NAVIGANT

Evaluation Report for Wyoming's Energy FinAnswer Program (PY 2011 through 2013)

Prepared for:
Rocky Mountain Power

ROCKY MOUNTAIN POWER
A DIVISION OF PACIFICORP

Prepared by:

NAVIGANT

Navigant Consulting, Inc.
1375 Walnut Street
Suite 200
Boulder, CO 80302

303.728.2500
www.navigant.com

In Partnership with:

EMI CONSULTING

EMI Consulting
83 Columbia Street
Suite 400
Seattle, WA 98104

206.621.1160
www.emiconsulting.com

January 29, 2015

NAVIGANT

Table of Contents

NAVIGANT

List of Figures and Tables

Figures:

Tables:

NAVIGANT

Under Separate Attachment

Appendix A. Glossary of Terms

Appendix B. EM&V Best Practices

Appendix C. *wattsmart* Business Program Logic Model

Appendix D. Energy FinAnswer Participant Survey

Appendix E. Energy FinAnswer Near-Participant Interview Guide

Appendix F. WY EF Participant Survey Findings for S2 2013

NAVIGANT

Executive Summary

This report describes the findings from the Impact and Process Evaluation of Wyoming's 2011-2013 Energy FinAnswer program years including program- and project-level gross and net realization rates, program cost-effectiveness results, and feedback from program participants concerning satisfaction and areas for improvement for the program as a whole. These evaluation results generated recommendations for improving program processes, methods, and delivery as Energy FinAnswer transitions to the *wattsmart* Business program.

Program Overview

The Energy FinAnswer program offers custom incentives and engineering services to commercial and industrial (C&I) customers in Wyoming for implementation of energy efficiency measures (EEMs).[1]

The EEMs can include both equipment installed as upgrades (i.e., retrofits) to existing equipment and equipment installed as part of new construction projects. Commercial retrofit projects must cover a minimum size of 20,000 square feet per electric meter to be eligible. Commercial new construction and all industrial projects are eligible regardless of facility size. Rocky Mountain Power project managers and an established network of energy engineering firms implement the Energy FinAnswer program under contract with Rocky Mountain Power. The program offering includes:

- A vendor-neutral, investment-grade energy analysis to identify energy efficiency opportunities
- Financial incentives equal to $0.12 per kilowatt-hour (kWh) of first-year energy savings plus $50 per kilowatt (kW) of average monthly demand savings (up to 50 percent of project costs)
- For engineers and designers, design team honorariums and incentives for new construction projects that exceed the International Energy Conservation Code (IECC) 2003 by a minimum of 10 percent

Evaluation Objectives

This evaluation addressed the following objectives:

- Verify the annual and combined 2011 through 2013 gross and net energy and demand impacts of the Rocky Mountain Power's Energy FinAnswer program[2]
- Review the effectiveness of program operations, highlighting achievements and identifying opportunities for process improvement
- Characterize participant and near-participant motivations

[1] Qualifying rate schedules are: 6, 6A, 6B, 8, 9, 9A, 10, 21, and 23. Dairy barns served on residential rates also qualify.
[2]The evaluation team planned for 90/10 by program and state; the confidence/precision for Wyoming's Energy FinAnswer is 90/3.5.

» Perform cost-effectiveness calculations on evaluated results for each year evaluated and in total

Impact Evaluation

The impact evaluation of Rocky Mountain Power's Energy FinAnswer program quantified energy and demand impacts for incented technologies, including:

» Quantifying the impacts of all measures and activities on annual gross energy consumption while accounting for any interactions among technologies

» Establishing post-implementation performance for installed measures and activities

» Explaining discrepancies between the results of this study and the reported savings estimates

Evaluation metrics and parameters reported through this effort include:

» Gross program demand and energy savings estimates and realization rates for projects

» Energy usage profiles for C&I technologies obtained through measurement & verification (M&V) activities

» Net program savings estimates and realization rates as a function of both spillover and free-ridership

Summary of Impact Findings

Navigant used a combination of in-depth project file reviews, interviews with facility staff, and on-site M&V activities involving spot measurements and end-use metering of incented equipment to calculate *two* sets of realization rates for the 2011-2013 Energy FinAnswer program in Wyoming. Twenty projects participated in the Energy FinAnswer program during the 2011 through 2013 program years, and the team visited 11 (representing 99 percent of reported savings) during the on-site verification activities. This sample achieved a 90/3.5 confidence and precision at the program-level.

One of the sites visited, the Wastewater Treatment Plant (WWTP) project ID EFWC2_000009, experienced major equipment failure issues and had to shut down the efficiency measures installed during the project, resulting in a zero percent realization rate. Navigant felt that including this zero in the measure-level weighting calculations did not present an accurate picture of the overall program-level realization rates and therefore classified all the measures in this project under a separate WWTP specific measure category, and did not use this measure in the weighting calculations. This ensured that while the project was included in the overall program realization rate, the results did not influence the other projects within the sample.

The 2011-2013 program-level demand savings realization rate was 71 percent and the program-level energy savings realization rate was 96 percent as shown in Table ES-1. The team also calculated a set of realization rates with the WWTP treated as a separate category for comparison purposes. Table ES-2 shows these results.[3] Section 3 provides further explanation on the handling of the WWTP in the evaluation results.

Table ES-1. Program-Level Realization Rates for WY Energy FinAnswer

Program Year	Program Reported kW	Gross Program Evaluated kW	Gross Program kW Realization Rate	Program Reported kWh	Gross Program Evaluated kWh	Gross Program kWh Realization Rate
2011	63	62	*98%*	1,942,616	2,062,459	*106%*
2012	381	203	*53%*	7,036,789	5,696,157	*81%*
2013	626	491	*78%*	8,955,113	9,541,661	*107%*
All	1,070	756	*71%*	17,934,518	17,300,277	*96%*

Table ES-2. Program-Level Realization Rates for WY Energy FinAnswer (WWTP removed)

Program Year	Program Reported kW	Gross Program Evaluated kW	Gross Program kW Realization Rate	Program Reported kWh	Gross Program Evaluated kWh	Gross Program kWh Realization Rate
2011	63	62	*99%*	1,942,616	2,062,459	*106%*
2012	381	247	*104%*	7,036,789	5,729,147	*96%*
2013	626	530	*85%*	8,955,113	9,575,599	*107%*
All	1,070	839	*90%*	17,934,518	17,367,205	*103%*

Net-To-Gross Ratio

The evaluation team calculated a net-to-gross (NTG) ratio of 0.64 using the limited number of participants during Wyoming's 2011-2013 Energy FinAnswer program years. With only three participants in the sample, the team used both the 0.64 NTG ratio and the 0.80 used in the prior evaluation to compare Wyoming's 2011-2013 Energy FinAnswer program results.

[3] Navigant does not encourage using the second option with the WWTP removed from the sample as it causes undo bias in the evaluation results.

Cost-Effectiveness

The evaluation team used a cost-effectiveness model, calibrated and updated with Rocky Mountain Power's input parameters, to produce results for five primary cost tests: PacifiCorp's Total Resource Cost test (PTRC), Total Resource Cost test (TRC), Utility Cost Test (UCT), Rate Impact Measure test (RIM), and the Participant Cost Test (PCT), for calculating the program's benefit/cost ratios. Table ES-3 provides the cost-effectiveness results for the five cost tests over the 2011 through 2013 evaluated program years using the calculated NTG ratio of 0.64. Table ES-4 provides the cost-effectiveness results with the NTG ratio of 0.80 used during the previous evaluation cycle.

