

Wyoming Low Income Weatherization Program Evaluation, Measurement & Verification Report 2016-2017

*Prepared for
Rocky Mountain Power*

August 2020

Prepared by:



ADM Associates, Inc.
3239 Ramos Circle
Sacramento, CA 95827
916-363-8383

Table of Contents

1. Executive Summary.....	1
2. Introduction and Purpose of Study.....	7
3. Description of Program.....	8
4. Impact Evaluation.....	10
5. Process Evaluation.....	19
6. Cost Effectiveness Evaluation.....	26
7. Conclusions and Recommendations.....	29
8. Appendix: Participant Survey.....	31

List of Tables

Table 1-1: Wyoming LIW Program Claimed and Evaluated Energy Savings for 2016-2017	1
Table 1-2: Wyoming LIW Program Claimed and Evaluated Energy Savings for 2016 and 2017	2
Table 1-3: Rocky Mountain Power’s Low Income Weatherization Program in Wyoming Number of Participants by Implementation Agency 2016-2017	3
Table 1-4: Low Income Weatherization Program Level Results – PY2016-2017	4
Table 1-5: Low Income Weatherization Program Level Cost-Effectiveness Results – PY2016.....	4
Table 1-6: Low Income Weatherization Program Level Cost-Effectiveness Results – PY2017.....	5
Table 3-1: Rocky Mountain Power’s Low Income Weatherization Program in Wyoming Number of participants by Implementation Agency 2016-2017	9
Table 4-1: Wyoming Low Income Weatherization Program Claimed and Evaluated Energy Savings for 2016-2017	10
Table 4-2: Wyoming Low Income Weatherization Program Claimed and Evaluated Energy Savings for 2016 and 2017	11
Table 4-3: 2016-2017 Wyoming Low Income Weatherization Program Participant Survey Sample Size	13
Table 4-4: 2016-2017 Wyoming Low Income Weatherization Program Claimed Gross Energy Savings for Building Shell	14
Table 4-5: Frequency of Wyoming Building Shell Measure Installations 2016-2017 ...	16
Table 4-6: 2016 Wyoming LIW Program Building Shell Claimed and Evaluated Gross Energy Savings.....	16
Table 4-7: Individual Building Shell Weatherization UES Values and Sources.....	18
Table 5-1: Wyoming’s Low- Income Weatherization Program Numbers of Homes Served 2013-2017	21
Table 5-2: How Did Participants Learn About the Program?	22
Table 5-3: Why Did Respondents Decide to Participate in the Program?	23
Table 5-4: What measures did survey respondents receive?.....	23
Table 6-1 - Low Income Weatherization Program Inputs.....	26
Table 6-2: Low Income Weatherization Annual Program Costs	26
Table 6-3 - Low Income Weatherization Program – Savings by Program Year	26
Table 6-4: Benefit/Cost Ratios by Program Year.....	27

Table 6-5: Low Income Weatherization Program Level Results – PY2016-2017	27
Table 6-6 - Low Income Weatherization Program Level Cost-Effectiveness Results – PY2016.....	27
Table 6-7 - Low Income Weatherization Program Level Cost-Effectiveness Results – PY2017.....	28

List of Figures

Figure 1-1: Wyoming Low Income Weatherization Program Funding Flow	3
Figure 3-1: Wyoming Low Income Weatherization Program Funding Flow	8
Figure 5-1: Satisfaction with Energy Savings Measures.....	24

1. Executive Summary

This report provides the results of ADM's impact and process evaluations of the Rocky Mountain Power's Low Income Weatherization (LIW) program in Wyoming during 2016 and 2017.

The program provides energy-efficiency weatherization services at no cost to income-eligible Rocky Mountain Power customers living in single family homes, manufactured homes or multi-unit residential housing in Wyoming. During the evaluation period, the program included building shell, lighting and water heating measures. Thirteen households participated in the program during the evaluation period.

1.1 Impact Evaluation Results

Table 1-1 presents the claimed gross savings, evaluated gross savings, and realization rates for each measure through the program during 2016-2017.

Table 1-1: Wyoming LIW Program Claimed and Evaluated Energy Savings for 2016-2017

Year	Measure Category	Measure Type	Quantity	Claimed Gross Savings (kWh)	Evaluated Gross Savings (kWh/yr.)	Realization Rate
2016-2017	Building Shell	WY Weatherization	12	26,232	35,490	135.3%
		WY Weatherization (insulation and/or windows)	1	2,153	3,544	164.6%
	Lighting ¹	Florescent Lighting - WY	8	184	-	-
	Water Heating ¹	Pipe Insulation - WY	1	92	-	-
		Low Flow Shower Head - WY	1	230	-	-
2016-2017 TOTAL			23	28,891	39,034	135.1%

¹ One of the Wyoming building shell weatherization measure participants also had three other lighting and water heating individual measures with claimed savings outside of the bundled building shell weatherization measure. These were the only measures with claimed savings outside of the bundled building shell weatherization measure in Wyoming during the program years 2016-2017 and accounted for only 1.8% of claimed savings across the program. ADM evaluated these individual lighting and water heating measures as part of the Wyoming participant's bundled building shell weatherization measure, resulting in no evaluated savings for the individual lighting and water heating measures and an increased evaluated savings in the bundled building shell weatherization measure.

Table 1-2: Wyoming LIW Program Claimed and Evaluated Energy Savings for 2016 and 2017

Year	Measure Category	Measure Type	Quantity	Claimed Gross Savings (kWh)	Evaluated Gross Savings (kWh/yr.)	Realization Rate
2016	Building Shell	WY Weatherization	8	17,488	28,352	162.1%
		WY Weatherization (insulation and/or windows)	1	2,153	3,544	164.6%
	Lighting	Florescent Lighting - WY	8	184	-	0%
	Water Heating	Pipe Insulation - WY	1	92	-	0%
		Low Flow Shower Head - WY	1	230	-	0%
2016 TOTAL			19	20,147	31,897	158.3%
Year	Measure Category	Measure Type	Quantity	Claimed Gross Savings (kWh)	Evaluated Gross Savings (kWh/yr.)	Realization Rate
2017	Building Shell	WY Weatherization	4	8,744	7,137	81.6%
2017 TOTAL			4	8,744	7,137	81.6%

1.2 Process Evaluation Results

In Wyoming, Rocky Mountain Power’s LIW program is implemented by two local non-profit service agencies: Wyoming Weatherization Service and Council of Community Services (collectively called “the agencies”). Wyoming Weatherization Service’s sole purpose is to provide weatherization services, while Council of Community Services provides a variety of wrap-around services to income-eligible families and individuals.

Covered costs: For its customers who are program participants, Rocky Mountain Power provided funding for 50% of the cost of eligible electricity-saving measures.

Program goals: Neither Rocky Mountain Power nor the agencies indicated that there were program performance goals such as number of homes served or target energy savings per home.

Figure 1-1: Wyoming Low Income Weatherization Program Funding Flow

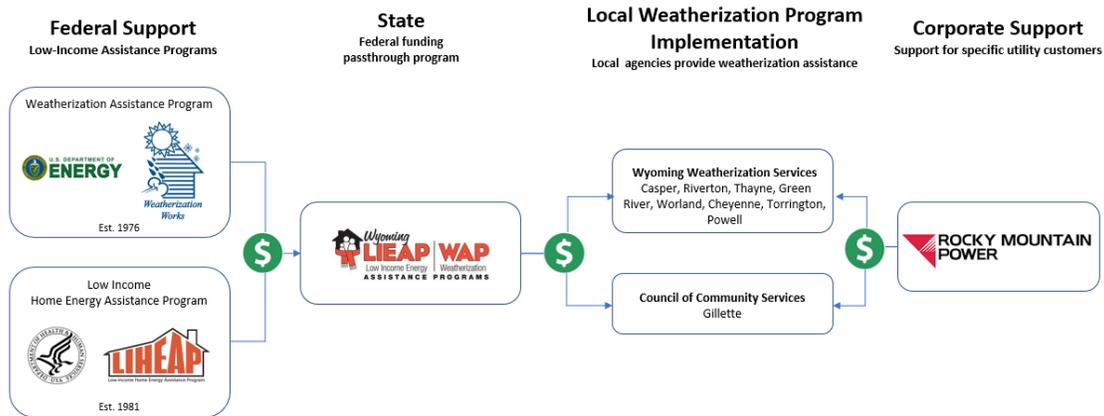


Table 1-3: Rocky Mountain Power’s Low Income Weatherization Program in Wyoming Number of Participants by Implementation Agency 2016-2017

Agency	2016	2017	Total
Wyoming Weatherization Service	9	1	10
Council of Community Services	0	3	3
Total	9	4	13

Rocky Mountain Power benefits from working with these implementation agencies in the following ways:

- **Trained workforce.** Weatherization crews receive annual training from agencies.
- **Leveraging multiple funding streams** to maximize the number of measures that can be installed in a single home and therefore maximizes benefits for customers and overall energy savings.
- **Lower program administration costs.** By managing multiple funding streams, agencies distribute overhead costs across funders.

All survey respondents shared positive feedback about the program. Respondents rated their satisfaction with program measures and their overall experience highly. The agencies reported non-energy savings that included maintaining the inventory of affordable housing, increasing home comfort and reducing energy costs for participants.

1.3 Cost Effectiveness Results

Navigant estimated the cost-effectiveness results for the Wyoming Low Income Weatherization Program, based on 2016 and 2017 ex-post savings estimates provided by ADM and expenditures provided by Rocky Mountain Power. The 2016 and 2017

combined program passed the cost-effectiveness criteria for all tests except the Rate Impact Test as shown in Table 1-4.

Table 1-4: Low Income Weatherization Program Level Results – PY2016-2017

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0345	\$20,254	\$41,342	\$21,088	2.04
Total Resource Cost Test (TRC) No Adder	\$0.0345	\$20,254	\$37,584	\$17,330	1.86
Utility Cost Test (UCT)	\$0.0345	\$20,254	\$37,584	\$17,330	1.86
Rate Impact Test (RIM)		\$91,302	\$37,584	-\$53,718	0.41
Lifecycle Revenue Impacts (\$/kWh)	\$0.0000001002				

Table 1-5 presents program level cost effectiveness test results for 2016. The program passed the cost-effectiveness criteria for all tests except the Rate Impact Test.

Table 1-5: Low Income Weatherization Program Level Cost-Effectiveness Results – PY2016

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0330	\$15,836	\$33,835	\$18,000	2.14
Total Resource Cost Test (TRC) No Adder	\$0.0330	\$15,836	\$30,759	\$14,924	1.94
Utility Cost Test (UCT)	\$0.0330	\$15,836	\$30,759	\$14,924	1.94
Rate Impact Test (RIM)		\$73,987	\$30,759	-\$43,228	0.42
Lifecycle Revenue Impacts (\$/kWh)	\$0.0000001624				

Table 1-6 includes program level costs effectiveness test results for 2017. The program passed the cost-effectiveness criteria for all tests except the Rate Impact Test.

