say this, the Kit's are amazing!! I just love the Kit's. On my Kit I used all of the stuff. I used the Filter Tone Alarm, I used the shower head for my restrume, I used the shower timer for when I need to shower, I used the lights for my bedroom because the lights went out yesterday, and finally I used the Thermometer for my bedroom because it has been really cold and I want to see if it gets any warmer. I also used the night light in my hall so i don't trip over my dogs. All this helps me so much in my life.

Sincerely

[redacted]

Dear Idaho Power,

4/19/18

Thank you for the Idaho power kits they are awesome. The shower timer is awesome and helps me keep track on how long I've been in the shower. Sometimes I have to keep on turning the shower timer and then I end up staying in the shower for like 20 minutes.

The Thamoniter is cool and it helps me tell what the temperature is in my bedroom or in the family room. It gets so cold at night in my bedroom so I look at my thermometer and see how cold it is in my room at night. When I go in my sisters room it is so cold and I bring my thamoniter and see what temperature it is in there room.

Sincerely,

[redacted]

Dear Idaho Power

Thank you for the idaho power kit it has help me save power. The first reason why it has help me is my basement is super dark so the nightlight has help. The nightlight made it brighter so I don't run into the wall when I'm trying to wake my sisters up. Also the LED lights have made my kitchen way brighter than it use to be. When my kitchen lights are on it makes it super bright until my bedroom.

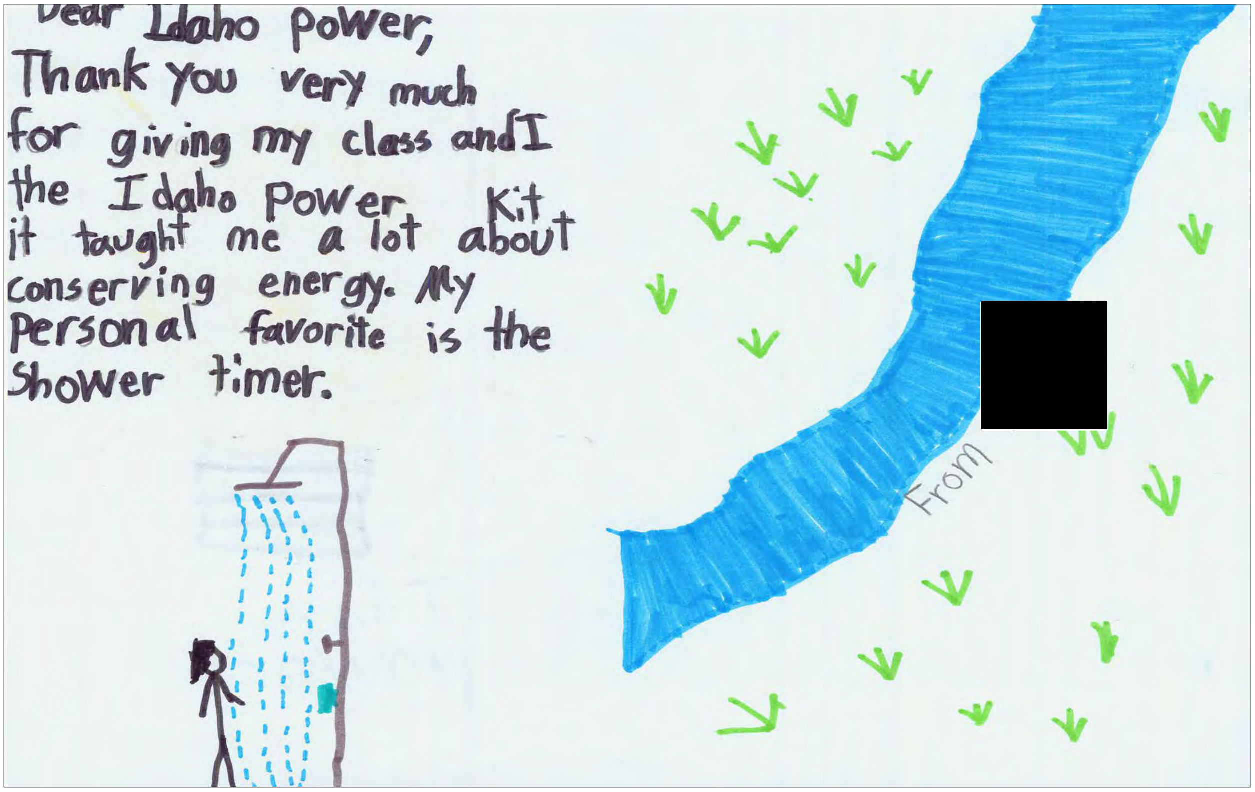
The shower timer has help because I use to take 15 minutes but now I take 5 minutes. It help me save water because I use to just let the water poor on me so I could be warm while I did my hair. Also before I got in the shower I use to let it get warm while I just sat there. It has help my sister for sure SHE TAKES THE LONGEST SHOWER but now my mom said use the shower timer.

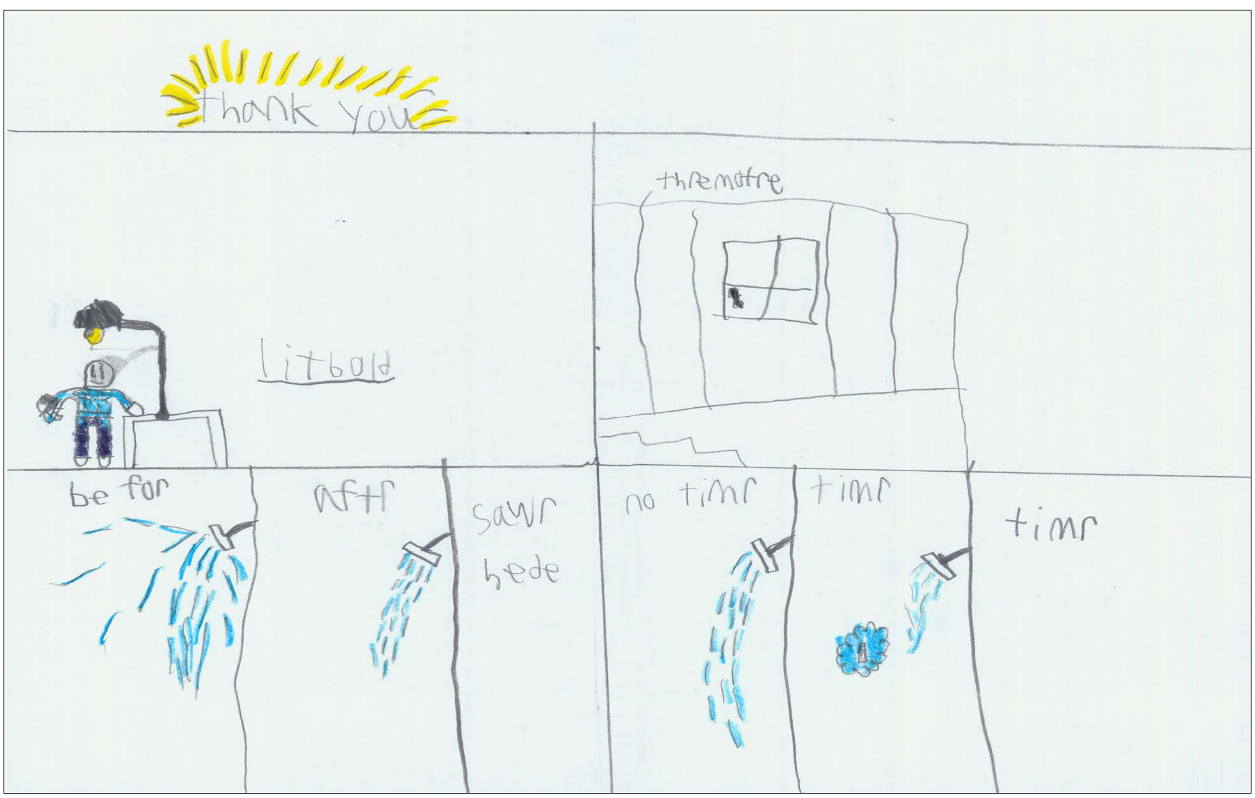
Thank you for sending Mrs. Boyd she taught us a lot. The very first lesson was about fish and how they help us save energy. Then she taught us about wires and DON'T TOUCH THEM or don't go inside the fence when there is big towers that have wires connected to them. She also let us put on a glove that electrician uses to fix the wires and let us crank a light thing.

