



20
21

DEMAND-SIDE
MANAGEMENT

ANNUAL
REPORT

SUPPLEMENT 1
COST-EFFECTIVENESS

MARCH 15 **2022**

SAFE HARBOR STATEMENT

This document may contain forward-looking statements, and it is important to note that the future results could differ materially from those discussed. A full discussion of the factors that could cause future results to differ materially can be found in Idaho Power's filings with the Securities and Exchange Commission.



Printed on recycled paper

TABLE OF CONTENTS

Supplement 1: Cost-Effectiveness	1
Cost-Effectiveness.....	1
Methodology	2
Assumptions	3
Conservation Adder.....	5
Net-to-Gross	6
Results	6
Cost-Effectiveness Tables by Program	14
Educational Distributions	14
Energy House Calls	16
Heating & Cooling Efficiency Program	18
Home Energy Report	21
Rebate Advantage	22
Residential New Construction Program.....	24
Shade Tree Project.....	26
Weatherization Assistance for Qualified Customers	27
Weatherization Solutions for Eligible Customers	28
Commercial Energy-Saving Kits	29
Custom Projects.....	31
New Construction.....	34
Retrofits	40
Small Business Direct Install	49
Irrigation Efficiency Rewards	50

LIST OF TABLES

Table 1. 2021 non-cost-effective measures 8

Table 2. 2021 DSM detailed expenses by program (dollars)..... 10

Table 3. Cost-effectiveness of 2021 programs by benefit/cost test..... 13

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.

Prior to the actual implementation of energy efficiency or demand response programs, Idaho Power performs a preliminary analysis to assess whether a potential program design or measure may be cost-effective. 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 (RETAC), the Consortium for Energy Efficiency (CEE), American Council for an Energy-Efficient Economy (ACEEE), and Advanced Load Control Alliance (ALCA) 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 utility cost test (UCT) in Idaho, and the total resource cost (TRC) test in Oregon, at the program and measure level. In addition, Idaho Power looks at both the UCT and TRC, as well as the 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. In 2020, Idaho Power transitioned to the UCT as the primary cost-effectiveness test in Idaho as directed by the Idaho Public Utilities Commission (IPUC) in Order Nos. 34469 and 34503. The company will continue calculating the TRC and PCT because each perspective can help inform the company and stakeholders about the effectiveness of a particular program or measure. Additionally, programs and measures offered in Oregon must still use the TRC as the primary cost-effectiveness test as directed by the Public Utility Commission of Oregon (OPUC) in Order No. 94-590.

Idaho Power uses several assumptions when calculating the cost-effectiveness of a given program or measure. For some measures within the programs, savings can vary based on factors, such as participation levels or the participants' locations. For instance, heat pumps installed in the Boise area will have lower savings than those installed in the McCall area because of climate differences. If program participation and savings increase, fixed costs (such as labor and marketing) are distributed more broadly, and the program's cost-effectiveness increases.

When an existing program or measure is not cost-effective from either the UCT perspective in Idaho or the TRC perspective in Oregon, Idaho Power works with the Energy Efficiency Advisory Group (EEAG) to get additional input about next steps. The company must demonstrate why a non-cost-effective measure or program was implemented, or continued to be offered, and communicate the steps the company plans to take to improve its cost-effectiveness. This aligns with the expectations of the IPUC and OPUC.

In OPUC Order No. 94-590, issued in 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 offered in Oregon pass the TRC test. 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.

Non-cost-effective measures and programs may be offered by a utility if they meet one or more of the following additional conditions specified by Section 13 of OPUC 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 demand-side management (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

For operational and administrative efficiency, Idaho Power endeavors to offer identical programs in both its Oregon and Idaho jurisdictions; however, due to the different primary cost-effectiveness tests in each state, measures may not be offered in both states.

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*.

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 2021 dollars. The result of the one-year perspective is shown in Table 3 and the Cost-Effectiveness Tables by Program section in this supplement.

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 deployable demand-reduction capacity for the company.

As approved in IPUC Order No. 32923 and OPUC Order No. 13-482, the settlement agreement determined a specific methodology for valuing demand response and defined the annual value of operating the three demand response programs for the maximum allowable 60 hours to be no more than \$16.7 million. This value has been updated with each *Integrated Resource Plan* (IRP) based on changes to the assumed capital cost of the deferred resource and the financial assumptions. This amount was reevaluated from information in the 2015, 2017, 2019 *Second Amended*, and 2021 IRPs to be \$18.5, \$19.8, \$19.6, and \$21.3 million respectively. In addition, for each IRP cycle the company has reevaluated the effectiveness of its demand response resources in meeting system needs. As a result of the analysis completed in preparation for the 2021 IRP, the company identified changes necessary for the demand response programs to meet evolving system needs. These changes were approved in IPUC No. 35336 (IPC-E-21-32) and OPUC ADV 1355, will supersede the terms of the 2013 settlement agreement, and include a different cost-effectiveness methodology that Idaho Power will rely on going forward.

In 2021, the cost of operating the three demand response programs was \$8.3 million. Idaho Power estimates that if the three programs were dispatched for the full 60 hours, the total costs would have been approximately \$11.1 million and would have remained cost-effective under the settlement agreement methodology

Assumptions

Idaho Power relies on third-party research 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 residential and irrigation measures within this supplement, savings and costs were derived from either the Regional Technical Forum (RTF) or the *Idaho Power Energy Efficiency Potential Study* conducted by Applied Energy Group (AEG).

The RTF regularly reviews, evaluates, and recommends eligible energy efficiency measures and provides the estimated savings and costs associated with those measures. As the RTF updates these savings and cost 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 2021 dollars. The costs are escalated by 14.9%, which is the percentage provided by the RTF in workbook RTFStandardInformationWorkbook_v4_5.xlsx.

Idaho Power uses a technical reference manual (TRM) developed by ADM Associates, Inc. for the savings and cost assumptions in the Commercial and Industrial (C&I) Energy Efficiency Program's New Construction and Retrofits options. In 2020, the company began the process to update the assumptions

in the TRM based on the 2018 International Energy Conservation Code (IECC). The updated TRM will be the source for most prescriptive savings values for the New Construction and Retrofits in the C&I Energy Efficiency program and have been implemented as of mid-2021.

Idaho Power also relies on other sources for savings and cost assumptions, 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 a code changes, a 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 in the *Demand-Side Management 2021 Annual Report*. Generally, the 2021 energy savings reported for most programs will use the assumptions set at the beginning of the year.

The remaining inputs used in the cost-effectiveness models are obtained from the IRP process. Idaho Power's 2019 Second Amended IRP was acknowledged by the IPUC under case IPC-E-19-19 on March 16, 2021 and with the OPUC under case LC 74 on June 4, 2021. Because the 2019 Second Amended IRP was not acknowledged at the time of the 2021 DSM program planning, Idaho Power had shared with EEAG its intent to use updated avoided costs based on the 2017 IRP for the 2021 program year.

Appendix C—Technical Appendix of Idaho Power's 2017 IRP contains the financial assumptions, such as discount rate, escalation rate and line losses, used in the cost-effectiveness analysis. DSM avoided costs vary by season and time of day and are applied to an end-use load shape to obtain the value of a particular measure or program. DSM avoided energy costs are based on both the projected fuel costs of a peak-load serving resource and forward electricity prices as determined by Idaho Power's power supply model, AURORA[®] Electric Market Model. The avoided capital cost of capacity is based on a gas-fired, simple-cycle turbine. In the 2017 IRP, the annual avoided capacity cost is \$122 per kilowatt (kW). Transmission and distribution (T&D) benefits are also included in the cost-effectiveness analyses. In compliance with Order No. 33365, this value is escalated and added to the 2017 DSM avoided energy costs and included in the cost-effectiveness analysis for 2021. Idaho Power plans to begin using the financial assumptions from the 2019 Second Amended IRP for program year 2022 with the above updates.

As recommended by the NAEF's *Understanding Cost-Effectiveness of Energy Efficiency Programs*, Idaho Power's weighted average cost of capital (WACC) of 6.74% is used to discount future benefits and costs to today's dollars. Once the DSM avoided 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 test 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 participants. Because the participant benefit is based on the anticipated bill savings of the

customer, Idaho Power believes an alternate discount rate in place of the WACC is appropriate.

The participant bill savings are based on Idaho Power's 2021 average customer segment rate, and are not escalated. The participant bill savings are discounted using a real discount rate of 4.54%. The 4.54% is based on the 2017 IRP's WACC of 6.74% and an escalation rate of 2.1%. 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 2021 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 system line-loss factor is 9.6% while the summer peak line-loss factor is 9.7%.

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 nonconservation 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% 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% conservation adder when calculating the cost-effectiveness of all their DSM programs." Staff recommended the utilities have the option to use a 10% adder, and the IPUC agreed with the recommendation to allow utilities to use the 10% 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% 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* as a ratio that does the following:

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% for nearly all measure and program cost-effectiveness analyses.

Sensitivity analyses are conducted to show what the minimum NTG percentage needs to be for a program to remain (or become) cost-effective from either the TRC or UCT perspective. These NTG percentages are shown in the program cost-effectiveness pages of this supplement.

Results

Idaho Power calculates cost-effectiveness on a program basis and, where relevant, a measure basis. As part of *Supplement 1: Cost-Effectiveness* and where applicable, Idaho Power publishes the cost-effectiveness by measure, the PCT and RIM test at the program level, the assumptions associated with cost-effectiveness, and the 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, Home Energy Report Program, Multifamily Energy Savings Program, Small Business Direct Install, Weatherization Assistance for Qualified Customers (WAQC), and Weatherization Solutions for Eligible Customers programs. These programs have few or no participant-related costs. For energy efficiency programs, the cost-effectiveness models do not assume ongoing participant costs.

This supplement contains annual cost-effectiveness metrics for each program using actual information from 2021 and includes results of the UCT, TRC, PCT, and RIM. Current 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 2021, most of Idaho Power's energy efficiency programs were cost-effective from the UCT perspective, except for Energy House Calls, Home Energy Report Program, Small Business Direct Install, and the two weatherization programs for income-qualified customers.

Energy House Calls has UCT and TRC ratios of 0.43 and 0.50 respectively. The program's cost-effectiveness was impacted by the updated savings assumptions coupled with the suspension of in-home visits due to COVID-19 from March 2020 through November 2021. Going forward, the program faces additional cost-effectiveness challenges as the savings assumptions for duct sealing, LED lightbulbs, showerheads, and faucet aerators have declined or have been deactivated by the RTF. Because the program would have likely remained cost-effective in 2020 had in-home work not been suspended, Idaho Power will continue to work through the homes that remain on the waitlist. Idaho Power will continue to work with stakeholders, including EEAG, to determine the best course of action in 2022.

The Home Energy Report Program has a UCT of 0.57 and TRC of 0.62. Due to the continuous nature of the HER program with costs and savings extending numerous years for the same participants, a program life-cycle cost-effectiveness is utilized to understand the cost-effectiveness of the offering. The program life cost-effectiveness is calculated to have a UCT of 0.87 and TRC of 0.96. The main drivers contributing to the lower cost-effectiveness ratios are the relatively short measure life of the reports and realized savings coming in lower than initially expected. Idaho Power plans to evaluate the program in 2022 and will continue to work with the vendor to improve the program's overall cost-effectiveness.

Small Business Direct Install achieved a UCT of 0.99 and TRC of 1.54. The cost-effectiveness ratios include the costs associated with the 2020 process evaluation which was completed in 2021. If the evaluation costs are removed, the UCT and TRC ratios for the program are 1.00 and 1.55, respectively. Idaho Power will continue to monitor the program's cost-effectiveness as it expands the offering to the Capital and Canyon-West regions of the service area in 2022.

WAQC had a TRC of 0.31 and a UCT ratio of 0.19, and Weatherization Solutions for Eligible Customers had a TRC of 0.28 and a UCT ratio of 0.15. To calculate the cost-effectiveness for the income-qualified weatherization programs, Idaho Power adopted the following IPUC staff recommendations from Case No. GNR E-12-01:

- Applied a 100% NTG.
- Claimed 100% of energy savings for each project.
- Included indirect administrative overhead costs. The overhead costs of 3.381% were calculated from the \$1,296,605 of indirect program expenses divided by the total DSM expenses of \$38,353,505 as shown in Appendix 3 of the *Demand-Side Management 2021 Annual Report*.
- Applied the 10% 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.

While the WAQC and Weatherization Solutions for Eligible Customers remain not cost-effective, unless the Idaho and Oregon commission directs otherwise, Idaho Power will continue to offer the programs to the company's limited-income customers on an ongoing basis. Idaho Power will also

continue to consult with EEAG and the weatherization managers at the Community Action Partnerships to look for ways to improve the cost-effectiveness of the programs.

The sector cost-effectiveness ratios include all the benefits and costs associated with programs that produce quantifiable energy savings. The portfolio cost-effectiveness is the sum of all energy efficiency activities, including those that do not have savings associated, such as overhead expenses. For 2021, the commercial and industrial sector had a UCT of 2.74 and TRC of 1.46, and irrigation sector had a UCT of 3.33 and TRC of 4.49. The residential and portfolio cost-effectiveness was calculated with and without the benefits associated with WAQC, which is funded through base rates and not through the energy efficiency rider. While the program provides real savings to customers that would otherwise be unable to afford to weatherize their home, it remains not cost-effective. Presenting the cost-effectiveness of the residential sector with and without WAQC remains consistent with how other Idaho utilities present their sector and portfolio cost-effectiveness results. Without WAQC, the residential sector has a UCT of 1.02 and TRC of 0.74 and the portfolio has a UCT of 2.17 and TRC of 2.18. With WAQC, the residential sector has a UCT of 0.80 and TRC of 0.63 and the portfolio has a UCT of 2.08 and TRC of 2.13.

One hundred two out of 272 individual measures in various programs are not cost-effective from either the UCT or TRC perspective. Of the 102 measures, 24 are not cost-effective from the UCT perspective. Eight of those measures are associated with the direct-install programs that had in-home activity suspended due to COVID-19 restrictions.

These measures have B/C ratios below one due to some administration costs still being incurred to maintain the program while in-home activity was suspended. For most of the measures offered in Oregon that fail the TRC, 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 UM-1710 or with the specific program advice filings. The filings and exception requests are noted in Table 1.

Table 1. 2021 non-cost-effective measures

Program	Number of Measures	Number Fail UCT	Notes
Energy House Calls	8	8	Program impacted by the suspension of in-home activity due to COVID-19 restrictions. Offering will be modified in 2022 due to cost-effectiveness. Exception requested for the program under UM 1710.
Heating & Cooling Efficiency	10	5	Program to be modified in 2022 to incorporate updated savings assumptions, new measures, and recommendations from the 2021 evaluation. Cost-effectiveness exception request for ductless heat pump 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 thermostats requested and approved with OPUC Advice No. 17-09.

Program	Number of Measures	Number Fail UCT	Notes
Rebate Advantage	10	0	All measures pass UCT. One measure would be cost-effective with a TRC 1.21 without the inclusion of administration costs. Meets OPUC Order No. 94-590, Section 10. Exception request for the program requested and approved with UM-1710, Order No. 21-079.
Custom Projects	4	3	One measure passes UCT and fail TRC. Would be cost-effective with a TRC of 1.01 without the inclusion of administration costs. Meets OPUC Order No. 94-590, Section 10. One Cohort offering fails UCT and TRC but would be cost-effective without administration costs. One Cohort offering would be cost-effective from the program-lifecycle perspective. One Cohort offering failed cost-effectiveness but participation led to a large cost-effective capital project.
New Construction and Retrofits	2	1	One measure passes UCT and fails TRC. Offered in Idaho only. One measure fails UCT with ratio of 0.89. Measure only offered in Idaho and will be monitored in 2022.
New Construction	18	2	Sixteen measures pass UCT and fail TRC. Offered in Idaho only. Two measures fail UCT with ratios of 0.92 and 0.89. Measures offered in Idaho only and will be monitored in 2022.
Retrofits	44	1	Forty-three measures pass UCT and fail TRC. Of those, thirty-nine are offered in Idaho only. The three measures that are offered in Idaho and Oregon, the measures pass the TRC without the inclusion of admin costs. Meets OPUC Order No. 94-590, Section 10. One Oregon only measure fails TRC. Measure is included to increase participation in a cost-effective program. Meets OPUC Order No. 94-590 Section 13. Exception D. One Idaho only measure fails UCT with ratio of 0.91. Measure would be cost-effective without the inclusion of admin costs with a UCT of 1.15.
Irrigation Efficiency Rewards	6	4	Several measures fail either the UCT, TRC, or both. Program to be modified in 2022 with updated savings assumptions. Measures expected to become cost-effective or removed from the program offering.
Total	102	24	

The following tables list the annual program cost-effectiveness results including measure-level cost-effectiveness. Exceptions to the measure-level tables are programs that are analyzed at the project level such as: the Custom Projects option of the C&I Energy Efficiency Program, the Custom Incentive option of Irrigation Efficiency Rewards, Small Business Direct Install, WAQC, and Weatherization Solutions for Eligible Customers.

The measure-level cost-effectiveness includes the following inputs: measure life, energy savings, incremental cost, incentives, program administration cost, and non-energy impacts/benefits.