Table 1-6: Low Income Weatherization Program Level Cost-Effectiveness Results – PY2017

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0412	\$4,418	\$7,507	\$3,088	1.70
Total Resource Cost Test (TRC) No Adder	\$0.0412	\$4,418	\$6,824	\$2,406	1.54
Utility Cost Test (UCT)	\$0.0412	\$4,418	\$6,824	\$2,406	1.54
Rate Impact Test (RIM)		\$17,315	\$6,824	-\$10,491	0.39
Lifecycle Revenue Impacts (\$/kWh)	\$0.0000000389				

1.4 Conclusions and Recommendations

ADM's evaluation results in the following conclusions:

- During the evaluation period, the program resulted in total evaluated energy savings of 39,034 kWh from fourteen households that participated in the program.
- Rocky Mountain Power continued their partnership with Wyoming Weatherization Services and Council of Community Services to implement the LIW program. The agencies expressed positive program outcomes including reduced energy demand, improved home comfort, reduction of health and safety hazards, and retention of homes in the affordable housing inventory.
- The 2016 and 2017 combined program, and each individual year, passed the cost-effectiveness standards for all tests except the Rate Impact Test.

Based on its evaluation, ADM recommend the following actions for Rocky Mountain Power to consider in its future implementation of its LIW program in Wyoming:

- Rocky Mountain Power should continue partnering with agencies that provide federally funded weatherization services to take advantage of existing program infrastructure and leveraged funding.
- Rocky Mountain Power could consider sharing Rocky Mountain Power's program objectives (qualitative and quantitative) in order to more clearly determine the

success of the program. Both Rocky Mountain Power and the agencies would likely benefit from more explicit program goals.

- Rocky Mountain Power could consider building stronger relationships with the agencies in order to identify opportunities that become apparent through stronger partnership interactions. For example, Rocky Mountain Power might consider joining Wyoming Weatherization Service on their annual “Round the World Trip” – a tour of program participant home inspections.
- Rocky Mountain Power could consider requesting more detailed tracking data from implementers to increase the accuracy and granularity of measures’ energy saving data. For example, additional data could include baseline and efficient wattages for bulbs installed through the program, specifications for baseline and replacement efficient refrigerators, and pre- and post-installation insulation conditions. Implementers are already recording extensive data in the DOE-approved auditing software used for projects that include Weatherization Assistance Program (WAP) funding, and therefore the additional data reporting should not create an unreasonable burden.
- Rocky Mountain Power might consider adding cooling measures to the list of reimbursed measures to increase the number of homes eligible for Rocky Mountain Power funding to install shell measures.
- The agencies might consider date ranking non-priority status applicants so the 22% of households without any vulnerable members can benefit from the duration of their time on the wait list.
- Rocky Mountain Power could consider reducing the interval between program implementation and evaluation.
- Rocky Mountain Power could consider implementing a process for collecting weatherization program customers’ email addresses to enable more accurate and comprehensive program evaluations.
- Rocky Mountain Power might consider producing branded energy efficiency education materials for distribution to program participants.

2. Introduction and Purpose of Study

This report provides results of the ADM Associates, Inc. (ADM) impact and process evaluations of the Rocky Mountain Power 2016-2017 Low Income Weatherization (LIW) program in Wyoming. It also includes results of a cost effectiveness evaluation completed by Navigant.

2.1 Impact evaluation

The primary objective of the impact evaluation was to determine ex-post verified gross energy (kWh) savings that resulted from the installation of energy saving measures through the program.

2.2 Process evaluation

The objective of the process evaluation was to gain an in-depth understanding of program operations and identify both program strengths and opportunities for improvement. The process evaluation includes information gathered from Rocky Mountain Power staff, and Wyoming Weatherization Services as well as a participant survey.

2.3 Cost effectiveness evaluation

The cost-effectiveness evaluation, completed by Navigant using cost estimates provided by Rocky Mountain Power and energy saving estimates provided by ADM, includes results of the following cost effectiveness tests:

- Total Resource Cost Test (PTRC) + Conservation Adder
- Total Resource Cost Test (TRC) No Adder
- Utility Cost Test (UCT)
- Rate Impact Test (RIM)
- Lifecycle Revenue Impacts (\$/kWh)

The Participant Cost Test (PCT) was not conducted since the Low-Income Weatherization program provides weatherization measures at no cost to eligible customers and this test is therefore not applicable.

The following chapters provide descriptions of the methods used to complete these evaluations and their results.

3. Description of Program

In Wyoming, Rocky Mountain Power’s LIW program is implemented by two local non-profit service agencies: Wyoming Weatherization Service (WWS) and Council of Community Services (CCS). Wyoming Weatherization Services’ sole purpose is to provide weatherization services, while Council of Community Services provides a variety of wrap-around services to income-eligible families and individuals.

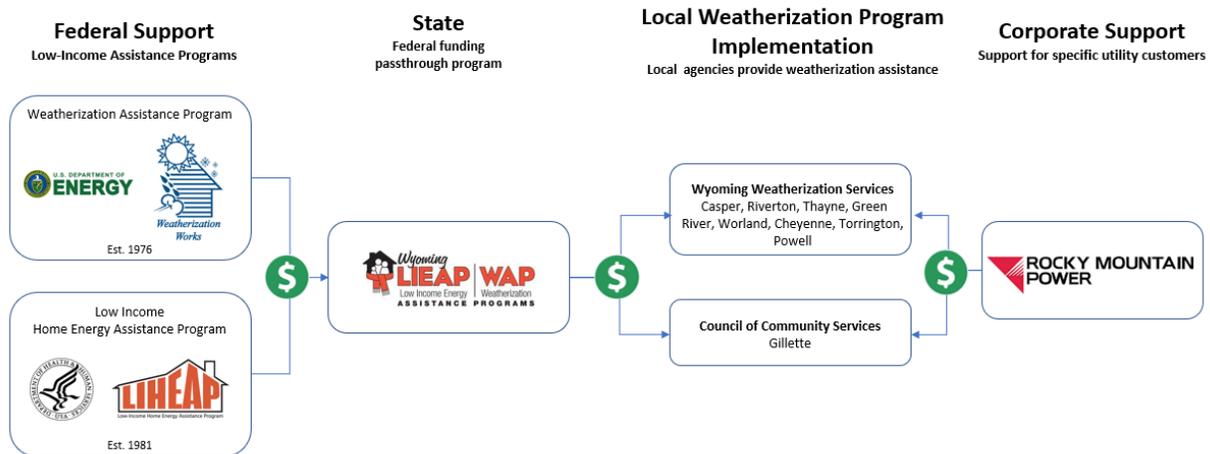
Each also receives federal funding for the Department of Energy (DOE)’s Weatherization Assistance Program (WAP) as shown in Figure 3-1. No state weatherization funding is available.

WWS has eight offices throughout the state staffed by two to three 2-person crews that install weatherization measures and uses licensed contractors to install electrical, HVAC and plumbing measures. This evaluation focused on information from WWS since only 4 households were served by CCS during the evaluation period.

Covered costs: For its customers who are program participants, Rocky Mountain Power provided funding for 50% of the cost of eligible electricity-saving measures.

Program goals: Neither Rocky Mountain Power nor the agencies indicated that there were program performance goals such as number of homes served or target energy savings per home.

Figure 3-1: Wyoming Low Income Weatherization Program Funding Flow



*Table 3-1: Rocky Mountain Power’s Low Income Weatherization Program in Wyoming
Number of participants by Implementation Agency 2016-2017*

Agency	2016	2017	Total
Wyoming Weatherization Service	9	1	10
Council of Community Services	0	3	3
Total	9	4	13

WWS provided Rocky Mountain Power funded measures to nine homes during 2016 and one during 2017. Unlike Rocky Mountain Power’s LIW program in other states, in Wyoming, Rocky Mountain Power only provided funding for electric heated homes. No Rocky Mountain Power-funded electricity-saving measures were installed in non-electric heated homes. This accounts for the low number of Rocky Mountain Power funded program participants.

4. Impact Evaluation

This chapter provides the results of ADM's impact evaluation of the Rocky Mountain Power LIW program in Wyoming during 2016 and 2017. Table 4-1 presents the impact evaluation results including the quantity, claimed gross savings, evaluated gross savings, and realization rates for each measure type across the combined program years, 2016 through 2017. Table 4-2 presents the same information for each individual year, 2016 and 2017.

Table 4-1: Wyoming Low Income Weatherization Program Claimed and Evaluated Energy Savings for 2016-2017

Year	Measure Category	Measure Type	Quantity	Claimed Gross Savings (kWh)	Evaluated Gross Savings (kWh/yr.)	Realization Rate
2016-2017	Building Shell	WY Weatherization	12	26,232	35,490	135.3%
		WY Weatherization (insulation and/or windows)	1	2,153	3,544	164.6%
	Lighting ²	Florescent Lighting - WY	8	184	-	-
	Water Heating ²	Pipe Insulation - WY	1	92	-	-
		Low Flow Shower Head - WY	1	230	-	-
2016-2017 TOTAL			23	28,891	39,034	135.1%

² One of the Wyoming building shell weatherization measure participants also had three other lighting and water heating individual measures with claimed savings outside of the bundled building shell weatherization measure. These were the only measures with claimed savings outside of the bundled building shell weatherization measure in Wyoming during the program years 2016-2017 and accounted for only 1.8% of claimed savings across the program. ADM evaluated these individual lighting and water heating measures as part of the Wyoming participant's bundled building shell weatherization measure, resulting in no evaluated savings for the individual lighting and water heating measures and an increased evaluated savings in the bundled building shell weatherization measure.

Table 4-2: Wyoming Low Income Weatherization Program Claimed and Evaluated Energy Savings for 2016 and 2017

Year	Measure Category	Measure Type	Quantity	Claimed Gross Savings (kWh)	Evaluated Gross Savings (kWh/yr.)	Realization Rate
2016	Building Shell	WY Weatherization	8	17,488	28,352	162.1%
		WY Weatherization (insulation and/or windows)	1	2,153	3,544	164.6%
	Lighting	Florescent Lighting - WY	8	184	-	0%
	Water Heating	Pipe Insulation - WY	1	92	-	0%
		Low Flow Shower Head - WY	1	230	-	0%
2016 TOTAL			19	20,147	31,897	158.3%
Year	Measure Category	Measure Type	Quantity	Claimed Gross Savings (kWh)	Evaluated Gross Savings (kWh/yr.)	Realization Rate
2017	Building Shell	WY Weatherization	4	8,744	7,137	81.6%
2017 TOTAL			4	8,744	7,137	81.6%

4.1 Impact Evaluation Methodology

The impact evaluation component of this report estimates annual gross energy savings (kWh) as framed by the following research questions:

- How many and which measure types were installed through the program?
- What were the kWh savings achieved by the program?

The methodology used to address each of these questions is detailed in the following sections.