Table ES-3. WY Energy FinAnswer Cost-Benefit Results – 2011-2013 Combined (0.64 NTG)

Benefit/Cost Test Performed	Evaluated Gross kWh Savings	Evaluated Net kWh Savings	Evaluated Costs	Evaluated Benefits	B/C Ratio
PacifiCorp Total Resource Cost Test (PTRC)	17,300,277	11,072,177	$3,135,915	$9,118,009	2.91
Total Resource Cost Test (TRC)	17,300,277	11,072,177	$3,135,915	$8,289,099	2.64
Utility Cost Test (UCT)	17,300,277	11,072,177	$2,537,634	$8,289,099	3.27
Rate Impact Test (RIM)	17,300,277	11,072,177	$9,883,615	$8,289,099	0.84
Participant Cost Test (PCT)	17,300,277	11,072,177	$3,486,376	$13,111,094	3.76

Table ES-4. WY Energy FinAnswer Cost-Benefit Results – 2011-2013 Combined (0.80 NTG)

Benefit/Cost Test Performed	Evaluated Gross kWh Savings	Evaluated Net kWh Savings	Evaluated Costs	Evaluated Benefits	B/C Ratio
PacifiCorp Total Resource Cost Test (PTRC)	17,300,277	13,840,222	$3,693,735	$11,397,511	3.09
Total Resource Cost Test (TRC)	17,300,277	13,840,222	$3,693,735	$10,361,374	2.81
Utility Cost Test (UCT)	17,300,277	13,840,222	$2,537,634	$10,361,374	4.08
Rate Impact Test (RIM)	17,300,277	13,840,222	$11,720,110	$10,361,374	0.88
Participant Cost Test (PCT)	17,300,277	13,840,222	$3,486,376	$13,111,094	3.76

Process Evaluation

The process evaluation sought to characterize the Energy FinAnswer program from the perspective of program staff, participants, and near-participants in order to identify both existing strengths and areas for refinement that may better serve the Wyoming C&I market in future years.

The evaluation team surveyed four 2012-2013 participants, and nine near-participants in August 2014, but no 2011participants responded to the survey. Findings from the surveys and interviews include the following:

- **Program satisfaction is high for both participants and near-participants.** Three out of four participants were very satisfied with the program and six out of the nine near-participants were satisfied or very satisfied with the program overall.
- **Near-participants frequently canceled or delayed projects for reasons unrelated to program processes.** Five out of nine interviewees canceled their projects or put them on hold for reasons including facility closures, concerns with return on investment, internal timelines, and purely technological challenges.
- **Wyoming participants were new to Rocky Mountain Power energy efficiency programs.** Two-thirds of near-participants had not previously taken advantage of any Rocky Mountain Power programs and were participating for the first time.
- **Near-participants are more likely to consider new energy-efficient projects as compared to past participants.** Three out of the four participants surveyed indicated no potential for energy-efficient plans. However, nearly half of the near-participants had plans to pursue additional energy efficiency opportunities.
- **Financial incentives and economic information were the most influential components of the program.** Participants reported that the program incentive and payback information had the most influence on their decision to install energy-efficient equipment.

Program Evaluation Recommendations

The evaluation team offers the following recommendations, in no particular order, to improve future program efforts as the Energy FinAnswer program transitions to the *wattsmart* Business program.

- **Recommendation 1: Increase project scrutiny on Wastewater Treatment facilities.** Rocky Mountain Power should apply heightened scrutiny to wastewater treatment projects for quality, permanence, and reasonableness. Navigant's experience with wastewater treatment sites in general, beyond PacifiCorp's programs, shows these projects to have a record of poor realization rates and frequent shutdowns. Wastewater treatment plants must prioritize continuous, reliable operation over energy savings. Projects that involve new processes or equipment that has not been proven to work reliably under the harsh wastewater conditions is likely to result in reduced measure life and savings.
- **Recommendation 2: Consider air compression system leak detection incentives.** The program should consider incentives for initial site leak detection assessments for large compressed air users, including instruction to facility staff on continued leak detection activities.
- **Recommendation 3: Ensure measure classifications in database are correct.** Impact evaluation activities found incorrect measure classifications in the Rocky Mountain Power program database for some of the measures in completed projects. Proper measure tracking is essential to accurately estimate program savings.

1 Introduction

This section provides a description of Wyoming's Energy FinAnswer program, along with a discussion of the underlying program theory and logic model depicting the activities, outputs, and desired outcomes of the program.[4]

1.1 Program Description

The Energy FinAnswer program offers custom incentives and engineering services to commercial and industrial (C&I) customers in Wyoming for implementation of energy efficiency measures (EEMs).[5]

The EEMs can include equipment installed as upgrades (i.e., retrofits) to existing equipment and equipment installed as part of new construction projects. Commercial retrofit projects must cover a minimum size of 20,000 square feet per electric meter to be eligible. Commercial new construction and all industrial projects are eligible regardless of facility size. Rocky Mountain Power project managers and an established network of energy engineering firms implement the Energy FinAnswer program under contract with Rocky Mountain Power. The program offering includes the following:

- A vendor-neutral, investment-grade energy analysis to identify energy efficiency opportunities
- Financial incentives equal to $0.12 per kilowatt-hour (kWh) of first-year energy savings plus $50 per kilowatt (kW) of average monthly demand savings (up to 50 percent of project costs)
- For engineers and designers, design team honorariums and incentives for new construction projects that exceed International Energy Conservation Code (IECC 2003) by a minimum of 10 percent

Incentives offered through this program are subject to a cap that prevents the incentive from reducing the payback period for a project below one year. Wyoming's FinAnswer Express program handles any lighting-only projects.[6] The Energy FinAnswer program includes a commissioning requirement and post-installation verification to document the energy savings and measure costs for installed measures. For comprehensive new construction and major renovation projects, where the whole building exceeds IECC 2003 by at least 10 percent, Energy FinAnswer includes design assistance, design team incentives, and an incentive based on energy savings.

[4] In 2014 the program transitioned to become the custom portion of the *wattsmart* Business program and is no longer offered as Energy FinAnswer. However, for purposes of the 2011-2013 program evaluation cycle, the Energy FinAnswer program title, description, and theory still apply.
[5] Qualifying rate schedules are: 6, 6A, 6B, 8, 9, 9A, 10, 21, and 23. Dairy barns served on residential rates also qualify.
[6] The FinAnswer Express program was a prescriptive incentive program offered by Rocky Mountain Power to non-residential customers. However, this program also transitioned to become the prescriptive portion of the *wattsmart* Business program in 2014 and is no longer offered as FinAnswer Express.

1.2 Program Changes from 2011 to 2013

Rocky Mountain Power began marketing the Energy FinAnswer program under the *wattsmart* campaign and in formally transitioned Energy FinAnswer to become the custom portion of the *wattsmart* Business program in December of 2014. Future evaluations will no longer include a separate Energy FinAnswer program as part of the evaluation portfolio.