Program administration costs include all non-incentive costs such as: labor, marketing, training, education, purchased services, and evaluation. Energy and expense data have been rounded to the nearest whole unit.

2021 DSM Detailed Expenses by Program

Included in this supplement is a detailed breakout of program expenses shown in Appendix 2 of the *Demand-Side Management 2021 Annual Report*. These expenses are broken out by funding source and major-expense type (labor/administration, materials, other expenses, purchased services, and incentives).

Table 2. 2021 DSM detailed expenses by program (dollars)

Sector/Program	Idaho Rider	Oregon Rider	Idaho Power	Total Program
Energy Efficiency Total	\$ 20,699,788	\$ 1,017,538	\$ 1,380,241	\$ 23,097,567
Residential Total	2,849,542	71,773	1,335,554	4,256,869
Easy Savings: Low-Income Energy Efficiency Education...	—	—	145,827	145,827
Labor/Administrative Expense.....	—	—	20,341	20,341
Materials and Equipment	—	—	125,000	125,000
Other Expense	—	—	486	486
Educational Distributions	433,963	15,826	—	449,790
Labor/Administrative Expense.....	18,730	992	—	19,722
Materials and Equipment	367,089	12,370	—	379,459
Other Expense	(5,295)	(279)	—	(5,574)
Purchased Services.....	53,440	2,743	—	56,183
Energy Efficient Lighting	41,438	2,194	—	43,631
Labor/Administrative Expense.....	17,688	944	—	18,631
Purchased Services.....	23,750	1,250	—	25,000
Energy House Calls.....	17,375	882	—	18,257
Labor/Administrative Expense.....	7,585	419	—	8,004
Other Expense	4,412	463	—	4,875
Purchased Services.....	5,378	—	—	5,378
Heating & Cooling Efficiency Program.....	600,636	34,522	25	635,182
Incentives	333,092	20,825	—	353,917
Labor/Administrative Expense.....	133,905	7,048	—	140,953
Materials and Equipment	110	6	—	116
Other Expense	59,164	3,384	25	62,573
Purchased Services.....	74,364	3,259	—	77,623
Home Energy Audit.....	70,448	—	—	70,448
Labor/Administrative Expense.....	52,309	—	—	52,309
Materials and Equipment	1,706	—	—	1,706
Other Expense	8,999	—	—	8,999
Purchased Services.....	7,433	—	—	7,433
Home Energy Report Program	970,197	—	—	970,197
Incentives	935,315	—	—	935,315
Labor/Administrative Expense.....	22,406	—	—	22,406
Other Expense	12,475	—	—	12,475
Multifamily Energy Savings Program	65,525	3,449	—	68,973
Labor/Administrative Expense.....	9,929	523	—	10,451
Materials and Equipment	54,693	2,879	—	57,572
Other Expense	903	48	—	950
Oregon Residential Weatherization	—	4,595	—	4,595
Labor/Administrative Expense.....	—	3,217	—	3,217
Other Expense	—	1,378	—	1,378
Rebate Advantage.....	164,243	8,950	—	173,193
Incentives	84,000	4,000	—	88,000
Labor/Administrative Expense.....	55,141	2,903	—	58,044
Materials and Equipment	—	—	—	—
Other Expense	8,502	1,247	—	9,749
Purchased Services.....	16,600	800	—	17,400
Residential New Construction Program	246,245	1,356	—	247,600
Incentives	156,000	—	—	156,000
Labor/Administrative Expense.....	71,985	—	—	71,985

Sector/Program	Idaho Rider	Oregon Rider	Idaho Power	Total Program
Materials and Equipment	0	–	–	0
Other Expense	18,260	1,356	–	19,615
Shade Tree Project	184,680	–	–	184,680
Labor/Administrative Expense.....	52,680	–	–	52,680
Purchased Services	132,000	–	–	132,000
Weatherization Assistance for Qualified Customers.....	–	–	1,186,839	1,186,839
Labor/Administrative Expense.....	–	–	69,352	69,352
Other Expense	–	–	53	53
Purchased Services	–	–	1,117,434	1,117,434
Weatherization Solutions for Eligible Customers.....	54,793	–	2,863	57,656
Labor/Administrative Expense.....	(0)	–	2,863	2,863
Other Expense	53	–	–	53
Purchased Services	54,740	–	–	54,740
Commercial/Industrial Total	15,499,626	724,242	9,630	16,233,498
Commercial Energy-Saving Kits	71,501	3,117	–	74,617
Labor/Administrative Expense.....	11,315	606	–	11,921
Materials and Equipment	46,767	2,511	–	49,278
Purchased Services	13,419	–	–	13,419
Custom Projects	7,966,164	633,110	9,630	8,608,903
Incentives	6,286,416	543,210	–	6,829,625
Labor/Administrative Expense.....	350,102	17,925	9,630	377,656
Materials and Equipment	834	44	–	878
Other Expense	286,903	18,716	–	305,618
Purchased Services	1,041,910	53,216	–	1,095,126
New Construction	2,673,925	17,246	–	2,691,171
Incentives	2,302,217	2,903	–	2,305,120
Labor/Administrative Expense.....	178,197	9,459	–	187,656
Other Expense	5,027	265	–	5,292
Purchased Services	188,483	4,620	–	193,103
Retrofits	3,735,093	91,657	–	3,826,750
Incentives	2,984,164	52,474	–	3,036,638
Labor/Administrative Expense.....	108,644	5,749	–	114,393
Materials and Equipment	933	49	–	982
Other Expense	1,336	70	–	1,406
Purchased Services	640,016	33,314	–	673,331
Small Business Direct Install	1,052,943	(20,887)	–	1,032,056
Labor/Administrative Expense.....	19,541	1,061	–	20,602
Other Expense	11,521	606	–	12,127
Purchased Services	1,021,882	(22,555)	–	999,327
Irrigation	2,350,620	221,523	35,057	2,607,200
Irrigation Efficiency Rewards	2,350,620	221,523	35,057	2,607,200
Incentives	1,992,972	202,622	–	2,195,594
Labor/Administrative Expense.....	312,657	16,563	35,057	364,277
Materials and Equipment	4,808	274	–	5,082
Other Expense	39,126	2,059	–	41,185
Purchased Services	1,057	5	–	1,061
Market Transformation Total	2,828,794	148,884	–	2,977,678
NEAA	2,828,794	148,884	–	2,977,678
Purchased Services	2,828,794	148,884	–	2,977,678

Sector/Program	Idaho Rider	Oregon Rider	Idaho Power	Total Program
Other Program and Activities Total	\$ 2,583,383	\$ 130,997	\$ (3)	\$ 2,714,377
Commercial/Industrial Energy Efficiency Overhead	742,155	39,474	(3)	781,626
Labor/Administrative Expense	640,186	34,291	—	674,477
Other Expense	78,299	3,938	(3)	82,234
Purchased Services	23,670	1,246	—	24,916
Energy Efficiency Direct Program Overhead	279,095	16,987	—	296,082
Labor/Administrative Expense	278,133	14,671	—	292,804
Other Expense	962	2,316	—	3,278
Oregon Commercial Audit	—	4,401	—	4,401
Labor/Administrative Expense	—	1,021	—	1,021
Other Expense	—	630	—	630
Purchased Services	—	2,750	—	2,750
Residential Energy Efficiency Education Initiative	470,432	12,635	—	483,067
Labor/Administrative Expense	69,498	3,664	—	73,163
Materials and Equipment	190,694	3,413	—	194,107
Other Expense	121,074	3,923	—	124,997
Purchased Services	89,166	1,634	—	90,800
Residential Energy Efficiency Overhead	1,091,701	57,501	—	1,149,202
Labor/Administrative Expense	209,908	11,091	—	220,998
Other Expense	859,376	45,230	—	904,607
Purchased Services	22,417	1,180	—	23,597
Indirect Program Expenses Total	\$ 1,070,419	\$ 56,143	\$ 170,043	\$ 1,296,605
Energy Efficiency Accounting and Analysis	1,043,916	54,802	170,043	1,268,761
Labor/Administrative Expense	388,154	20,472	158,494	567,120
Other Expense	28,241	1,486	11,548	41,275
Purchased Services	627,521	32,844	—	660,365
Energy Efficiency Advisory Group	10,479	552	—	11,031
Labor/Administrative Expense	841	45	—	886
Other Expense	9,638	507	—	10,145
Special Accounting Entries	16,024	789	—	16,814
Special Accounting Entry	16,024	789	—	16,814
Demand Response Total	\$ 760,713	\$ 367,528	\$ 7,139,037	\$ 8,267,278
Residential Total	420,376	25,366	306,247	751,989
A/C Cool Credit	420,376	25,366	306,247	751,989
Incentives	—	3,652	306,247	309,899
Labor/Administrative Expense	78,126	4,136	—	82,262
Materials and Equipment	(44,370)	(2,335)	—	(46,705)
Other Expense	27,625	1,454	—	29,079
Purchased Services	358,995	18,459	—	377,454
Commercial/Industrial Total	101,236	175,121	225,617	501,973
Flex Peak Program	101,236	175,121	225,617	501,973
Incentives	—	169,756	225,617	395,372
Labor/Administrative Expense	85,053	4,514	—	89,566
Other Expense	16,183	852	—	17,035
Irrigation Total	239,101	167,041	6,607,173	7,013,315
Irrigation Peak Rewards	239,101	167,041	6,607,173	7,013,315
Incentives	—	154,482	6,601,114	6,755,596

Sector/Program	Idaho Rider	Oregon Rider	Idaho Power	Total Program
Labor/Administrative Expense.....	74,046	3,912	6,059	84,016
Materials and Equipment	46,677	2,457	–	49,134
Other Expense	33,536	1,765	–	35,301
Purchased Services	84,842	4,425	–	89,267
Grand Total	\$ 27,943,096	\$ 1,721,091	\$ 8,689,318	\$ 38,353,505

Note: Totals may not add up due to rounding.

Table 3. Cost-effectiveness of 2021 programs by benefit/cost test

Program/Sector	UCT	TRC	RIM	PCT
Educational Distributions	2.39	3.10	0.44	N/A
Energy House Calls	0.43	0.50	0.23	N/A
Heating & Cooling Efficiency Program	1.14	0.36	0.38	0.84
Home Energy Report Program ¹	0.57	0.62	0.24	N/A
Multifamily Energy Savings Program ²	N/A	N/A	N/A	N/A
Rebate Advantage	1.13	0.66	0.35	1.97
Residential New Construction Pilot Program	1.64	0.99	0.43	2.13
Shade Tree Project.....	1.07	1.21	0.48	N/A
Weatherization Assistance for Qualified Customers	0.19	0.31	0.14	N/A
Weatherization Solutions for Eligible Customers	0.15	0.28	0.12	N/A
Residential Energy Efficiency Sector³.....	1.02	0.74	0.35	2.61
Commercial Energy-Saving Kits	1.64	2.00	0.55	N/A
Custom Projects	2.98	1.32	0.91	1.35
New Construction.....	2.98	2.70	0.67	3.72
Retrofits.....	2.53	1.27	0.64	1.70
Small Business Direct Install	0.99	1.54	0.46	N/A
Commercial/Industrial Energy Efficiency Sector⁴.....	2.74	1.46	0.77	1.76
Irrigation Efficiency Rewards	3.32	4.49	0.88	4.58
Irrigation Energy Efficiency Sector⁵.....	3.33	4.49	0.88	4.58
Energy Efficiency Portfolio⁶.....	2.17	2.18	0.70	2.73

¹ Cost-effectiveness based on 2021 savings and expenses. Cost-effectiveness ratios also calculated for the program life-cycle. Program life-cycle UCT and TRC 0.87 and 0.96, respectively.

² In-home work suspended for most of 2021 due to COVID-19. No savings reported for 2021.

³ Residential sector cost-effectiveness excludes WAQC benefits and costs. If included, the UCT, TRC, RIM, and PCT would be 0.80, 0.63, 0.32, and 2.41, respectively.

⁴ Commercial/Industrial Energy Efficiency Sector cost-effectiveness ratios include savings and participant costs from Green Motors Rewinds.

⁵ Irrigation Energy Efficiency Sector cost-effectiveness ratios include savings and participant costs from Green Motors Rewinds.

⁶ Portfolio cost-effectiveness excludes WAQC benefits and costs. If included, the CT, TRC, RIM, and PCT would be 2.08, 2.13, 0.69, and 2.72 respectively.

COST-EFFECTIVENESS TABLES BY PROGRAM

Educational Distributions

Segment: Residential
2021 Program Results

Cost Inputs				Ref
Program Administration	\$	449,790		
Program Incentives.....		–		I
Total UC	\$	449,790		P
Measure Equipment and Installation (Incremental Participant Cost)	\$	–		M
Net Benefit Inputs (NPV)				Ref
Resource Savings				
2021 Annual Gross Energy (kWh)		2,931,280		
NPV Cumulative Energy (kWh)		25,080,544	\$	1,074,116 S
10% Credit (Northwest Power Act).....				107,412
Total Electric Savings	\$	1,181,527		A
Participant Bill Savings				
NPV Cumulative Participant Bill Savings	\$	\$2,014,350		B
Other Benefits				
Non-Utility Rebates/Incentives.....	\$	–		NUI
NEBs	\$	214,848		NEB

Notes: Energy savings as reported by the Franklin Energy for the 2020 to 2021 student kits.
NEBs for giveaway bulbs, welcome kit bulbs, and energy-saving kits include PV of periodic lightbulb replacement costs.
NEBs for student kit include the NPV of therm savings.
No participant costs.

Summary of Cost-Effectiveness Results						
Test		Benefit		Cost	Ratio	
UC Test.....		\$	1,074,116	\$	449,790	2.39
TRC Test			1,396,376		449,790	3.10
RIM Test.....			1,074,116		2,464,139	0.44
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				4.54%		
Escalation Rate				2.10%		
Net-to-Gross (NTG).....				100%		
Minimum NTG Sensitivity.....				42%		
Average Customer Segment Rate/kWh.....				\$0.085		
Line Losses.....				9.60%		

Year: 2021

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/ Notes
						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	
Student Energy Efficiency Kit (SEEK) Program	2020-2021 kit offering. Kits include: high efficiency showerhead, showertimer, 3 LEDs, FilterTone alarm, digital thermometer, LED nightlight.	No kit	Kit	IPC_Student Kits	9	174.08	\$58.02	\$9.15	–	–	\$0.075	4.44	5.59	1
Welcome Kit (Lightbulb only kit)	2 - 250 to 1049 lumen General Purpose bulbs 2 - 1490 to 2600 lumen General Purpose bulb 1 - LED night light	No kit	Kit	IPC_Welcome Kit	12	22.86	\$9.68	\$3.21	–	–	\$0.389	1.09	1.56	2
Nightlight Give away	LED night light	baseline bulb	Lamp	IPC_Nightlight	10	12.00	\$4.25	–	–	–	\$0.042	8.43	9.27	3

^a Average measure life.

^b Estimated kWh savings measured at the customer's meter, excluding line losses.

^c NPV of DSM avoided costs. Based on end-use load shape, measure life, savings including line losses, and avoided costs by pricing period as acknowledged in the 2017 Integrated Resource Plan. 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 2021 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 Franklin Energy. 2020-2021. Idaho Power Energy Wise Program Summary Report. 2021. Savings calculated from kit surveys.

² RTF. ResLighting_Bulbs_v8_2.xlsm. 2020.

³ DNV GL. Idaho Power Educational Distributions Impact and Process Evaluation. 2020.

Energy House Calls

Segment: Residential
2021 Program Results

Cost Inputs			Ref
Program Administration	\$ 18,257		
Program Incentives.....	—	I	
Total UC	\$ 18,257	P	
Measure Equipment and Installation (Incremental Participant Cost)	\$ —	M	
Net Benefit Inputs (NPV)			Ref
Resource Savings			
2021 Annual Gross Energy (kWh)	14,985		
NPV Cumulative Energy (kWh)	185,113	\$ 7,880	S
10% Credit (Northwest Power Act).....		788	
Total Electric Savings	\$ 8,668	A	
Participant Bill Savings			
NPV Cumulative Participant Bill Savings.....	\$ 15,803	B	
Other Benefits			
Non-Utility Rebates/Incentives.....	\$ —	NUI	
NEBs	\$ 416	NEB	

Notes: NEBs include PV of periodic bulb replacement costs for direct-install LED bulbs.
NEBs for faucet aerators include the NPV of water and waste water savings.
No participant costs.