4.1.1 Data Collection and Measure Verification

ADM reviewed and reconciled program tracking data to the participation counts and ex-ante savings indicated in the 2016 and 2017 annual reports. ADM reviewed a census of program tracking data. In concert with tracking data reviews, ADM also reviewed the savings values and measure savings assumptions and calculations contained in the Technical Resource Library (TRL) files. ADM issued data requests as needed to ensure that all data was collected that could be reasonably expected or required for this evaluation.

ADM conducted surveys to verify measure installation and collected additional primary data from program participants. ADM attempted to survey all 2016 and 2017 participants in Rocky Mountain Power's LIW Program in Wyoming.

The following provides additional detail regarding data collection and measure verification activities.

- **Review of the program tracking database** is an essential first step for verifying data integrity. ADM assessed the program data management system DSMC – which facilitates data collection and organization. ADM reviewed a census of program tracking data contained in DSMC. Each program year's dataset was reviewed for completeness, consistency, and compliance with the provided TRL files.
- **Review of measure savings assumptions and calculations** occurred concurrent with the DSMC data reviews mentioned above. Savings values are maintained in the Technical Reference Library (TRL). The TRL files sometimes include measure savings assumptions, calculations, source papers or files (e.g. RTF versions), and additional documentation that together comprise the generally accepted rules and guidance for evaluating programs. ADM reviewed all TRL documentation and included in this report any errors, omissions, or inconsistencies identified during ADM's review.
- **Data requests** related to EM&V activities occurred throughout the period of this evaluation. ADM provided Rocky Mountain Power various data requests for DSMC and TRL data pulls and reports, and other program data and verification, as necessary.
- **Online surveys were conducted** to verify measure installation and collect additional primary data from program participants. ADM surveyed a representative sample of known 2016 and 2017 participants in Rocky Mountain Power's LIW program in Wyoming.

4.1.2 Sample Design

ADM attempted to survey a census of the 13 total homes that participated in the LIW program and was able to complete four surveys. This sample of known program participants was surveyed for measure installation rates and process evaluation questions regarding the specific measures they implemented according to DSMC datasets. The LIW Program Participant Survey sample size is provided in Table 4-3.

Table 4-3: 2016-2017 Wyoming Low Income Weatherization Program Participant Survey Sample Size

Survey	Number of Survey Invites Sent	Number of Completed Surveys (n)	Response Rate
Wyoming LIW Program Participant Survey	13	4	31%

4.1.3 Impact Evaluation Approach

The Rocky Mountain Power LIW program in Wyoming consisted of one building shell measure category which bundles together numerous individual building shell weatherization measures for each participant home in Wyoming. The impact evaluation consisted of various methodologies to evaluate each individual building shell measure for each participant home, including engineering analyses and deemed savings reviews. The engineering analyses included primary data collection regarding home size and heat type from publicly available housing or county assessor data. Both the engineering analyses and deemed savings review methodologies included a review of the deemed savings values, savings assumptions and calculations, modeling files, and other information contained in the applicable TRL files and sources of savings values. ADM did not conduct an impact evaluation of net savings as the NTG is assumed to be 1.0 for Rocky Mountain Power’s Wyoming LIW program.

4.2 Evaluated Gross Annual Energy (kWh) Savings

The following measures were installed through the program in 2016-2017:

- Building shell measures, including weatherization measures.

Engineering calculations or deemed savings reviews were performed for a census of the individual building shell program measures that comprised the bundled building shell weatherization measure category. ADM’s estimation of verified unit energy savings (“UES”) per measure takes into consideration Wyoming’s deemed savings values and the measure savings assumptions and calculations contained in Rocky Mountain Power’s TRL files. The UES values may be adjusted to reflect specific, generally accepted evaluation requirements in Wyoming.

4.2.1 Building Shell Measures

Rocky Mountain Power's LIW program consisted of one building shell measure category that included numerous individual building shell weatherization measures and represented approximately 98% of the total LIW program claimed savings.³ Rocky Mountain Power claimed the following gross energy savings for the building shell measure category shown in Table 4-4.

Table 4-4: 2016-2017 Wyoming Low Income Weatherization Program Claimed Gross Energy Savings for Building Shell

Measure Category	Measure Type	2016 Quantity	2016 Savings (kWh)	2017 Quantity	2017 Savings (kWh)
Building Shell	WY Weatherization	8	17,488	4	8,744
	WY Weatherization (insulation and/or windows)	1	2,153	-	-
	TOTAL	9	19,641	4	8,744

4.2.2 Database Review

For the building shell measures in Rocky Mountain Power's LIW Program in 2016 and 2017, ADM reviewed and reconciled the program tracking data to the claimed participation counts and ex-ante claimed savings in the 2016 and 2017 annual reports. Further, ADM conducted the ex-ante review activities detailed below for building shell measures:

- Verification that the program tracking dataset does not include duplicate or erroneous data entries
- Confirmed data entries in program tracking dataset include all necessary fields for savings calculations
- Verification that all energy savings are claimed in accordance with the applicable TRL documents and calculations

For the WY weatherization measure in 2016 and 2017, Rocky Mountain Power claimed an ex-ante Unit Energy Savings (UES) value of 2,186 kWh. ADM verified that the source

³ The building shell measure category accounted for 100% of the evaluated savings in this report. The only measures with claimed savings outside of the building shell measure category in Wyoming during the program years 2016-2017 were associated with a participant that was also a building shell measure category participant. ADM evaluated the individual lighting and water heating measures as part of the Wyoming participant's bundled building shell weatherization measure, resulting in no evaluated savings for the individual lighting and water heating measures and an increased evaluated savings in the bundled building shell measure category.

for this ex-ante UES value is the Wyoming Low-Income Weatherization Program Evaluation Report for program years 2011-2013⁴ as indicated in the TRL extract file.

For the WY weatherization (insulation and/or windows) measure in 2016, Rocky Mountain Power claimed an ex-ante UES value of 2,153 kWh. ADM verified that the source for this ex-ante UES value is the Wyoming Low-Income Weatherization Program Analysis in Support of Tariff Filing completed in 2006⁵ as indicated in the TRL extract file. It is unclear why Rocky Mountain Power claimed this UES value for one building shell measure category participant in 2016 instead of the other WY weatherization measure UES value of 2,186 kWh which was claimed for the other eight participants in 2016.

4.2.3 Inputs to Savings Calculations

For the 13 homes that received the Wyoming building shell weatherization measures, ADM collected primary data regarding home size and heat type from publicly available housing or county assessor data. The average home size that participated in the LIW program building shell measure was 1,310 square feet. Other inputs to the savings calculations for the bundled building shell weatherization measures include previous impact evaluations of individual measures in Wyoming and the UES values contained in the applicable TRL files and sources of savings values for individual building shell measures in Wyoming.

4.2.4 Evaluated Ex-Post Gross Unit Energy Savings

Table 4-5 reports the frequency of each individual building shell weatherization measure installed as part of the bundled building shell measure category in Wyoming. Florescent lighting and insulation measures were the most commonly installed.

⁴ Wyoming Low-Income Weatherization Program Evaluation Report for Program Years 2011-2013; Smith & Lehmann Consulting; September 1, 2015.

⁵ Wyoming Low-Income Weatherization Program: Analysis in Support of Tariff Filing; Quantec, LLC; July 31, 2006.

Table 4-5: Frequency of Wyoming Building Shell Measure Installations 2016-2017

Year	Building Shell WY Weatherization Individual Measure	Number of Homes that Received the WY Weatherization Individual Measure	Total Quantity of WY Weatherization Individual Measure Installed
2016	Ceiling Insulation	5	5
	Double Glass Replacement	3	17
	Duct Sealing	1	1
	Floor Insulation	6	6
	Florescent Lighting	8	58
	Ground Cover	2	2
	Low Flow Showerhead	2	2
	Refrigerator Replacement	1	1
	Thermal Doors	4	4
	Wall Insulation	1	1
	Weather Strip Doors	3	3
	Weather Strip Windows	4	4
2017	Air Sealed/Infiltration	2	2
	Ceiling Insulation	2	2
	Duct Sealing	1	1
	Florescent Lighting	3	28
	LED Bulbs	1	10
	Pipe Insulation	4	4
	Weather Strip Windows	3	3

Table 4-6 shows claimed and evaluated gross savings for the building shell measure category in addition to the realization rate. The realization rate for the Wyoming building shell measure category across both program years 2016 and 2017 is 135.1 percent.

Table 4-6: 2016 Wyoming LIW Program Building Shell Claimed and Evaluated Gross Energy Savings

Year	Measure Category	Measure Type	Claimed Savings (kWh)	Evaluated Gross Savings (kWh)	Realization Rate
2016	Building Shell	WY Weatherization	17,488	28,352	162.1%
		WY Weatherization (insulation and windows)	2,153	3,544	164.6%
2017	Building Shell	WY Weatherization	8,744	7,137	81.6%
2016-2017 TOTAL			28,891	39,033	135.1%

ADM performed a combination of engineering calculations and deemed savings reviews for each of the 13 homes that received building shell weatherization measures in Wyoming. Table 4-7 shows the UES value and source of the UES value for each individual building shell weatherization measure that comprise the bundled building shell measure category. ADM applied the UES values for each individual measure to the quantity of individual measures installed in each participants home. For insulation measures with UES values by square footage and heat type, ADM used home size and heat type data collected for each participant home from publicly available housing or county assessor data. Insulation savings were capped at 25% of the annual electricity usage for a Wyoming home in 2012. The calculated savings for the individual installed measures for each participant household were summed, resulting in a 135.1% realization rate compared to the claimed UES values for the bundled building shell measure category across both program years 2016 and 2017. The average evaluated gross savings for homes that received building shell measures in the Wyoming LIW Program is 3,003 kWh, compared to the claimed savings value of 2,183 kWh.

Table 4-7: Individual Building Shell Weatherization UES Values and Sources

Building Shell WY Weatherization Individual Measure	Ex-post Unit Energy Savings Value (kWh)	Source of Unit Energy Savings Value
Ceiling Insulation	1.03 kWh per sq. ft.	RMP ¹ 2015 Wyoming TRL ² file
Double Glass Replacement	3.54 kWh per sq. ft.	RMP 2015 Wyoming TRL file
Duct Sealing	1,784 kWh per home	RMP 2015 Wyoming TRL file
Floor Insulation	4.94 kWh per sq. ft.	RMP 2015 Wyoming TRL file
Florescent Lighting	23.41 kWh per bulb	RMP 2014 Wyoming TRL file
LED Bulbs	21.49 kWh per bulb	ADM WY Residential Evaluation 2017-2018
Low Flow Showerhead	286.67 kWh per showerhead	ADM WY Residential Evaluation 2017-2018
Pipe Insulation	124 kWh per home	WY LIW Program Evaluation 2014-2016
Refrigerator Replacement	1,206 kWh per refrigerator	WY LIW Program Evaluation 2014-2016
Thermal Doors	123 kWh per door	WY LIW Program Evaluation 2014-2016
Wall Insulation	4.29 kWh per sq. ft.	RMP 2015 Wyoming TRL file
Weather Strip Doors	108 kWh per door	WY LIW Program Evaluation 2014-2016
Weather Strip Windows	3.54 kWh per sq. ft.	RMP 2015 Wyoming TRL file

¹ Rocky Mountain Power

²Technical Reference Library

5. Process Evaluation

ADM completed a process evaluation of the Rocky Mountain Power LIW program during 2016 and 2017 that consisted of:

- Review of program materials
- In-depth interviews with program staff
- Program participant survey

5.1 Review of Program Materials and In-depth Interviews with Program Staff

ADM evaluators interviewed LIW program staff from Rocky Mountain Power and from WWS to gain insight into program design, to identify program objectives, and to assess the program during the evaluation period of 2016 and 2017.