Sincerely,

[redacted]

(continued)


Dear Idaho power,
Thank you very much for giving my class and I the Idaho Power Kit it taught me a lot about conserving energy. My personal favorite is the Shower timer.
From [redacted]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Student Letters

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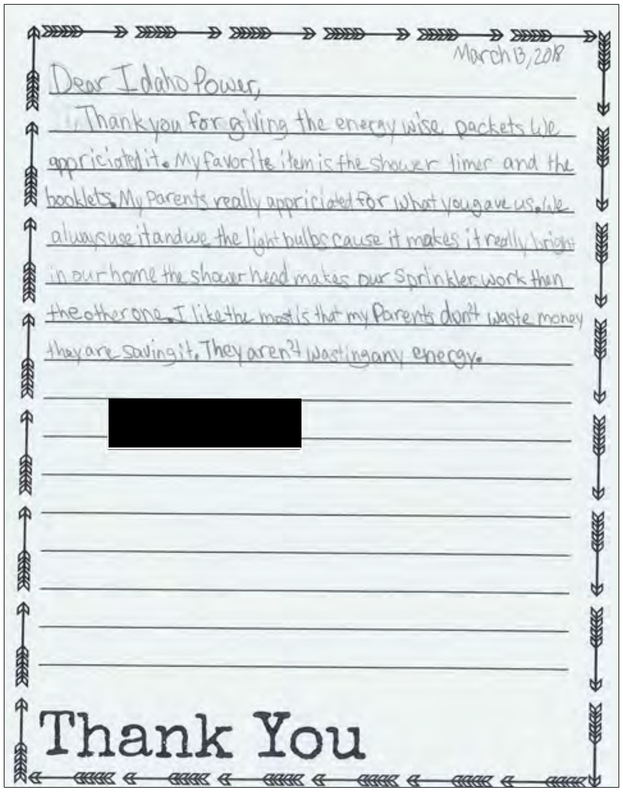


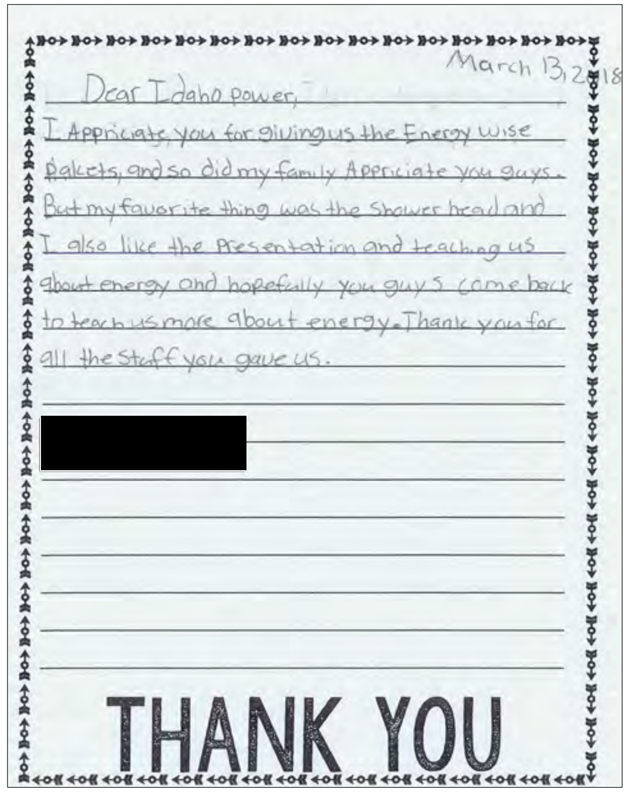
March 13, 2018

Dear Idaho Power,

Thank you for giving the energy wise packets we appriciated it. My favorite item is the shower timer and the booklets. My Parents really appriciated for what you gave us. We always use it and we the light bulbs cause it makes it really bright in our home the shower head makes our Sprinkler work then the other one. I like the most is that my Parents don't waste money they are saving it. They aren't wasting any energy.

[redacted]

Thank You



March 13, 2018

Dear Idaho power,

I Appriciate you for giving us the Energy wise pakets, and so did my family Appriciate you guys. But my favorite thing was the Shower head and I also like the Presentation and teaching us about energy and hopefully you guys come back to teach us more about energy. Thank you for all the stuff you gave us.

[redacted]

THANK YOU

April 16th, 2018

To Whom It May Concern (Reader),

Thank you reader (or readers) for all the things that you have given me, and my classmates. Some of those things is a lessons book, and a kit. I especially like the Idaho Power Kit. It is very resourceful and can save my family hundreds of dollars. Well, it will save my family hundreds of dollars once I install all of the items. So far I have only used a few items, but don't be sad about that. The items I have used are very helpful to me and my family.

As I stated before, I am grateful for the IDPK (Idaho Power Kit) Anyway, you might be wondering what items I have been using are. If that is your question, then here is your answer. I have been using two things so far. The first one is the shower timer. The reason why it is first is because I have been using it the longest. Item number two is something I actually don't use. My eight-year-old brother uses it. It's the LED night light. I have addressed this as the second item because I have no idea when and how long he uses it. I do know, however that he uses it at night. Now, lets see why my brother and I use these items.

I use the shower timer because I am known for taking long showers. To prove my point, here is an example before I got the shower timer. Say that it is Thursday. (That is my usual shower time.) I just finished my ballet class and I am a sweaty, greasy mess. As I come home my mother orders me to take a shower. As I start the water, I adjust the temperature to be just the right amount of warmth. Now, I finally get in and lose track of time and take a shower for two hours. So, when I started using the timer things were different. Instead of taking a two hour shower, I would watch the timer and wash off until I was done, and this was accomplished without going over five minutes. Remember when I said that my brother uses the night light? Well, he uses it because he is scared of the dark. (Don't tell him that I told you that reader.) So there is what, and why I use the items from the IDPK. As you know it is very helpful and I am glad you gave to my class, so again, thank you.

Sincerely,

[redacted]

5-9-18

Dear Idaho Power,

Thank you for the take-home work-book and the kit. I learned that it is very important to turn off lights when your not using them or not to take to long in the shower. The only thing that my family used from the kit, and my family enough time to do all the things in the kit were, use the shower timer, use the night light, and save cold water when waiting for warm water. And once agen thank you for the stuff.

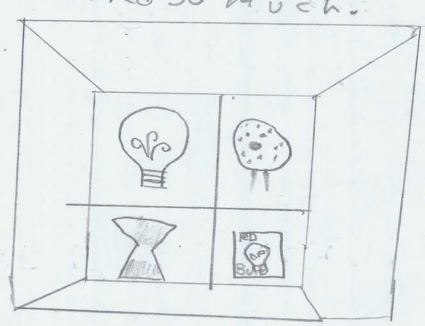
A Lake Ridge Elem. Student,

Nicole 5th grade

Thank You!

for the kits there were so useful and helpful

My favorite thing in the kit was the LeD lightBulB and. i learned so much.



Thank you!

So So So so so so so so so so so so so !!!!!!

Student Letters

(continued)

ESP;
5-9-18

Dear Idaho Power,

Thank you for providing this program to us. I learned so much about the Earth and things we rely on. I also learned about how to use the supplies in the kit. The most interesting I learned is that we can help save usefull stuff by many ways. I learned about the night light by installing it in my hall way and when ever I shut my bathroom door it turns on and when ever I open it, it turns off, thats because the hall way light is never on. Once again thank you so much.

— Sincerly [redacted]

Dear, Idaho power company

Thank you for the take home kit. It had some great helps for our fanily to learn to conselve energy. Also a thank you to Liz Haugee us about energy. I learned so much from you.

Sincely, [redacted]

Filer 4th grade

Dear Idaho power company,

Thank you for the home kit.

Thank you Liz Haugee for teaching us about how you help birds, squirls, and fish. Thanks for teaching us about how to save electricity.

sincerly

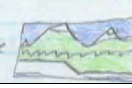
[redacted]

Dear Idaho Power

Thank you for the kit. It had some stuff that really helped our family learn to use less energy. My brother also got this kit in fourth grade. So some of the stuff had already been installed. Most of the stuff was used though.

Thank you to Liz Haugee for teaching us important lessons for saving energy. I tried to remember all of of her stuff she said. I do not know if I forgot any of it but I remember is very interesting.

[redacted] grade



"I would like to say thank you for my child learning a lot from this program. I am also learning some great information about the energy, etc."