Summary of Cost-Effectiveness Results			
Test	Benefit	Cost	Ratio
UC Test.....	\$ 7,880	\$ 18,257	0.43
TRC Test	9,085	18,257	0.50
RIM Test.....	7,880	34,060	0.23
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			4.54%
Escalation Rate			2.10%
Net-to-Gross (NTG)			100%
Minimum NTG Sensitivity.....			231%
Average Customer Segment Rate/kWh			\$0.085
Line Losses.....			9.60%

Year: 2021

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/ Notes
						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-Manufactured Home Idaho -Heating-All	18	972.81	\$507.86	–	–	–	\$1.218	0.43	0.47	1, 2
PTCS Duct Sealing	Manufactured Home Prescriptive Duct Sealing - Electric FAF - Heating Zone 2 or 3	Pre-existing duct leakage	Home	Residential-Manufactured Home Idaho -Heating-All	18	1,248.19	\$651.62	–	–	–	\$1.218	0.43	0.47	1, 2
PTCS Duct Sealing	Manufactured Home Prescriptive Duct Sealing - Heat Pump - Heating Zone 1	Pre-existing duct leakage	Home	Residential-Manufactured Home Idaho -Heating-All	18	615.06	\$321.09	–	–	–	\$1.218	0.43	0.47	1, 2
PTCS Duct Sealing	Manufactured Home Prescriptive Duct Sealing - Heat Pump - Heating Zone 2 or 3	Pre-existing duct leakage	Home	Residential-Manufactured Home Idaho -Heating-All	18	875.72	\$457.17	–	–	–	\$1.218	0.43	0.47	1, 2
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	5.65	\$2.39	\$2.89	–	–	\$1.218	0.35	0.80	2, 3
Low-flow faucet aerator	Direct install. Kitchen. Manufactured Home. Electric Resistance Hot Water.	non- low flow faucet aerator	Aerator	Residential-All-Water Heating-Water Heater	10	59.38	\$21.43	\$56.77	–	–	\$1.218	0.30	1.11	2, 4
Low-flow faucet aerator	Direct install. Bathroom. Manufactured Home. Electric Resistance Hot Water.	non- low flow faucet aerator	Aerator	Residential-All-Water Heating-Water Heater	10	39.92	\$14.41	\$45.91	–	–	\$1.218	0.30	1.27	2, 4
Water heater pipe covers	Up to 6 feet.	no existing coverage	Pipe wrap	Residential-All-Water Heating-Water Heater	10	74.81	\$27.00	–	–		\$1.218	0.30	0.33	2, 5

^a Average measure life.

^b Estimated kWh savings measured at the customer's meter, excluding line losses.

^c NPV of DSM avoided costs. Based on end-use load shape, measure life, savings including line losses, and avoided costs by pricing period as acknowledged in the 2017 Integrated Resource Plan. TRC Test Benefit calculation includes 10% conservation adder from the Northwest Power Act.

^d Average program administration and overhead costs to achieve each kWh of savings. Calculated from 2021 actuals.

^e UCT Ratio = (NPV DSM Avoided Costs) / ((Admin Cost/kWh * kWh Savings) + Incentives)

^f TRC Ratio = ((NPV DSM Avoided Costs * 110%) + NEB) / ((Admin Cost/kWh * kWh Savings) + Incentives + (Incremental Participant Cost - Incentives))

^g RTF. ResMH PerformanceDuctSeal_v3_0.xlsm. 2015.

^h Measure not cost-effective. Program and measures not cost-effective due to some administration costs incurred while the program was suspended due to COVID-19 restrictions. Offering will be modified in 2022.

ⁱ RTF. ResLighting_Bulbs_v8_2.xlsm. 2020.

^j RTF. Aerators_v1_1.xlsm. 2018.

^k AEG. Potential Study. 2020.

Heating & Cooling Efficiency Program

Segment: Residential
2021 Program Results

Cost Inputs				Ref
Program Administration	\$	281,265		
Program Incentives		353,917	I	
Total UC	\$	635,182	P	
Measure Equipment and Installation (Incremental Participant Cost)	\$	1,942,560	M	
Net Benefit Inputs (NPV)				Ref
Resource Savings				
2021 Annual Gross Energy (kWh)		1,365,825		
NPV Cumulative Energy (kWh)		15,236,675	\$	725,884 S
10% Credit (Northwest Power Act)		72,588		
Total Electric Savings	\$	798,472	A	
Participant Bill Savings				
NPV Cumulative Participant Bill Savings	\$	1,272,783	B	
Other Benefits				
Non-Utility Rebates/Incentives	\$	–	NUI	
NEBs	\$	–	NEB	

Summary of Cost-Effectiveness Results			
Test	Benefit	Cost	Ratio
UC Test	\$ 725,884	\$ 635,182	1.14
TRC Test	798,472	2,223,826	0.36
RIM Test	725,884	1,907,966	0.38
PCT	1,626,700	1,942,560	0.84

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	4.54%
Escalation Rate	2.10%
Net-to-Gross (NTG)	100%
Minimum NTG Sensitivity	n/a
Average Customer Segment Rate/kWh	\$0.085
Line Losses	9.60%

Note: 2021 cost-effectiveness ratios include evaluation expenses. If evaluation expense were removed from the program's cost-effectiveness, the UCT and TRC would be 1.19 and 0.36, respectively.

Year: 2021

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/ Notes
						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	4,279.98	\$2,164.16	–	\$5,799.01	\$800.00	\$0.222	1.24	0.35	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	587.09	\$296.86	–	\$199.21	\$250.00	\$0.222	0.78	0.99	1, 2, 3, 5
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	584.06	\$295.33	–	\$210.36	\$250.00	\$0.222	0.78	0.96	1, 2, 3, 5
Open-Loop Heat Pump	Open loop water source heat pump for existing 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	9,786.76	\$6,083.99	–	\$18,063.09	\$1,000.00	\$0.222	1.92	0.33	4, 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	8,353.94	\$5,193.27	–	\$18,713.58	\$1,000.00	\$0.222	1.82	0.28	4, 6
Ductless Heat Pump	Zonal to DHP. (Heating & Cooling Zone Weighted Average)	Zonal Electric	Unit	Residential-All-Heating-Air-Source Heat Pump	15	1,384.29	\$699.96	–	\$4,468.50	\$750.00	\$0.222	0.66	0.16	1, 4, 13
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	1,517.11	\$678.67	–	\$875.54	\$300.00	\$0.222	1.07	0.62	4, 7
Evaporative Cooler	Evaporative Cooler	Central Air Conditioning	Unit	Residential-Single Family Idaho-Cooling-All	12	1,471.00	\$1,172.25	–	\$253.58	\$150.00	\$0.222	2.46	2.22	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	905.82	\$518.14	–	\$725.69	\$350.00	\$0.222	0.94	0.61	4, 9, 14
Electronically Commutated Motor (ECM) Blower Motor	ECM Blower Motor	permanent split capacitor (PSC) motor	Unit	IPC_ECM	18	2,855.13	\$1,625.30	–	\$300.00	\$50.00	\$0.222	2.38	1.91	10
Whole-House Fan	Whole-House Fan	Displaced forced air dx cooling	Unit	Residential-Single Family Idaho-Cooling-All	18	445.60	\$514.96	–	\$700.00	\$200.00	\$0.222	1.72	0.71	4, 10

Supplement 1: Cost-Effectiveness

Measure Name	Measure Descriptions	Replacing	Measure Unit	End Use	Measure Life (yrs) ^a	Benefit			Cost			B/C Tests		Source/ Notes
						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 Thermostat	Smart Thermostat	non wi-fi enabled thermostat/no thermostat	Unit	Residential-Single Family Idaho -Heating-All	5	576.43	\$92.24	—	\$138.64	\$75.00	\$0.222	0.45	0.38	11, 12

^a Average measure life.

^b Estimated kWh savings measured at the customer's meter, excluding line losses.

^c NPV of DSM avoided costs. Based on end-use load shape, measure life, savings including line losses, and avoided costs by pricing period as acknowledged in the 2017 Integrated Resource Plan. 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 2021 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. ResSF&MHExistingHVAC_v5_1.xlsx. Weighted average of 2021 participants in heating and cooling zones 1-3.

² RTF. ResHeatingCoolingCommissioningControlsSizingSF_v3_6.xlsx. Weighted average of 2021 participants in heating and cooling zones 1-3.

³ RTF. ResMHHeatingCoolingCommissioningControlsSizing_v3_4.xlsx. Weighted average of 2021 participants in heating and cooling zones 1-3.

⁴ Measure not cost-effective from TRC perspective.

⁵ Measure UTC and TRC cost-effective without inclusion of admin costs.

⁶ RTF. ResGSHP_v2_7. 2016. Weighted average of 2021 participants in heating and cooling zones 1-3.

⁷ ResHPWH_v5_3.xlsx. 2021. Measure cost-effective without inclusion of admin costs.

⁸ New Mexico Technical Resource Manual for the Calculation of Energy Efficiency Savings. Evaporative Cooling. Santa Fe. 2019.

⁹ RTF. ResSFDuctSealing_v5_1.xlsx. 2019.

¹⁰ Idaho Power engineering calculations based on Integrated Design Lab inputs. 2015.

¹¹ RTF. ResConnectedTstats_v1.3.xlsx. 2018

¹² Measure not cost-effective. Measure is being piloted and will be monitored in 2022.

¹³ Measure not cost-effective from UCT and TRC. Will be monitored in 2022.

¹⁴ Measure UCT cost-effective without inclusion of admin costs.

Home Energy Report

Segment: Residential
2021 Program Results

Program Year 2021 Cost Inputs			Ref
Program Administration	\$	\$970,197	
Program Incentives		–	I ₂₀₂₁
Total UC	\$	\$970,197	P ₂₀₂₁
Measure Equipment and Installation (Incremental Participant Cost)	\$	–	M ₂₀₂₁
Program Life Cost Inputs (2020–2026)			Ref
NPV Program Administration	\$	3,395,048	
NPV Program Incentives		–	I _{all}
NPV Total UC	\$	3,395,048	P _{all}
Measure Equipment and Installation (Incremental Participant Cost)	\$	–	M _{all}
Program Year 2021 Benefit Inputs			Ref
Resource Savings			
2021 Annual Gross Energy (kWh)	15,929,074	\$ 550,396	S ₂₀₂₁
10% Credit (Northwest Power Act)		55,040	
Total Electric Savings	\$	605,436	A ₂₀₂₁
Participant Bill Savings			
NPV Cumulative Participant Bill Savings	\$	1,355,947	B ₂₀₂₁
Other Benefits			
Non-Utility Rebates/Incentives	\$	–	NUI ₂₀₂₁
NEBs	\$	–	NEB ₂₀₂₁
Net Benefit Inputs (2020–2026)			Ref
Resource Savings			
NPV Cumulative Energy (kWh) 2020–2026	79,941,382	\$ 2,966,644	S _{all}
10% Credit (Northwest Power Act)		296,664	
Total Electric Savings	\$	3,263,308	A _{all}
Participant Bill Savings			
NPV Cumulative Participant Bill Savings	\$	6,207,155	B _{all}
Other Benefits			
Non-Utility Rebates/Incentives	\$	–	NUI _{all}
NEBs	\$	–	NEB _{all}

Summary of Cost-Effectiveness Results Program Year 2021

Test	Benefit	Cost	Ratio
UC Test	\$ 550,396	\$ 970,197	0.57
TRC Test	605,436	970,197	0.62
RIM Test	550,396	2,326,144	0.24
PCT	N/A	N/A	N/A

Summary of Cost-Effectiveness Results Program Life (2020–2026)

Test	Benefit	Cost	Ratio
UC Test	\$ 2,966,644	\$ 3,395,048	0.87
TRC Test	3,263,308	3,395,048	0.96
RIM Test	2,966,644	9,602,203	0.31
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	4.54%
Escalation Rate	2.10%
Net-to-Gross (NTG)	100%
Minimum NTG Sensitivity (2021)	176%
Minimum NTG Sensitivity (2020–2026)	114%
Average Customer Segment Rate/kWh	\$0.085
Line Losses	9.60%

Note: 2021 savings as reported by Aclara is 16,666,871 kWh. Idaho Power discounting savings by 5% for reporting and analysis as recommended by evaluators to account for potential double-counting of savings. Percentage will be reviewed in future evaluations

Rebate Advantage

Segment: Residential
2021 Program Results

Cost Inputs				Ref
Program Administration	\$	85,193		
Program Incentives		88,000	I	
Total UC	\$	173,193	P	
Measure Equipment and Installation (Incremental Participant Cost)	\$	241,996	M	
Net Benefit Inputs (NPV)				Ref
Resource Savings				
2021 Annual Gross Energy (kWh)	235,004			
NPV Cumulative Energy (kWh)	3,981,837	\$	196,114	S
10% Credit (Northwest Power Act)			19,611	
Total Electric Savings		\$	215,726	A
Participant Bill Savings				
NPV Cumulative Participant Bill Savings	\$	389,162	B	
Other Benefits				
Non-Utility Rebates/Incentives	\$	—	NUI	
NEBs	\$	—	NEB	

Summary of Cost-Effectiveness Results

Test	Benefit	Cost	Ratio
UC Test	\$ 196,114	\$ 173,193	1.13
TRC Test	215,726	327,190	0.66
RIM Test	196,114	562,355	0.35
PCT	477,162	241,996	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	4.54%
Escalation Rate	2.10%
Net-to-Gross (NTG)	100%
Minimum NTG Sensitivity	276%
Average Customer Segment Rate/kWh	\$0.085
Line Losses	9.60%

Year: 2021

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/ Notes
						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_Heating Zone (HZ) 1_Cooling Zone (CZ) 3	Manufactured home built to Housing and Urban Development (HUD) code.	Home	Residential-Manufactured Home Idaho -Heating-All	45	2,070.80	\$1,728.11	–	\$2,888.68	\$1,000.00	\$0.288	1.08	0.55	1,2
ENERGY STAR manufactured home	Estar_electric_HZ2_CZ1	Manufactured home built to HUD code.	Home	Residential-Manufactured Home Idaho -Heating-All	45	3,020.26	\$2,520.45	–	\$2,888.68	\$1,000.00	\$0.288	1.35	0.74	1,2
ENERGY STAR manufactured home	Estar_electric_HZ2_CZ2	Manufactured home built to HUD code.	Home	Residential-Manufactured Home Idaho -Heating-All	45	3,022.11	\$2,522.00	–	\$2,888.68	\$1,000.00	\$0.288	1.35	0.74	1,2
ENERGY STAR manufactured home	Estar_electric_HZ2_CZ3	Manufactured home built to HUD code.	Home	Residential-Manufactured Home Idaho -Heating-All	45	3,024.85	\$2,524.28	–	\$2,888.68	\$1,000.00	\$0.288	1.35	0.74	1,2
ENERGY STAR manufactured home	Estar_electric_HZ3_CZ1	Manufactured home built to HUD code.	Home	Residential-Manufactured Home Idaho -Heating-All	45	3,819.13	\$3,187.12	–	\$2,888.68	\$1,000.00	\$0.288	1.52	0.88	1,2,3
Northwest Energy Efficient Manufactured (NEEM) home	NEEM_electric_HZ1_CZ3	Manufactured home built to HUD code.	Home	Residential-Manufactured Home Idaho -Heating-All	43	2,612.39	\$2,147.58	–	\$4,723.31	\$1,000.00	\$0.288	1.23	0.43	1,2
NEEM home	NEEM_electric_HZ2_CZ1	Manufactured home built to HUD code.	Home	Residential-Manufactured Home Idaho -Heating-All	43	3,733.25	\$3,069.01	–	\$4,723.31	\$1,000.00	\$0.288	1.48	0.58	1,2
NEEM home	NEEM_electric_HZ2_CZ2	Manufactured home built to HUD code.	Home	Residential-Manufactured Home Idaho -Heating-All	43	3,735.67	\$3,071.00	–	\$4,723.31	\$1,000.00	\$0.288	1.48	0.58	1,2
NEEM home	NEEM_electric_HZ2_CZ3	Manufactured home built to HUD code.	Home	Residential-Manufactured Home Idaho -Heating-All	43	3,739.15	\$3,073.87	–	\$4,723.31	\$1,000.00	\$0.288	1.48	0.58	1,2
NEEM home	NEEM_electric_HZ3_CZ1	Manufactured home built to HUD code.	Home	Residential-Manufactured Home Idaho -Heating-All	44	4,679.39	\$3,876.58	–	\$4,723.31	\$1,000.00	\$0.288	1.65	0.70	1,2

^a Average measure life.

^b Estimated kWh savings measured at the customer's meter, excluding line losses.

^c NPV of DSM avoided costs. Based on end-use load shape, measure life, savings including line losses, and avoided costs by pricing period as acknowledged in the 2017 Integrated Resource Plan. 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 2021 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. NewMHNHomesandHVAC_v4_2.xlsm. 2021.

² Measure not cost-effective from TRC perspective.

³ Measure cost-effective without inclusion of admin costs.

Residential New Construction Program

Segment: Residential
2021 Program Results

Cost Inputs				Ref
Program Administration	\$	91,600		
Program Incentives.....		156,000	I	
Total UC.....	\$	247,600	P	
Measure Equipment and Installation (Incremental Participant Cost)	\$	433,276	M	
Net Benefit Inputs (NPV)				Ref
Resource Savings				
2021 Annual Gross Energy (kWh).....		389,748		
NPV Cumulative Energy (kWh)	6,844,616	\$	406,537	S
10% Credit (Northwest Power Act).....		40,654		
Total Electric Savings.....	\$	447,191	A	
Participant Bill Savings				
NPV Cumulative Participant Savings.....	\$	696,826	B	
Other Benefits				
Non-Utility Rebates/Incentives.....	\$	—	NUI	
NEBs	\$	70,511	NEB	

Notes: 2018 International Energy Conservation Code (IECC) with amendments adopted in Idaho in 2021.