5.1.1 Roles and Responsibilities

Rocky Mountain Power is a subsidiary of PacifiCorp. PacifiCorp's LIW program manager oversees the program in Utah, Wyoming, Washington, Idaho and California. The program manager who oversaw the program during the 2016-2017 evaluation period is no longer with PacifiCorp and was therefore unavailable to interview. Current program staff, some of whom held positions in the LIW program during evaluation period, were interviewed.

Rocky Mountain Power works with two community nonprofit organizations to implement the program for Rocky Mountain Power in Wyoming: WWS and CCS.

ADM evaluators interviewed the CFO of WWS, the agency that provided services to nine of thirteen households that participated in the program during the evaluation period. No representative of CCS was interviewed as part of this evaluation.

The CFO of WWS oversees the LIW contract with Rocky Mountain Power and submits documentation for any weatherization expenses that are eligible for reimbursement from Rocky Mountain Power.

WWS is responsible for the following program activities:

- Receiving a list of qualify program participants Wyoming Low Income Heating Energy Assistance Program.
- Determining which order customers will be served in based on federal priority mandates.
- Identifying which WWS customers are Rocky Mountain Power customers, and which measures are eligible for Rocky Mountain Power funding.

- Conducting home energy audits, installing energy efficient measures, and inspecting homes post-installation.
- Verifying that invoices from agencies are correct and process them for payment by the appropriate funding source

5.1.2 Tracking and Reporting

Rocky Mountain Power provided ADM with program tracking data that specified what measures were installed per project and estimated energy savings per measure. Customers' phone numbers and email addresses (when available) at the time of participation in the program were included in the tracking data.

5.1.3 Communication

Implementation agency staff did not indicate any concerns about the frequency of communication between the agency and Rocky Mountain Power. They expressed no reservations about increasing the frequency of communication with Rocky Mountain Power nor having Rocky Mountain Power make office or project site visits with WWS staff.

5.1.4 Marketing and Outreach

The availability of the program is communicated to potential participants primarily through when individuals apply for assistance from the Low Income Home Energy Assistance Program (LIHEAP). WWS indicated that their greatest challenge in enrolling more homes in Rocky Mountain Power's LIW program with them is identifying electrically heated homes.

5.1.5 Quality Assurances and Quality Controls (QA/QC)

The program's quality assurance and quality control practices are driven by DOE's Weatherization Assistance Program QA/QC requirements that were implemented in 2015 after the previous program evaluation period. DOE requires that all jobs are inspected by Quality Control Inspectors (QCIs) who have been certified by the Building Performance Institute.

In addition, WWS makes an annual trip inspecting homes served by each regional office. Rocky Mountain Power did not visit WWS offices nor inspect homes that received Rocky Mountain Power-funded measures.

5.1.6 In Depth Interview Takeaways

The following findings resulted from ADM's in-depth interviews with program staff:

- Two notable program changes took place during the evaluation period: 1) the transition from CFLs in 2016 to LED light bulbs in 2017 and 2) the addition of inspections completed by certified Quality Control Inspectors in 2015 as required by the DOE.
- Program implementers expressed positive program outcomes including reduced energy demand, improved home comfort, reduction of health and safety hazards, and retention of homes in the affordable housing inventory.
- WWS has difficulty identifying homes that are eligible for Rocky Mountain Power because few homes are electrically heated in Wyoming.
- WWS expressed no challenges providing services to rural customers.
- Long wait times result from the federal weatherization programs' prioritization system. Some applicants that don't qualify in any priority category may wait in excess of two years to be enrolled in the program.
- WWS expressed that they feel they would benefit from Rocky Mountain Power-provided energy efficiency education materials.
- WWS indicated that they would like to be able to use Rocky Mountain Power funding to pay for cooling measures.
- All crew members receive weatherization training on an annual basis. Crews would like more training on furnace maintenance.
- Wyoming's WAP provided weatherization services to 506 households in 2016 and 393 in 2017 – a total of 899 during the evaluation period. During this time only 13 (~1.4%) of homes were served with Rocky Mountain Power weatherization funding.
- The number of homes served by Rocky Mountain Power low-income weatherization funding has steadily declined since 2013, see Table 5-1.

*Table 5-1: Wyoming's Low- Income Weatherization Program
Numbers of Homes Served 2013-2017*

Year	Homes served
2013	36
2014	23
2015	17
2016	9
2017	4

5.2 Program Participant Survey

ADM conducted a survey of qualifying low-income participants who received measures or services from the program. Participant emails (n = 1) and phone numbers (n = 13) were identified from data provided by Rocky Mountain Power and linked to the tracking data. ADM attempted to contact a total of 13 program participants as part of the survey efforts.

ADM staff made 35 phone calls to 13 participants with phone numbers during the month of December and January (up to 4 times per household) resulting in four completed surveys, one refusal, two disconnected phones and three wrong numbers. Phone calls were discontinued after the max attempts to reach participants were met for the three remaining working phone numbers.

Due to the extremely low population of only 13 homes serviced with Rocky Mountain Power funds, ADM was unable to achieve the desired 90% statistical confidence and +10% precision with the sample size of four.

ADM analyzed the survey responses from the four participants. Program participants were offered monetary incentives (\$10 gift cards) for completing the survey. Survey topics covered measure installation rates as well as customer experiences with the program, installation crew and agency staff.

LIW program participants first learned about the program through a variety of channels. Most participants reported learning about the program from a community agency (75%) with one learning about the program from a friend or neighbor (25%) as indicated below in Table 5-2.

Table 5-2: How Did Participants Learn About the Program?

Response	<i>n</i>	Percentage of Respondents
From a community agency/another program (LIHEAP)	3	75%
From a friend/neighbor	1	25%

Respondents reported deciding to participate in the program to save money on their energy bills (100%), to improve home comfort (75%), because the services were provided at no cost (75%), to reduce energy use for environmental reasons (100%), to improve the value of the home (50%) and other reasons (25%) as shown in Table 5-3.

Table 5-3: Why Did Respondents Decide to Participate in the Program?

Response	<i>n</i>	Percentage of Respondents
To save money on energy bills	4	100%
To improve home comfort	3	75%
The services were provided at no cost	3	75%
To reduce energy use for environmental reasons	4	100%
To improve value of the home	2	50%
Other “Windows in home were bad”	1	25%

*Note: The sum of *n* may exceed the total surveyed (4) and percentages may exceed 100% because respondents could choose more than one response.*

5.2.1 Measures Installed

ADM asked survey respondents to confirm that measures were installed in their homes through the program. Survey respondents confirmed receipt of most all measures indicated in the program records (as listed in Table 5-4), with the exception of window installation, for which the one surveyed respondent did not recall six windows being installed, rather they believed it was five. Due to the long period of time after the installation took place, ADM assumed an installation service rate (ISR) for the windows of 100%.

Program participants who received the remaining measures (LED light bulbs, weather stripping on doors, pipe insulation, air sealed/infiltration, low flow shower heads, ground cover and duct sealing) did not complete the survey.

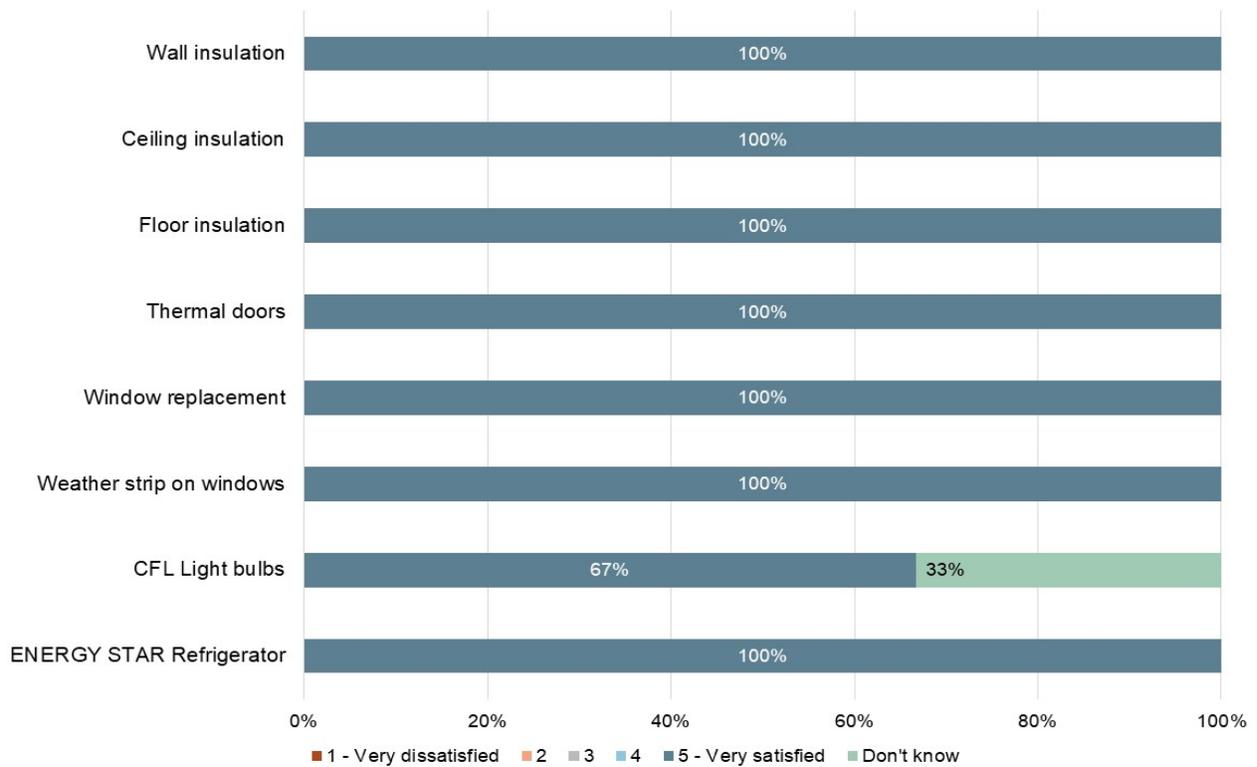
Table 5-4: What measures did survey respondents receive?

Measures	Number of Respondents	ISR
ENERGY STAR certified refrigerator	1	100%
CFL light bulbs	3	100%
Weather stripping on windows	2	100%
Window replacement	1	100%
Thermal doors	2	100%
Floor insulation	1	100%
Ceiling insulation	3	100%
Wall insulation	1	100%

Note: The percentages may exceed 100% because respondents were only asked to confirm receipt of measures indicated in tracking data and percentages were calculated for each item individually.