[redacted], Parent
Sherman Elementary School

Appendices

Appendix A

Appendix B

Appendix C

Appendix D

Appendix E

Projected Savings from Showerhead Retrofit

Showerhead Retrofit Inputs and Assumptions:

Average household size:	**5.09**	people[1]
Average number of full bathrooms per home:	**2.01**	full bathrooms per home[1]
% of water heated by gas:	**49.62%**	[1]
% of water heated by electricity:	**50.38%**	[1]
Installation / participation rate of:	**39.12%**	[1]
Average Showerhead has a flow rate of:	**1.95**	gallons per minute[1]
Retrofit Showerhead has a flow rate of:	**1.26**	gallons per minute[1]
Number of participants:	**9,439**	[1]
Shower duration:	**8.20**	minutes per day[2]
Showers per day per person:	**0.67**	showers per day[2]
Product life:	**10**	years[3]

Projected Water Savings:

Showerhead retrofit projects an **annual** reduction of:	**13,069,285**	gallons[4]
Showerhead retrofit projects a **lifetime** reduction of:	**130,692,848**	gallons[5]

Projected Electricity Savings:

Showerhead retrofit projects an **annual** reduction of:	**865,119**	kWh[2,6]
Showerhead retrofit projects a **lifetime** reduction of:	**8,651,186**	kWh[2,7]

Projected Natural Gas Savings:

Showerhead retrofit projects an **annual** reduction of:	**42,609**	therms[2,8]
Showerhead retrofit projects a **lifetime** reduction of:	**426,093**	therms[2,9]

1 Data Reported by Program Participants.

2 (March 4, 2010). EPA WaterSense® Specification for Showerheads Supporting Statement. Retrieved from http://www.epa.gov/WaterSense/docs/showerheads_finalsuppstat508.pdf

3 Provided by manufacturer.

4 [(Average Household Size x Shower Duration x Showers per Day per Person) ÷ Average Number of Full Bathrooms per Home] x (Average Showerhead Flow Rate - Retrofit Showerhead Flow Rate) x Number of Participants x Installation Rate x 365 days

5 [(Average Household Size x Shower Duration x Showers per Day per Person) ÷ Average Number of Full Bathrooms per Home] x (Average Showerhead Flow Rate - Retrofit Showerhead Flow Rate) x Number of Participants x Installation Rate x 365 days x Product Life

6 Projected Annual Water Savings x Percent of Water that is Hot Water x 0.18 kWh/gal x % of Water Heated by Electricity

7 Projected Annual Water Savings x Percent of Water that is Hot Water x 0.18 kWh/gal x % of Water Heated by Electricity x Product Life

8 Projected Annual Water Savings x Percent of Water that is Hot Water x 0.009 Therms/gal x % of Water Heated by Natural Gas

9 Projected Annual Water Savings x Percent of Water that is Hot Water x 0.009 Therms/gal x % of Water Heated by Natural Gas x Product Life

Projected Savings from Shower Timer Installation

Shower Timer Inputs and Assumptions:		
% of water heated by gas:	**49.62%**	[1]
% of water heated by electricity:	**50.38%**	[1]
Installation / participation rate of Shower Timer:	**72.70%**	[1]
Average showerhead has a flow rate of:	**1.95**	gallons per minute[1]
Retrofit showerhead has flow rate of:	**1.26**	gallons per minute[1]
Number of participants:	**9,439**	[1]
Average of baseline and retrofit showerhead flow rate:	**1.60**	gallons per minute[2]
Shower duration:	**8.20**	minutes per day[3]
Shower timer duration:	**5.00**	minutes per day[4]
Showers per capita per day (SPCD):	**0.67**	showers per day[3]
Percent of water that is hot water:	**73%**	[5]
Days per year:	**365.00**	days
Product life:	**2.00**	years[5]
Projected Water Savings:		
Shower Timer installation projects an **annual** reduction of:	**8,613,793.12**	gallons[6]
Shower Timer installation projects a **lifetime** reduction of:	**17,227,586.23**	gallons[7]
Projected Electricity Savings:		
Shower Timer installation projects an **annual** reduction of:	**570,188**	kWh[8]
Shower Timer installation projects a **lifetime** reduction of:	**1,140,376**	kWh[9]
Projected Natural Gas Savings:		
Shower Timer installation projects an **annual** reduction of:	**28,083**	therms[10]
Shower Timer installation projects a **lifetime** reduction of:	**56,166**	therms[11]

1 Data Reported by Program Participants.

2 Average of the baseline GPM and the retrofit GPM

3 (March 4, 2010). EPA WaterSense® Specification for Showerheads Supporting Statement. Retrieved from http://www.epa.gov/WaterSense/docs/showerheads_finalsuppstat508.pdf

4 Provided by manufacturer.

5 Navigant EM&V Report for Super Savers Program in Illinois PY7

6 Annual water savings = Water Flow (Average of baseline and retrofit flow) × (Baseline Shower duration - Shower Timer duration) × Participants × Days per year × SPCD × Installation Rate of Shower Timer

7 Projected Annual Water Savings x Product Life

8 Projected Annual Water Savings x Percent of Water that is Hot Water x 0.18 kWh/gal x % of Water Heated by Electricity x Participants

9 Projected Annual Water Savings x Percent of Water that is Hot Water x 0.18 kWh/gal x % of Water Heated by Electricity x Product Life x Participants

10 Projected Annual Water Savings x Percent of Water that is Hot Water x 0.009 Therms/gal x % of Water Heated by Natural Gas x Participants

11 Projected Annual Water Savings x Percent of Water that is Hot Water x 0.009 Therms/gal x % of Water Heated by Natural Gas x Product Life x Participants

Projected Savings from FilterTone® Alarm Installation

FilterTone® Installation Inputs and Assumptions:

Annual energy (electricity) use by a central air conditioner:	**4,467**	kWh[1]
Annual energy (natural gas) use by a central space heating or furnace:	**421**	therms[1]
Projected increase in efficiency (electricity):	**1.75%**	[2]
Projected increase in efficiency (natural gas):	**0.92%**	[2]
Product life:	**10**	years[3]
Installation / participation rate of:	**24.16%**	[4]
Number of participants:	**9,439**	[4]

Projected Electricity Savings:

The FilterTone installation projects an **annual** reduction of:	**178,261**	kWh[5]
The FilterTone installation projects a **lifetime** reduction of:	**1,782,608**	kWh[6]

Projected Natural Gas Savings:

The FilterTone installation projects an **annual** reduction of:	**8,832**	therms[7]
The FilterTone installation projects a **lifetime** reduction of:	**88,323**	therms[8]

1 *U.S. Department of Energy, Energy Information Administration 2005 Residential Energy Consumption Web site for Mountain West States: http://www.eia.gov/consumption/residential/data/2005/*

2 *Reichmuth P.E., Howard. (1999). Engineering Review and Savings Estimates for the 'Filtertone' Filter Restriction Alarm.*

3 *Provided by manufacturer.*

4 *Data reported by program participants.*

5 *Annual energy (electricity) use by a central air conditioner, heat pump or furnace x Projected increase in efficiency (electricity) x Installation rate x Number of participants*

6 *Annual energy (electricity) use by a central air conditioner, heat pump or furnace x Projected increase in efficiency (electricity) x Installation rate x Number of participants x Product life*

7 *Annual energy (natural gas) use by a central air conditioner, heat pump or furnace x Projected increase in efficiency (natural gas) x Installation rate x Number of participants*

8 *Annual energy (natural gas) use by a central air conditioner, heat pump or furnace x Projected increase in efficiency (natural gas) x Installation rate x Number of participants x Product life*

Projected Savings from First 9-watt LED Light Bulb Retrofit

LED Retrofit Inputs and Assumptions:

Product life:	**25,000**	hours[1]
Watts used by the LED light bulb:	**9**	watts[1]
Hours of operation per day:	**2.81**	hours per day[2]
Watts used by the replaced incandescent light bulb:	**58.29**	watts[3]
Installation / participation rate of:	**62.01%**	[3]
Number of participants:	**9,439**	[3]

Projected Electricity Savings:

The LED retrofit projects an **annual** reduction of:	**295,924**	kWh[2,4]
The LED retrofit projects a **lifetime** reduction of:	**3,551,092**	kWh[2,5]

1 Provided by manufacturer.

2 Frontier Associates. (2011). Oncor's LivingWise Program: Measurement & Verification Update.

3 Data reported by program participants.

4 {[(Wattage of incandescent light bulb replaced - Wattage of LED light bulb) x Hours of operation per day x 365 Days] ÷ 1,000} x Number of participants x Installation rate

5 {[(Wattage of incandescent light bulb replaced - Wattage of LED light bulb) x 12 years] ÷ 1,000} x Number of participants x Installation rate

Projected Savings from Second 9-watt LED Light Bulb Retrofit

LED Retrofit Inputs and Assumptions:

