



An IDACORP Company



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SUPPLEMENT 1: COST EFFECTIVENESS

TABLE OF CONTENTS

- Supplement 1: Cost-Effectiveness1
- Cost-Effectiveness.....1
- Methodology.....2
- Assumptions.....3
- Conservation Adder6
- Net-to-Gross.....6
- Results.....7
- 2018 DSM Detailed Expenses by Program10
- Cost-Effectiveness Tables by Program14
- Educational Distributions.....14
- Energy Efficient Lighting.....16
- Energy House Calls.....18
- Heating & Cooling Efficiency Program.....20
- Multifamily Energy Savings Program23
- Rebate Advantage26
- Residential New Construction Pilot Program.....28
- Shade Tree Project30
- Simple Steps, Smart Savings™31
- Weatherization Assistance for Qualified Customers.....33
- Weatherization Solutions for Eligible Customers.....34
- Commercial Energy-Saving Kits35
- Custom Projects37
- New Construction40
- Retrofits45
- Irrigation Efficiency Rewards54

List of Tables

Table 1. 2018 non-cost-effective measures	10
Table 2. 2018 DSM detailed expenses by program (dollars).....	11
Table 3. Cost-effectiveness of 2018 programs by B/C test.....	14

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 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

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

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

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

Measure Name	Measure Descriptions	Replacing	Measure Unit	End Use	Measure Life (yrs) ^a	Benefit			Cost			B/C Tests		Source
						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	
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

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

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

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

Measure Name	Measure Descriptions	Replacing	Measure Unit	End Use	Measure Life (yrs) ^a	Benefit			Cost			B/C Tests		Source
						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	
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

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

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.

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

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%

Year: 2018

Program: Energy House Calls

Market Segment: Residential

Program Type: Energy Efficiency

Measure Name	Measure Descriptions	Replacing	Measure Unit	End Use	Measure Life (yrs) ^a	Benefit			Cost			B/C Tests		Source
						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	
PTCS Duct Sealing	Manufactured Home Prescriptive Duct Sealing - Electric FAF - Heating Zone 1	Pre-existing duct leakage	Home	Residential-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-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-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-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

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

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

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

Measure Name	Measure Descriptions	Replacing	Measure Unit	End Use	Measure Life (yrs) ^a	Benefit			Cost			B/C Tests		Source
						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	
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

Measure Name	Measure Descriptions	Replacing	Measure Unit	End Use	Measure Life (yrs) ^a	Benefit			Cost			B/C Tests		Source
						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	
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. ResSFEExistingHVAC_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. ResMHEExistingHVAC_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

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.

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%

Year: 2018

Program: Multifamily Energy Savings Program

Market Segment: Residential

Program Type: Energy Efficiency

Measure Name	Measure Descriptions	Replacing	Measure Unit	End Use	Measure Life (yrs) ^a	Benefit			Cost			B/C Tests		Source
						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	
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

Measure Name	Measure Descriptions	Replacing	Measure Unit	End Use	Measure Life (yrs) ^a	Benefit			Cost			B/C Tests		Source
						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	
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- 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

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

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

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

Measure Name	Measure Descriptions	Replacing	Measure Unit	End Use	Measure Life (yrs) ^a	Benefit			Cost			B/C Tests		Source
						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	
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

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

Notes: 2012 International Energy Conservation Code (IECC) with amendments adopted in Idaho in 2014.

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

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%

Year: 2018 Program: Residential New Construction Pilot Program Market Segment: Residential Program Type: Energy Efficiency

Measure Name	Measure Descriptions	Replacing	Measure Unit	End Use	Measure Life (yrs) ^a	Benefit			Cost			B/C Tests		Source
						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	
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

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

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

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

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

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

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

Measure Name	Measure Descriptions	Replacing	Measure Unit	End Use	Measure Life (yrs) ^a	Benefit			Cost			B/C Tests		Source
						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	
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

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

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

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

Measure Name	Measure Descriptions	Replacing	Measure Unit	End Use	Measure Life (yrs) ^a	Benefit			Cost			B/C Tests		Source
						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	
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

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

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

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

Measure Name	Measure Descriptions	Replacing	Measure Unit	End Use	Measure Life (yrs) ^a	Benefit			Cost			B/C Tests		Source
						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	
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			Cost			B/C Tests		Source
						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	
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))

^h 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

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

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

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

Measure Name	Measure Descriptions	Replacing	Measure Unit	End Use	Measure Life (yrs) ^a	Benefit			Cost			B/C Tests		Source
						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	
Lighting	Interior Light Load Reduction. Part A: 10-19.9% below code.	Code standards	ft ²	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	ft ²	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	ft ²	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	ft ²	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

Measure Name	Measure Descriptions	Replacing	Measure Unit	End Use	Measure Life (yrs) ^a	Benefit			Cost			B/C Tests		Source
						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	
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

Measure Name	Measure Descriptions	Replacing	Measure Unit	End Use	Measure Life (yrs) ^a	Benefit			Cost			B/C Tests		Source
						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	
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

Measure Name	Measure Descriptions	Replacing	Measure Unit	End Use	Measure Life (yrs) ^a	Benefit			Cost			B/C Tests		Source
						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	
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

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

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

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

Measure Name	Measure Descriptions	Replacing	Measure unit	End Use	Measure Life (yrs) ^a	Benefit			Cost			B/C Tests		Source
						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	
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

Measure Name	Measure Descriptions	Replacing	Measure unit	End Use	Measure Life (yrs) ^a	Benefit			Cost			B/C Tests		Source
						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	
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

Measure Name	Measure Descriptions	Replacing	Measure unit	End Use	Measure Life (yrs) ^a	Benefit			Cost			B/C Tests		Source
						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	
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

Measure Name	Measure Descriptions	Replacing	Measure unit	End Use	Measure Life (yrs) ^a	Benefit			Cost			B/C Tests		Source
						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	
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

Measure Name	Measure Descriptions	Replacing	Measure unit	End Use	Measure Life (yrs) ^a	Benefit			Cost			B/C Tests		Source
						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	
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 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

Measure Name	Measure Descriptions	Replacing	Measure unit	End Use	Measure Life (yrs) ^a	Benefit			Cost			B/C Tests		Source
						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	
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 <= 1/4 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 > 1/4 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			Cost			B/C Tests		Source
						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	
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

Measure Name	Measure Descriptions	Replacing	Measure unit	End Use	Measure Life (yrs) ^a	Benefit			Cost			B/C Tests		Source
						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	
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

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

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

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

Measure Name ^a	Measure Descriptions	Replacing	Measure Unit	End Use	Measure Life (yrs) ^b	Benefit			Cost			B/C Tests		Sources
						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	
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))

ⁱ 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

Measure Name	Measure Descriptions	Replacing	Measure Unit	End Use	Measure Life (yrs) ^a	Benefit			Cost			B/C Tests		Source
						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	
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

Measure Name	Measure Descriptions	Replacing	Measure Unit	End Use	Measure Life (yrs) ^a	Benefit			Cost			B/C Tests		Source
						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	
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.