ADM asked respondents to rate their satisfaction with the measures they received through the program on a scale from 1 to 5, in which 1 meant “very dissatisfied” and 5 meant “very satisfied”. All respondents (4/4 or 100%) rated their satisfaction as a 5 (very satisfied) for all measures with the exception of one participant who stated they “Don’t know” for CFL light bulbs (see Figure 5-1).

Figure 5-1: Satisfaction with Energy Savings Measures



5.2.2 Program Satisfaction

Overall, 100% of program participants surveyed reported the highest satisfaction with the LIW program (a rating of 5 out of 5, indicating they “very satisfied” with the program overall).

5.2.3 Wyoming Survey Takeaways

The following section summarizes the conclusions for the LIW program survey results in Wyoming.

- All survey respondents shared positive feedback and support for the program. Respondents rated their satisfaction with program measures and their overall experience highly.
- One respondent (25%) offered a suggestion for improvements in the program: The agency neglected to fill holes they made to blow insulation into the walls. The participant suggested that the agency make sure to fill such insulation holes in the future.
- A small portion of participants chose the “don’t remember” or “don’t know” option available in many questions indicating they had difficulty recalling details about program participation two to four years after the in-home audits/visits and installation of measures.
- The low response rate and inability to reach many program participants for feedback and verification of installation rates could possibly be improved by decreasing the time between program implementation and the process evaluations.

6. Cost Effectiveness Evaluation

Rocky Mountain Power contracted with Navigant to calculate the program cost-effectiveness based on the evaluated savings assessed by ADM. ADM provided the measure life and incremental cost inputs needed to calculate the cost-effectiveness of the program. Measure life and incremental cost values were assigned on an individual measure basis and came from the TRL files provided by Rocky Mountain Power. Table 6-1 includes the cost effectiveness evaluation inputs for 2016 and 2017.

Table 6-1 - Low Income Weatherization Program Inputs

Parameter	PY2016	PY2017
Discount Rate	6.66%	6.66%
Residential Line Loss	9.51%	9.51%
Residential Energy Rate (\$/kWh) ¹	\$0.1127	\$0.1117
Inflation Rate	1.90%	1.90%

¹ Future rates determined using a 1.90% annual escalator.

Table 6-2 reports program costs by year.

Table 6-2: Low Income Weatherization Annual Program Costs

Program Year	Engineering Costs	Utility Admin	Program Delivery	Program Development	Incentives	Total Utility Costs	Gross Customer Costs
2016	\$0	\$5,116	\$962	\$138	\$9,620	\$15,836	\$0
2017	\$0	\$3,467	\$80	\$72	\$800	\$4,418	\$0
2016-2017	\$0	\$8,583	\$1,042	\$210	\$10,419	\$20,254	\$0

Table 6-3 includes energy savings resulting from the program for the evaluation period.

Table 6-3 - Low Income Weatherization Program – Savings by Program Year

Program Year	Gross kWh Savings	Realization Rate	Adjusted Gross kWh Savings	Net to Gross Ratio	Net kWh Savings	Measure Life
2016	20,147	158%	31,896	100%	31,896	27
2017	8,744	82%	7,137	100%	7,137	27
2016-2017	28,891	135%	39,033	100%	39,033	27

Table 6-4 includes the summarized results of the following cost effectiveness tests for the evaluation period: Total Resource Cost Test (PTRC), Total Resource Cost Test (TRC), Utility Cost Test (UCT), and Rate Impact Test (RIM). The Participant Cost Test (PCT) was not conducted since the Low-Income Weatherization program provides weatherization measures at no cost to eligible customers and this test is therefore not applicable.

Table 6-4: Benefit/Cost Ratios by Program Year

Program Year	PTRC	TRC	UCT	RIM
2016	2.14	1.94	1.94	0.42
2017	1.70	1.54	1.54	0.39
2016-2017	2.04	1.86	1.86	0.41

Table 6-5 includes program level cost effectiveness test results for the 2016 and 2017. The program passed the cost-effectiveness criteria for all tests except the RIM test.

Table 6-5: Low Income Weatherization Program Level Results – PY2016-2017

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0345	\$20,254	\$41,342	\$21,088	2.04
Total Resource Cost Test (TRC) No Adder	\$0.0345	\$20,254	\$37,584	\$17,330	1.86
Utility Cost Test (UCT)	\$0.0345	\$20,254	\$37,584	\$17,330	1.86
Rate Impact Test (RIM)		\$91,302	\$37,584	-\$53,718	0.41
Lifecycle Revenue Impacts (\$/kWh)	\$0.0000001002				

Table 6-6 includes program level cost effectiveness test results for 2016. The program passed the cost-effectiveness criteria for all tests except the RIM test.

Table 6-6 - Low Income Weatherization Program Level Cost-Effectiveness Results – PY2016

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
--------------------------------	-------------------------	--------------	-----------------	---------------------	---------------------------

Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0330	\$15,836	\$33,835	\$18,000	2.14
Total Resource Cost Test (TRC) No Adder	\$0.0330	\$15,836	\$30,759	\$14,924	1.94
Utility Cost Test (UCT)	\$0.0330	\$15,836	\$30,759	\$14,924	1.94
Rate Impact Test (RIM)		\$73,987	\$30,759	-\$43,228	0.42
Lifecycle Revenue Impacts (\$/kWh)	\$0.0000001624				

Table 6-7 includes program level costs effectiveness test results for 2017. The program passed the cost-effectiveness criteria for all tests except the RIM test.

Table 6-7 - Low Income Weatherization Program Level Cost-Effectiveness Results – PY2017

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0412	\$4,418	\$7,507	\$3,088	1.70
Total Resource Cost Test (TRC) No Adder	\$0.0412	\$4,418	\$6,824	\$2,406	1.54
Utility Cost Test (UCT)	\$0.0412	\$4,418	\$6,824	\$2,406	1.54
Rate Impact Test (RIM)		\$17,315	\$6,824	-\$10,491	0.39
Lifecycle Revenue Impacts (\$/kWh)	\$0.0000000389				

7. Conclusions and Recommendations

ADM's evaluation resulted in the following conclusions:

- During the evaluation period, the program resulted in total evaluated energy savings of 39,034 kWh from thirteen households that participated in the program.
- Rocky Mountain Power continued their partnership with WWS and CCS to implement the LIW program. Program implementers expressed positive program outcomes including reduced energy demand, improved home comfort, reduction of health and safety hazards, and retention of homes in the affordable housing inventory.
- The 2016 and 2017 combined program, and each individual year, passed the cost-effectiveness standards for all tests except the Rate Impact Test.

Based on its evaluation, ADM recommend the following actions for Rocky Mountain Power to consider in its future implementation of its LIW program in Wyoming.

- Rocky Mountain Power should continue partnering with agencies that provide federally funded weatherization services to take advantage of existing program infrastructure and leveraged funding.
- Rocky Mountain Power could consider sharing its program objectives (qualitative or quantitative) in order to more clearly determine the success of the program. Both Rocky Mountain Power and implementation partners would likely benefit from more explicit program goals.
- Rocky Mountain Power could consider building stronger relationship with program implementers in order to identify opportunities that become apparent through stronger partnership interactions. For example, Rocky Mountain Power might consider joining WWS on their annual "Round the World Trip" – a tour of WAP program participant home inspections.
- Rocky Mountain Power could consider requesting more detailed tracking data from implementers to increase the accuracy and granularity of measures' specifications. For example, additional data could include baseline and efficient wattages for bulbs installed through the program, specifications for baseline and replacement efficient refrigerators, and pre- and post-installation insulation conditions. Implementers are already recording extensive data in the DOE-approved auditing software used for projects that include Weatherization Assistance Program (WAP) funding, and therefore the additional data reporting should not create an unreasonable burden.

- Rocky Mountain Power might consider adding cooling measures, this would increase the number of homes eligible for Rocky Mountain Power funding to install shell measures.
- Implementers might consider date ranking non-priority status applicants so the 22% of households without any vulnerable members can benefit from the duration of their time on the wait list.
- Rocky Mountain Power could consider reducing the interval between program implementation and evaluation.
- Rocky Mountain Power could consider implementing a process for collecting weatherization program customers' email addresses to enable more accurate and comprehensive program evaluations.
- Rocky Mountain Power might consider producing branded energy efficiency education materials for distribution to program participants.

8. Appendix: Participant Survey

Rocky Mountain Power Low Income Weatherization Program Participant Survey

Variables

- 03 Weather Strip Windows - WY
- 07 Weather Strip Doors - WY
- 08 Wall Insulation - WY
- 09 Ceiling Insulation - WY
- 11 Floor Insulation - WY
- 12 Pipe Insulation - WY
- 581 Duct Sealing - WY
- 18 Air Sealed/Infiltration - WY
- 19 Low Flow Shower Head - WY
- 21 Florescent Lighting - WY
- 31 Thermal Doors - WY
- 32 Double Glass Replacement - WY
- 46 Ground Cover - WY
- 901 Refrigerator Replacement - WY
- 50 LED Bulbs - WY Customer Name Site Address
- Site City Site State Site Zip
- Customer Phone
- Contact Email Address
- Agency Name

Page exit logic: Skip / Disqualify Logic IF: #1 Question "Do you recall participating in [question('value'), id='308'] Home Energy Efficiency Program? Through this program you may have received light bulbs, or you may have had an appliance replaced with an ENERGY STAR certified appliance; you may also have received home weatherization or other home energy improvement measures." is one of the following answers ("No", "Don't know") THEN: Disqualify and display: Thank you for your time!

Do you recall participating in [question('value'), id='308'] Home Energy Efficiency Program? Through this program you may have received light bulbs, or you may have had an appliance replaced with an ENERGY STAR certified appliance; you may also have received home weatherization or other home energy improvement measures. *

- Yes
- No
- Don't know

Do you rent or own this property? *

- Rent
- Own

How did you first learn about the Home Energy Efficiency Program?

- From an information brochure
- From a friend/neighbor
- From your property owner/landlord
- From a community agency
- From a contractor
- From the internet
- From information received through Rocky Mountain Power
- Other (please specify)

Why did you choose to participate in the program? (Select all that apply)

- To save money on energy bills
- To reduce energy use for environmental reasons
- The services were provided at no cost
- To improve home comfort
- To improve value of the home
- Other (please specify)
- Don't remember
- Don't know

Program records indicate that you received the following items from the Home Energy Efficiency Program. Could you please confirm whether these records are correct? *

	Yes	No	Don't know
LED light bulbs			
CFL light bulbs			
ENERGY STAR certified refrigerator			
Window replacement			
Ceiling insulation			
Furnace fan			
Duct sealing and/or duct insulation			

Logic: Hidden unless: Question "LED light bulbs" is one of the following answers ("Yes")

Before today, had you ever heard of light emitting diode light bulbs, or LED light bulbs?