Summary of Cost-Effectiveness Results				
Test		Benefit	Cost	Ratio
UC Test.....	\$	406,537	\$ 247,600	1.64
TRC Test		517,702	524,876	0.99
RIM Test.....		406,537	944,427	0.43
PCT		923,337	433,276	2.13
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				4.54%
Escalation Rate				2.10%
Net-to-Gross (NTG).....				100%
Minimum NTG Sensitivity.....				61%
Average Customer Segment Rate/kWh				\$0.085
Line Losses.....				9.60%

Year: 2021

Program: Residential New Construction 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/ Notes
						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	
Next Step Home	Next Step Home - average per home savings.	Home built to International Energy Conservation Code 2018 Code. Adopted 2021.	Home	Residential-All-Heating-Air-Source Heat Pump	61	4,330.53	\$4,517.07	\$783.46	\$4,814.17	\$1,733.33	\$0.235	1.64	0.99	1

^a Average measure life.

^b Estimated kWh savings measured at the customer's meter, excluding line losses.

^c NPV of DSM avoided costs. Based on end-use load shape, measure life, savings including line losses, and avoided costs by pricing period as acknowledged in the 2017 Integrated Resource Plan. 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 2021 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 NEEA circuit rider code enforcement initiative. 2021 average per home savings. Costs and NEBs from RTF: RESNCMTHouse_ID_v3_1_.xlsx. 2019.

Shade Tree Project

Segment: Residential
2021 Program Results

Cost Inputs			Ref
Program Administration	\$	184,680	
Program Incentives.....		–	I
Total UC.....	\$	184,680	P
Measure Equipment and Installation (Incremental Participant Cost)	\$	–	M
Net Benefit Inputs (NPV)			Ref
Resource Savings			
2021 Annual Gross Energy (kWh) from 2013–2017 plantings...	44,173		
Cumulative Energy (kWh) from 2021 plantings.....	4,553,126		
NPV Cumulative Energy (kWh)	1,129,418	\$	158,983 S
10% Credit (Northwest Power Act).....			15,898
Total Electric Savings.....	\$	174,881	A
Participant Bill Savings			
NPV Cumulative Participant Bill Savings	\$	181,155	B
Other Benefits			
Non-Energy Impacts (Therms).....	\$	(24,516)	NEI
NEBs	\$	36,863	NEB

Summary of Cost-Effectiveness Results			
Test	Benefit	Cost	Ratio
UC Test.....	\$ 197,139	\$ 184,680	1.07
TRC Test	223,316	184,680	1.21
RIM Test.....	197,139	409,312	0.48
PCT	N/A	N/A	N/A

Benefits and Costs Included in Each Test			
UC Test.....	= S * NTG		= P
TRC Test	= ((A + NEI) * NTG)+NEB		= 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	4.54%
Escalation Rate	2.10%
Net-to-Gross (NTG).....	124%
Minimum NTG Sensitivity	116%
Average Customer Segment Rate/kWh	\$0.085
Line Losses.....	9.60%

Note: Annual report shows incremental savings from the 2013 - 2017 planting years. Cost-effectiveness based on the trees distributed in 2021 to coincide with the 2021 financials.
Net-to-gross factor of 124% applied to energy savings and therm impacts to account for trees shading neighboring homes per evaluator's recommendation.
Trees distributed in 2021 via the mail are approximately 1 year younger than trees distributed at in person events. Expected savings impact shifted out one year to account for the smaller trees.
NEIs include costs associated with increased home heating energy. Other NEBs associated with air quality, stormwater runoff, and carbon dioxide.

Weatherization Assistance for Qualified Customers

Segment: Residential
2021 Program Results

Cost Inputs			Ref
Program Administration	\$ 159,934		
Community Action Partnership (CAP) Agency Payments	905,302		
Total UC	\$ 1,065,236	P	
Accruals/Reversal of Carryover Dollars	121,603		
Total Program Expenses	1,186,839		
Idaho Power Indirect Overhead Expense Allocation—3.381%	\$ 36,016	OH	
Additional State Funding	503,313	M	
Net Benefit Inputs (NPV)			Ref
Resource Savings			
2021 Annual Gross Energy (kWh)	291,105		
NPV Cumulative Energy (kWh)	4,472,044	\$ 210,273	S
10% Credit (Northwest Power Act)	21,027		
Total Electric Savings	\$ 231,301	A	
Participant Bill Savings			
NPV Cumulative Participant Bill Savings	\$ 410,555	B	
Other Benefits			
Non-Utility Rebates/Incentives	\$ —	NUI	
NEBs			
Health and Safety	\$ 245,255		
Repair	11,113		
Other	4,433		
NEBs Total	\$ 260,801	NEB	

Summary of Cost-Effectiveness Results			
Test	Benefit	Cost	Ratio
UC Test	\$ 210,273	\$ 1,101,252	0.19
TRC Test	492,102	1,604,565	0.31
RIM Test	210,273	1,511,806	0.14
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	4.54%
Escalation Rate	2.10%
Net-to-Gross (NTG)	100%
Minimum NTG Sensitivity	522%
Average Customer Segment Rate/kWh	\$0.085
Line Losses	9.60%

Notes: Savings based on a billing analysis of the 2016-2018 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
2021 Program Results

Cost Inputs			Ref
Program Administration	\$	7,892	
Weatherization LLC Payments		49,764	
Total Program Expenses/Total UC	\$	57,656	P
Idaho Power Indirect Overhead Expense Allocation—3.381%	\$	1,949	OH
Additional State Funding	—		M
Net Benefit Inputs (NPV)			Ref
Resource Savings			
2021 Annual Gross Energy (kWh)	12,591		
NPV Cumulative Energy (kWh)	193,427	\$ 9,095	S
10% Credit (Northwest Power Act)		909	
Total Electric Savings	\$	10,004	A
Participant Bill Savings			
NPV Cumulative Participant Bill Savings	\$	17,757	B
Other Benefits			
Non-Utility Rebates/Incentives	\$	—	NUI
NEBs			
Health and Safety		3,772	
Repair		—	
Other		2,894	
NEBs Total	\$	6,666	NEB

Notes: Savings based on a billing analysis of the 2016–2018 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.

Summary of Cost-Effectiveness Results			
Test	Benefit	Cost	Ratio
UC Test	\$ 9,095	\$ 59,605	0.15
TRC Test	16,670	59,605	0.28
RIM Test	9,095	77,363	0.12
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	4.54%
Escalation Rate	2.10%
Net-to-Gross (NTG)	100%
Minimum NTG Sensitivity	676%
Average Customer Segment Rate/kWh	\$0.085
Line Losses	9.60%

Commercial Energy-Saving Kits

Segment: Commercial
2021 Program Results

Cost Inputs			Ref
Program Administration	\$ 74,617		
Program Incentives	–	I	
Total UC	\$ 74,617	P	
Measure Equipment and Installation (Incremental Participant Cost)	\$ –	M	

Net Benefit Inputs (NPV)			Ref
Resource Savings			
2021 Annual Gross Energy (kWh)	296,751		
NPV Cumulative Energy (kWh)	2,714,110	\$ 122,634	S
10% Credit (Northwest Power Act)		12,263	
Total Electric Savings	\$ 134,897	A	
Participant Bill Savings			
NPV Cumulative Participant Bill Savings	\$ 147,260	B	
Other Benefits			
Non-Utility Rebates/Incentives	\$ –	NUI	
NEBs	\$ 14,660	NEB	

Summary of Cost-Effectiveness Results			
Test	Benefit	Cost	Ratio
UC Test	\$ 122,634	\$ 74,617	1.64
TRC Test	149,557	74,617	2.00
RIM Test	122,634	221,878	0.55
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	4.54%
Escalation Rate	2.10%
Net-to-Gross (NTG)	100%
Minimum NTG Sensitivity	61%
Average Customer Segment Rate/kWh	\$0.057
Line Losses	9.60%

Notes: NEBs include PV of periodic bulb replacement costs for direct-install LED bulbs and water, waste water, and therm savings from water-saving devices.

Supplement 1: Cost-Effectiveness

Year: 2021

Program: Commercial Energy-Saving Kits

Market Segment: Commercial

Program Type: Energy Efficiency

Measure Name						Benefit			Cost			B/C Tests		Source/Notes
						Annual Gross Energy Savings (kWh/yr) ^a	NPV DSM 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.	no kit	kit	IPC_Commercial Kit Restaurant	10	793.11	\$300.59	\$48.91	–	–	\$0.251	1.51	1.90	1
Retail Commercial Kit	2-9W LEDs, 2-8W LED BR30s, 1-bathroom aerator, 2-exit sign retrofit	no kit	kit	IPC_Commercial Kit Retail	11	214.51	\$89.49	\$9.68	–	–	\$0.251	1.66	2.00	1
Office Commercial Kit	2-9W LEDs, 2-bathroom aerators, 1-kitchen aerator, 2-exit sign retrofit, 1-advance power strip	no kit	kit	IPC_Commercial Kit Office	12	177.14	\$78.04	\$16.85	–	–	\$0.251	1.75	2.31	1

^a Average measure life.

^b Estimated kWh savings measured at the customer's meter, excluding line losses.

^c NPV of DSM avoided costs. Based on end-use load shape, measure life, savings including line losses, and avoided costs by pricing period as acknowledged in the 2017 Integrated Resource Plan. 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 2021 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 IPC analysis based on average hours of use by building type and varying electric water heat saturations. Hours of use from TRM. Electric water heat saturation from 2020 participant surveys.

Custom Projects

Segment: Industrial
2021 Program Results

Cost Inputs				Ref
Program Administration	\$	1,779,278		
Program Incentives		6,829,625	I	
Total UC	\$	8,608,903		P
Measure Equipment and Installation (Incremental Participant Cost)	\$	20,770,784	M	
Net Benefit Inputs (NPV)				Ref
Resource Savings				
2021 Annual Gross Energy (kWh)		53,728,267		
NPV Cumulative Energy (kWh)		548,905,116	\$	25,613,396 S
10% Credit (Northwest Power Act)		2,561,340		
Total Electric Savings	\$	28,174,736		A
Participant Bill Savings				
NPV Cumulative Participant Savings	\$	19,489,434	B	
Other Benefits				
Non-Utility Rebates/Incentives	\$	—	NUI	
NEBs	\$	1,666,311	NEB	

Summary of Cost-Effectiveness Results			
Test	Benefit	Cost	Ratio
UC Test	\$ 25,613,396	\$ 8,608,903	2.98
TRC Test	29,841,047	22,550,062	1.32
RIM Test	25,613,396	28,098,337	0.91
PCT	27,985,370	20,770,784	1.35

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	4.54%
Escalation Rate	2.10%
Net-to-Gross (NTG)	100%
Minimum NTG Sensitivity	54%
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.
NEB/impacts on a \$/kWh for each end-use. Based on 2019 impact evaluation of other C&I programs.
2021 cost-effectiveness ratios include evaluation expenses. If evaluation expense were removed from the program's cost-effectiveness, the UCT and TRC would be 2.99 and 1.33, respectively.

Supplement 1: Cost-Effectiveness

Year: 2021

Program: Custom Projects

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/ Notes
						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	7	525.20	\$132.07	\$—	\$143.71	\$15.00	\$0.031	4.22	0.91	1, 5
Green Motors Program Rewind: Motor size 20 HP	Green Motors Program Rewind: Motor size 20 HP	Standard rewind practice	Motor	MF_Motors	7	702.77	\$176.73	\$—	\$160.33	\$20.00	\$0.031	4.23	1.07	1
Green Motors Program Rewind: Motor size 25 HP	Green Motors Program Rewind: Motor size 25 HP	Standard rewind practice	Motor	MF_Motors	8	893.48	\$263.00	\$—	\$183.19	\$25.00	\$0.031	4.99	1.37	1
Green Motors Program Rewind: Motor size 30 HP	Green Motors Program Rewind: Motor size 30 HP	Standard rewind practice	Motor	MF_Motors	8	962.42	\$283.29	\$—	\$201.19	\$30.00	\$0.031	4.73	1.35	1
Green Motors Program Rewind: Motor size 40 HP	Green Motors Program Rewind: Motor size 40 HP	Standard rewind practice	Motor	MF_Motors	8	1,120.77	\$329.90	\$—	\$245.86	\$40.00	\$0.031	4.41	1.29	1
Green Motors Program Rewind: Motor size 50 HP	Green Motors Program Rewind: Motor size 50 HP	Standard rewind practice	Motor	MF_Motors	8	1,206.18	\$355.05	\$—	\$272.18	\$50.00	\$0.031	4.06	1.26	1
Green Motors Program Rewind: Motor size 60 HP	Green Motors Program Rewind: Motor size 60 HP	Standard rewind practice	Motor	MF_Motors	8	1,268.50	\$373.39	\$—	\$321.01	\$60.00	\$0.031	3.76	1.14	1
Green Motors Program Rewind: Motor size 75 HP	Green Motors Program Rewind: Motor size 75 HP	Standard rewind practice	Motor	MF_Motors	8	1,305.49	\$384.28	\$—	\$346.98	\$75.00	\$0.031	3.33	1.09	1
Green Motors Program Rewind: Motor size 100 HP	Green Motors Program Rewind: Motor size 100 HP	Standard rewind practice	Motor	MF_Motors	8	1,723.08	\$507.20	\$—	\$430.43	\$100.00	\$0.031	3.31	1.15	1
Green Motors Program Rewind: Motor size 125 HP	Green Motors Program Rewind: Motor size 125 HP	Standard rewind practice	Motor	MF_Motors	8	1,990.39	\$585.88	\$—	\$429.04	\$125.00	\$0.031	3.14	1.31	1
Green Motors Program Rewind: Motor size 150 HP	Green Motors Program Rewind: Motor size 150 HP	Standard rewind practice	Motor	MF_Motors	8	2,366.02	\$696.45	\$—	\$477.90	\$150.00	\$0.031	3.12	1.39	1
Green Motors Program Rewind: Motor size 200 HP	Green Motors Program Rewind: Motor size 200 HP	Standard rewind practice	Motor	MF_Motors	8	3,138.34	\$923.79	\$—	\$575.33	\$200.00	\$0.031	3.11	1.51	1
Green Motors Program Rewind: Motor size 250 HP	Green Motors Program Rewind: Motor size 250 HP	Standard rewind practice	Motor	MF_Motors	8	3,798.53	\$1,118.12	\$—	\$739.44	\$250.00	\$0.031	3.04	1.43	1
Green Motors Program Rewind: Motor size 300 HP	Green Motors Program Rewind: Motor size 300 HP	Standard rewind practice	Motor	MF_Motors	8	4,534.67	\$1,334.80	\$—	\$747.42	\$300.00	\$0.031	3.03	1.65	1
Green Motors Program Rewind: Motor size 350 HP	Green Motors Program Rewind: Motor size 350 HP	Standard rewind practice	Motor	MF_Motors	8	5,286.56	\$1,556.13	\$—	\$783.39	\$350.00	\$0.031	3.03	1.81	1

Measure Name	Measure Descriptions	Replacing	Measure Unit	End Use	Measure Life (yrs) ^a	Benefit			Cost			B/C Tests		Source/ Notes
						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	8	5,994.15	\$1,764.41	\$—	\$874.97	\$400.00	\$0.031	3.01	1.83	1
Green Motors Program Rewind: Motor size 450 HP	Green Motors Program Rewind: Motor size 450 HP	Standard rewind practice	Motor	MF_Motors	8	6,732.12	\$1,981.63	\$—	\$956.42	\$450.00	\$0.031	3.01	1.87	1
Green Motors Program Rewind: Motor size 500 HP	Green Motors Program Rewind: Motor size 500 HP	Standard rewind practice	Motor	MF_Motors	8	7,490.56	\$2,204.88	\$—	\$1,033.25	\$500.00	\$0.031	3.01	1.92	1
Green Motors Program Rewind: Motor size 600 HP	Green Motors Program Rewind: Motor size 600 HP	Standard rewind practice	Motor	MF_Motors	8	10,137.37	\$2,983.99	\$—	\$1,554.95	\$600.00	\$0.031	3.26	1.76	1
Green Motors Program Rewind: Motor size 700 HP	Green Motors Program Rewind: Motor size 700 HP	Standard rewind practice	Motor	MF_Motors	8	11,776.73	\$3,466.54	\$—	\$1,696.44	\$700.00	\$0.031	3.25	1.85	1
Green Motors Program Rewind: Motor size 800 HP	Green Motors Program Rewind: Motor size 800 HP	Standard rewind practice	Motor	MF_Motors	8	13,430.58	\$3,953.36	\$—	\$1,882.26	\$800.00	\$0.031	3.25	1.89	1
Green Motors Program Rewind: Motor size 900 HP	Green Motors Program Rewind: Motor size 900 HP	Standard rewind practice	Motor	MF_Motors	8	15,077.39	\$4,438.11	\$—	\$2,075.09	\$900.00	\$0.031	3.25	1.92	1
Green Motors Program Rewind: Motor size 1,000 HP	Green Motors Program Rewind: Motor size 1,000 HP	Standard rewind practice	Motor	MF_Motors	8	16,681.86	\$4,910.39	\$—	\$2,236.32	\$1,000.00	\$0.031	2.23	1.57	1
School Cohort 2020-2021	cohort workshop training	no change	participant	Commercial-School-Miscellaneous-All	1	4,556,394.00	\$155,790.20	\$—	\$155,470.89	\$90,916.29	\$0.031	0.67	0.58	2, 3
Wastewater Energy Efficiency Cohort	cohort workshop training	no change	participant	Industrial-Water & Wastewater-All-All	1	965.00	\$33.70	\$—	\$960.00	\$174.00	\$0.031	0.17	0.04	2, 4
Eastern Idaho Water Cohort	cohort workshop training	no change	participant	Industrial-Water & Wastewater-All-All	1	674,892.00	\$23,571.12	\$—	\$3,416.56	\$2,392.00	\$0.031	1.01	1.07	2
Municipal Water Supply Optimization Cohort	cohort workshop training	no change	participant	Industrial-Water & Wastewater-All-All	1	963,080.00	\$33,636.31	\$—	\$26,591.57	\$18,448.00	\$0.031	0.70	0.66	2, 3, 5

^a Average measure life.