Product life:	**25,000**	hours[1]
Watts used by the LED light bulb:	**9**	watts[1]
Hours of operation per day:	**2.81**	hours per day[2]
Watts used by the replaced incandescent light bulb:	**58.11**	watts[3]
Installation / participation rate of:	**51.25%**	[3]
Number of participants:	**9,439**	[3]

Projected Electricity Savings:

The LED retrofit projects an **annual** reduction of:	**243,629**	kWh[2,4]
The LED retrofit projects a **lifetime** reduction of:	**2,923,553**	kWh[2,5]

1 Provided by manufacturer.

2 Frontier Associates. (2011). Oncor's LivingWise Program: Measurement & Verification Update.

3 Data reported by program participants.

4 {[(Wattage of incandescent light bulb replaced - Wattage of LED light bulb) x Hours of operation per day x 365 Days] ÷ 1,000} x Number of participants x Installation rate

5 {[(Wattage of incandescent light bulb replaced - Wattage of LED light bulb) x 12 years] ÷ 1,000} x Number of participants x Installation rate

Projected Savings from Third 9-watt LED Light Bulb Retrofit

LED Retrofit Inputs and Assumptions:

Product life:	**25,000**	hours[1]
Watts used by the LED light bulb:	**9**	watts[1]
Hours of operation per day:	**2.81**	hours per day[2]
Watts used by the replaced incandescent light bulb:	**58.11**	watts[3]
Installation / participation rate of:	**41.76%**	[3]
Number of participants:	**9,439**	[3]

Projected Electricity Savings:

The LED retrofit projects an **annual** reduction of:	**198,541**	kWh[2,4]
The LED retrofit projects a **lifetime** reduction of:	**2,382,496**	kWh[2,5]

1 Provided by manufacturer.

2 Frontier Associates. (2011). Oncor's LivingWise Program: Measurement & Verification Update.

3 Data reported by program participants.

4 {[(Wattage of incandescent light bulb replaced - Wattage of LED light bulb) x Hours of operation per day x 365 Days] ÷ 1,000} x Number of participants x Installation rate

5 {[(Wattage of incandescent light bulb replaced - Wattage of LED light bulb) x 12 years] ÷ 1,000} x Number of participants x Installation rate

Projected Savings from LED Night Light Retrofit

Energy Efficient Night Light Retrofit Inputs and Assumptions:

Average length of use:	**4,380**	hours per year[1]
Average night light uses:	**7**	watts
Retrofit night light uses:	**0.5**	watts
Product life:	**10**	years[2]
Energy saved per year:	**28**	kWh per year
Energy saved over life expectancy:	**285**	kWh
Installation / participation rate of:	**79.07%**	[3]
Number of participants:	**9,439**	[3]

Projected Electricity Savings:

The Energy Efficient Night Light retrofit projects an **annual** reduction of:	**212,475**	kWh[4]
The Energy Efficient Night Light retrofit projects a **lifetime** reduction of:	**2,124,751**	kWh[5]

1 Assumption (12 hours per day)

2 Product life provided by manufacturer

3 Data reported by program participants

4(kWh per year x Number of participants) x Installation rate

5((kWh per year x Number of participants) x Installation rate) x Effective useful life

Home Check-Up

	Total	Capital	Canyon	Eastern	Southern	Western
Total Participants	9,439	2,678	3,067	1,212	1,408	1,074
Students	9,107	2,585	2,965	1,168	1,358	1,031
Surveys Received	5,252	1,133	2,139	737	766	477
Percent Response	56%	42%	70%	61%	54%	44%

	Total	Capital	Canyon	Eastern	Southern	Western
1 What type of home do you live in?						
Single Family Home (Mobile)	10%	7%	10%	12%	13%	13%
Single Family Home (Manufactured)	8%	5%	8%	8%	8%	11%
Single Family Home (Built)	66%	70%	64%	65%	63%	56%
Multi-Family (2-4 units)	11%	11%	11%	11%	8%	11%
Multi-Family (5-20 units)	5%	5%	5%	4%	7%	6%
Multi-Family (21+ units)	2%	2%	1%	1%	1%	2%
2 Was your home built before 1992?						
Yes	42%	42%	34%	59%	44%	53%
No	58%	58%	66%	41%	56%	47%
3 Is your home owned or rented?						
Owned	70%	76%	66%	74%	69%	73%
Rented	30%	24%	34%	26%	31%	27%
4 How many kids live in your home (age 0-17)?						
1	13%	17%	11%	12%	9%	15%
2	30%	38%	27%	29%	29%	27%
3	27%	24%	27%	26%	29%	26%
4	16%	12%	17%	16%	18%	17%
5+	15%	8%	18%	17%	16%	16%

Due to rounding of numbers, percentages may not add up to 100%

Home Check-Up

(continued)

		Total	Capital	Canyon	Eastern	Southern	Western
5	How many adults live in your home (age 18+)?						
	1	11%	11%	12%	12%	11%	13%
	2	69%	76%	65%	70%	69%	65%
	3	12%	8%	14%	12%	14%	13%
	4	5%	3%	6%	5%	4%	7%
	5+	3%	2%	3%	1%	3%	3%
6	Does your home have a programmable outdoor sprinkler system?						
	Yes	66%	80%	69%	54%	59%	44%
	No	34%	20%	31%	46%	41%	56%
7	Does your home have a programmable thermostat?						
	Yes	78%	85%	79%	73%	77%	71%
	No	22%	15%	21%	27%	23%	29%
8	What is the main source of heating in your home?						
	Natural Gas	43%	55%	46%	43%	33%	21%
	Electric Heater	42%	37%	39%	41%	49%	52%
	Propane	4%	2%	3%	7%	5%	5%
	Heating Oil	1%	1%	2%	1%	2%	1%
	Wood	5%	2%	5%	4%	6%	14%
	Other	5%	4%	6%	4%	4%	7%
9	What type of air conditioning unit do you have?						
	Central Air Conditioner	73%	87%	76%	54%	66%	64%
	Evaporative Cooler	6%	4%	5%	7%	7%	8%
	Room Unit	12%	7%	11%	18%	14%	19%
	Don't Have One	10%	3%	8%	21%	13%	10%
10	Does your home have a Dishwasher?						
	Yes	84%	95%	86%	78%	78%	73%
	No	16%	5%	14%	22%	22%	27%

Due to rounding of numbers, percentages may not add up to 100%

Home Check-Up

(continued)

	Total	Capital	Canyon	Eastern	Southern	Western
11 How many half-bathrooms are in your home?						
0	63%	55%	58%	74%	74%	73%
1	29%	38%	33%	21%	20%	21%
2	5%	5%	6%	4%	5%	4%
3	1%	1%	2%	1%	1%	1%
4+	0%	1%	1%	0%	0%	1%
12 How many full bathrooms are in your home?						
1	23%	14%	22%	28%	30%	37%
2	57%	59%	62%	44%	54%	51%
3	16%	22%	13%	24%	13%	9%
4	3%	4%	3%	3%	3%	1%
5+	1%	1%	1%	1%	0%	1%
13 How many toilets are in your home?						
1	16%	8%	14%	21%	22%	28%
2	46%	37%	46%	45%	52%	52%
3	30%	43%	32%	24%	18%	15%
4	6%	10%	5%	8%	5%	2%
5+	2%	3%	2%	2%	2%	2%
14 How is your water heated?						
Natural Gas	50%	63%	55%	44%	33%	30%
Electricity	50%	37%	45%	56%	67%	70%

Due to rounding of numbers, percentages may not add up to 100%

Home Activities

	Total	Capital	Canyon	Eastern	Southern	Western
Total Participants	9,439	2,678	3,067	1,212	1,408	1,074
Students	9,107	2,585	2,965	1,168	1,358	1,031
Surveys Received	5,252	1,133	2,139	737	766	477
Percent Response	56%	42%	70%	61%	54%	44%

	Total	Capital	Canyon	Eastern	Southern	Western
1 What is the flow rate of your old showerhead?						
0 - 1.0 GPM	13%	10%	11%	14%	18%	17%
1.1 - 1.5 GPM	21%	22%	19%	21%	20%	26%
1.6 - 2.0 GPM	20%	23%	20%	19%	20%	16%
2.1 - 2.5 GPM	21%	21%	23%	23%	19%	16%
2.6 - 3.0 GPM	15%	14%	17%	12%	15%	16%
3.1+ GPM	10%	10%	10%	11%	8%	8%
2 Did you install the new High-Efficiency Showerhead?						
Yes	39%	35%	41%	39%	38%	43%
No	61%	65%	59%	61%	62%	57%
3 If you answered "yes" to question 2, what is the flow rate of your new showerhead?						
0 - 1.0 GPM	26%	23%	24%	23%	32%	38%
1.1 - 1.5 GPM	40%	39%	44%	39%	39%	34%
1.6 - 1.75 GPM	33%	38%	32%	38%	29%	28%
4 Did you use the Shower Timer?						
Yes	73%	72%	74%	68%	78%	68%
No	27%	28%	26%	31%	22%	32%
5 Did your family install the first 9-watt LED Light Bulb?						
Yes	62%	59%	63%	60%	69%	59%
No	38%	41%	37%	40%	31%	41%