- Yes
- No
- Don't know

Logic: Hidden unless: Question "LED light bulbs" is one of the following answers ("Yes")

Do you believe you could identify a typical LED light bulb if one was placed in front of you?

- Yes
- No
- Don't know

Logic: Hidden unless: Question "CFL light bulbs" is one of the following answers ("Yes")

Before today, had you ever heard of compact fluorescent light bulbs, or CFL light bulbs?

- Yes
- No
- Don't know

Logic: Hidden unless: Question "CFL light bulbs" is one of the following answers ("Yes")

Do you believe you could identify a typical CFL light bulb if one was placed in front of you?

- Yes
- No
- Don't know

Logic: Show/hide trigger exists.

Did someone visit your household to discuss ways of saving energy and to install energy efficient equipment?

- Yes
- No
- Don't know

Logic: Show/hide trigger exists. Hidden unless: #9 Question "Did someone visit your household to discuss ways of saving energy and to install energy efficient equipment?" is one of the following answers ("Yes")

Are you the person who scheduled the home visit?

- Yes
- No
- Don't know

Logic: Hidden unless: #12 Question "Were you at home at the time of this visit?" is one of the following answers ("Yes")

Using a scale where 1 means "completely disagree" and 5 means "completely agree," how much do you agree with the following statements about the work that was done on the home:

	Completely disagree 1	2	3	4	Completely agree 5	Don't know
The completion of the work was timely and efficient						
The work crew was courteous and professional						
The information provided about your home's energy use was useful						
The information provided about your home's energy use was easy to understand						

Logic: Show/hide trigger exists. Hidden unless: Question "LED light bulbs" is one of the following answers ("Yes")

You indicated that you received LED light bulbs from the program. Program records indicate you received [question("value"), id="18"] LED light bulbs. To the best of your knowledge, is that number correct or did you receive a different number of LED light bulbs?

- Yes, that is the correct number of LED light bulbs
- No, I received a different number of LED light bulbs
- Don't remember
- Don't know

Validation: Must be numeric Whole numbers only Positive numbers only

Logic: Hidden unless: #15 Question "You indicated that you received LED light bulbs from the program. Program records indicate you received [question("value"), id="18"] LED light bulbs. To the best of your knowledge, is that number correct or did you receive a different number of LED light bulbs?" is one of the following answers ("No, I received a different number of LED light bulbs")

What is the correct number of LED light bulbs that you received? *

Logic: Show/hide trigger exists. Hidden unless: (#15 Question "You indicated that you received LED light bulbs from the program. Program records indicate you received [question("value"), id="18"] LED light bulbs. To the best of your knowledge, is that number correct or did you receive a different number of LED light bulbs?" is one of the following answers ("Yes, that is the correct number of LED light bulbs") OR Question "What is the correct number of LED light bulbs that you received?" is greater than "0")

Has anyone removed any of the LED light bulbs that were installed through this program?

- Yes
- No
- Don't remember
- Don't know

Logic: Show/hide trigger exists. Hidden unless: #16 Question "Has anyone removed any of the LED light bulbs that were installed through this program?" is one of the following answers ("Yes")

Why were some LED light bulbs removed? (Select all that apply)

- LED light bulb(s) broke or burned out
- LED light bulb(s) did not work as needed (e.g., lights too dim)
- Using them in another home or at work
- Storing them for later use
- Gave them away
- Returned them to the program
- Other (please specify)

Logic: Hidden unless: #17 Question "Why were some LED light bulbs removed? (Select all that apply)" is one of the following answers ("LED light bulb(s) broke or burned out", "LED light bulb(s) did not work as needed (e.g., lights too dim)", "Using them in another home or at work", "Storing them for later use", "Gave them away", "Returned them to the program", "Other (please specify)")

How long were the LED light bulbs installed before someone removed them?

- Less than one year
- More than one year

Logic: Show/hidden trigger exists. Hidden unless: (#15 Question "You indicated that you received LED light bulbs from the program. Program records indicate you received [question("value"), id="18"] LED light bulbs. To the best of your knowledge, is that number correct or did you receive a different number of LED light bulbs?" is one of the following answers ("Yes, that is the correct number of LED light bulbs") OR Question "What is the correct number of LED light bulbs that you received?" is greater than "0")

Were any of the LED light bulbs you received from the program never installed?

- Yes
- No
- Don't remember
- Don't know

Logic: Show: Hidden unless: #19 Question "Were any of the LED light bulbs you received from the program never installed?" is one of the following answers ("Yes")

Why were some of the LED light bulbs never installed?

Page entry logic: This page will show when: (Question "LED light bulbs" is one of the following answers ("Yes") AND #15 Question "You indicated that you received LED light bulbs from the program. Program records indicate you received [question("value"), id="18"] LED light bulbs. To the best of your knowledge, is that number correct or did you receive a different number of LED light bulbs?" is one of the following answers ("Yes, that is the correct number of LED light bulbs")) Validation: Must be numeric Whole numbers only Positive numbers only

Logic: Hidden unless: (Question "LED light bulbs" is one of the following answers ("Yes") AND #15 Question "You indicated that you received LED light bulbs from the program. Program records indicate you received [question("value"), id="18"] LED light bulbs. To the best of your knowledge, is that number correct or did you receive a different number of LED light bulbs?" is one of the following answers ("Yes, that is the correct number of LED light bulbs"))

To verify, of the [question("value"), id="18"] LED light bulbs you received, how many are currently installed, were installed and removed, or were never installed?

- Number of LED light bulbs currently installed
- Number of LED light bulbs installed and removed
- Number of LED light bulbs never installed

Total : [#]

Page entry logic: This page will show when: (Question "LED light bulbs" is one of the following answers ("Yes") AND Question "What is the correct number of LED light bulbs that you received?" is greater than "0") Must be numeric Whole numbers only Positive numbers only

Logic: Hidden unless: (Question "LED light bulbs" is one of the following answers ("Yes") AND Question "What is the correct number of LED light bulbs that you received?" is greater than "0")

To verify, of the [question('value'), id='76'] LED light bulbs you received, how many are currently installed, were installed and removed, or were never installed?

- Number of LED light bulbs currently installed
- Number of LED light bulbs installed and removed
- Number of LED light bulbs never installed

Total : [#]

Page entry logic: This page will show when: (Question "LED light bulbs" is one of the following answers ("Yes") AND (#15 Question "You indicated that you received LED light bulbs from the program. Program records indicate you received [question("value"), id="18"] LED light bulbs. To the best of your knowledge, is that number correct or did you receive a different number of LED light bulbs?" is one of the following answers ("Yes, that is the correct number of LED light bulbs") OR #15 Question "You indicated that you received LED light bulbs from the program. Program records indicate you received [question("value"), id="18"] LED light bulbs. To the best of your knowledge, is that number correct or did you receive a different number of LED light bulbs?" is one of the following answers ("No, I received a different number of LED light bulbs")))

Logic: Hidden unless: (Question "LED light bulbs" is one of the following answers ("Yes") AND (#15 Question "You indicated that you received LED light bulbs from the program. Program records indicate you received [question("value"), id="18"] LED light bulbs. To the best of your knowledge, is that number correct or did you receive a different number of LED light bulbs?" is one of the following answers ("Yes, that is the correct number of LED light bulbs") OR #15 Question "You indicated that you received LED light bulbs from the program. Program records indicate you received [question("value"), id="18"] LED light bulbs. To the best of your knowledge, is that number correct or did you receive a different number of LED light bulbs?" is one of the following answers ("No, I received a different number of LED light bulbs")))

On a scale of 1 to 5, where 1 is "not at all confident" and 5 is "completely confident," how confident are you of where in your home the LED light bulbs are currently installed?

Not at all
confident

Completely
confident

Don't know

1

2

3

4

5

Page entry logic: This page will show when: (Question "LED light bulbs" is one of the following answers ("Yes") AND Q22A is greater than "0") Must be numeric Whole numbers only Positive numbers only

Logic: Hidden unless: (Question "LED light bulbs" is one of the following answers ("Yes") AND Q22A is greater than "0")

To the best of your recollection, how many of the [question("value"), id="267"] LED light bulbs received through the program are currently installed in each of the following locations?

- Bedrooms
 - Bathrooms
 - Living room
 - Kitchen
 - Entryway
 - Dining room
 - Garage
 - Basement
 - Den
 - Stairway
 - Office
 - Laundry room
 - Other
- Total: [#]

Page entry logic: This page will show when: (Question "LED light bulbs" is one of the following answers ("Yes") AND Q23A is greater than "0") Must be numeric Whole numbers only Positive numbers only

Logic: Hidden unless: (Question "LED light bulbs" is one of the following answers ("Yes") AND Q23A is greater than "0")

To the best of your recollection, how many of the [question("value"), id="268"] LED light bulbs received through the program are currently installed in each of the following locations?

- Bedrooms
- Bathrooms
- Living room
- Kitchen
- Entryway
- Dining room
- Garage
- Basement
- Den

- Stairway
 - Office
 - Laundry room
 - Other
- Total : [#]

Page entry logic: This page will show when: (#15 Question "You indicated that you received LED light bulbs from the program. Program records indicate you received [question("value"), id="18"] LED light bulbs. To the best of your knowledge, is that number correct or did you receive a different number of LED light bulbs?" is one of the following answers ("Yes, that is the correct number of LED light bulbs") OR Question "What is the correct number of LED light bulbs that you received?" is greater than "0")

Logic: Hidden unless: (#15 Question "You indicated that you received LED light bulbs from the program.

Program records indicate you received [#ofLEDs] LED light bulbs. To the best of your knowledge, is that number correct or did you receive a different number of LED light bulbs?" is one of the following answers ("Yes, that is the correct number of LED light bulbs") OR Question "What is the correct number of LED light bulbs that you received?" is greater than "0")

What type of light bulbs did the LED light bulbs replace? (Select all that apply)
Incandescent

- CFL light bulbs
- LED light bulbs
- Installed in new fixture
- Other (please specify)
- Don't remember
- Don't know

Logic: Show/hide trigger exists. Hidden unless: Question "CFL light bulbs" is one of the following answers ("Yes")

You indicated that you received CFL light bulbs from the program. Program records indicate you received [question("value"), id="13"] CFL light bulbs. To the best of your knowledge, is that number correct or did you receive a different number of CFL light bulbs?

- Yes, that is the correct number of CFL light bulbs
- No, received a different number of CFL light bulbs
- Don't remember
- Don't know

Validation: Must be numeric Whole numbers only Positive numbers only

Logic: Hidden unless: #27 Question "You indicated that you received CFL light bulbs from the program. Program records indicate you received [question("value"), id="13"] CFL light bulbs. To the best of your knowledge, is that number correct or did you receive a different number of CFL light bulbs?" is one of the following answers ("No, received a different number of CFL light bulbs")

What is the correct number of CFL light bulbs that you received? *

Logic: Show/hide trigger exists. Hidden unless: (#27 Question "You indicated that you received CFL light bulbs from the program. Program records indicate you received [question("value"), id="13"] CFL light bulbs.