^b Estimated kWh savings measured at the customer's meter, excluding line losses.

^c NPV of DSM avoided costs. Based on end-use load shape, measure life, savings including line losses, and avoided costs by pricing period as acknowledged in the 2017 Integrated Resource Plan. 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 2021 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 RTE_Ind_and_Ag_GreenMotorRewind_v3_1.xlsm. 2017.

ⁱ 2021 average savings per cohort participant.

^j Offering cost-effective when viewed from a lifecycle perspective.

^k Offering cost-effectiveness based on one facility that was re-baselined. Participation in the cohort lead to capital projects that totaled 591,296 kWh/yr.

^l Offering cost-effective without inclusion of admin costs.

New Construction

Segment: Commercial
2021 Program Results

Cost Inputs			Ref
Program Administration	\$	386,051	
Program Incentives		2,305,120	I
Total UC	\$	2,691,171	P
Measure Equipment and Installation (Incremental Participant Cost)	\$	3,774,949	M
Net Benefit Inputs (NPV)			Ref
Resource Savings			
2021 Annual Gross Energy (kWh)		17,536,004	
NPV Cumulative Energy (kWh)		170,076,883	
10% Credit (Northwest Power Act)		801,353	S
Total Electric Savings	\$	8,814,886	A
Participant Bill Savings			
NPV Cumulative Participant Bill Savings	\$	9,302,097	B
Other Benefits			
Non-Utility Rebates/Incentives	\$	—	NUI
NEBs	\$	2,436,678	NEB

Notes: Non-energy benefits/impacts on a \$/kWh for each end-use. Based on 2019 impact evaluation.

Summary of Cost-Effectiveness Results				
Test		Benefit	Cost	Ratio
UC Test.....	\$	8,013,533	\$ 2,691,171	2.98
TRC Test		11,251,564	4,160,999	2.70
RIM Test.....		8,013,533	11,993,267	0.67
PCT		14,043,894	3,774,949	3.72
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				4.54%
Escalation Rate				2.10%
Net-to-Gross (NTG)				100%
Minimum NTG Sensitivity.....				34%
Average Customer Segment Rate/kWh.....				\$0.057
Line Losses.....				9.60%

Year: 2021

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/ Notes
						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	0.43	\$0.23	\$-	\$0.13	\$0.10	\$0.031	2.00	1.74	1
Lighting	Interior Light Load Reduction. Part B: 20-29.9% below code.	Code standards	ft ²	Commercial-Miscellaneous-Interior Lighting-All	14	0.86	\$0.45	\$-	\$0.25	\$0.20	\$0.031	2.00	1.80	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	1.95	\$1.03	\$-	\$0.58	\$0.30	\$0.031	2.85	1.77	1
Lighting	Exterior Light Load Reduction. Minimum of 15% below code.	Code standards	kW	IPC_Outdoor Lighting	15	4,059.00	\$1,784.11	\$-	\$287.00	\$200.00	\$0.031	5.48	4.75	1
Lighting	Networked Lighting Controls - Interior	Code standards	kWh	Commercial-Miscellaneous-Interior Lighting-All	12	1.00	\$0.46	\$-	\$0.33	\$0.26	\$0.031	1.57	1.38	1
Lighting	Networked Lighting Controls - Exterior	Code standards	kWh	IPC_Outdoor Lighting	12	1.00	\$0.37	\$-	\$0.33	\$0.20	\$0.031	1.58	1.10	1
Lighting	Occupancy Sensors	Code standards	Sensor	Commercial-Miscellaneous-Interior Lighting-All	8	329.00	\$97.89	\$-	\$134.00	\$25.00	\$0.031	2.78	0.75	1, 2
Lighting	High-Efficiency Exit Signs	Code standards	Sign	IPC_8760	16	28.00	\$15.58	\$-	\$10.83	\$7.50	\$0.031	1.86	1.47	1
A/C	Unitary Commercial Air Conditioners, Air Cooled (Cooling Mode). Split system & single package. Part A: Base to CEE Tier 1	IECC 2018 Code Standard	Tons	Commercial-Miscellaneous-Cooling-All	15	47.00	\$34.03	\$-	\$79.00	\$25.00	\$0.031	1.29	0.47	1, 2
A/C	Unitary Commercial Air Conditioners, Air Cooled (Cooling Mode). Split system & single package. Part B: Base to CEE Tier 2	IECC 2018 Code Standard	Tons	Commercial-Miscellaneous-Cooling-All	15	88.00	\$63.72	\$-	\$123.00	\$50.00	\$0.031	1.21	0.56	1, 2
Heat Pump	Heat Pumps, Air Cooled (Cooling Mode). Split system & single package. Part A: Base to CEE Tier 1	IECC 2018 Code Standard	Tons	Commercial-Miscellaneous-Cooling-All	15	72.00	\$52.14	\$-	\$36.00	\$50.00	\$0.031	1.00	1.50	1
Heat Pump	Heat Pumps, Air Cooled (Cooling Mode). <= 5 tons. Split system & single package. Part B: Base to CEE Tier 2	IECC 2018 Code Standard	Tons	Commercial-Miscellaneous-Cooling-All	15	104.00	\$75.31	\$-	\$67.00	\$70.00	\$0.031	1.03	1.18	1
VRF AC	Variable Refrigerant Flow Units. Air Conditioner. Part B: Base to CEE Tier 1	IECC 2018 Air Cooled AC Code Standard	Tons	Commercial-Miscellaneous-Cooling-All	15	87.00	\$63.00	\$-	\$93.00	\$35.00	\$0.031	1.67	0.72	1, 2
VRF AC	Variable Refrigerant Flow Units. <= 5 tons. A/C. Part C: Base to CEE Tier 2	IECC 2018 Air Cooled AC Code Standard	Tons	Commercial-Miscellaneous-Cooling-All	15	119.00	\$86.17	\$-	\$108.00	\$55.00	\$0.031	1.47	0.85	1, 2
VRF Heat Pump	Variable Refrigerant Flow Units. Heat Pump. Part B: Base to CEE Tier 1	IECC 2018 Air Cooled AC Code Standard	Tons	Commercial-Miscellaneous-Cooling-All	15	97.00	\$70.24	\$-	\$36.00	\$50.00	\$0.031	1.33	1.98	1

Supplement 1: Cost-Effectiveness

Measure Name	Measure Descriptions	Replacing	Measure Unit	End Use	Measure Life (yrs) ^a	Benefit			Cost			B/C Tests		Source/ Notes
						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. <= 5 tons. Heat Pump. Part C: Base to CEE Tier 2	IECC 2018 Air Cooled AC Code Standard	Tons	Commercial-Miscellaneous-Cooling-All	15	129.00	\$93.41	\$-	\$71.00	\$85.00	\$0.031	1.05	1.37	1
A/C	Air Conditioners, Water Cooled Any Size	IECC 2018 Air Cooled AC Code Standard	Ton	Commercial-Miscellaneous-Cooling-All	15	67.00	\$48.52	\$-	\$225.00	\$40.00	\$0.031	1.15	0.24	1, 2
HP	Heat Pumps, Water Cooled Any Size	IECC 2018 Air Cooled AC Code Standard	Ton	Commercial-Miscellaneous-Cooling-All	15	133.00	\$96.31	\$-	\$370.00	\$100.00	\$0.031	0.92	0.28	1, 2, 6
VRF HP	Variable Refrigerant Flow, Water Cooled Heat Pump <= 64 Tons Base to CEE Tier 1	IECC 2018 Air Cooled AC Code Standard	Ton	Commercial-Miscellaneous-Cooling-All	15	128.00	\$92.69	\$-	\$145.00	\$100.00	\$0.031	0.89	0.68	1, 2, 6
A/C	Air-cooled chiller condenser, IPLV 14.0 EER or higher	IECC 2018 Code standards	Tons	Commercial-Miscellaneous-Cooling-All	20	102.00	\$91.96	\$-	\$209.00	\$80.00	\$0.031	1.11	0.48	2, 3
A/C	Water-cooled chiller electronically operated, reciprocating and positive displacement	IECC 2018 Code standards	Tons	Commercial-Miscellaneous-Cooling-All	20	61.00	\$55.00	\$-	\$103.00	\$40.00	\$0.031	1.31	0.58	2, 4
A/C	Airside economizer	IECC 2018 Code standards	Ton of cooling	Commercial-Miscellaneous-Cooling-All	15	197.00	\$142.65	\$-	\$81.36	\$75.00	\$0.031	1.76	1.79	1
A/C	Water-side Economizer	IECC 2018 Code Standard	Combined chiller tonnage	Commercial-Miscellaneous-Cooling-All	10	153.00	\$73.51	\$-	\$725.82	\$50.00	\$0.031	1.34	0.11	1, 2
A/C	Direct evaporative cooler	IECC 2018 Code standards	Tons	Commercial-Miscellaneous-Cooling-All	15	315.00	\$228.09	\$-	\$364.00	\$200.00	\$0.031	1.09	0.67	1, 2
A/C	Indirect evaporative cooler	IECC 2018 Code Standard	Tons	Commercial-Miscellaneous-Cooling-All	15	225.00	\$162.92	\$-	\$1,553.00	\$130.00	\$0.031	1.19	0.11	1, 2
A/C	Evaporative Pre-Cooler on Air-Cooled Chillers	air-cooled condenser coil	Tons	Commercial-Miscellaneous-Cooling-All	15	63.00	\$45.62	\$-	\$173.00	\$30.00	\$0.031	1.43	0.29	1, 2
A/C	Evaporative Pre-Cooler on Air-Cooled Refrigeration Systems	air-cooled condenser coil	Tons	Commercial-Miscellaneous-Refrigeration-All	15	110.00	\$59.39	\$-	\$173.00	\$30.00	\$0.031	1.78	0.37	1, 2
Building Shell	Reflective roof treatment	IECC 2018 Code Standard	ft ² roof area	Commercial-Miscellaneous-Cooling-All	15	0.12	\$0.08	\$-	\$0.05	\$0.05	\$0.031	1.57	1.72	1
Controls	Energy Management System (EMS) controls. Part A: 1 strategy	IECC 2018 Code standards	Tons of cooling	Commercial-Miscellaneous-Ventilation-All	15	227.00	\$129.51	\$17.08	\$162.00	\$60.00	\$0.031	1.93	0.94	1, 2
Controls	Energy Management System (EMS) controls. Part B: 2 strategies	IECC 2018 Code standards	Tons of cooling	Commercial-Miscellaneous-Ventilation-All	15	409.00	\$233.35	\$17.08	\$198.00	\$80.00	\$0.031	2.52	1.30	1

Measure Name	Measure Descriptions	Replacing	Measure Unit	End Use	Measure Life (yrs) ^a	Benefit			Cost			B/C Tests		Source/ Notes
						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	EMS controls. Part C: 3 strategies	IECC 2018 Code standards	Tons of cooling	Commercial-Miscellaneous-Ventilation-All	15	473.00	\$269.87	\$28.46	\$233.00	\$100.00	\$0.031	2.35	1.31	1
Controls	EMS controls. Part D: 4 strategies	IECC 2018 Code Standard	Tons of cooling	Commercial-Miscellaneous-Ventilation-All	15	567.00	\$323.50	\$59.77	\$269.00	\$120.00	\$0.031	2.35	1.45	1
Controls	EMS controls. Part E: 5 strategies	IECC 2018 Code standards	Tons of cooling	Commercial-Miscellaneous-Ventilation-All	15	617.00	\$352.03	\$59.77	\$304.00	\$140.00	\$0.031	2.21	1.38	1
Controls	Guest room energy management system	IECC 2018 Code standards	Ton	Commercial-Lodging-Ventilation-All	11	550.00	\$235.85	\$-	\$57.50	\$50.00	\$0.031	3.52	3.48	1
Controls	Variable speed drive on HVAC system applications	IECC 2018 Code standards	HP	Commercial-Miscellaneous-Ventilation-All	15	582.00	\$332.06	\$-	\$153.91	\$125.00	\$0.031	2.32	2.12	1
Controls	Part C: Variable speed drive on Potato/Onion Storage Shed Ventilation	No VFD	HP	IPC_Onion Potato VSD	10	1,193.00	\$393.98	\$-	\$264.00	\$250.00	\$0.031	1.37	1.44	1
Controls	Demand Controlled Kitchen Ventilation Exhaust Hood	Kitchen hood with constant speed ventilation motor	HP	Commercial-Restaurant-Ventilation-All	15	4,590.00	\$2,557.85	\$-	\$248.00	\$250.00	\$0.031	6.52	7.21	1
Appliances with Electric Dryer	Efficient Laundry Machines (electric dryer)	IECC 2018 Code standards	Unit	Commercial-Miscellaneous-Miscellaneous-All	9	814.50	\$276.13	\$1,171.15	\$400.00	\$200.00	\$0.031	1.23	3.47	5
Refrigeration	Efficient Refrigeration Condenser	Code standards	Ton	Commercial-Miscellaneous-Refrigeration-All	15	114.00	\$61.55	\$-	\$192.00	\$40.00	\$0.031	1.41	0.35	1, 2
Automatic High-Speed Doo	Refrigerator to Dock	Code standards	ft ²	Commercial-Miscellaneous-Refrigeration-All	16	360.00	\$201.93	\$-	\$167.00	\$80.00	\$0.031	2.22	1.25	1
Automatic High-Speed Door	Freezer to Refrigerator	Code standards	ft ²	Commercial-Warehouse-Refrigeration-All	16	1,829.00	\$1,025.93	\$-	\$167.00	\$160.00	\$0.031	4.73	5.04	1
Automatic High-Speed Door	Freezer to Dock	Code standards	ft ²	Commercial-Warehouse-Refrigeration-All	16	2,531.00	\$1,419.70	\$-	\$167.00	\$320.00	\$0.031	3.56	6.36	1
High-Volume, Low-Speed Fan	High-Volume, Low-Speed Fan	Standard high-speed fan	Fan	Commercial-Warehouse-Ventilation-All	15	16,733.00	\$9,546.98	\$-	\$3,185.00	\$2,000.00	\$0.031	3.79	2.84	1
Compressed Air	Air compressor VFD	No existing VFD	HP	Commercial-Miscellaneous-Miscellaneous-All	13	949.00	\$467.37	\$-	\$223.00	\$200.00	\$0.031	2.04	2.04	1
Compressed Air	No-Loss Condensate Drain	Open tube with ball valve	HP	Commercial-Miscellaneous-Miscellaneous-All	10	1,970.00	\$748.57	\$-	\$194.00	\$200.00	\$0.031	2.87	3.23	1

Supplement 1: Cost-Effectiveness

Measure Name	Measure Descriptions	Replacing	Measure Unit	End Use	Measure Life (yrs) ^a	Benefit			Cost			B/C Tests		Source/ Notes
						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	Low Pressure Drop Filter	Standard filter	HP	Commercial-Miscellaneous-Miscellaneous-All	10	44.00	\$16.72	\$-	\$10.00	\$10.00	\$0.031	1.47	1.62	1
Compressed Air	Refrigerated Compressed Air Dryer	Standard air dryer	CFM	Commercial-Miscellaneous-Miscellaneous-All	13	10.62	\$5.23	\$-	\$6.00	\$3.00	\$0.031	1.57	0.91	1, 2
Compressed Air	Efficient Compress Air Nozzle	Code standards	unit	Commercial-Miscellaneous-Miscellaneous-All	15	2,223.00	\$1,238.15	\$-	\$85.00	\$80.00	\$0.031	8.31	8.85	1
Engine Block Heater Control	Wall-mounted engine block heater	Standard engine block heater without controls	Unit	IPC_Engine Block	15	2,738.00	\$1,218.71	\$-	\$70.00	\$100.00	\$0.031	6.59	8.66	1
Engine Block Heater Controls	Engine-mounted engine block heater	Standard engine block heater without controls	Unit	IPC_Engine Block	15	2,352.00	\$1,046.90	\$-	\$120.00	\$150.00	\$0.031	4.70	5.97	1
Dairy VFD	VFD on milking vacuum pump	No existing VFD	VFD	Commercial-Miscellaneous-Miscellaneous-All	10	548.00	\$208.23	\$-	\$273.00	\$170.00	\$0.031	1.11	0.79	1, 2
Dairy VFD	VFD on milking transfer pump	No existing VFD	VFD	Commercial-Miscellaneous-Miscellaneous-All	10	7,687.00	\$2,920.95	\$-	\$1,469.00	\$1,500.00	\$0.031	1.68	1.88	1
Engine block heater	Stationary pump-driven circulating block heater	Circulating Block Heater on a Backup Generator <200 kW	per unit	IPC_Engine Block	15	1,106.00	\$492.29	\$-	\$239.00	\$200.00	\$0.031	2.10	1.98	1
Engine block heater	Stationary pump-driven circulating block heater	Circulating Block Heater on a Backup Generator 201-500 kW	per unit	IPC_Engine Block	15	2,493.00	\$1,109.66	\$-	\$573.00	\$350.00	\$0.031	2.60	1.88	1
Engine block heater	Stationary pump-driven circulating block heater	Circulating Block Heater on a Backup Generator 501-1000 kW	per unit	IPC_Engine Block	15	4,385.00	\$1,951.80	\$-	\$573.00	\$500.00	\$0.031	3.07	3.03	1
Ice Machines	ENERGY STAR Ice Machine <200 lbs per day	non ENERGY STAR ice machine	unit	Commercial-Miscellaneous-Miscellaneous-All	9	285.00	\$96.62	\$-	\$311.00	\$100.00	\$0.031	0.89	0.33	1, 2, 6
Ice Machines	ENERGY STAR Ice Machine >= 200 lbs per day	non ENERGY STAR ice machine	unit	Commercial-Miscellaneous-Miscellaneous-All	9	2,608.00	\$884.16	\$-	\$311.00	\$300.00	\$0.031	2.32	2.48	1
High-Efficiency Battery Chargers	High-Efficiency Battery Chargers - Single or Three Phase	Code standards	unit	Commercial-Miscellaneous-Miscellaneous-All	15	3,337.00	\$1,858.61	\$-	\$400.00	\$200.00	\$0.031	6.13	4.06	1

^a Average measure life.