1.3 Program Participation

Program years 2011 to 2013 saw 20 Energy FinAnswer projects completed in Wyoming: six projects in 2011, eight projects in 2012, and six projects in 2013. The 20 projects included the installation of 40 EEMs as some projects included multiple measures. Over the three year period the program reported 17,934,518 kWh in energy savings; Table 1 summarizes the program project counts that included the installation of the associated measure category.[7]

Table 1. Wyoming's Energy FinAnswer Measure Category Details for PY 2011-2013

Measure Category	Project Counts[8]	Reported kWh Savings	Percent of Total Savings
Motors	15	4,891,478	27.3%
HVAC	6	4,764,451	26.6%
Compressed Air	7	7,879,941	43.9%
Controls	4	255,066	1.4%
Building Shell	3	91,290	0.5%
Lighting	5	52,292	0.3%
All	40	17,934,518	100.0%

1.4 Program Theory and Logic Model

Program logic models depict the primary program activities, actions required to implement the program, the outputs expected to result from each activity, and the expected short-, mid-, and long-term outcomes of those activities. This includes marketing, participant recruitment, and training, among others. The outputs depict tangible, tracked, or tallied "products" resulting from each primary activity (i.e., marketing materials, training documents, and databases of recruited participants). Outcomes represent the intended results of successful deployment of the identified activities.

[7] Measure categories here are from the program database and do not adjust for any incorrect classifications.
[8] For lack of a better term, Navigant uses "project counts" in this table even though these numbers more strictly align with *the number of line items in the tracking database* by measure category. A single project could have multiple line items in the tracking database for the same measure category, as well as include multiple measure categories.

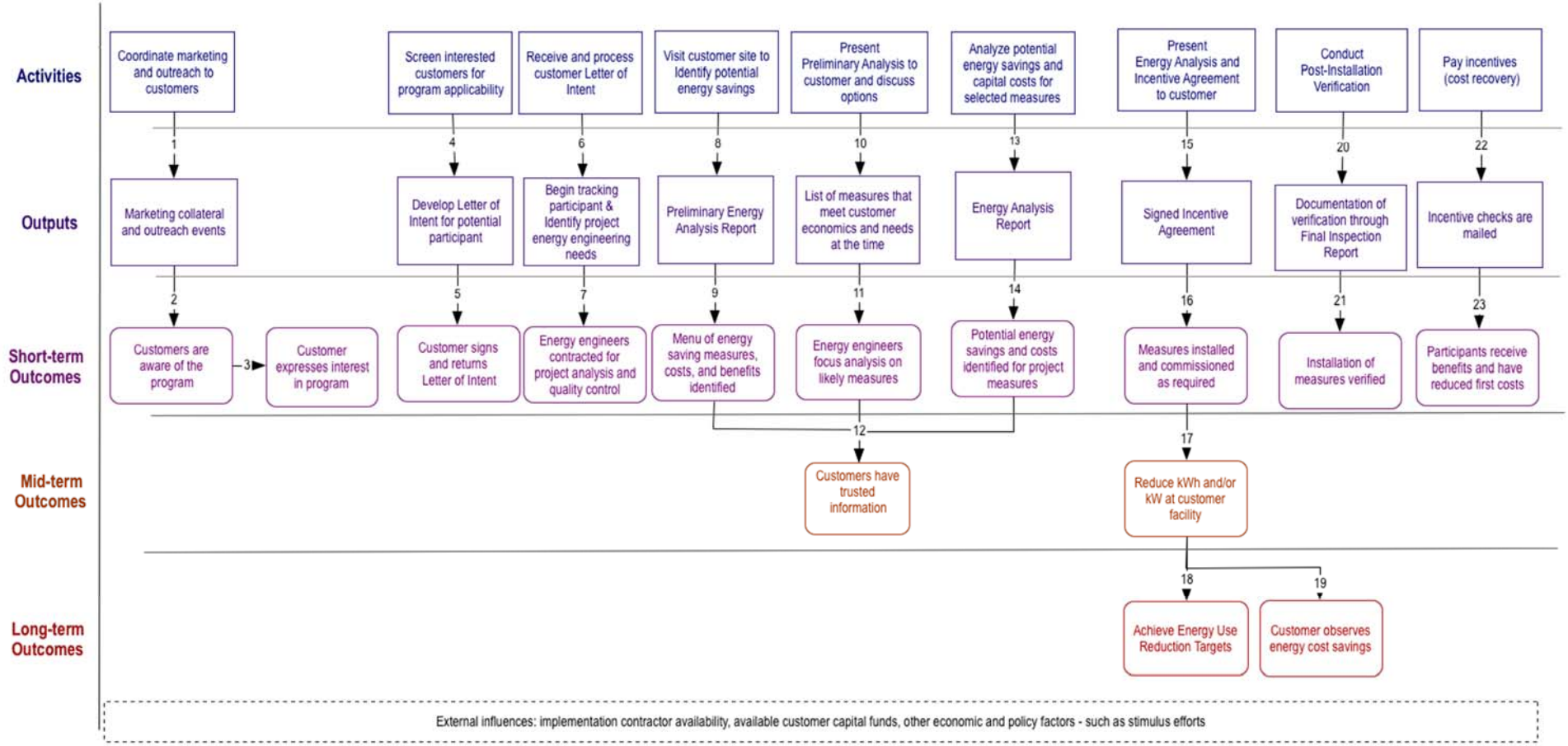
Developing a logic model that clearly provides the theory of action and change is an important step in evaluation, allowing the evaluator and program actors to see inside the program "black box." [9] Program logic models provide a framework for an evaluation by highlighting key linkages between program activities and expected outcomes. The process and impact evaluations focus on these linkages, particularly those on the critical path to achieving savings goals. The evaluation identifies properly working linkages in the program logic model, as well as weak or broken linkages which could cause program shortfalls in achieving the intended short-, mid-, or long-term outcome(s). With this foundation, the evaluation team can then make informed choices related to the prioritization and focus of evaluation resources.

The evaluation team reviewed program documentation and spoke with program managers and implementers to verify the underlying theory for the Energy FinAnswer program Logic Model (Figure 1), which remained unchanged from the 2009-2010 program evaluation.[10]

[9] Sue Funnell and Patricia Rogers, 2011, *Purposeful Program Theory: Effective Use of Theories of Change and Logic Models*. John Wiley & Sons.

[10] The transition to the new *wattsmart* Business program renders the Energy FinAnswer logic model obsolete beginning October 2014. Appendix C provides the new *wattsmart* Business program logic model for use in future evaluations.

Figure 1. Energy FinAnswer Program Logic Model (2011)



Each number in the list below corresponds to a linkage in the logic model diagram and provides further details for the Energy FinAnswer program theory.