To the best of your knowledge, is that number correct or did you receive a different number of CFL light bulbs?" is one of the following answers ("Yes, that is the correct number of CFL light bulbs") OR #28 Question "What is the correct number of CFL light bulbs that you received?" is greater than "0") Has anyone removed any of the CFL light bulbs that were installed through this program?

- Yes
- No
- Don't remember
- Don't know

Logic: Show/hide trigger exists. Hidden unless: #29 Question "Has anyone removed any of the CFL light bulbs that were installed through this program?" is one of the following answers ("Yes")

Why were some CFL light bulbs removed? (Select all that apply)

- CFL light bulbs broke or burned out
- CFL light bulbs did not work as needed (e.g., lights too dim)
- Using them in another home or at work
- Storing them for later use
- Gave them away
- Returned them to the program
- Other (please specify)

Logic: Hidden unless: #30 Question "Why were some CFL light bulbs removed? (Select all that apply)" is one of the following answers ("CFL light bulbs broke or burned out", "CFL light bulbs did not work as needed (e.g., lights too dim)", "Using them in another home or at work", "Storing them for later use", "Gave them away", "Returned them to the program", "Other (please specify)")

How long were the CFL light bulbs installed before someone removed them?

- Less than one year
- More than one year

Logic: Show/hide trigger exists. Hidden unless: (#27 Question "You indicated that you received CFL light bulbs from the program. Program records indicate you received [question("value"), id="13"] CFL light bulbs. To the best of your knowledge, is that number correct or did you receive a different number of CFL light bulbs?" is one of the following answers ("Yes, that is the correct number of CFL light bulbs") OR #28 Question "What is the correct number of CFL light bulbs that you received?" is greater than "0")

Were any of the CFL light bulbs you received from the program never installed?

- Yes
- No
- Don't remember
- Don't know

Logic: Hidden unless: #32 Question "Were any of the CFL light bulbs you received from the program never installed?" is one of the following answers ("Yes")

Why were some of the CFL light bulbs never installed?

Page entry logic: This page will show when: (Question "CFL light bulbs" is one of the following answers ("Yes") AND #27 Question "You indicated that you received CFL light bulbs from the program. Program records indicate you received [question("value"), id="13"] CFL light bulbs. To the best of your knowledge, is that number correct or did you receive a different number of CFL light bulbs?" is one of the following answers ("Yes, that is the correct number of CFL light bulbs")) Must be numeric Whole numbers only Positive numbers only

Logic: Hidden unless: (Question "CFL light bulbs" is one of the following answers ("Yes") AND #27 Question "You indicated that you received CFL light bulbs from the program. Program records indicate you received [question("value"), id="13"] CFL light bulbs. To the best of your knowledge, is that number correct or did you receive a different number of CFL light bulbs?" is one of the following answers ("Yes, that is the correct number of CFL light bulbs"))

To verify, of the [question("value"), id="13"] CFL light bulbs you received, how many are currently installed, were installed and removed, or were never installed?

- Number of CFL light bulbs currently installed
 - Number of CFL light bulbs installed and removed
 - Number of CFL light bulbs never installed
- Total : [#]

Page entry logic: This page will show when: (Question "CFL light bulbs" is one of the following answers ("Yes") AND #28 Question "What is the correct number of CFL light bulbs that you received?" is greater than "0") Must be numeric Whole numbers only Positive numbers only

Logic: Hidden unless: (Question "CFL light bulbs" is one of the following answers ("Yes") AND #28 Question "What is the correct number of CFL light bulbs that you received?" is greater than "0")

To verify, of the [question("value"), id="97"] CFL light bulbs you received how many are currently installed, were installed and removed, or were never installed?

- Number of CFL light bulbs currently installed
 - Number of CFL light bulbs installed and removed
 - Number of CFL light bulbs never installed
- Total : [#]

Logic: Hidden unless: (Question "CFL light bulbs" is one of the following answers ("Yes") AND (#27 Question "You indicated that you received CFL light bulbs from the program. Program records indicate you received [question("value"), id="13"] CFL light bulbs. To the best of your knowledge, is that number correct or did you receive a different number of CFL light bulbs?" is one of the following answers ("Yes, that is the correct number of CFL light bulbs") OR #27 Question "You indicated that you received CFL light bulbs from the program. Program records indicate you received [question("value"), id="13"] CFL light bulbs. To the best of your knowledge, is that number correct or did you receive a different number of CFL light bulbs?" is one of the following answers ("No, received a different number of CFL light bulbs"))

On a scale of 1 to 5, where 1 is "not at all confident" and 5 is "completely confident," how confident do you feel with your memory of where in your home the CFL light bulbs are currently installed?

Not at all confident					Completely confident	Don't know
1	2	3	4	5		

Page entry logic: This page will show when: (Question "CFL light bulbs" is one of the following answers ("Yes") AND Q35A is greater than "0") Must be numeric Whole numbers only Positive numbers only

Logic: Hidden unless: (Question "CFL light bulbs" is one of the following answers ("Yes") AND Q35A is greater than "0")

To the best of your recollection, how many of the [question("value"), id="269"] CFL light bulbs received through the program are currently installed in each of the following locations?

- Bedrooms
 - Bathrooms
 - Living room
 - Kitchen
 - Entryway
 - Dining room
 - Garage
 - Basement
 - Den
 - Stairway
 - Office
 - Laundry room
 - Other
- Total: [#]

Page entry logic: This page will show when: (Question "CFL light bulbs" is one of the following answers ("Yes") AND Q36A is greater than "0") Must be numeric Whole numbers only Positive numbers only

Logic: Hidden unless: (Question "CFL light bulbs" is one of the following answers ("Yes") AND Q36A is greater than "0")

To the best of your recollection, how many of the [question("value"), id="266"] CFL light bulbs received through the program are currently installed in each of the following locations?

- Bedrooms
 - Bathrooms
 - Living room
 - Kitchen
 - Entry way
 - Dining room
 - Garage
 - Basement
 - Den
 - Stairway
 - Office
 - Laundry Room
 - Other
- Total: [#]

Logic: Hidden unless: (#27 Question "You indicated that you received CFL light bulbs from the program. Program records indicate you received [question("value"), id="13"] CFL light bulbs. To the best of your knowledge, is that number correct or did you receive a different number of CFL light bulbs?" is one of the following answers ("Yes, that is the correct number of CFL light bulbs") OR #28 Question "What is the correct number of CFL light bulbs that you received?" is greater than "0")

What type of light bulbs did the CFL light bulbs replace? (Select all that apply)

- Incandescent
- CFL
- LED
- Installed in new fixture
- Other (please specify)
- Don't remember
- Don't know

Logic: Hidden unless: Question "ENERGY STAR certified refrigerator" is one of the following answers ("Yes")

You indicated that your refrigerator was replaced. What is the door-style of the new refrigerator?

- Freezer-on-top
- Freezer-on-bottom
- Side-by-side
- Don't remember
- Don't know

Logic: Show/hide trigger exists. Hidden unless: Question "ENERGY STAR certified refrigerator" is one of the following answers ("Yes")

Is the refrigerator you received still installed? *

- Yes
- No
- Don't remember
- Don't know

Logic: Hidden unless: #41 Question "Is the refrigerator you received still installed? " is one of the following answers ("No")

Why is the refrigerator not currently installed? *

Logic: Hidden unless: #41 Question "Is the refrigerator you received still installed? " is one of the following answers ("No")

How long did you have the refrigerator before it was removed?

- Less than one year
- More than one year

Logic: Hidden unless: (((((Question "18 Air Sealed/Infiltration - WY" is greater than "0" OR Question "09 Ceiling Insulation - WY" is greater than "0") OR Question "11 Floor Insulation - WY" is greater than "0") OR Question "08 Wall Insulation - WY" is greater than "0") OR Question "46 Ground Cover - WY" is greater than "0") OR Question "31 Thermal Doors - WY" is greater than "0")

Program records show that you had some home energy improvements such as air drafts sealed, insulation, ground cover, and/or a new thermal door installed by a participating agency or contractor. Is that correct?

	Yes	No	Don't know
Air drafts sealed			
Ceiling insulation			
Floor insulation			
Wall insulation			
Ground cover			
Thermal door			

Logic: Hidden unless: (((((Question "Air drafts sealed" is one of the following answers ("Yes") OR Question "Ceiling insulation" is one of the following answers ("Yes")) OR Question "Floor insulation" is one of the following answers ("Yes")) OR Question "Wall insulation" is one of the following answers ("Yes")) OR Question "Ground cover" is one of the following answers ("Yes")) OR Question "Thermal door" is one of the following answers ("Yes"))

On a scale of 1 to 5, where 1 is "not at all important" and 5 is "extremely important," how important were the following factors in your decision to receive air draft sealing, insulation, ground cover and/or a thermal door?

	Not at all important 1	2	3	4	Extremely important 5	Don't know
Improve home comfort						
The improvements were provided at no cost						
Reduce electric bills						

Logic: Hidden unless: (((((Question "Air drafts sealed" is one of the following answers ("Yes") AND Question "Ceiling insulation" is one of the following answers ("Yes")) AND Question "Floor insulation" is one of the following answers ("Yes")) AND Question "Wall insulation" is one of the following answers ("Yes")) AND Question "Ground cover" is one of the following answers ("Yes")) AND Question "Thermal door" is one of the following answers ("Yes"))

Where there any other factors that were also important to your decision to receive the home energy improvements? If so, what were they?

Logic: Show/hide trigger exists. Hidden unless: Question "Weather stripping on doors" is one of the following answers ("Yes")

You indicated that you received energy saving weather stripping on a door in your home. Is the door currently sealed with weather stripping? *

- Yes
- No
- Don't know

Logic: Show/hide trigger exists. Hidden unless: #47 Question "You indicated that you received energy saving weather stripping on a door in your home. Is the door currently sealed with weather stripping?" is one of the following answers ("No")

Why is the door not currently sealed with weather stripping?

- Weather stripping broke
- Weather stripping not working as needed
- Door not working as needed
- The weather stripping was never installed on the door
- Other (please specify)
- Don't remember
- Don't know

Logic: Hidden unless: #48 Question "Why is the door not currently sealed with weather stripping? " is one of the following answers ("Weather stripping broke", "Weather stripping not working as needed", "Door not working as needed", "Other (please specify)")

How long was the weather stripping installed on the door before someone removed it?

- Less than one year
- More than one year

Logic: Hidden unless: #48 Question "Why is the door not currently sealed with weather stripping? " is one of the following answers ("The weather stripping was never installed on the door")

Why was the weather stripping never installed on the door(s)?

Logic: Show/hidden trigger exists. Hidden unless: Question "Weather stripping on windows" is one of the following answers ("Yes")

You indicated that you received energy saving weather stripping on a window in your home. Is the window currently sealed with weather stripping? *

- Yes
- No
- Don't Know

Logic: Show/hidden trigger exists. Hidden unless: #51 Question "You indicated that you received energy saving weather stripping on a window in your home. Is the window currently sealed with weather stripping?" is one of the following answers ("No")

Why is the window not currently sealed with weather stripping?