^b Estimated kWh savings measured at the customer's meter, excluding line losses.

^c NPV of DSM avoided costs. Based on end-use load shape, measure life, savings including line losses, and avoided costs by pricing period as acknowledged in the 2017 Integrated Resource Plan. 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 2021 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. 2021.

² Idaho only measure.

³ Idaho Power TRM prepared by ADM Associates, Inc. 2021. Averaged air-cooled chillers.

⁴ Idaho Power TRM prepared by ADM Associates, Inc. 2021. Averaged water-cooled chillers.

⁵ Idaho Power TRM prepared by ADM Associates, Inc. 2021. NEBs from water savings from RTF. ComClothesWashers_v5_1.xlsm. Simple average. 2018.

⁶ Measure not cost-effective from UCT perspective. Will continue to monitor in 2022.

Retrofits

Segment: Commercial
2021 Program Results

Cost Inputs			Ref
Program Administration	\$	790,112	
Program Incentives		3,036,638	I
Total UC	\$	3,826,750	P
Measure Equipment and Installation (Incremental Participant Cost)	\$	10,744,301	M
Net Benefit Inputs (NPV)			Ref
Resource Savings			
2021 Annual Gross Energy (kWh)		21,181,022	
NPV Cumulative Energy (kWh)	205,428,909	\$	9,679,218 S
10% Credit (Northwest Power Act)		967,922	
Total Electric Savings	\$	10,647,140	A
Participant Bill Savings			
NPV Cumulative Participant Savings	\$	11,235,622	B
Other Benefits			
Non-Utility Rebates/Incentives	\$	—	NUI
NEBs	\$	4,036,159	NEB

Note: Measure inputs from Evergreen Consulting Group or the TRM prepared by ADM Associates, Inc., unless otherwise noted.
NEB/impacts on a \$/kWh for each end-use. Based on 2019 impact evaluation.

Summary of Cost-Effectiveness Results			
Test	Benefit	Cost	Ratio
UC Test	\$ 9,679,218	\$ 3,826,750	2.53
TRC Test	14,683,300	11,534,413	1.27
RIM Test	9,679,218	15,062,372	0.64
PCT	18,308,420	10,744,301	1.70
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			4.54%
Escalation Rate			2.10%
Net-to-Gross (NTG)			100%
Minimum NTG Sensitivity			55%
Average Customer Segment Rate/kWh			\$0.057
Line Losses			9.60%

Year: 2021

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/ Notes
						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	
Permanent Fixture Removal	Permanent Fixture Removal		fixture	Commercial-Miscellaneous-Interior Lighting-All	6	873.61	\$183.46	\$-	\$29.08	\$22.69	\$0.031	3.69	3.59	1
Light Emitting Diode (LEDs)	Screw-in or pin-based LED	Screw-in or pin-base lamp using higher wattage	fixture	Commercial-Miscellaneous-Interior Lighting-All	12	138.06	\$63.27	\$-	\$22.80	\$4.73	\$0.031	7.02	2.57	1
LEDs	HID LED screw-in replacement lamp	Existing HID lamp using > input watts	fixture	Commercial-Miscellaneous-Interior Lighting-All	12	662.71	\$303.70	\$-	\$107.70	\$49.23	\$0.031	4.35	2.60	1
LEDs	LED Tubes (type A, B & DM)	fixture using higher wattage	fixture	Commercial-Miscellaneous-Interior Lighting-All	12	203.00	\$93.03	\$-	\$42.86	\$12.47	\$0.031	4.96	2.08	1
LEDs	LED Tubes (type C) or LED Level 1 Retrofit Kit	fixture using higher wattage	fixture	Commercial-Miscellaneous-Interior Lighting-All	12	309.96	\$142.05	\$-	\$85.80	\$33.55	\$0.031	3.29	1.64	1
LEDs	LED Level 1 retrofit kit with single control strategy	fixture using higher wattage	fixture	Commercial-Miscellaneous-Interior Lighting-All	12	289.43	\$132.64	\$-	\$127.38	\$40.52	\$0.031	2.68	1.07	1
LEDs	LED Level 1 retrofit kit with multiple control strategy	fixture using higher wattage	fixture	Commercial-Miscellaneous-Interior Lighting-All	12	410.70	\$188.21	\$-	\$140.40	\$65.71	\$0.031	2.40	1.35	1
LEDs	LED Level 1 retrofit kit with networked control strategy	fixture using higher wattage	fixture	Commercial-Miscellaneous-Interior Lighting-All	12	455.35	\$208.67	\$-	\$142.98	\$81.96	\$0.031	2.17	1.46	1
LEDs	LED fixture or LED Level 2 retrofit kit	fixture using higher wattage	fixture	Commercial-Miscellaneous-Interior Lighting-All	12	440.45	\$201.84	\$-	\$178.93	\$83.69	\$0.031	2.07	1.15	1
LEDs	LED fixture or LED Level 2 retrofit kit with single control strategy	fixture using higher wattage	fixture	Commercial-Miscellaneous-Interior Lighting-All	12	518.33	\$237.53	\$-	\$203.25	\$108.85	\$0.031	1.90	1.19	1
LEDs	LED fixture or LED Level 2 retrofit kit with multiple control strategy	fixture using higher wattage	fixture	Commercial-Miscellaneous-Interior Lighting-All	12	599.94	\$274.93	\$-	\$282.13	\$143.99	\$0.031	1.69	1.01	1
LEDs	LED fixture or LED Level 2 retrofit kit with networked control strategy	fixture using higher wattage	fixture	Commercial-Miscellaneous-Interior Lighting-All	12	722.45	\$331.08	\$-	\$348.50	\$187.84	\$0.031	1.57	0.98	1, 2
LED Exit Sign	LED Exit Sign	fixture using higher wattage	sign	IPC_8760	12	230.68	\$100.50	\$-	\$61.89	\$40.00	\$0.031	2.13	1.60	1
LED sign lighting retrofit kit	LED sign lighting retrofit kit	fixture using higher wattage	fixture	Commercial-Miscellaneous-Interior Lighting-All	12	427.11	\$195.73	\$-	\$161.34	\$76.68	\$0.031	2.18	1.23	1
Lighting Controls (Idaho)	Lighting Controls	Manual controls	controls	Commercial-Miscellaneous-Interior Lighting-All	10	159.70	\$60.84	\$-	\$85.47	\$27.31	\$0.031	1.89	0.74	1, 3

Supplement 1: Cost-Effectiveness

Measure Name	Measure Descriptions	Replacing	Measure unit	End Use	Measure Life (yrs) ^a	Benefit			Cost			B/C Tests		Source/ Notes
						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 (Oregon)	Lighting Controls	Manual controls	controls	Commercial-Miscellaneous-Interior Lighting-All	10	139.18	\$53.03	\$-	\$75.47	\$25.00	\$0.031	1.81	0.73	1, 15
Refrigeration Case Lighting	Refrigeration Case Lighting	fixture using higher wattage	lamp	Commercial-Miscellaneous-Refrigeration-All	7	365.73	\$90.86	\$-	\$107.23	\$52.26	\$0.031	1.43	0.84	1, 3
Permanent Fixture Removal	Permanent Fixture Removal		fixture	IPC_Outdoor Lighting	6	1,013.14	\$191.07	\$-	\$39.44	\$17.69	\$0.031	3.89	2.97	1
Light Emitting Diode (LEDs)	Screw-in or pin-based LED	Screw-in or pin-base lamp using higher wattage	fixture	IPC_Outdoor Lighting	12	156.95	\$57.42	\$-	\$36.02	\$3.09	\$0.031	7.22	1.54	1
LEDs	HID LED screw-in replacement lamp	Existing HID lamp using > input watts	fixture	IPC_Outdoor Lighting	12	743.75	\$272.09	\$-	\$106.32	\$43.98	\$0.031	4.06	2.31	1
LEDs	LED Tubes (type A, B & DM)	fixture using higher wattage	fixture	IPC_Outdoor Lighting	12	287.20	\$105.07	\$-	\$63.89	\$12.24	\$0.031	4.97	1.59	1
LEDs	LED Tubes (type C) or LED Level 1 Retrofit Kit	fixture using higher wattage	fixture	IPC_Outdoor Lighting	12	526.92	\$192.77	\$-	\$125.38	\$37.74	\$0.031	3.56	1.50	1
LEDs	LED Level 1 retrofit kit with single control strategy	fixture using higher wattage	fixture	IPC_Outdoor Lighting	12	646.59	\$236.55	\$-	\$167.32	\$77.59	\$0.031	2.42	1.39	1
LEDs	LED Level 1 retrofit kit with multiple control strategy	fixture using higher wattage	fixture	IPC_Outdoor Lighting	12	850.79	\$311.25	\$-	\$202.36	\$119.11	\$0.031	2.14	1.50	1
LEDs	LED Level 1 retrofit kit with networked control strategy	fixture using higher wattage	fixture	IPC_Outdoor Lighting	12	933.44	\$341.49	\$-	\$218.51	\$149.35	\$0.031	1.92	1.52	1
LEDs	LED fixture or LED Level 2 retrofit kit	fixture using higher wattage	fixture	IPC_Outdoor Lighting	12	912.48	\$333.82	\$-	\$279.77	\$127.75	\$0.031	2.25	1.22	1
LEDs	LED fixture or LED Level 2 retrofit kit with single control strategy	fixture using higher wattage	fixture	IPC_Outdoor Lighting	12	951.89	\$348.24	\$-	\$341.84	\$152.30	\$0.031	2.02	1.06	1
LEDs	LED fixture or LED Level 2 retrofit kit with multiple control strategy	fixture using higher wattage	fixture	IPC_Outdoor Lighting	12	753.43	\$275.63	\$-	\$269.49	\$135.62	\$0.031	1.77	1.05	1
LEDs	LED fixture or LED Level 2 retrofit kit with networked control strategy	fixture using higher wattage	fixture	IPC_Outdoor Lighting	12	1,636.51	\$598.69	\$-	\$556.48	\$327.30	\$0.031	1.72	1.14	1
LED sign lighting retrofit kit	LED sign lighting retrofit kit	fixture using higher wattage	fixture	IPC_Outdoor Lighting	12	487.27	\$178.26	\$-	\$172.05	\$68.22	\$0.031	2.01	1.02	1
Lighting Controls (Idaho)	Lighting Controls	Manual controls	controls	IPC_Outdoor Lighting	10	295.20	\$91.36	\$-	\$103.41	\$19.82	\$0.031	2.27	0.81	1, 3
Lighting Controls (Oregon)	Lighting Controls	Manual controls	controls	IPC_Outdoor Lighting	10	366.20	\$113.34	\$-	\$110.26	\$20.12	\$0.031	2.80	0.95	1, 2
Air Conditioning (AC) Units	Base to CEE Tier 1	working pre-existing system	tons	Commercial-Miscellaneous-Cooling-All	15	152.00	\$110.06	\$-	\$940.00	\$85.00	\$0.031	1.23	0.13	3, 4
AC Units	Base to CEE Tier 2	working pre-existing system	tons	Commercial-Miscellaneous-Cooling-All	15	193.00	\$139.75	\$-	\$984.00	\$110.00	\$0.031	1.20	0.16	3, 4

Measure Name	Measure Descriptions	Replacing	Measure unit	End Use	Measure Life (yrs) ^a	Benefit			Cost			B/C Tests		Source/ Notes
						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	
AC Units	<= 5 ton VRF. Base to CEE Tier 2	working pre-existing system	tons	Commercial-Miscellaneous-Cooling-All	15	161.00	\$116.58	\$-	\$1,093.00	\$100.00	\$0.031	1.11	0.12	3, 4
AC Units	VRF. Base to CEE Tier 1	working pre-existing system	tons	Commercial-Miscellaneous-Cooling-All	15	129.00	\$93.41	\$-	\$1,078.00	\$75.00	\$0.031	1.18	0.09	3, 4
AC Units	Water-cooled AC that meets CEE Tier 1	working pre-existing system	tons	Commercial-Miscellaneous-Cooling-All	15	130.00	\$94.13	\$-	\$1,237.00	\$75.00	\$0.031	1.19	0.08	3, 4
AC Units	Air-conditioning Tune Up		ton	Commercial-Miscellaneous-Cooling-All	10	99.50	\$47.81	\$-	\$35.00	\$25.00	\$0.031	1.70	1.38	4
Heat Pump (HP) Units	Air Cooled HP Base to CEE Tier 1	working pre-existing system	tons	Commercial-Miscellaneous-Cooling-All	15	187.00	\$135.41	\$-	\$888.00	\$110.00	\$0.031	1.17	0.17	3, 4
HP Units	<= 5 ton HP Unit. Base to CEE Tier 2	working pre-existing system	tons	Commercial-Miscellaneous-Cooling-All	15	219.00	\$158.58	\$-	\$919.00	\$130.00	\$0.031	1.16	0.19	3, 4
HP Units	Water-cooled HP that meets CEE Tier 1	working pre-existing system	tons	Commercial-Miscellaneous-Cooling-All	15	129.00	\$93.41	\$-	\$971.00	\$75.00	\$0.031	1.18	0.11	3, 4
HP Units	<= 5 ton Air-cooled VRF. Base to CEE Tier 2	working pre-existing system	tons	Commercial-Miscellaneous-Cooling-All	15	175.00	\$126.72	\$-	\$1,034.00	\$110.00	\$0.031	1.10	0.13	3, 4
HP Units	Air-cooled VRF. Base to CEE Tier 1	working pre-existing system	tons	Commercial-Miscellaneous-Cooling-All	15	143.00	\$103.55	\$-	\$999.00	\$90.00	\$0.031	1.10	0.11	3, 4
HP Units	Water-cooled VRF that meets CEE Tier 1	working pre-existing system	tons	Commercial-Miscellaneous-Cooling-All	15	75.00	\$54.31	\$-	\$1,187.00	\$45.00	\$0.031	1.15	0.05	3, 4
Chiller Units	Air-cooled chiller, IPLV 14.0 EER or higher	working pre-existing system	tons	Commercial-Miscellaneous-Cooling-All	20	154.00	\$138.85	\$-	\$784.00	\$110.00	\$0.031	1.21	0.19	3, 5
Chiller Units	Water-cooled chiller electronically operated, reciprocating and positive displacement	working pre-existing system	tons	Commercial-Miscellaneous-Cooling-All	20	91.00	\$82.05	\$-	\$596.00	\$60.00	\$0.031	1.31	0.15	3, 6
Economizers	Air-side economizer control addition	No prior control	Ton of cooling	Commercial-Miscellaneous-Cooling-All	15	279.00	\$202.03	\$-	\$155.01	\$100.00	\$0.031	1.86	1.36	4
Economizers	Air-side economizer control repair	Non-functional economizer	Ton of cooling	Commercial-Miscellaneous-Cooling-All	15	279.00	\$202.03	\$-	\$73.65	\$50.00	\$0.031	3.44	2.70	4
Economizers	Water-side economizer control addition	No prior control	Combined chiller tonnage	Commercial-Miscellaneous-Cooling-All	10	153.00	\$73.51	\$-	\$725.82	\$50.00	\$0.031	1.34	0.11	3, 4