1. Rocky Mountain Power coordinates marketing efforts and outreach through account managers. By design, individual programs are not marketed to customers. Instead, Rocky Mountain Power markets the portfolio of energy efficiency programs.
2. Customers become aware of the program through marketing and account managers.
3. Customers either directly submit Letters of Intent (LOI) or express interest through the Rocky Mountain Power efficiency program's phone number, online inquiry form, email to the energy expert, or their customer or community manager. The majority of participants are expected to express interest in energy efficiency or demand reduction projects without being familiar with the Energy FinAnswer program by name.
4. The Rocky Mountain Power project manager (PM) screens interested customers to identify projects that are candidates for Energy FinAnswer and meet program eligibility criteria.
5. PM drafts Letter of Intent (LOI) and provides it to the customer along with program information.
6. The customer submits signed LOI to begin the program process. Rocky Mountain Power receives and reviews applications. PM coordinates customer contacts with account manager, asks project screening questions, and determines the general scope of the project.
7. Rocky Mountain Power PM selects an appropriate energy engineer from a list of pre-qualified engineering firms that support Rocky Mountain Power. The PM contracts with the energy engineer to scope and analyze the project potential.
8. The energy engineer visits the customer's facility and identifies potential energy savings opportunities through an initial site visit before conducting a detailed energy analysis.
9. After the initial site visit, the engineer submits an Initial Site Visit Report, previously, or Preliminary Energy Analysis Report (PEAR), currently, to the PM.
10. The PM discusses the menu of opportunities identified from this scoping visit with customer.
11. The customer identifies likely measures from the menu of opportunities based on the customer economics and other considerations at the time. The PM conducts further screening, and decides to move forward with energy analysis. Small or well-defined projects may go forward with a PEAR meeting customer need for certainty prior to project investment with required quality control review to avoid unnecessary analysis expense; the PM will make the determination to go ahead based on customer need and project timeline.
12. The customer can rely on this information to make decisions, thus reducing information barriers. Throughout the customer's participation, Rocky Mountain Power provides technical support, as needed, to ensure that implementation meets the intent and requirements of the program.
13. The energy engineer conducts detailed project engineering to quantify savings opportunities for the measures that the customer is able and willing to consider at the time.

14. The engineer develops an Energy Analysis Report (EAR) that includes EEMs that could improve efficiency as well as potential costs, savings, and any commissioning necessary to ensure proper EEM operation and savings.[11] Rocky Mountain Power requires that EARs be peer-reviewed by a second energy engineering consultant as a quality control check before delivering the report to the customer. The EAR and peer review ensure the identification of appropriate EEMs, along with costs and savings.
15. Rocky Mountain Power presents the EAR and Incentive Agreement highlighting incentives and stipulations for recommended measures to the customer, and reaches an agreement on which measures to implement. The customer signs the Incentive Agreement for agreed-upon measures. Before purchasing or installing equipment, the customer is required to sign an incentive agreement with Rocky Mountain Power based on the EAR estimates.
16. EEMs are implemented either by the customer or their contractor. Commissioning is completed for those EEMs for which commissioning was prescribed in the EAR. The customer notifies Rocky Mountain Power of project completion and the status of any expected commissioning.
17. EEMs reduce energy consumption (and, in some cases, demand) at the facility.
18. Reduced energy consumption contributes to meeting annual program targets.
19. Customers experience reduced energy costs.
20. An energy engineer verifies proper installation of measures, reviews the commissioning report (if any), and obtains invoicing information.
21. A Final Inspection Report is submitted to Rocky Mountain Power. The Final Inspection Report documents verification of energy savings; verification ensures that expected savings occur.
22. Rocky Mountain Power processes incentives after final incentive calculation.
23. Rocky Mountain Power mails incentive checks to the customer. These incentives reduce customer costs for the project.

The process evaluation team compared actual program outcomes with the outcomes expected in the logic model by identifying indicators for each expected outcome. The process evaluation team sourced the indicator data either from directly observable program tracking data or other archives, or through analysis of survey or interview responses. Table 2 identifies these indicators and corresponding data sources.

[11] For some Energy FinAnswer projects, Rocky Mountain Power requires the customer to commission certain measures. The EAR provides details regarding these requirements on a measure-specific basis. If the customer chooses not to commission the project, when it's required, their incentive will be based on kWh savings and allowed project costs that are reduced by 20 percent. Commissioning reports are submitted to Rocky Mountain Power along with invoices and other documentation before the incentive is awarded to the customer.

Table 2. Indicators and Data Sources for Program Outcomes

Outcome	Indicator	Data Source
Short-Term Outcomes		
Customers are aware of the program.	Non-participant awareness	Customer surveys
Customer expresses interest in the program.	Program attracts interested participants; participation	Customer surveys; program tracking data; non-participant data
Customer signs and returns LOI.	LOI in project file	Project files; customer surveys
Energy engineers selected for project analysis and quality control.	Engineers identified for projects	Program tracking data; energy engineer interviews
Energy-saving measures, costs, and benefits identified.	Energy analysis report includes measures, costs, and benefits	Project files; customer surveys; energy engineer interviews
Measures installed and commissioned as required.	Commissioning report in project file; final inspection report; invoices	Project files; customer surveys; energy engineer interviews
Installation of measures verified.	Verification in project file	Project files; energy engineer interviews
Customers receive benefits and have reduced first costs.	Customers receive benefits	Cost recovery in program tracking data; customer surveys
Mid-Term Outcomes		
Customers have trusted information.	Customers find technical assistance valuable.	Customer surveys
Reduce kW and/or kWh at customer facility.	Customers realize expected savings.	Customer surveys
Long-Term Outcomes		
Achieve peak demand and energy use reduction targets.	Rocky Mountain Power meets targets.	Program goals; program tracking data
Customers observe energy cost savings.	Customers realize expected savings.	Customer surveys

2 Evaluation Methodology

The following chapter describes the evaluation methodologies used in Wyoming's 2011-2013 Energy FinAnswer program. The evaluation team developed and informed these methods through an independent review of evaluation best practices.[12]

2.1 Impact Evaluation Methodology

This section summarizes the impact evaluation methods used to develop project- and program-level realization rates for the Energy FinAnswer program. Findings provide Rocky Mountain Power staff with the feedback they need to increase program efficacy and to advance the research and policy requirements of the Wyoming Public Service Commission by providing an independent quantitative review of program achievements.

The impact evaluation of Wyoming's Energy FinAnswer program aimed to characterize energy and demand impacts for incented projects in the 2011 through 2013 program years, including the following:

- Quantifying the impacts of all measures and activities on annual gross energy consumption while accounting for any interactions among technologies
- Establishing post-implementation performance for installed measures and activities
- Explaining discrepancies between the results of this study and the reported savings estimates

Evaluation metrics and parameters reported through this effort include the following:

- Gross program demand and energy savings estimates and realization rates for projects
- Energy usage profiles for commercial and industrial (C&I) technologies obtained through measurement & verification (M&V) activities

See section 3 for gross and net impact results.

The Energy FinAnswer programs include only custom projects. The evaluation team employed a combination of International Performance Measurement and Verification Protocol (IPMVP) Options A, B, and C to review the data in the project file and confirm results due to the limited number of projects evaluated.[13]

2.1.1 Project File Reviews

A thorough review of the Energy FinAnswer project files allowed the evaluation team to increase the accuracy of calculated measure savings and demand reductions, thereby ensuring that they were

[12] See Appendix B for detail on EM&V Best Practices.

[13] For more information regarding IPMVP options and definitions, see http://www.evo-world.org/index.php?option=com_content&view=article&id=272&Itemid=397&lang=en.

representative of installation conditions. For each project file reviewed, the evaluation team characterized any data gaps, consistency issues, and the accuracy of the information used to estimate project-level savings.

Figure 2 presents an example of the overview of parameters verified through the project file review process. Overall, the evaluation team found the Energy FinAnswer project files and assumptions to be sound and within industry standards.