Due to rounding of numbers, percentages may not add up to 100%

Home Activities

(continued)

		Total	Capital	Canyon	Eastern	Southern	Western
6	If you answered "yes" to question 5, what is the wattage of the incandescent bulb you replaced?						
	40-watt	17%	16%	16%	15%	19%	24%
	60-watt	40%	42%	41%	44%	35%	32%
	75-watt	15%	14%	18%	10%	15%	14%
	100-watt	8%	10%	8%	5%	7%	12%
	Other	19%	19%	16%	27%	24%	18%
7	Did your family install the second 9-watt LED Light Bulb?						
	Yes	51%	49%	52%	48%	55%	50%
	No	49%	51%	48%	51%	45%	50%
8	If you answered "yes" to question 7, what is the wattage of the incandescent bulb you replaced?						
	40-watt	16%	14%	15%	16%	20%	17%
	60-watt	40%	41%	41%	39%	37%	38%
	75-watt	16%	18%	18%	11%	14%	17%
	100-watt	7%	8%	7%	8%	6%	10%
	Other	20%	19%	19%	27%	23%	18%
9	Did your family install the third 9-watt LED Light Bulb?						
	Yes	42%	41%	42%	40%	43%	41%
	No	58%	59%	58%	59%	57%	59%
10	If you answered "yes" to question 9, what is the wattage of the incandescent bulb you replaced?						
	40-watt	16%	14%	17%	14%	18%	18%
	60-watt	36%	40%	37%	35%	31%	34%
	75-watt	16%	14%	17%	10%	17%	19%
	100-watt	9%	11%	9%	9%	7%	10%
	Other	23%	21%	20%	33%	27%	19%
11	Did your family install the FilterTone® Alarm?						
	Yes	24%	22%	27%	23%	21%	24%
	No	76%	78%	73%	77%	79%	75%

Due to rounding of numbers, percentages may not add up to 100%

Home Activities

(continued)

	Total	Capital	Canyon	Eastern	Southern	Western
12 How much did your family turn down the thermostat in winter for heating?						
1 - 2 Degrees	20%	24%	21%	17%	18%	14%
3 - 4 Degrees	18%	20%	19%	15%	16%	22%
5+ Degrees	13%	14%	13%	11%	9%	17%
Didn't Adjust Thermostat	49%	42%	47%	57%	57%	48%
13 How much did your family turn up the thermostat in summer for cooling?						
1 - 2 Degrees	18%	19%	18%	14%	17%	19%
3 - 4 Degrees	17%	20%	17%	12%	16%	15%
5+ Degrees	15%	17%	15%	9%	13%	20%
Didn't Adjust Thermostat	51%	44%	50%	64%	53%	45%
14 Did you install the LED Night Light?						
Yes	79%	76%	79%	80%	84%	73%
No	21%	24%	20%	19%	16%	27%
15 Did your family lower your water heater settings?						
Yes	23%	21%	24%	21%	22%	25%
No	77%	79%	76%	79%	78%	74%
16 Did your family raise the temperature on your refrigerator?						
Yes	18%	17%	22%	13%	16%	17%
No	81%	83%	78%	87%	84%	82%
17 Did you complete the optional online energy use activity?						
All of it	6%	4%	8%	3%	6%	8%
Some of it	15%	15%	17%	9%	15%	17%
None	78%	81%	75%	87%	79%	75%
18 Did you work with your family on this Program?						
Yes	62%	64%	60%	70%	64%	49%
No	38%	36%	39%	30%	36%	51%

Due to rounding of numbers, percentages may not add up to 100%

Home Activities

(continued)

	Total	Capital	Canyon	Eastern	Southern	Western
19 Did your family change the way they use water?						
Yes	56%	58%	54%	55%	61%	52%
No	44%	42%	45%	44%	39%	47%
20 Did your family change the way they use energy?						
Yes	64%	64%	62%	63%	73%	62%
No	36%	36%	38%	37%	27%	38%
21 How would you rate the Idaho Power Energy Wise® Program?						
Great	52%	54%	50%	52%	55%	54%
Pretty Good	37%	35%	38%	36%	38%	33%
Okay	9%	8%	10%	9%	6%	10%
Not So Good	2%	2%	2%	3%	1%	3%

Due to rounding of numbers, percentages may not add up to 100%

Participant List

REGION	SCHOOL	TEACHER	T	S	SURVEYS RETURNED
Southern	Alturas Elementary School	Kelly Michalec	1	49	Yes
Southern	Alturas Elementary School	Deborah VanLaw	1	25	No
Eastern	American Falls Intermediate School	Kristen Jensen	1	11	No
Capital	Amity Elementary School	Sharon Shaw	1	32	Yes
Capital	Amity Elementary School	Susie Cox	1	32	Yes
Capital	Amity Elementary School	Elizabeth Waldon-Brooks	1	32	Yes
Eastern	Arbon Valley Elementary School	Debbie Curry	1	7	Yes
Southern	Bickel Elementary	Maggie Wright	1	40	No
Southern	Bickel Elementary	Maggie Wright	1	44	No
Canyon	Birch Elementary School	Juilana Lookhart	1	28	Yes
Canyon	Birch Elementary School	MaryJo Pegram	1	28	Yes
Canyon	Birch Elementary School	Carol Briggs	1	28	Yes
Canyon	Birch Elementary School	Brenda Fly	1	28	Yes
Eastern	Blackfoot Charter Community Learning Center	Benjamin Parker	1	19	Yes
Eastern	Blackfoot Charter Community Learning Center	Britani Barrus	1	20	Yes
Eastern	Blackfoot Charter Community Learning Center	Krystal Murdock	1	19	Yes
Eastern	Blackfoot Charter Community Learning Center	Diane Ball	1	19	No
Southern	Bliss Elementary School	Angel Beutler	1	12	Yes
Western	Cambridge Elementary School	Danielle Petitmermet	1	12	Yes
Capital	Cecil Andrus Elementary	Kate Aschenbrenner	1	27	Yes
Canyon	Centennial Elementary School	Diane Gharring	1	28	No
Canyon	Centennial Elementary School	Doris Atherton	1	30	Yes
Canyon	Centennial Elementary School	Jessica Bowman	1	30	No
Canyon	Central Canyon Elementary School	Kim Engelbrecht	1	26	No
Canyon	Central Canyon Elementary School	Jessica Lillquist	1	27	Yes
Canyon	Central Canyon Elementary School	Liz Freeman	1	27	Yes
Canyon	Central Canyon Elementary School	Janet Anderson	1	28	Yes
Canyon	Central Elementary School	Courtney Craner	1	30	Yes
Canyon	Central Elementary School	Amber Vincent	1	29	No
Capital	Christine Donnell School of Arts	Debra Tiffany	1	30	Yes
Capital	Christine Donnell School of Arts	Amy Hymas	1	30	Yes

Note: "T" represents number of teachers and "S" represents number of students

Participant List

(continued)