- Weather stripping broke
- Weather stripping not working as needed
- Window not working as needed
- The weather stripping was never installed on the window
- Other (please specify)
- Don't remember
- Don't know

Logic: Hidden unless: #52 Question "Why is the window not currently sealed with weather stripping? " is one of the following answers ("Weather stripping broke", "Weather stripping not working as needed", "Window not working as needed", "Other (please specify)")

How long was the weather stripping installed on the window before someone removed it?

- Less than one year
- More than one year

Logic: Hidden unless: #52 Question "Why is the window not currently sealed with weather stripping? " is one of the following answers ("The weather stripping was never installed on the window")

Why was the weather stripping never installed on the door window?

Logic: Show/hide trigger exists. Hidden unless: Question "Window replacement" is one of the following answers ("Yes")

You indicated that you received energy saving windows from the program. Our records indicate you received [question('value'), id='299'] windows in your home. To the best of your knowledge, is that number correct, or did the agency or contractor replace a different number of windows in your home?*

- Yes, that is the correct number of windows
- No, a different number of windows
- Don't remember
- Don't know

Validation: Must be numeric Whole numbers only Positive numbers only

Logic: Show/hide trigger exists. Hidden unless: #55 Question "You indicated that you received energy saving windows from the program. Our records indicate you received [question('value'), id='299'] windows in your home. To the best of your knowledge, is that number correct, or did the agency or contractor replace a different number of windows in your home?" is one of the following answers ("No, a different number of windows")

What is the correct number of windows you received? *

Page entry logic: This page will show when: #55 Question "You indicated that you received energy saving windows from the program. Our records indicate you received [question('value'), id='299'] windows in your home. To the best of your knowledge, is that number correct, or did the agency or contractor replace a different number of windows in your home?" is one of the following answers ("Yes, that is the correct number of windows")

Validation: Must be numeric Whole numbers only Positive numbers only

Logic: Hidden unless: #55 Question "You indicated that you received energy saving windows from the program. Our records indicate you received [question('value'), id='299'] windows in your home. To the best of your knowledge, is that number correct, or did the agency or

contractor replace a different number of windows in your home?" is one of the following answers ("Yes, that is the correct number of windows")

To verify, of the [question('value'), id='299'] windows replaced, how many windows are currently installed, were installed and removed, or were never installed?*

- Number of windows currently installed
- Number of windows that were installed and removed
- Number of windows that were never installed

Total: 0

Page entry logic: This page will show when: #56 Question "What is the correct number of windows you received?" is greater than 0.

Validation: Must be numeric Whole numbers only Positive numbers only

Logic: Hidden unless: #56 Question "What is the correct number of windows you received?" is greater than

To verify, of the [question('value'), id='129'] windows replaced, how many windows are currently installed, were installed and removed, or were never installed?*

- Number of windows currently installed
- Number of windows that were installed and removed
- Number of windows that were never installed

Total: 0

Logic: Hidden unless: (Q54B is greater than "0" OR Q55B is greater than "0")

Why were the windows removed? *

- Window(s) broke
- Window(s) not working as needed
- Other (please specify)
- Don't remember
- Don't know

Logic: Hidden unless: (Q54B is greater than "0" OR Q55B is greater than "0")

How long were the windows installed before someone removed them?

- Less than one year
- More than one year

Logic: Hidden unless: (Q54C is greater than "0" OR Q55C is greater than "0")

Why were the windows never installed?

Logic: Show/hide trigger exists. Hidden unless: (Question "581 Duct Sealing - WY" is exactly equal to "1" OR Question "Heat duct sealing" is one of the following answers ("Yes"))

Program records show that you had your heating, ventilation and / or air conditioning ducts sealed by a participating agency or contractor. Is that correct? *

- Yes
- No
- Don't remember
- Don't know

Logic: Hidden unless: #62 Question "Program records show that you had your heating, ventilation and / or air conditioning ducts sealed by a participating agency or contractor. Is that correct?" is one of the following answers ("Yes")

On a scale of 1 to 5, where 1 is "not at all important" and 5 is "extremely important," how important were the following factors in your decision to receive the duct sealing?

	Not at all important 1	2	3	4	Extremely important 5	Don't know
Improve home comfort						
The improvements were provided at no cost						
Reduce electric bills						

Logic: Hidden unless: #62 Question "Program records show that you had your heating, ventilation and / or air conditioning ducts sealed by a participating agency or contractor. Is that correct?" is one of the following answers ("Yes")

Were there any other factors that were important to your decision to receive the duct sealing? If so, what were they?

Logic: Show/hidden trigger exists. Hidden unless: Question "Low flow shower head(s)" is one of the following answers ("Yes")

You indicated that you received an energy saving shower head from the program. Is the shower head still installed? *

- Yes
- No
- Don't remember
- Don't know

Logic: Show/hidden trigger exists. Hidden unless: Question "You indicated that you received an energy saving shower head from the program. Is the shower head still installed?" is one of the following answers ("Yes")

Was the shower head you received every removed? *

- Yes
- No
- Don't remember
- Don't know

Logic: Show/hidden trigger exists. Hidden unless: Question "Was the shower head you received every removed?" is one of the following answers ("Yes")

- Why was the shower head removed?
- Shower head broke

- Shower head not working as needed
- Returned to the program
- Other (please specify)*
- Don't remember
- Don't know

Logic: Hidden unless: Question "Why was the shower head removed?" is one of the following answers ("Shower head broke", "Shower head not working as needed", "Returned to the program", "Other (please specify)")

How long was the shower head installed before it was removed?

- Less than one year
- More than one year

Logic: Hidden unless: Question "You indicated that you received an energy saving shower head from the program. Is the shower head still installed?" is one of the following answers ("No")

Why was the shower head never installed?

Logic: Hidden unless: (Question "Water pipe insulation" is one of the following answers ("Yes") OR Question "12 Pipe Insulation - WY" is greater than "0")

You indicated you had water pipe insulation installed by a participating agency or contractor. On a scale of 1 to 5, where 1 is "not at all important" and 5 is "extremely important," how important were the following factors in your decision to receive the water pipe insulation?

	Not at all important 1	2	3	4	Extremely important 5	Don't know
Improve home comfort						
The improvements were provided at no cost						
Reduce electric bills						

Logic: Hidden unless: (Question "Water pipe insulation" is one of the following answers ("Yes") OR Question "12 Pipe Insulation - WY" is greater than "0")

Were there any other factors that were also important to your decision to receive the water pipe insulation? If so, what were they?

Was the home visit scheduled at a convenient time for you?

- Yes
- No
- Don't remember
- Don't know

Did the home energy auditor or inspector arrive within 15 minutes of the scheduled appointment?

- Yes
- No
- Don't remember
- Don't know

Logic: Show/hidden trigger exists.

When the auditor or inspector visited your home, did they talk with you about ways to use less electricity in your home or leave materials with you that described how you could save electricity?

- Yes
- No
- Don't remember
- Don't know

Logic: Show/hidden trigger exists. Hidden unless: Question "When the auditor or inspector visited your home, did they talk with you about ways to use less electricity in your home or leave materials with you that described how you could save electricity?" is one of the following answers ("Yes")

Because of the information you received from the auditor or inspector, do you feel you now know more about how to save electricity in your home?

- Yes, I know more now
- No, I know about the same as before
- Don't know

Logic: Show/hidden trigger exists. Hidden unless: Question "When the auditor or inspector visited your home, did they talk with you about ways to use less electricity in your home or leave materials with you that described how you could save electricity?" is one of the following answers ("Yes")

Because of the information you received from the auditor or inspector, have you done anything in your home or changed any habits to use less electricity?

- Yes
- No
- Don't know

Logic: Hidden unless: Question "Because of the information you received from the auditor or inspector, have you done anything in your home or changed any habits to use less electricity?" is one of the following answers ("Yes")

Because of the information you received from the auditor or inspector, what are the things you have done to use less electricity?

Logic: Hidden unless: Question "Because of the information you received from the auditor or inspector, do you feel you now know more about how to save electricity in your home?" is one of the following answers ("Yes, I know more now")

On a scale of 1 to 5, where 1 is "not at all useful" and 5 is "extremely useful," how useful was the energy education about saving electricity that you received from the auditor or inspector?

Not at all useful					Extremely useful	Don't know
1	2	3	4	5		

Would it have been helpful if the auditor or inspector had provided additional information about your bill, energy saving tips, or referred you to other agencies?

- Yes, more information would have been helpful
- No, what was provided was enough
- Don't know

The final set of questions is about your satisfaction with the home improvements or items you received and other aspects of the program. For each, please rate your satisfaction on a scale of 1 to 5, where 1 is "very dissatisfied" and 5 is "very satisfied."

	Very dissatisfied 1	2	3	4	Very satisfied 5	Don't know
The scheduling of the visit						
The information you received about ways to use less electricity						
Reduce your electric bills						

Logic: Hidden unless: Question "LED light bulbs OR Question "CFL light bulbs OR Question "ENERGY STAR certified refrigerator(s) OR Question "Air drafts sealed OR Question "Ceiling insulation OR Question "Floor insulation OR Question "Wall insulation OR Question "Ground cover OR Question "Thermal door(s) OR Question "Weather stripping OR Question "Weather

stripping on window(s) OR Question "Window replacements OR Question "Water pipe insulation OR Question "Heat duct sealing OR Question "Shower head(s) OR Question "The scheduling of the visit" is one of the following answers ("Very dissatisfied 1", "2") OR Question "The information you received about ways to use less electricity" is one of the following answers ("Very dissatisfied 1", "2")

You indicated you were less than satisfied with some of the product(s) or service(s) you received. What was less than satisfactory about the product(s) or service(s)?

Logic: Show/hidden trigger exists.

In the course of participating in the program, how often did you contact agency staff with questions about the items or services you could or did receive through this program?

- Never
- Once
- 2 or 3 times
- 4 times or more
- Don't remember
- Don't know

Logic: Show/hidden trigger exists. Hidden unless: Question "In the course of participating in the program, how often did you contact agency staff with questions about the items or services you could or did receive through this program? " is one of the following answers ("Once", "2 or 3 times", "4 times or more")

How satisfied were you with the communication from agency staff? Please rate your satisfaction on a scale of 1 to 5, where 1 is "very dissatisfied" and 5 is "very satisfied."

very dissatisfied

very satisfied

1

2

3

4

5

Don't know

Logic: Hidden unless: Question "How satisfied were you with the communication from agency staff? Please rate your satisfaction on a scale of 1 to 5, where 1 is "very dissatisfied" and 5 is "very satisfied."" is one of the following answers ("Very dissatisfied 1", "2")

Would you like your gift card to be sent to the following email address: [question('value'), id='31']?

- Yes
- No (Please enter correct email address)

I will pass on the gift card

Logic: Hidden unless: #69 Question "Would you like your gift card to be sent to the following email address: [question('value'), id='31']?" is one of the following answers ("Yes")

To confirm, your email address is [question("value"), id="31"]?

- Yes
- No