Figure 2. Parameters Verified Through Project File Reviews (Example)

Site Name	Sample
Site Address	Address
Project #	EF000_000317
Program	Wyoming Energy FinAnswer
Customer Name	Contact name
Program Year	2013
Project Description	Fan Controls
Measure Category[ies]	HVAC
Installation Date	1/7/2013
Incentive Amount	$61,921
NCI M&V Report Author	Navigant
NCI Field Staff Present On-Site	Navigant
Site Visit Date(s)	8/20/2014
Site Visit Type	Verification and trend data collection

2.1.2 Sampling Frame Development

For the evaluation of the Energy FinAnswer program, the evaluation team adopted a *Ratio Estimation* approach to sampling, which achieved increased precision and reliability by taking advantage of a relatively stable correlation between an auxiliary variable and the variable of interest (i.e., the ratio of actual savings to program-reported savings). This approach served to reduce the overall coefficient of variation within the population.

Moreover, the evaluation team proportionately stratified the sample by program-reported savings into two subgroups (i.e., strata). The evaluation team selected projects proportionately within each stratum to ensure the following:

1. The evaluation of the largest projects and contributors to program performance
2. The fair representation of medium and smaller projects in the evaluation

The impact evaluation achieved a 90/3.5 confidence and precision across the 2011 through 2013 program years by energy (kWh) savings. Table 3 provides an overview of the impact evaluation framework, representing 99 percent of the reported Energy FinAnswer Program savings for the 2011 through 2013 program years.

Table 3. Overview of the Impact Evaluation Sampling Framework

Sample Strata	Total Number of Projects	Projects in Sample	Reported kWh Savings	Evaluated kWh Savings	Portion of Reported Savings Evaluated[14]
1	3	3	11,114,030	11,422,265	100%
2	17	8	6,820,488	5,878,012	73%
Total	20	11	17,934,518	17,300,277	90%

2.1.3 Gross Energy and Demand Realization Rate Calculation

The impact evaluation team combined gross energy and demand realization rates for each project in the impact evaluation sample to form *program-level* realization rates for each program year. The team researched the following technical issues in order to accurately determine *gross* program impacts and realization rates:

- The appropriateness of the pre-installation technology performance baseline via project file and secondary literature review
- Installation and quantity of claimed measures
- Baseline and measure performance characteristics of the measures installed, and revision of performance variables (e.g., operating hours) as needed
- Load shapes for the EEMs installed through the programs
- Demand savings (kW) and energy savings (kWh) impacts of the efficiency measures installed for projects sampled by calculating case weights for each evaluated project; the case weight is simply the number of projects in the population in each stratum divided by the number of projects in the final sample in the corresponding stratum.[15]

[14] This percentage represents the portion of the reported program savings that fell within the bounds of the evaluation sample frame. It does not represent the relation between the reported and evaluated savings numbers in the prior two columns.

[15] The TecMarket Works Team, June 2004, The California Evaluation Framework, Prepared for the California Public Utilities Commission and the Project Advisory Group.

The program-level realization rate is the ratio between the product of case weights and *verified* savings estimates and the product of case weights and *reported* savings estimates, as illustrated in the following equation:

$$Program\ Realization\ Rate_i = \frac{\sum_{i=1}^{n} Case\ Weight_i \times Verified\ Savings\ Estimate_i}{\sum_{i=1}^{n} Case\ Weight_i \times Reported\ Savings\ Estimate_i}$$

See section 3 for energy and demand realization rate results.

2.1.4 Program Cost-Effectiveness

The cost-effectiveness of utility-funded programs in the state is typically analyzed using tests prescribed by the California Standard Practice Manual.[16] For the purposes of this evaluation, Rocky Mountain Power specifically required the following cost-effectiveness tests:

- PacifiCorp Total Resource Cost Test (PTRC)
- Total Resource Cost Test (TRC)
- Utility Cost Test (UCT)
- Ratepayer Impact (RIM)
- Participant Cost Test (PCT)

[16] The California Standard Practice Manual is an industry-accepted manual identifying cost and benefit components and cost-effectiveness calculation procedures. Definitions and methodologies of these cost-effectiveness tests can be found at http://www.energy.ca.gov/greenbuilding/documents/background/07-J_CPUC_STANDARD_PRACTICE_MANUAL.PDF.

Table 4 presents descriptions of generally accepted cost-effectiveness tests.

Table 4. Details of Cost-Effectiveness Tests[17]

Test	Acronym	Key Question Answered	Summary Approach
Participant Cost Test	PCT	Will the participants benefit over the measure life?	Comparison of costs and benefits of the customer installing the measure
Utility Cost Test	UCT	Will utility revenue requirements increase?	Comparison of program administrator costs to supply-side resource costs
Ratepayer Impact Measure	RIM	Will utility rates increase? Considers rate impacts on all participants, and potential for cross-subsidization.	Comparison of program administrator costs and utility bill reductions to supply-side resource costs
Total Resource Cost Test	TRC	Will the total costs of energy in the utility service territory decrease?	Comparison of program administrator and customer costs to utility resource savings
PacifiCorp Total Resource Cost Test	PTRC	Will the total costs of energy in the utility service territory decrease when a proxy for benefits of conservation resources is included?	Comparison of program administrator and customer costs to utility resource savings including 10 percent benefits adder

Section 3.3 provides the benefit/cost results and findings for each of the evaluated program years.

2.2 *Validity and Reliability of Impact M&V Findings*

The evaluation team identified several sources of uncertainty associated with estimating the impacts of the Energy FinAnswer program. Examples of such sources include the following:

- Sample selection bias
- Physical measurement bias (e.g., meter bias, sensor placement, and non-random selection of equipment or circuits to monitor)
- Engineering analysis error (e.g., baseline construction, engineering model bias, and modeler bias)

The evaluation team remained cognizant of these issues throughout the evaluation process and adopted methods to reduce the uncertainty arising from these sources, thereby improving the validity and reliability of study findings.

[17] Navigant modified Table 2-2 from: "Understanding Cost Effectiveness of Energy Efficiency Programs: Best Practices, Technical Methods, and Emerging Issues for Policy – Makers" NAPEE, November 2008. http://www.epa.gov/cleanenergy/documents/suca/cost-effectiveness.pdf.

2.2.1 Reducing Uncertainty from Sample Selection Bias

Evaluators recognize the problem that selection bias creates for program evaluation, even when adhering to impact evaluation sample design protocols, if the selected projects did not choose to participate in the evaluation effort. In an effort to minimize non-response bias, the evaluation team established and implemented the following recruitment protocols:

- Notified participants as early as possible in the evaluation process
- Accurately characterized M&V activities and the duration of the evaluation process
- Maintained brief and frequent communication with participants and informed them of any changes/additions to the evaluation effort

The intent of these protocols was to give each participant ample time to prepare documentation and secure the appropriate resources to support the evaluation effort. Brief and frequent contact with each participant ensured the participant remained engaged.