REGION	SCHOOL	TEACHER	T	S	SURVEYS RETURNED
Capital	Christine Donnell School of Arts	Cynthia Compton	1	30	Yes
Eastern	Claude A. Wilcox Elementary School	Tricia Hemsley	1	22	Yes
Eastern	Claude A. Wilcox Elementary School	Hailey Herron	1	23	Yes
Eastern	Claude A. Wilcox Elementary School	Krista Campos	1	24	Yes
Capital	Collister Elementary School	Gwendolyn Balmer	1	13	Yes
Canyon	Crimson Point Elementary	Amber Irvine	1	27	No
Canyon	Crimson Point Elementary	Tonia Burbank	1	30	Yes
Canyon	Crimson Point Elementary	Mary Holmes	1	27	Yes
Capital	Cynthia Mann Elementary School	Cindy Sundvik	1	30	Yes
Capital	Cynthia Mann Elementary School	Lisa Stitt	1	25	Yes
Capital	Cynthia Mann Elementary School	Michelle Steen	1	30	No
Capital	Danette Aston (Homeschool)	Danette Aston	1	0	No
Capital	Desert Sage Elementary	Janie Abramovich	1	27	No
Capital	Desert Sage Elementary	Courtney Parker	1	27	No
Capital	Desert Sage Elementary	Kari Porter	1	27	No
Capital	Desert Sage Elementary	Christina Zubizareta	1	27	No
Canyon	Desert Springs Elementary School	Lisa Jauregui	1	26	Yes
Canyon	Desert Springs Elementary School	Lindsay Mangum	1	26	Yes
Canyon	Desert Springs Elementary School	Jackie Sodaro	1	25	Yes
Canyon	Desert Springs Elementary School	Stacey Pearson	1	25	Yes
Eastern	Donald D. Stalker Elementary School	LaNita McRae	1	20	Yes
Eastern	Donald D. Stalker Elementary School	Lisa Clark	1	22	Yes
Canyon	East Canyon Elementary	Trisha Cramer	1	25	Yes
Canyon	East Canyon Elementary	Brett Mizuta	1	25	No
Canyon	East Canyon Elementary	Tiara Shippy	1	25	Yes
Canyon	East Canyon Elementary	Brian Constant	1	25	No
Eastern	Edahow Elementary School	Megan Bullock	1	28	Yes
Eastern	Edahow Elementary School	Debbie Nickel	1	28	Yes
Capital	Eliza Hart Spalding Elementary School	Shawna Brenna	1	32	Yes
Capital	Eliza Hart Spalding Elementary School	Jessica Burkhart	1	32	No
Capital	Eliza Hart Spalding Elementary School	Rachel Lindquist	1	32	Yes
Capital	Eliza Hart Spalding Elementary School	Stefawn Wester	1	27	Yes
Eastern	Ellis Elementary School	Sherry VanEvery	1	27	Yes
Eastern	Ellis Elementary School	Michael Gornichec	1	28	No
Eastern	Ellis Elementary School	Margo Lamont	1	28	Yes

Note: "T" represents number of teachers and "S" represents number of students

Participant List

(continued)

REGION	SCHOOL	TEACHER	T	S	SURVEYS RETURNED
Southern	Ernest Hemingway STEM School	Kevin Quaderer	1	21	No
Southern	Filer Intermediate School	Sarah Wendell	1	28	Yes
Southern	Filer Intermediate School	Jennifer Zamora	1	28	Yes
Southern	Filer Intermediate School	Katelynn Hulsey	1	28	Yes
Southern	Filer Intermediate School	Cassie Royse	1	28	Yes
Southern	Filer Intermediate School	Austin Humphries	1	28	Yes
Southern	Filer Intermediate School	Susan Hamby	1	27	Yes
Southern	Filer Intermediate School	Robyn Flint	1	29	Yes
Southern	Filer Intermediate School	Jenni Jacobson	1	28	Yes
Southern	Filer Intermediate School	Jody Meeks	1	28	No
Southern	Filer Intermediate School	Tes Fields	1	28	No
Western	Fruitland Elementary School	Linda Langley	1	27	No
Western	Fruitland Elementary School	Stacy Wescott	1	25	No
Western	Fruitland Elementary School	Heather Heitz	1	26	Yes
Western	Fruitland Elementary School	Amber Bridgewater	1	27	Yes
Western	Fruitland Elementary School	Ish Green	1	26	Yes
Western	Garden Valley Elementary	Shannon Court	1	20	No
Eastern	Gate City Elementary School	Lacey Smart	1	31	No
Capital	Gateway School of Language	Laurie Harvey	1	23	Yes
Capital	Gateway School of Language	Judie Bradburn	1	27	Yes
Eastern	Gem Prep Pocatello	Mallory England	1	28	No
Capital	Glenns Ferry Elementary	Stacie Pollard	1	20	No
Capital	Grace Jordan Elementary School	Darwood Ashmead	1	27	No
Eastern	Grace Lutheran School	Katie Grant	1	30	Yes
Eastern	Green Acres Elementary School	Kathy Walker	1	28	Yes
Eastern	Green Acres Elementary School	Rachel Thomas	1	28	Yes
Canyon	Greenhurst Elementary School	Tami Ashley	1	30	Yes
Canyon	Greenhurst Elementary School	John Stull	1	30	Yes
Eastern	Groveland Elementary	Julie Rider	1	25	Yes
Eastern	Groveland Elementary	Kalli Johns	1	26	No
Southern	Hailey Elementary	Kristin Barsotti	1	20	No
Southern	Hansen Elementary School	Marcie Parkinson	1	30	Yes
Capital	Hawthorne Elementary School	Susie Noland	1	32	Yes
Southern	Heritage Academy School	Martice Fontes	1	14	Yes
Capital	Highlands Elementary School	Eileen Beatty	1	30	Yes

Note: "T" represents number of teachers and "S" represents number of students

Participant List

(continued)

REGION	SCHOOL	TEACHER	T	S	SURVEYS RETURNED
Capital	Highlands Elementary School	Angela Troy	1	16	No
Capital	Hillsdale Elementary School	Michelle Montoya	1	31	Yes
Capital	Hillsdale Elementary School	Glenda Torfin	1	28	No
Capital	Hillsdale Elementary School	Jocelyn Robinson	1	31	No
Capital	Hillsdale Elementary School	Angie Fraas	1	32	Yes
Western	Homedale Elementary School	Jamie Bahem	1	26	Yes
Western	Homedale Elementary School	Toby Johnson	1	24	No
Western	Homedale Elementary School	Robyn Chandler	1	25	No
Western	Homedale Elementary School	Kayla Blackstock	1	26	No
Capital	Horizon Elementary School	Sherry Young	1	32	No
Capital	Horizon Elementary School	Jon Parrott	1	32	No
Capital	Horizon Elementary School	Breanna Knight	1	32	No
Western	Horseshoe Bend Elementary School	Suzette Womack	1	20	No
Capital	Hunter Elementary School	Diane Escandon	1	29	Yes
Capital	Hunter Elementary School	Rene Bilkiss	1	29	Yes
Capital	Hunter Elementary School	Angela Zweifel	1	29	Yes
Capital	Hunter Elementary School	Rebecca Lenon	1	29	Yes
Capital	Hunter Elementary School	Cinda Bodell	1	29	No
Southern	I.B. Perrine Elementary School	Rob Weaver	1	30	Yes
Southern	I.B. Perrine Elementary School	Emily Strom	1	30	Yes
Southern	I.B. Perrine Elementary School	Mary Fraley	1	30	No
Canyon	Indian Creek & Ross Elementary School	Karen Stear	1	29	No
Canyon	Indian Creek & Ross Elementary School	Katie Harding	1	30	Yes
Canyon	Indian Creek & Ross Elementary School	Stacy Saunders	1	29	No
Eastern	Indian Hills Elementary	Bridget Durante	1	25	No
Eastern	Indian Hills Elementary	Maria Coleman	1	24	Yes
Canyon	Iowa Elementary	Thea Marie	1	27	Yes
Canyon	Iowa Elementary	Pepper Allen	1	27	Yes
Canyon	Iowa Elementary	Veronica Knutson	1	28	No
Capital	Joplin Elementary School	Kirsten Grover	1	25	No
Capital	Joplin Elementary School	Amy Bass	1	25	No
Western	Kenneth Carberry Elementary School	Marrissa Keenan	1	30	No
Western	Kenneth Carberry Elementary School	Karen Nichols	1	30	Yes
Western	Kenneth Carberry Elementary School	Alissa Combe	1	30	Yes
Western	Kenneth Carberry Elementary School	Vicki Beckman	1	30	Yes

Note: "T" represents number of teachers and "S" represents number of students

Participant List

(continued)