Supplement 1: Cost-Effectiveness

Measure Name	Measure Descriptions	Replacing	Measure unit	End Use	Measure Life (yrs) ^a	Benefit			Cost			B/C Tests		Source/ Notes
						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 Coolers	Direct evaporative cooler	Replacing standard AC unit	Ton	Commercial-Miscellaneous-Cooling-All	15	350.00	\$253.44	\$-	\$1,178.00	\$200.00	\$0.031	1.20	0.23	3, 4
Evaporative Coolers	Indirect evaporative cooler	Replacing standard AC unit	ton	Commercial-Miscellaneous-Cooling-All	15	250.00	\$181.03	\$-	\$2,367.00	\$130.00	\$0.031	1.31	0.08	3, 4
Evaporative Pre-Cooler on Air-Cooled Chillers	Evaporative Pre-Cooler on Air-Cooled Chillers	existing air-cooled condenser coil	ton	Commercial-Miscellaneous-Cooling-All	15	63.00	\$45.62	\$-	\$173.00	\$30.00	\$0.031	1.43	0.29	3, 4
Automated Control Systems	Energy Management System (EMS) controls with 1 strategy	Proposed strategy not existing (retrofit system)	tons of cooling	Commercial-Miscellaneous-Ventilation-All	15	372.00	\$212.24	\$22.77	\$198.00	\$100.00	\$0.031	1.90	1.22	4
Automated Control Systems	EMS controls with 2 strategies	Proposed strategy not existing (retrofit system)	tons of cooling	Commercial-Miscellaneous-Ventilation-All	15	622.00	\$354.88	\$17.08	\$233.00	\$150.00	\$0.031	2.10	1.62	4
Automated Control Systems	EMS controls with 3 strategies	Proposed strategy not existing (retrofit system)	tons of cooling	Commercial-Miscellaneous-Ventilation-All	15	811.00	\$462.71	\$51.23	\$269.00	\$175.00	\$0.031	2.31	1.90	4
Automated Control Systems	EMS controls with 4 strategies	Proposed strategy not existing (retrofit system)	tons of cooling	Commercial-Miscellaneous-Ventilation-All	15	1,728.00	\$985.91	\$273.24	\$304.00	\$200.00	\$0.031	3.89	3.80	4
Automated Control Systems	EMS controls with 5 strategies	Proposed strategy not existing (retrofit system)	tons of cooling	Commercial-Miscellaneous-Ventilation-All	15	1,796.00	\$1,024.70	\$276.09	\$340.00	\$225.00	\$0.031	3.65	3.55	4
Automated Control Systems	EMS controls with 1 strategy	Proposed strategy not existing (new system)	tons of cooling	Commercial-Miscellaneous-Ventilation-All	15	227.00	\$129.51	\$17.08	\$162.00	\$60.00	\$0.031	1.93	0.94	3, 4
Automated Control Systems	EMS controls with 2 strategies	Proposed strategy not existing (new system)	tons of cooling	Commercial-Miscellaneous-Ventilation-All	15	409.00	\$233.35	\$17.08	\$198.00	\$80.00	\$0.031	2.52	1.30	4
Automated Control Systems	EMS controls with 3 strategies	Proposed strategy not existing (new system)	tons of cooling	Commercial-Miscellaneous-Ventilation-All	15	473.00	\$269.87	\$28.46	\$233.00	\$100.00	\$0.031	2.35	1.31	4
Automated Control Systems	EMS controls with 4 strategies	Proposed strategy not existing (new system)	tons of cooling	Commercial-Miscellaneous-Ventilation-All	15	567.00	\$323.50	\$59.77	\$269.00	\$120.00	\$0.031	2.35	1.45	4
Automated Control Systems	EMS controls with 5 strategies	Proposed strategy not existing (new system)	tons of cooling	Commercial-Miscellaneous-Ventilation-All	15	617.00	\$352.03	\$59.77	\$304.00	\$140.00	\$0.031	2.21	1.38	4
Automated Control Systems	Lodging room occupancy controls	Manual controls	Unit	Commercial-Lodging-Ventilation-All	11	643.00	\$262.69	\$-	\$150.61	\$75.00	\$0.031	2.77	1.69	4
Electronically Commutated Motor (ECM)	ECM/PMSM motor in HVAC applications.	Shaded pole or permanent split capacitor motor	HP	Commercial-Miscellaneous-Ventilation-All	15	8,815.25	\$5,029.52	\$-	\$239.50	\$200.00	\$0.031	10.63	10.79	4

Measure Name	Measure Descriptions	Replacing	Measure unit	End Use	Measure Life (yrs) ^a	Benefit			Cost			B/C Tests		Source/ Notes
						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	
Premium Windows	Low U-value, U-factor of .30 or less	Standard window	sq ft window area	Commercial-Miscellaneous-Heating-Electric Furnace	25	9.00	\$5.87	\$-	\$22.08	\$2.50	\$0.031	2.11	0.29	3, 4
Reflective roofing	Adding reflective roof treatment	non-reflective low pitch roof	ft2 roof area	Commercial-Miscellaneous-Cooling-All	15	0.12	\$0.08	\$-	\$0.05	\$0.05	\$0.031	1.57	1.72	4
Ceiling Insulation	Increase to R38 min. insulation.	Insulation level, R11 or less	sq ft	Commercial-Miscellaneous-Heating-Electric Furnace	25	0.38	\$0.25	\$-	\$1.45	\$0.20	\$0.031	1.18	0.19	3, 4
Wall Insulation	Increase to R11 min. insulation.	Insulation level, R2.5 or less	sq ft wall area	Commercial-Miscellaneous-Heating-Electric Furnace	25	2.82	\$1.84	\$-	\$0.64	\$0.40	\$0.031	3.78	2.78	4
Wall Insulation	Increase to R19 min. insulation.	Insulation level, R2.5 or less	sq ft wall area	Commercial-Miscellaneous-Heating-Electric Furnace	25	3.16	\$2.06	\$-	\$0.85	\$0.55	\$0.031	3.18	2.39	4
Laundry Machines	High efficiency washer	Standard washer, electric dryer	Machine	Commercial-Miscellaneous-Miscellaneous-All	9	814.50	\$276.13	\$1,171.15	\$400.00	\$200.00	\$0.031	1.23	3.47	4, 7
HVAC Fan Motor Belts	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	4	83.00	\$11.16	\$-	\$4.40	\$5.00	\$0.031	1.47	1.76	4
HVAC Fan Motor Belts	Synchronous belt	Standard fan belt	HP	Commercial-Miscellaneous-Ventilation-All	4	213.00	\$28.64	\$-	\$67.00	\$25.00	\$0.031	0.91	0.43	3, 16
Engine block heater	Stationary pump-driven circulating block heater	Circulating Block Heater on a Backup Generator <200 kW	unit	IPC_Engine Block	15	1,106.00	\$492.29	\$-	\$1,268.00	\$200.00	\$0.031	2.10	0.42	3, 4
Engine block heater	Stationary pump-driven circulating block heater	Circulating Block Heater on a Backup Generator 201-500 kW	unit	IPC_Engine Block	15	2,493.00	\$1,109.66	\$-	\$2,152.00	\$350.00	\$0.031	2.60	0.55	3, 4
Engine block heater	Stationary pump-driven circulating block heater	Circulating Block Heater on a Backup Generator 501-1000 kW	unit	IPC_Engine Block	15	4,385.00	\$1,951.80	\$-	\$2,645.00	\$500.00	\$0.031	3.07	0.77	3, 4
Engine block heater	Wall mounted engine block heater	standard engine block heater without controls	Unit	IPC_Engine Block	15	2,738.00	\$1,218.71	\$-	\$120.00	\$100.00	\$0.031	6.59	6.54	4
Engine block heater	Engine-mounted engine block heater	standard engine block heater without controls	Unit	IPC_Engine Block	15	2,352.00	\$1,046.90	\$-	\$170.00	\$150.00	\$0.031	4.70	4.74	4
High Efficiency Battery Chargers	High Efficiency Battery Chargers	Standard battery charger	unit	Commercial-Miscellaneous-Miscellaneous-All	15	3,337.00	\$1,858.61	\$-	\$400.00	\$200.00	\$0.031	6.13	4.06	4

Supplement 1: Cost-Effectiveness

						Benefit			Cost			B/C Tests		Source/ Notes
Measure Name	Measure Descriptions	Replacing	Measure unit	End Use	Measure Life (yrs) ^a	Annual Gross Energy Savings (kWh/yr) ^b	NPV DSM Avoided Costs ^c	NEB	Gross Incremental Participant Cost ^d	Incentive/ Unit	Admin Cost (\$/kWh) ^e	UCT Ratio ^f	TRC Ratio ^g	
High Volume Low Speed Fan	High Volume Low Speed Fan	Standard high-speed fan	Fan	Commercial-Warehouse-Ventilation-All	15	16,733.00	\$9,339.57	\$-	\$4,185.00	\$2,000.00	\$0.031	3.71	2.18	4
Compressed Air	VFD on air compressor	No existing VFD	HP	Commercial-Miscellaneous-Miscellaneous-All	13	949.00	\$467.37	\$-	\$223.00	\$200.00	\$0.031	2.04	2.04	4
Compressed Air	Low Pressure Filter	Standard filter	HP	Commercial-Miscellaneous-Miscellaneous-All	10	44.00	\$16.72	\$-	\$10.00	\$10.00	\$0.031	1.47	1.62	4
Compressed Air	No-Loss Condensate Drain	Open tube with ball valve	Unit	Commercial-Miscellaneous-Miscellaneous-All	10	1,970.00	\$748.57	\$-	\$244.00	\$200.00	\$0.031	2.87	2.70	4
Compressed Air	Efficient Compress Air Nozzle	Standard air nozzle	Unit	Commercial-Miscellaneous-Miscellaneous-All	15	2,223.00	\$1,238.15	\$-	\$85.00	\$80.00	\$0.031	8.31	8.85	4
Compressed Air	Efficient Refrigerated Compressed Air Dryer	Standard air dryer	CFM	Commercial-Miscellaneous-Miscellaneous-All	13	10.62	\$5.23	\$-	\$6.00	\$3.00	\$0.031	1.57	0.91	3, 4
Refrigeration	Install auto-closer - walk-in	no/damaged auto-closer, low temp	Door	Commercial-Miscellaneous-Refrigeration-All	8	2,509.00	\$727.70	\$-	\$736.00	\$400.00	\$0.031	1.52	0.98	2, 4
Refrigeration	Install auto-closer - reach-in	Damaged auto-closer, low temp	Door	Commercial-Miscellaneous-Refrigeration-All	8	326.00	\$94.55	\$-	\$736.00	\$75.00	\$0.031	1.11	0.14	3, 4
Refrigeration	Install auto-closer - walk-in	No/damaged auto-closer, med. Temp	Door	Commercial-Miscellaneous-Refrigeration-All	8	562.00	\$163.00	\$-	\$736.00	\$135.00	\$0.031	1.07	0.24	3, 4
Refrigeration	Install auto-closer - reach-in	Damaged auto-closer, med. Temp	Door	Commercial-Miscellaneous-Refrigeration-All	8	243.00	\$70.48	\$-	\$736.00	\$55.00	\$0.031	1.13	0.10	3, 4
Refrigeration	Anti-sweat heat controls	Low/med.temp case without controls	Linear ft	Commercial-Miscellaneous-Refrigeration-All	8	256.00	\$74.25	\$-	\$77.26	\$50.00	\$0.031	1.28	0.96	3, 4
Evaporative Pre-Cooler on Air-Cooled Refrigeration Systems	Evaporative Pre-Cooler on Air-Cooled Refrigeration Systems	existing air-cooled condenser coil	ton	Commercial-Miscellaneous-Refrigeration-All	15	110.00	\$59.39	\$-	\$173.00	\$30.00	\$0.031	1.78	0.37	3, 4
Refrigeration	No-heat glass door	commercial glass door	door	Commercial-Miscellaneous-Refrigeration-All	12	779.00	\$345.68	\$-	\$664.00	\$200.00	\$0.031	1.54	0.55	3, 4
Defrost Coil Control	Defrost Coil Control - Cooler or Freezer	no evaporative coil defrost control	per fan	Commercial-Miscellaneous-Refrigeration-All	10	195.50	\$72.29	\$-	\$500.00	\$50.00	\$0.031	1.29	0.16	3, 4

						Benefit			Cost			B/C Tests		Source/ Notes
Measure Name	Measure Descriptions	Replacing	Measure unit	End Use	Measure Life (yrs) ^a	Annual Gross Energy Savings (kWh/yr) ^b	NPV DSM Avoided Costs ^c	NEB	Gross Incremental Participant Cost ^d	Incentive/ Unit	Admin Cost (\$/kWh) ^e	UCT Ratio ^f	TRC Ratio ^g	
Automatic high speed doors	Freezer to Dock	manual or electric warehouse door	sq ft	Commercial-Warehouse-Refrigeration-All	16	2,812.00	\$1,577.32	\$-	\$188.00	\$320.00	\$0.031	3.87	6.31	4
Automatic high speed doors	Freezer to Refrigerator	manual or electric warehouse door	sq ft	Commercial-Warehouse-Refrigeration-All	16	2,032.00	\$1,139.80	\$-	\$188.00	\$160.00	\$0.031	5.11	5.00	4
Automatic high speed doors	Refrigerator to Dock	manual or electric warehouse door	sq ft	Commercial-Warehouse-Refrigeration-All	16	400.00	\$224.37	\$-	\$188.00	\$80.00	\$0.031	2.43	1.23	4
Strip Curtain	For walk-in freezers	no protective barrier	sq ft	Commercial-Warehouse-Refrigeration-All	4	210.00	\$27.88	\$-	\$9.00	\$5.00	\$0.031	2.42	1.98	4
Strip Curtain	For walk-in refrigerators	no protective barrier	sq ft	Commercial-Warehouse-Refrigeration-All	4	78.00	\$10.35	\$-	\$9.00	\$5.00	\$0.031	1.40	1.00	4
Compressor Head Fan Motor to ECM	Compressor Head Fan Motor to ECM	SP or PSC with motors less than or equal to existing motor size	unit	Commercial-Grocery-Refrigeration-All	15	345.61	\$187.06	\$-	\$228.08	\$100.00	\$0.031	1.69	0.86	3, 4
Floating Head/Suction Pressures	Head pressure controller	Standard head pressure control	HP	Commercial-Miscellaneous-Refrigeration-All	16	440.00	\$249.71	\$-	\$311.90	\$160.00	\$0.031	1.44	0.84	3, 4
Floating Head/Suction Pressures	Suction pressure controller	Standard suction pressure control	HP	Commercial-Miscellaneous-Refrigeration-All	16	104.00	\$59.02	\$-	\$86.91	\$40.00	\$0.031	1.37	0.72	3, 4
Demand Controlled Kitchen Ventilation Exhaust Hood	VFD installed on kitchen exhaust and/or makeup air fan	Kitchen hood with constant speed ventilation motor	HP	Commercial-Miscellaneous-Cooking-All	15	4,590.00	\$2,557.85	\$-	\$469.00	\$250.00	\$0.031	6.52	4.60	4
Ice Machines	Ice Machines (<200 lbs/day)	code	per unit	Commercial-Miscellaneous-Miscellaneous-All	9	285.00	\$96.62	\$-	\$311.00	\$100.00	\$0.031	0.89	0.33	3, 4, 8
Ice Machines	Ice Machines (>200 lbs/day)	code	per unit	Commercial-Miscellaneous-Miscellaneous-All	9	2,608.00	\$884.16	\$-	\$311.00	\$300.00	\$0.031	2.32	2.48	4
Commercial Kitchen Equipment	Efficient Hot Food Holding Cabinet (Half Size)		per unit	Commercial-Miscellaneous-Cooking-All	10	1,605.05	\$610.20	\$-	\$315.94	\$200.00	\$0.031	2.44	1.84	9
Commercial Kitchen Equipment	Efficient Hot Food Holding Cabinet (Full Size)		per unit	Commercial-Miscellaneous-Cooking-All	10	2,839.99	\$1,079.69	\$-	\$672.68	\$400.00	\$0.031	2.21	1.56	9
Commercial Kitchen Equipment	Efficient Hot Food Holding Cabinet (Double Size)		per unit	Commercial-Miscellaneous-Cooking-All	10	5,238.05	\$1,991.38	\$-	\$2,838.36	\$800.00	\$0.031	2.07	0.73	3, 9

Supplement 1: Cost-Effectiveness

Measure Name	Measure Descriptions	Replacing	Measure unit	End Use	Measure Life (yrs) ^a	Benefit			Cost			B/C Tests		Source/ Notes
						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	
New On-Demand Overwrapper	New On-Demand Overwrapper		per unit	Commercial-Grocery-Food Preparation-All	10	1,583.68	\$588.26	\$-	\$345.19	\$100.00	\$0.031	3.95	1.64	10
Commercial Kitchen Equipment	ENERGY STAR listed electric combination oven (5-15 pans)	Standard electric oven	oven	Commercial-Miscellaneous-Cooking-All	7	5,106.65	\$1,295.17	\$-	\$989.08	\$800.00	\$0.031	1.35	1.24	11
Commercial Kitchen Equipment	ENERGY STAR listed electric combination oven (16-20 pans)	Standard electric oven	oven	Commercial-Miscellaneous-Cooking-All	7	5,528.10	\$1,402.06	\$-	\$555.21	\$300.00	\$0.031	2.97	2.12	11
Commercial Kitchen Equipment	ENERGY STAR listed electric convection oven	Standard electric oven	oven	Commercial-Miscellaneous-Cooking-All	8	736.40	\$218.72	\$-	\$439.97	\$180.00	\$0.031	1.08	0.52	3, 12
Commercial Kitchen Equipment	ENERGY STAR listed electric fryer	Standard fryer	fryer	Commercial-Miscellaneous-Cooking-All	6	883.76	\$185.40	\$-	\$1,296.18	\$150.00	\$0.031	1.05	0.15	3, 13
Commercial Kitchen Equipment	ENERGY STAR listed electric steamer -Any Size	Standard steamer	pan	Commercial-Miscellaneous-Cooking-All	7	2,995.49	\$759.73	\$874.80	\$73.15	\$30.00	\$0.031	6.18	10.30	14
Variable Speed Controls	Variable speed drive on HVAC system application	single speed HVAC system fan/ump	HP	Commercial-Miscellaneous-Ventilation-All	15	622.00	\$354.88	\$-	\$184.55	\$125.00	\$0.031	2.46	1.92	4
Variable Speed Controls	Variable speed drive on potato and onion storage shed ventilation	no existing VFD	HP	IPC_Onion Potato VSD	10	1,193.00	\$393.98	\$-	\$264.00	\$250.00	\$0.031	1.37	1.44	4
Variable Speed Controls	VFD on milking vacuum pump	no existing VFD	HP	Commercial-Miscellaneous-Miscellaneous-All	10	3,084.00	\$1,171.88	\$-	\$356.00	\$250.00	\$0.031	3.39	2.85	4
Variable Speed Controls	VFD on milking transfer pump	no existing VFD	HP	Commercial-Miscellaneous-Miscellaneous-All	10	11,777.00	\$4,475.10	\$-	\$2,052.00	\$1,500.00	\$0.031	2.40	2.04	4

^a Average measure life.