2.2.2 Reducing Uncertainty from Physical Measurement Error

Inevitable error occurs with all physical measurement. For the impact evaluation of the Energy FinAnswer program, a large measurement effort involved installing current/power loggers to determine the operating characteristics of incented technologies across a broad range of applications. The evaluation team took the following steps to minimize the possible introduction of uncertainty resulting from bias/error by this process:

- **Logger Calibration:** To minimize measurement error from improper calibration of the current/power loggers, the evaluation team checked all loggers used in the field to ensure proper calibration prior to deployment. Field staff received training to use consistent measurement intervals whenever possible, and to synchronize the logger deployment activities (e.g., time delay), to ensure proper data comparisons across a uniform time period.
- **Logger Placement:** The field staff used a prescribed protocol for the placement and installation of loggers on circuits (e.g., current transformer placement) to minimize biases arising from the improper placement of loggers.
- **Logging Period:** Usage patterns for retrofit measures may vary from month to month, so sampling for a short duration could introduce a degree of error into the overall results. The evaluation team reduced this type of error by typically deploying loggers for a minimum of four weeks, and supplemented them with available facility records (e.g., Energy Management System [EMS] trends, production logs). The team calibrated the facility records, which spanned multiple months or years, with the collected logger data.
- **Logged Data Quality:** Poor quality data can also be a significant source of error and uncertainty. The evaluation team applied various quality assurance checks to minimize the potential impact of this problem, including the use of consistent spot measurements comparable against both the

EMS and logger data, and qualified analysts review all logger files to ensure results represented the investigated technologies.[18]

2.2.3 Reducing Uncertainty from Engineering Analysis Error

The evaluation team adopted the following protocols to minimize uncertainty from engineering analysis error in this study:

- Peer review of all project analysis findings to ensure the consistent use of methods and assumptions throughout the impact evaluation
- Data collection protocols that yielded appropriate inputs into the analysis models and review of all field observations with the evaluation team

2.3 Net to Gross Methodology

The evaluation team used interviewee self-reported responses to assess the program's influence on the participants' decisions to implement EEMs and determine what would have occurred absent program intervention. This estimation included an examination of the program's influence on three key characteristics of the project: its timing, its level of efficiency, and its scope (i.e., the size of the project). This estimate represents the amount of savings attributed to the program that would have occurred without its intervention, referred to as "*free ridership*."

The team's measurement of net savings then estimated program influence on the broader market because of the indirect effects of the program's activities. This estimate, referred to as "*spillover*," represents the amount of savings that occurred because of the program's intervention and influence but not currently reported by any PacifiCorp program. Navigant classified spillover savings into two categories based on measure types: "like" spillover and "unlike" spillover.

- **"Like" spillover** – energy savings associated with additional high efficiency equipment installed outside of the program of the same end-use as what that participant installed through the program. For example, if the participant installed high-efficiency lighting fixtures as part of the program, "like" spillover would be limited to any additional high efficiency lighting installed without any assistance from Rocky Mountain Power but influenced by program activity. This type of spillover is quantifiable using program tracking savings as a proxy.
- **"Unlike" spillover –** the savings associated with any other high efficiency equipment installed outside of the program that are not of the same end-use category as what was installed through the program. Continuing the example above, if the participant installed high efficiency lighting through the program, the high efficiency HVAC equipment installed outside of the program would be considered "unlike" spillover as it is not the same end-use. This type of spillover is not quantifiable, but it is useful to document and track.

[18] Current/power loggers were reviewed to ensure that consumption was representative of the technology being investigated. Suspect operating characteristics were reviewed with field staff and facility managers to clarify usage pattern anomalies.

A program's net savings are adjusted by both free ridership and spillover savings at the measure level and then extrapolated to the program. The net savings are the program-reported savings minus any free-ridership savings, plus any identified spillover savings – as shown in the following equation:

Net Program Savings = Gross Program Savings – Free-Ridership Savings + Spillover Savings

Often, this finding is described as a "net-to-gross ratio." This ratio is the net program savings divided by the gross program savings, or:

NTG Ratio = Net Program Savings ÷ Gross Program Savings

Section 3.2 provides the evaluation results with the NTG applied.[19]

2.4 Process Methodology

This section describes the methodology used to complete the process evaluation.

2.4.1 Overview of Steps in the Process Evaluation

The evaluation team undertook the following activities in order to meet the objectives of this evaluation:

- **Develop Process Evaluation Research Questions.** The evaluation team and Rocky Mountain Power staff established key process evaluation questions through the development of the 2011-2013 evaluation plan.
- **Review Program Documentation.** The evaluation team reviewed program documentation including regulatory filings, brochures, application forms, and websites.
- **Verify Logic Model.** The evaluation team worked with program staff to verify the logic model for the Energy FinAnswer program that describes the intended program design, activities, outputs, and outcomes.
- **Collect Process Data.** The evaluation team collected process data through interviews with program staff, interviews with near-participants, and telephone surveys with participating customers.
- **Analyze and Synthesize Process Data.** The evaluation team assessed the effectiveness of the program processes by analyzing in-depth interview data and participant survey data.

[19] Where possible, Navigant adhered to the NTG guidelines as set forth by the Department of Energy (DOE) Uniform Methods Project (UMP) when calculating the NTG ratios. (Dan Violette and Pamela Rathbun, 2014, *Estimating Net Savings: Common Practices*, National Renewable Energy Laboratory [NREL]).

2.4.2 Process Evaluation Research Questions

Discussions with program staff and a review of the program theory and logic identified seven overarching research questions to guide the process evaluation:

1. What are the program goals, concept, and design?
2. Do program staff and administrators have the resources and capacity to implement the program as planned, and if not, what more is needed?
3. Is the program being delivered in accordance with the logic model?
4. Is the program marketing effective? Specifically, how do customers find out about the program?
5. What is the program influence on participant actions? Specifically, what do participants identify as most important to their projects (i.e., program information, incentive/credit, payback, engineering, and their own company goals)?
6. What barriers are preventing customers from taking actions to reduce energy consumption and demand, and which jeopardize program cost-effectiveness?
7. Are participants achieving planned outcomes? Specifically, are participants feeling satisfied?

Evaluation staff used a mixed-methods approach to explore these questions including, program documentation review, interviews of program staff, near-participants, and participants. Table 5 shows the seven research questions and associated methods used to answer each.

Table 5. Process Evaluation Research Question Approach

	Q1	Q2	Q3	Q4	Q5	Q6	Q7
Program Documentation Review	X	X	X	X			
Program Staff and Administrator Interviews	X	X	X	X			
Participant Interviews				X	X	X	X
Near-Participant Interviews				X		X	

2.4.3 Program Documentation Review

The evaluation team reviewed program marketing materials, websites, program manuals, savings measurement tools regulatory filings, annual reports, previous evaluations, and project tracking data in order to identify how the program is marketed, how trade allies are supported, and how the process for enrollment, administration, and tracking works.

2.4.4 Logic Model Verification

The evaluation team verified that the existing program logic model, developed in 2011 for the Energy FinAnswer program in Wyoming, continued to represent the program theory during the current

evaluation.[20] To do so, the team used results from program administrator interviews and reviewed evaluation findings to assess whether the program produced the intended activities, outputs, and outcomes as defined in the 2011 program logic model.

2.4.5 Process Data Collection Activities

Interviews and surveys with program staff and participants supported the development of the program overview and logic model, as well as aided in the evaluation conclusions and recommendations for the Energy FinAnswer program.

2.4.5.1 Program Staff Interviews

The evaluation team interviewed two program management staff with the following objectives in mind:

- Understand the design and goals of the Energy FinAnswer program
- Understand any program changes that have been implemented in Wyoming going into the 2011-2013 cycle, and changes occurring during this cycle
- Follow up on how recommendations from previous evaluation were implemented (or not)
- Support confirmation or revision of the existing program logic model
- Identify program strengths, weaknesses, and opportunities for improvement from program staff perspective
- Identify other actionable ideas the program staff hopes to gain from the evaluation

2.4.5.2 Participant Surveys

The evaluation team conducted three semi-annual telephone surveys beginning in the second half of 2012. Changes in program evaluation objectives required slight alterations between these surveys, but all three rounds of surveys included questions about program influence and satisfaction. The last survey also included additional process questions on how customers learned about the program, the equipment installed, its operation, and interaction with trade allies.[21] The evaluation team did not re-sample from the measures completed during previous cycles.