REGION	SCHOOL	TEACHER	T	S	SURVEYS RETURNED
Southern	Kimberly Elementary School	Nicole Kindred	1	27	No
Capital	Lake Hazel Elementary	Courtney Randall	1	26	No
Capital	Lake Hazel Elementary	Michelle Roach	1	26	No
Capital	Lake Hazel Elementary	Elizabeth McLaughlin	1	26	No
Canyon	Lake Ridge Elementary School	Deanna Menssen	1	27	Yes
Canyon	Lake Ridge Elementary School	Laura Crawford	1	28	Yes
Canyon	Lake Ridge Elementary School	Tanya Scheibe	1	28	Yes
Canyon	Lake Ridge Elementary School	Laura VanDerschaaf	1	28	Yes
Canyon	Lakevue Elementary School	Kimberly Reinecker	1	30	No
Canyon	Lakevue Elementary School	Heather Stanton	1	30	Yes
Canyon	Lakevue Elementary School	Nicole Underwood	1	30	Yes
Canyon	Lakevue Elementary School	Tara Daniel	1	30	Yes
Canyon	Lewis & Clark Elementary	Adam Trowbridge	1	30	Yes
Canyon	Lewis & Clark Elementary	Caitlyn McConnell	1	30	Yes
Canyon	Lewis & Clark Elementary	Meghan Willard	1	30	Yes
Eastern	Lewis and Clark Elementary	Tamara Palmer	1	25	Yes
Eastern	Lewis and Clark Elementary	Breanna Parker	1	27	Yes
Eastern	Lewis and Clark Elementary	Sabrina Mathews	1	26	Yes
Capital	Longfellow Elementary School	Toni Novotny	1	26	Yes
Capital	Longfellow Elementary School	Julie Albert	1	26	No
Capital	Maple Grove Elementary	Kaitlyn Ilg	1	25	No
Capital	Maple Grove Elementary	Erin Luthy	1	25	No
Capital	Maple Grove Elementary	Scott Roe	1	25	No
Western	Marsing Elementary School	Carol Dewitt	1	24	Yes
Western	Marsing Elementary School	Tammy Aranzamendi	1	24	No
Western	Marsing Elementary School	Scott Thornton	1	24	No
Western	May Roberts Elementary School	Patty Edison	1	18	No
Western	May Roberts Elementary School	Brenda Corder	1	20	No
Western	Meadows Valley School	Sue Weber	1	9	Yes
Canyon	Melba Elementary	Katie Strawser	1	34	Yes
Canyon	Melba Elementary	Marie Rockwood	1	34	Yes
Canyon	Mill Creek Elementary School	Lyna Butler	1	25	Yes
Canyon	Mill Creek Elementary School	Anne Kinley	1	25	Yes
Canyon	Mill Creek Elementary School	Kim Platt	1	25	Yes
Canyon	Mill Creek Elementary School	Lauren Denny	1	25	Yes

Note: "T" represents number of teachers and "S" represents number of students

Participant List

(continued)

REGION	SCHOOL	TEACHER	T	S	SURVEYS RETURNED
Canyon	Mill Creek Elementary School	Terri Domme	1	25	Yes
Southern	Murtaugh Middle School	Brooke Stranger	1	31	Yes
Southern	Murtaugh Middle School	Eli Anderson	1	25	No
Canyon	Nampa Christian School	Zachary Dwello	1	16	Yes
Canyon	Nampa Christian School	Toni Brown	1	16	No
Western	New Plymouth Elementary School	Cherry Meckert	1	27	No
Western	New Plymouth Elementary School	Whitney Cowgill	1	24	Yes
Western	New Plymouth Elementary School	Dorothy Woods	1	27	Yes
Capital	North Elementary	Sherri Redmond	1	22	Yes
Capital	North Elementary	Rosemary Ash	1	24	Yes
Capital	North Elementary	Denise Weis	1	21	Yes
Capital	North Star Charter School	Carol Hendershot	1	30	No
Capital	North Star Charter School	Mariah Rodeghiero	1	31	No
Capital	North Star Charter School	Michelle Obenchain	1	30	No
Western	Notus Elementary School	Yvonne Golden	1	16	No
Western	Notus Elementary School	Amanda Cayler	1	17	No
Western	Nyssa Elementary School	Paula Barnhart	1	25	Yes
Western	Nyssa Elementary School	Trisha Bunker	1	42	Yes
Western	Ola Elementary School	Amy Davis	1	11	Yes
Southern	Oregon Trail Elementary School	Brian Johnson	1	25	No
Southern	Oregon Trail Elementary School	Shannon Youngman	1	25	Yes
Southern	Oregon Trail Elementary School	Charles Day	1	25	No
Southern	Oregon Trail Elementary School	Amy Hartwell	1	25	No
Canyon	Owyhee Elementary	Becki Wheeler	1	30	Yes
Canyon	Owyhee Elementary	Brenda Allen	1	30	Yes
Canyon	Owyhee Elementary	Christa Roesberry-Barber	1	30	Yes
Canyon	Owyhee Elementary School	Sara Walsh	1	20	Yes
Western	Park Intermediate	Grace Sharp	1	23	Yes
Western	Park Intermediate	Jenny Conant	1	21	No
Western	Park Intermediate	Kathleen Cahill	1	24	No
Western	Park Intermediate	Damon Courtois	1	23	No
Western	Park Intermediate	Jessica Mosley	1	24	Yes
Capital	Peregrine Elementary School	Trenna McCashland	1	34	Yes
Capital	Peregrine Elementary School	Barbara Nesbit	1	34	Yes

Note: "T" represents number of teachers and "S" represents number of students

Participant List

(continued)

REGION	SCHOOL	TEACHER	T	S	SURVEYS RETURNED
Capital	Peregrine Elementary School	Britnie Winters	1	34	No
Capital	Pierce Park Elementary	Bill Hoffman	1	27	No
Capital	Pierce Park Elementary	Shannon Nicholson	1	30	Yes
Southern	Pillar Falls Elementary School	Eva Filas	1	24	Yes
Southern	Pillar Falls Elementary School	Stephanie Allred	1	24	No
Southern	Pillar Falls Elementary School	Alexandra Messmer	1	24	Yes
Southern	Pillar Falls Elementary School	Krista Vining	1	24	Yes
Southern	Pillar Falls Elementary School	Noelle Wagner	1	24	No
Capital	Ponderosa Elementary School	La Veny Stoddard	1	27	No
Capital	Prospect Elementary	Tara Skeesuck	1	30	Yes
Capital	Prospect Elementary	Kit Shuman	1	30	No
Capital	Prospect Elementary	Alyssa Finley	1	30	No
Capital	Prospect Elementary	Stephanie Lewis	1	30	No
Capital	Prospect Elementary	Megan Yates	1	30	No
canyon	Purple Sage Elementary School	Jenna Oien	1	22	Yes
canyon	Purple Sage Elementary School	Melody Craw	1	22	Yes
canyon	Purple Sage Elementary School	Melissa McPherson	1	21	Yes
canyon	Purple Sage Elementary School	Madeline Laan	1	21	Yes
Western	Riggins Elementary School	Tracy Travis	1	9	No
Capital	Riverside Elementary School	Courtney Calhoun	1	25	No
Capital	Riverside Elementary School	Tara Leach	1	25	No
Southern	Rock Creek Elementary	Julie Delia	1	23	No
Southern	Rock Creek Elementary	Andy Arenz	1	25	No
Southern	Rock Creek Elementary	Pauli Connelly	1	23	No
Southern	Rock Creek Elementary	Barb Christensen	1	23	Yes
Eastern	Rockland Elementary School	Kristi Thomas	1	25	No
Canyon	Ronald Reagan Elementary School	Lisa Martell	1	26	Yes
Canyon	Ronald Reagan Elementary School	Sheryll Sharp	1	28	Yes
Canyon	Ronald Reagan Elementary School	Kelsey Rogers	1	26	Yes
Capital	Roosevelt Elementary School	Alicia Bradshaw	1	27	Yes
Capital	Roosevelt Elementary School	Elizabeth Mills	1	27	No
Canyon	Sacajawea Elementary School	Deborah Storey	1	24	No
Canyon	Sacajawea Elementary School	Penny Washburn	1	24	Yes
Canyon	Sacajawea Elementary School	Jennifer Howell	1	24	No
Capital	Sage International School of Boise	Jennifer Laird	1	26	Yes

Note: "T" represents number of teachers and "S" represents number of students

Participant List

(continued)