^b Estimated kWh savings measured at the customer's meter, excluding line losses.

^c NPV of DSM avoided costs. Based on end use load shape, measure life, savings including line losses, and avoided costs by pricing period as acknowledged in the 2017 Integrated Resource Plan. Total Resource Cost 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 2021 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. 2021.

² Measure not cost-effective from TRC perspective. Measure cost-effective without inclusion of admin costs.

³ Idaho only measure.

⁴ Idaho Power TRM prepared by ADM Associates, Inc. 2021.

⁵ Idaho Power TRM prepared by ADM Associates, Inc. 2021. Averaged air-cooled chillers.

⁶ Idaho Power TRM prepared by ADM Associates, Inc. 2021. Averaged water-cooled chillers.

⁷ Idaho Power TRM prepared by ADM Associates, Inc. 2021. NEBs from water savings from RTF. ComClothesWashers_v5_1.xlsm. Simple average. 2018.

⁸ Measure not cost-effective from UCT perspective. Will continue to monitor in 2022.

⁹ RTF. ComCookingHotFoodCabinet_v3_2. 2020.

¹⁰ RTF. ComOnDemandOverwrappers_v1_1. 2018.

¹¹ RTF. ComCookingCombinationOven_v3_1. 2019.

¹² RTF. ComCookingConvectionOven_v3_1. Simple average of Half Size Oven savings. 2018.

¹³ RTF. ComCookingFryer_v3_3. 2020.

¹⁴ RTF. ComCookingSteamer_v3_1. Calculated per pan savings using Any size savings divided by average steamer size of 6 pans. 2019.

¹⁵ Measure not cost-effective from TRC perspective. Measure included in the program to increase participation in a cost-effective program and encourage adoption of higher efficiency equipment.

¹⁶ Measure not cost-effective from UCT perspective. Measure cost-effective without inclusion of admin costs.

Small Business Direct Install

Segment: Commercial

2021 Program Results

Cost Inputs			Ref
Program Administration	\$	1,032,056	
Program Incentives.....		—	I
Total UC	\$	1,032,056	P
Measure Equipment and Installation (Incremental Participant Cost)	\$	—	M
Net Benefit Inputs (NPV)			Ref
Resource Savings			
2021 Annual Gross Energy (kWh)	2,421,842		
NPV Cumulative Energy (kWh)	22,150,523	\$	1,020,765 S
10% Credit (Northwest Power Act).....		102,076	
Total Electric Savings.....	\$	1,122,841	A
Participant Bill Savings			
NPV Cumulative Participant Bill Savings.....	\$	1,201,821	B
Other Benefits			
Non-Utility Rebates/Incentives.....	\$	—	NUI
NEBs	\$	462,967	NEB

Summary of Cost-Effectiveness Results			
Test	Benefit	Cost	Ratio
UC Test.....	\$ 1,020,765	\$ 1,032,056	0.99
TRC Test	1,585,809	1,032,056	1.54
RIM Test.....	1,020,765	2,233,877	0.46
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 + ((M-I) * NTG)	
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			4.54%
Escalation Rate			2.10%
Net-to-Gross (NTG).....			100%
Minimum NTG Sensitivity			101%
Average Customer Segment Rate/kWh			\$0.057
Line Losses.....			9.60%

Notes: NEB/impacts on a \$/kWh for each end-use. Based on 2019 impact evaluation of other C&I programs

2021 cost-effectiveness ratios include evaluation expenses. If evaluation expense were removed from the program's cost-effectiveness, the UCT and TRC would be 1.00 and 1.55, respectively.

Irrigation Efficiency Rewards

Segment: Irrigation
2021 Program Results

Cost Inputs				Ref
Program Administration	\$	411,606		
Program Incentives		2,195,594	I	
Total UC	\$	2,607,200	P	
Measure Equipment and Installation (Incremental Participant Cost)	\$	18,722,020	M	
Net Benefit Inputs (NPV)				Ref
Resource Savings				
2021 Annual Gross Energy (kWh)		9,680,497		
NPV Cumulative Energy (kWh)	122,996,040	\$	8,666,725	S
10% Credit (Northwest Power Act)		866,672		
Total Electric Savings	\$	9,533,397	A	
Participant Bill Savings				
NPV Cumulative Participant Bill Savings	\$	7,242,867	B	
Other Benefits				
Non-Utility Rebates/Incentives	\$	–	NUI	
NEBs	\$	\$76,398,646	NEB	

Summary of Cost-Effectiveness Results			
Test	Benefit	Cost	Ratio
UC Test	\$ 8,666,725	\$ 2,607,200	3.32
TRC Test	85,932,044	19,133,627	4.49
RIM Test	8,666,725	9,850,067	0.88
PCT	85,837,107	18,722,020	4.58

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	4.54%
Escalation Rate	2.10%
Net-to-Gross (NTG)	100%
Minimum NTG Sensitivity	30%
Average Customer Segment Rate/kWh	\$0.058
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.
For Custom option, NEBs including yield, labor, and other benefits reported by the customer. For Menu option, NEBs from RTF.
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.
2021 cost-effectiveness ratios include evaluation expenses. If evaluation expense were removed from the program's cost-effectiveness, the UCT and TRC would be 3.34 and 4.49, respectively.

Year: 2021

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/ Notes
						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	25.67	\$3.69	\$1.82	\$6.35	\$1.50	\$0.043	1.42	0.79	1, 2
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	25.67	\$3.69	\$1.82	\$0.91	\$0.25	\$0.043	2.72	2.92	1
Sprinklers	Rebuilt or new brass impact sprinklers	Worn sprinkler	Unit	IPC_Irrigation	4	3.27	\$0.47	\$9.26	\$12.31	\$2.75	\$0.043	0.16	0.79	1, 2
Levelers	Rebuilt or new wheel line levelers	Worn wheel line leveler	Unit	IPC_Irrigation	5	4.51	\$0.80	\$4.82	\$6.23	\$0.75	\$0.043	0.84	0.89	1, 2
Sprinklers	Center pivot/linear move: Install new sprinkler package on an existing system	Worn sprinkler system	Unit	IPC_Irrigation	5	23.99	\$4.24	\$11.33	\$25.15	\$8.00	\$0.043	0.47	0.61	1, 2
Gasket Replacement	New gaskets for hand lines, wheel lines, or portable mainline	Worn gasket	Unit	IPC_Irrigation	5	16.03	\$2.83	\$3.75	\$1.99	\$1.00	\$0.043	1.68	2.56	1
Drain Replacement	New drains, hand lines, wheel lines, or portable mainline	Worn drain	Unit	IPC_Irrigation	5	10.42	\$1.84	\$2.60	\$4.36	\$3.00	\$0.043	0.53	0.96	1, 2
Hub Replacement	New wheel line hubs	Worn hubs	Unit	IPC_Irrigation	10	26.37	\$13.09	\$5.75	\$41.49	\$12.00	\$0.043	1.00	0.47	1, 3, 4
New Goose Necks	New goose neck with drop tube or boomback	Worn gooseneck	Outlet	IPC_Irrigation	15	15.14	\$11.30	\$–	\$6.99	\$1.00	\$0.043	6.85	1.63	3, 4
Pipe Repair	Cut and pipe press or weld repair of leaking hand lines, wheel lines, and portable mainline	Leaking pipe	Joint	IPC_Irrigation	8	46.09	\$17.30	\$11.92	\$12.08	\$8.00	\$0.043	1.73	2.20	1, 4
Gasket Replacement	New center pivot base boot gasket	Worn gasket	Unit	IPC_Irrigation	8	1,924.56	\$722.55	\$–	\$391.29	\$125.00	\$0.043	3.48	1.68	1, 4

^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 NPV of DSM avoided costs. Based on end use load shape, measure life, savings including line losses, and avoided costs by pricing period as acknowledged in the 2017 Integrated Resource Plan. 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 2021 actuals.

^g UCT Ratio = ((NPV DSM Avoided Costs) / ((Admin Cost/kWh * kWh Savings) + Incentives))

^h TRC Ratio = (((NPV DSM Avoided Costs * 110%) + NEB) / ((Admin Cost/kWh * kWh Savings) + Incentives + (Incremental Participant Cost - Incentives)))

¹ RTF. AgIrrigationHardware_v4_1.xlsm. 2019. Weighted average of Western Idaho (14.53%), Eastern Washington & Oregon (1.04%), and Eastern & Southern Idaho (84.34%).

² Measure not cost-effective. Measure offering modified in 2022 with updated savings assumptions.

³ RTF. AgIrrigationHardware_v3_3.xlsm. 2016. Weighted average. Measure not included in v4_1.

⁴ Measure to be removed in 2022 based on updated RTF assumptions.

Supplement 1: Cost-Effectiveness

Year: 2021

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/ Notes
						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	222.19	\$191.32	–	\$132.16	\$15.00	\$0.043	7.79	1.49	1
Green Motors Program Rewind: Motor size 20 HP	Green Motors Program Rewind: Motor size 20 HP	Standard rewind practice	Motor	IPC_Irrigation	18	297.32	\$256.02	–	\$147.44	\$20.00	\$0.043	7.81	1.76	1
Green Motors Program Rewind: Motor size 25 HP	Green Motors Program Rewind: Motor size 25 HP	Standard rewind practice	Motor	IPC_Irrigation	17	447.57	\$369.23	–	\$168.45	\$25.00	\$0.043	8.34	2.16	1
Green Motors Program Rewind: Motor size 30 HP	Green Motors Program Rewind: Motor size 30 HP	Standard rewind practice	Motor	IPC_Irrigation	17	482.11	\$397.72	–	\$185.01	\$30.00	\$0.043	7.84	2.13	1
Green Motors Program Rewind: Motor size 40 HP	Green Motors Program Rewind: Motor size 40 HP	Standard rewind practice	Motor	IPC_Irrigation	17	561.43	\$463.16	–	\$226.09	\$40.00	\$0.043	7.22	2.04	1
Green Motors Program Rewind: Motor size 50 HP	Green Motors Program Rewind: Motor size 50 HP	Standard rewind practice	Motor	IPC_Irrigation	17	604.21	\$498.45	–	\$250.30	\$50.00	\$0.043	6.56	1.98	1
Green Motors Program Rewind: Motor size 60 HP	Green Motors Program Rewind: Motor size 60 HP	Standard rewind practice	Motor	IPC_Irrigation	21	553.16	\$530.32	–	\$295.19	\$60.00	\$0.043	6.33	1.83	1
Green Motors Program Rewind: Motor size 75 HP	Green Motors Program Rewind: Motor size 75 HP	Standard rewind practice	Motor	IPC_Irrigation	21	569.29	\$545.78	–	\$319.08	\$75.00	\$0.043	5.49	1.75	1
Green Motors Program Rewind: Motor size 100 HP	Green Motors Program Rewind: Motor size 100 HP	Standard rewind practice	Motor	IPC_Irrigation	21	751.39	\$720.36	–	\$395.82	\$100.00	\$0.043	5.44	1.85	1
Green Motors Program Rewind: Motor size 125 HP	Green Motors Program Rewind: Motor size 125 HP	Standard rewind practice	Motor	IPC_Irrigation	23	555.70	\$564.31	–	\$286.57	\$125.00	\$0.043	3.79	2.00	1
Green Motors Program Rewind: Motor size 150 HP	Green Motors Program Rewind: Motor size 150 HP	Standard rewind practice	Motor	IPC_Irrigation	23	660.58	\$670.82	–	\$319.20	\$150.00	\$0.043	3.76	2.12	1
Green Motors Program Rewind: Motor size 200 HP	Green Motors Program Rewind: Motor size 200 HP	Standard rewind practice	Motor	IPC_Irrigation	23	876.20	\$889.78	–	\$384.28	\$200.00	\$0.043	3.74	2.32	1
Green Motors Program Rewind: Motor size 250 HP	Green Motors Program Rewind: Motor size 250 HP	Standard rewind practice	Motor	IPC_Irrigation	19	1,357.04	\$1,214.97	–	\$493.90	\$250.00	\$0.043	3.94	2.42	1
Green Motors Program Rewind: Motor size 300 HP	Green Motors Program Rewind: Motor size 300 HP	Standard rewind practice	Motor	IPC_Irrigation	19	1,620.02	\$1,450.42	–	\$499.24	\$300.00	\$0.043	3.92	2.80	1
Green Motors Program Rewind: Motor size 350 HP	Green Motors Program Rewind: Motor size 350 HP	Standard rewind practice	Motor	IPC_Irrigation	19	1,888.64	\$1,690.92	–	\$523.25	\$350.00	\$0.043	3.92	3.08	1

Measure Name Measure Descriptions Replacing Measure Unit End Use Measure Life (yrs) ^a						Benefit			Cost			B/C Tests		Source/Notes
						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	19	2,141.43	\$1,917.24	–	\$584.43	\$400.00	\$0.043	3.90	3.12	1
Green Motors Program Rewind: Motor size 450 HP	Green Motors Program Rewind: Motor size 450 HP	Standard rewind practice	Motor	IPC_Irrigation	19	2,405.07	\$2,153.28	–	\$638.83	\$450.00	\$0.043	3.89	3.19	1
Green Motors Program Rewind: Motor size 500 HP	Green Motors Program Rewind: Motor size 500 HP	Standard rewind practice	Motor	IPC_Irrigation	19	2,676.03	\$2,395.87	–	\$690.15	\$500.00	\$0.043	3.90	3.27	1
Green Motors Program Rewind: Motor size 600 HP	Green Motors Program Rewind: Motor size 600 HP	Standard rewind practice	Motor	IPC_Irrigation	24	4,113.93	\$4,285.46	–	\$1,363.20	\$600.00	\$0.043	5.52	3.06	1
Green Motors Program Rewind: Motor size 700 HP	Green Motors Program Rewind: Motor size 700 HP	Standard rewind practice	Motor	IPC_Irrigation	24	4,779.22	\$4,978.49	–	\$1,487.24	\$700.00	\$0.043	5.50	3.24	1
Green Motors Program Rewind: Motor size 800 HP	Green Motors Program Rewind: Motor size 800 HP	Standard rewind practice	Motor	IPC_Irrigation	24	5,450.38	\$5,677.64	–	\$1,650.14	\$800.00	\$0.043	5.49	3.31	1
Green Motors Program Rewind: Motor size 900 HP	Green Motors Program Rewind: Motor size 900 HP	Standard rewind practice	Motor	IPC_Irrigation	24	6,118.68	\$6,373.80	–	\$1,819.20	\$900.00	\$0.043	5.48	3.37	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	24	8,423.43	\$8,774.65	–	\$2,682.83	\$1,500.00	\$0.043	3.77	2.75	1

^a Average measure life.

^b Estimated kWh savings measured at the customer's meter, excluding line losses.

^c NPV of DSM avoided costs. Based on end use load shape, measure life, savings including line losses, and avoided costs by pricing period as acknowledged in the 2017 Integrated Resource Plan. 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 2021 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: Ind_and_Ag_GreenMotorRewind_v3_1.xlsm. 2017.