Table 6 provides the timing and sampling frame for participant surveys and interviews. The evaluation team surveyed a total of four participants but only two using the survey in the second half of 2013 containing all of the process evaluation questions.[22]

---

[20] Rocky Mountain Power recently revamped the Energy FinAnswer program in Wyoming to be a part of the *wattsmart* Business program. However, this change occurred just after the completion of the 2011-2013 process evaluation; therefore, the program theory and logic model created for the 2011 Energy FinAnswer program remained current as of this writing. Appendix C displays the logic model for the new *wattsmart* Business program theory.

[21] After the first semi-annual survey, the program evaluation direction was to focus only on net savings and drop the process evaluation. The program direction changed again before the last survey to re-include process evaluation.

[22] During the last process evaluation survey period, the evaluation team attempted to reach participants who completed projects in 2011, but none of these participants completed the survey.

Table 6. Sample Frame for Participant Surveys in 2012-2013

Time Period	Sample	Unique Sites	Program Projects
First Half 2012 (Projects completed Jan. 1, 2012-June 30, 2012)	0	3	5
Second Half 2012 (Projects completed July 1, 2012-Dec. 31, 2012)	2	3	3
First Half 2013 (Projects completed Jan. 1, 2013-June 30, 2013)	0	2	2
Second Half 2013 (Projects completed July 1, 2013-Dec. 31, 2013)	2	2	4
Total	4	10	14

Participant interview research objectives included the following:

- Describe how customers come to participate in the program
- Understand overall customer satisfaction with the program, including (where appropriate) marketing, application materials, inspections, customer service, and the incentive or credit
- Understand program influence on customer actions, including free ridership and spillover
- Identify barriers customers are facing that prevent increasing energy efficiency

2.4.5.3 Near-Participant Interviews

The evaluation team conducted nine in-depth telephone interviews with near-participants in Wyoming to collect data on near-participant experiences with Energy FinAnswer. Forty-four unique customers who attempted participation in the Energy FinAnswer program in Wyoming during the 2011-2013 program years remained near participants at the end of 2013.

The evaluation team designed the interview questions to be open-ended to allow interviewees to describe their full range of experiences. The interviewer coded responses following each interview to make generalizable observations and comparisons between near-participants.

2.4.6 Process Data Analysis and Synthesis

The evaluation team reviewed all interview response data for missing or erroneous entries before tabulating the frequency of similar responses within categories. After analyzing data from each data collection activity individually, the evaluation team identified common process findings across activities.

3 Impact Evaluation Findings

The following section summarizes the impact evaluation findings for projects included in the 2011 through 2013 impact evaluation sample.

The evaluation team characterized savings as "reported" and "evaluated." Reported savings present project savings estimated at the time of measure installation. Evaluated savings represents sampled energy savings verified at the time of evaluation, with results extrapolated to the entire population.

3.1 Gross kW and kWh Savings

The evaluation team used a combination of in-depth project file reviews, interviews with facility staff, and on-site M&V activities involving spot measurements and end-use metering of incented equipment to calculate *two* sets of realization rates for the 2011-2013 Energy FinAnswer program in Wyoming. Twenty projects participated in the Energy FinAnswer program during the 2011 through 2013 program years, and the team visited 11 (representing 99 percent of reported savings) during the on-site verification activities. One of the sites visited, the Wastewater Treatment Plant (WWTP) project ID EFWC2_000009, experienced major equipment failure issues and had to shut down the efficiency measures installed during the project, resulting in a zero percent realization rate. Navigant felt that including this zero in the measure-level weighting calculations did not present an accurate picture of the overall program-level realization rates and therefore classified all the measures in this project under a separate WWTP specific measure category, and did not use this measure in the weighting calculations. This ensured that while the project was included in the overall program realization rate, the results did not influence the other projects within the sample.[23]

[23] Navigant does not encourage using the second option with the WWTP removed from the sample as it causes undo bias in the evaluation results.

The 2011-2013 *program-level* demand savings realization rate was 71 percent and the program-level energy savings realization rate was 96 percent as shown in Table 7. For comparison purposes only, the evaluation team provided realization rates after removing the WWTP as shown in Table 8.

Table 7. Program-Level Realization Rates for WY Energy FinAnswer

Program Year	Program Reported kW	Gross Program Evaluated kW	Gross Program kW Realization Rate	Program Reported kWh	Gross Program Evaluated kWh	Gross Program kWh Realization Rate
2011	63	62	*98%*	1,942,616	2,062,459	*106%*
2012	381	203	*53%*	7,036,789	5,696,157	*81%*
2013	626	491	*78%*	8,955,113	9,541,661	*107%*
All	1,070	756	*71%*	17,934,518	17,300,277	*96%*

Table 8. Program-Level Realization Rates for WY Energy FinAnswer (WWTP removed)

Program Year	Program Reported kW	Gross Program Evaluated kW	Gross Program kW Realization Rate	Program Reported kWh	Gross Program Evaluated kWh	Gross Program kWh Realization Rate
2011	63	62	*99%*	1,942,616	2,062,459	*106%*
2012	381	247	*104%*	7,036,789	5,729,147	*96%*
2013	626	530	*85%*	8,955,113	9,575,599	*107%*
All	1,070	839	*90%*	17,934,518	17,367,205	*103%*

The realization rates reflect the difference between expected savings at the time of installation and evaluated savings one to three years after project completion. However, customers often modify their operating profiles for reasons unrelated to program influence. For example, the C&I sector is particularly sensitive to economic changes as production throughput, occupancy, and customer demand drive operating schedules. Changes in equipment usage also affect the efficiency of the baseline and replacement technologies for completed projects in the Energy FinAnswer program. Throughout the impact evaluation, the evaluation team remained cognizant of these factors, which can influence project-level savings. Table 9 provides project-level demand savings for the 11 projects in the impact evaluation sample.

Table 9. Wyoming's Energy FinAnswer Project-Level Demand (kW) Realization Rates

Project ID	Year	Reported kW	Evaluated kW	Realization Rate
EF000_000317	2013	316.0	269.4	85%
EF000_000686	2013	214.0	182.5	85%

Project ID	Year	Reported kW	Evaluated kW	Realization Rate
EFSen_8274	2012	37.0	31.6	85%
EF000_000163	2012	0	0	NA
EFSen_8740	2011	37.0	37.0	100%
EFWC2_000009	2012	143.0	0	0%
EFSen_8753	2011	5.0	0	0%
EFSen_8292	2012	6.0	8.0	133%
EFSen_8915	2011	13.0	12.8	98%
EFSen_8797	2011	0	0	NA
EFW2S_8700	2011	0	5.8	NA
Total	-	771	547	71%

Sites with "NA" realization rates did not claim any demand savings. Table 10 details the energy savings realization rate for all projects in the evaluation sample.