REGION	SCHOOL	TEACHER	T	S	SURVEYS RETURNED
Capital	Sage International School of Boise	Kadie Johnson	1	26	Yes
Capital	Sage International School of Boise	Angel Larson	1	26	Yes
Eastern	Salmon Middle/High School	Krystal Smith	1	36	No
Western	Shadow Butte Elementary School	Amberlea Doyle	1	28	No
Western	Shadow Butte Elementary School	Melissa Stringfield	1	27	No
Capital	Shadow Hills Elementary School	Christy Schwehr	1	32	Yes
Capital	Shadow Hills Elementary School	Shannon Cullen	1	32	Yes
Canyon	Sherman Elementary School	Tyler Keefe	1	35	Yes
Canyon	Sherman Elementary School	Kenneth Moore	1	35	Yes
Canyon	Sherman Elementary School	Jennifer Jensen	1	35	Yes
Canyon	Sherman Elementary School	Josephine Fisher	1	25	Yes
Canyon	Sherman Elementary School	Jennifer Castricone	1	24	No
Canyon	Sherman Elementary School	Meribeth Mathews	1	23	No
Capital	Silver Sage Elementary School	Lisa Jimenez	1	24	Yes
Capital	Silver Sage Elementary School	Ashley Rowe	1	27	No
Canyon	Silver Trail Elementary School	Justine Burgess	1	27	Yes
Canyon	Silver Trail Elementary School	Dan Blitman	1	28	Yes
Canyon	Silver Trail Elementary School	Dan Hoehne	1	29	Yes
Canyon	Snake River Elementary	Heather Packer	1	27	Yes
Canyon	Snake River Elementary	Lindsey Strong	1	27	Yes
Canyon	Snake River Elementary	Matea Schindel	1	26	Yes
Capital	Star Elementary School	Candy Franscella	1	29	Yes
Capital	Star Elementary School	Carmi Scheller	1	29	No
Capital	Star Elementary School	Angela Fulkerson	1	29	No
Eastern	Stoddard Elementary School	Kimberly Buck	1	27	No
Eastern	Stoddard Elementary School	Hallie Snyder	1	27	Yes
Eastern	Stoddard Elementary School	Alicia Cody	1	27	Yes
Southern	Summit Elementary School	Kimberly Wallace	1	28	Yes
Southern	Summit Elementary School	Tracy Park	1	28	Yes
Southern	Summit Elementary School	Audra Thompson	1	28	Yes
Southern	Summit Elementary School	Maggie Stump	1	28	Yes
Southern	Summit Elementary School	Trisha Neudorff	1	28	No
Southern	Summit Elementary School	Michele Putnam	1	28	Yes
Southern	Summit Elementary School	Keyli Gonzalez	1	28	Yes
Southern	Summit Elementary School	Jorma Fletcher	1	28	Yes

Note: "T" represents number of teachers and "S" represents number of students

Participant List

(continued)

REGION	SCHOOL	TEACHER	T	S	SURVEYS RETURNED
Southern	Summit Elementary School	Todd Lakey	1	28	No
Southern	Summit Elementary School	Stacey Lakey	1	28	Yes
Southern	Summit Elementary School	Anne Winder	1	28	Yes
Southern	Summit Elementary School	Brad Winder	1	28	Yes
Eastern	Syringa Elementary School	Aubrey Eldredge	1	24	No
Eastern	Syringa Elementary School	Cindel Vasquez	1	21	Yes
Eastern	Syringa Elementary School	Andrea Gulden	1	21	No
Capital	Taft Elementary School	Jessica Rose	1	28	No
Capital	Taft Elementary School	Sarah Wright	1	28	Yes
Eastern	Tendoy Elementary	Diana Son	1	29	Yes
Eastern	Tendoy Elementary	Cody Perry	1	23	Yes
Capital	Trail Wind Elementary School	Chris Dinter	1	32	Yes
Capital	Trail Wind Elementary School	Lora Bushee	1	32	Yes
Capital	Trail Wind Elementary School	Judy Swain	1	32	Yes
Capital	Trail Wind Elementary School	Patti Wiseman-Adams	1	32	Yes
Eastern	Tyhee Elementary School	Jayne Johnson	1	26	Yes
Eastern	Tyhee Elementary School	Stefani Mitchell	1	27	No
Eastern	Tyhee Elementary School	Amy Hoesman	1	27	No
Capital	Valley View Elementary School	Meko Myers	1	25	Yes
Capital	Valley View Elementary School	Shawna Hiller	1	27	Yes
Canyon	Vision Charter School	Debra McDorman	1	30	No
Canyon	Vision Charter School	Andrea Martindale	1	32	No
Eastern	Wapello Elementary School	LaNae Porter	1	18	Yes
Eastern	Wapello Elementary School	Kristine Schnittgen	1	20	Yes
Capital	Washington Elementary	Jerad Relk	1	23	No
Capital	Washington Elementary	Maddie Johnson	1	23	Yes
Canyon	Washington Elementary School	Jalene Gilbert	1	27	Yes
Canyon	Washington Elementary School	Heather Mueller	1	27	Yes
Canyon	Washington Elementary School	Chris Wilcox	1	27	Yes
Canyon	Washington Elementary School	Tyler Maryon	1	25	Yes
Canyon	Washington Elementary School	Jan Damron	1	20	Yes
Canyon	Washington Elementary School	Teresa O'Toole	1	20	Yes
Canyon	West Canyon Elementary	Amy Ellis	1	25	Yes
Canyon	West Canyon Elementary	K'Ann Sanchez	1	25	Yes

Note: "T" represents number of teachers and "S" represents number of students

Participant List

(continued)

REGION	SCHOOL	TEACHER	T	S	SURVEYS RETURNED
Canyon	West Canyon Elementary	Brittany Woodworth	1	26	Yes
Canyon	West Canyon Elementary	Octavio Dario	1	26	Yes
Canyon	West Middle School	Michelle DiPaula	1	80	Yes
Canyon	West Middle School	Melissa Ross	1	25	Yes
Canyon	West Middle School	Kristin Lira	1	80	No
Canyon	West Middle School	Veronica Maple	1	80	No
Canyon	West Middle School	Megan Kotter	1	80	Yes
Western	Westside Elementary School	Shauna Bain	1	28	Yes
Western	Westside Elementary School	Danielle Hayes	1	28	Yes
Western	Westside Elementary School	Paula McElroy	1	28	Yes
Western	Westside Elementary School	Sarah Nesbitt	1	28	Yes
Western	Westside Elementary School	Amy Brownell	1	28	Yes
Capital	Whitney Elementary School	Eden Rodriguez	1	33	Yes
Capital	Whitney Elementary School	Kayden Tague	1	28	Yes
Capital	Whitney Elementary School	Tasha Crowell	1	29	No
Eastern	William Thomas Middle School	Jamie Clark	1	122	Yes
Canyon	Willow Creek Elementary School	Nick Channer	1	27	Yes
Canyon	Willow Creek Elementary School	Kim Chierici	1	27	Yes
Canyon	Willow Creek Elementary School	Nicole Gibbs	1	27	Yes
Canyon	Willow Creek Elementary School	Kayla Stone	1	27	Yes
Canyon	Wilson Elementary School	Debbie Peterson	1	28	Yes
Canyon	Wilson Elementary School	Melissa Langan	1	28	Yes
Canyon	Wilson Elementary School	Sandra Otero	1	28	Yes
		TOTALS	332	9,107	
		TOTAL PARTICIPANTS	9,439		
TOTAL PARTICIPATING 2017-2018 TEACHERS		332	213	64%	YES
			119	36%	NO
TOTAL STUDENT SURVEYS RETURNED		5,252			
TOTAL INCENTIVE PAID OUT		$20,100			
FULL YEAR SURVEY RETURN PERCENTAGE		58%			

Note: "T" represents number of teachers and "S" represents number of students

Teacher Program Evaluation Data

	Total	Capital	Canyon	Eastern	Southern	Western
Participants	332	93	102	44	50	43
Surveys Received	159	34	64	25	20	16
Percent Response	48%	37%	63%	57%	40%	37%

		Number	Percent
1	The materials were clearly written and well organized.		
	Strongly Agree	113	71%
	Agree	45	28%
	Disagree	0	0%
	Strongly Disagree	1	1%
2	The products in the Kit were easy for students to use.		
	Strongly Agree	93	58%
	Agree	62	39%
	Disagree	4	3%
	Strongly Disagree	0	0%
3	Students indicated that their parents supported the program.		
	Yes	147	95%
	No	8	5%
4	Would you conduct this Program again?		
	Yes	158	99%
	No	1	1%
5	Would you recommend this program to other colleagues?		
	Yes	158	99%
	No	1	1%
6	If my school is eligible for participation next year, I would like to enroll.		
	Yes	157	99%
	No	2	1%

Due to rounding of numbers, percentages may not add up to 100%

Parent/Guardian Program Evaluation Data

	Total	Capital	Canyon	Eastern	Southern	Western
Participants	9,439	2,678	3,067	1,212	1,408	1,074
Surveys Received	92	32	27	12	8	13
Percent Response	1.0%	1.2%	0.9%	1.0%	0.6%	1.2%

Total Parent Responses **92**

		Number	Percent
1	Was the Program easy for you and your child to use?		
	Yes	92	100%
	No	0	0%
2	Will you continue to use the Kit items after the completion of the Program?		
	Yes	91	99%
	No	1	1%
3	Would you like to see this Program continued in local schools?		
	Yes	89	97
	No	3	3%

Due to rounding of numbers, percentages may not add up to 100%

RESOURCE**ACTION**
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