Table 10. Wyoming's Energy FinAnswer Project-Level Energy (kWh) Realization Rates

Project ID	Year	Reported kWh	Evaluated kWh	Realization Rate
EF000_000317	2013	4,171,000	4,132,907	99%
EF000_000686	2013	4,072,161	4,034,971	99%
EFSen_8274	2012	2,870,869	2,844,650	99%
EF000_000163	2012	1,900,485	1,589,061	84%
EFSen_8740	2011	1,121,630	1,121,630	100%
EFWC2_000009	2012	1,079,531	0	0%
EFSen_8753	2011	394,852	756,215	192%
EFSen_8292	2012	170,985	203,119	119%
EFSen_8915	2011	147,941	112,108	76%
EFSen_8797	2011	74,896	118,491	158%
EFW2S_8700	2011	59,229	97,951	165%
Total	-	16,063,579	15,011,103	93%

The evaluation team notes the explanatory factors driving the lower (or higher) realization rates for specific projects in the following subsection.

3.1.1 Project-Level Observations and Considerations

The WWTP which received an incentive as project EFWC2_000009 had not repaired the equipment after it broke down. This resulted in a zero realization rate. Navigant has calculated overall realization rates

both with and without this project because problems are common with WWTP projects and this does not apply to the other projects in the program.

Project ERSen_8753 achieved nearly twice the *ex-ante* energy savings due to increased baseline energy for the pump. The file baseline was 140.4 kW but the spot measurement showed operation at 202 kW at 52.5 Hz, close to the maximum logged. Based on this, Navigant calculated the baseline at 200 kW without the VFD, resulting in the increased savings despite higher power operation than during the implemented period.

3.2 Program-Level Net Savings Results

The evaluation team calculated an average NTG ratio of 0.64 based on only three self-reported participant responses to free-ridership and spillover survey and interview questions for the current 2011-2013 evaluation (Table 11).

Table 11: Savings-Weighted Program Influence for PY2011-2013

Free Ridership Score	Like Spillover Score	Unlike Spillover Score	Net Savings Ratio
0.37	0.01	--	0.64

Results based on only three respondents. Strong caution urged when using these values.

Due to the limited response data, the team conducted the cost-effectiveness tests using both the 0.64 NTG ratio and the 0.80 NTG used in the prior Wyoming Energy FinAnswer study for comparison purposes. Table 12 provides evaluated program-level demand and energy savings with an applied NTG of 0.64, while Table 13 provides the net savings with an applied 0.80 NTG.

Table 12. Program-Level Net Realization Rates for WY Energy FinAnswer (0.64 NTG)

Program Year	Program Reported kW	Net Program Evaluated kW	Net kW Realization Rate	Program Reported kWh	Net Program Evaluated kWh	Net Program kWh Realization Rate
2011	63	40	*63%*	1,942,616	1,319,974	*68%*
2012	381	130	*34%*	7,036,789	3,645,540	*52%*
2013	626	315	*50%*	8,955,113	6,106,663	*68%*
All	1,070	485	*45%*	17,934,518	11,072,177	*62%*

Table 13. Program-Level Net Realization Rates for WY Energy FinAnswer (0.80 NTG)

Program Year	Program Reported kW	Net Program Evaluated kW	Net kW Realization Rate	Program Reported kWh	Net Program Evaluated kWh	Net Program kWh Realization Rate
2011	63	49	*78%*	1,942,616	1,649,967	*85%*
2012	381	162	*43%*	7,036,789	4,556,926	*65%*
2013	626	393	*63%*	8,955,113	7,633,329	*85%*
All	1,070	604	*56%*	17,934,518	13,840,222	*77%*

3.3 Cost-Effectiveness Results

The evaluation team initialized and validated the cost-effectiveness model used for this evaluation. Calibration of the model to prior inputs and outputs from previous evaluation cycles ensured similar inputs yielded similar outputs for the current cycle. The evaluation team worked through a range of input assumptions pertaining to avoided cost data formats, financial assumptions regarding discount and escalation rates, participant costs and benefits, and other input parameters.

Table 14 provides an overview of cost-effectiveness input values used by the evaluation team in the cost-effectiveness analysis.

Table 14. Wyoming Energy FinAnswer Cost-Effectiveness Evaluation Input Values

Input Description	2011	2012	2013	2011-2013
Discount Rate	7.17%	7.17%	6.88%	-
Inflation Rate	1.80%	1.80%	1.90%	-
Commercial Line Loss	7.64%	8.90%	8.90%	-
Industrial Line Loss	4.76%	5.61%	5.61%	-
Measure Life	15 yrs.	15 yrs.	15 yrs.	-
Commercial Retail Rate	$0.0751	$0.0794	$0.0827	-
Industrial Retail Rate	$0.0562	$0.0583	$0.0613	-
Gross Customer Costs	$444,512	$1,589,379	$1,452,485	$3,486,376
Program Costs	$333,943	$882,503	$1,127,374	$2,343,820
Program Delivery	$140,491	$257,009	$313,320	$710,820
Incentives Costs	$193,452	$625,494	$814,054	$1,633,000

The discount rates, inflation rates, and retail rates are based on the 2011 IRP for 2011-2012 and the 2013 IRP for 2013. Measure specific load shapes and the System Load Shape Decrement were used for all program years.
Program Delivery includes: engineering, program implementation, marketing, and utility administration costs.

Table 15 through Table 18 illustrate the costs, benefits, and benefit/cost ratio for the cost-effectiveness tests used in this evaluation using the calculated NTG of 0.64.

Table 15. Cost-Effectiveness Results - 2011 (0.64 NTG)

Benefit/Cost Test Performed	Evaluated Gross kWh Savings	Evaluated Net kWh Savings	Evaluated Costs	Evaluated Benefits	B/C Ratio
Total Resource Cost Test (PTRC)	2,062,459	1,319,974	$618,793	$1,162,436	1.88
Total Resource Cost Test (TRC)	2,062,459	1,319,974	$618,793	$1,056,760	1.71
Utility Cost Test (UCT)	2,062,459	1,319,974	$527,757	$1,056,760	2.00
Rate Impact Test (RIM)	2,062,459	1,319,974	$1,337,825	$1,056,760	0.79
Participant Cost Test (PCT)	2,062,459	1,319,974	$444,512	$1,459,183	3.28

Table 16. Cost-Effectiveness Results – 2012 (0.64 NTG)

Benefit/Cost Test Performed	Evaluated Gross kWh Savings	Evaluated Net kWh Savings	Evaluated Costs	Evaluated Benefits	B/C Ratio
Total Resource Cost Test (PTRC)	5,696,157	3,645,540	$1,274,212	$3,377,589	2.65
Total Resource Cost Test (TRC)	5,696,157	3,645,540	$1,274,212	$3,070,535	2.41
Utility Cost Test (UCT)	5,696,157	3,645,540	$882,503	$3,070,535	3.48
Rate Impact Test (RIM)	5,696,157	3,645,540	$3,234,205	$3,070,535	0.95
Participant Cost Test (PCT)	5,696,157	3,645,540	$1,589,379	$4,300,029	2.71

Table 17. Cost-Effectiveness Results – 2013 (0.64 NTG)

Benefit/Cost Test Performed	Evaluated Gross kWh Savings	Evaluated Net kWh Savings	Evaluated Costs	Evaluated Benefits	B/C Ratio
Total Resource Cost Test (PTRC)	9,541,661	6,106,663	$1,242,910	$4,577,985	3.68
Total Resource Cost Test (TRC)	9,541,661	6,106,663	$1,242,910	$4,161,804	3.35
Utility Cost Test (UCT)	9,541,661	6,106,663	$1,127,374	$4,161,804	3.69
Rate Impact Test (RIM)	9,541,661	6,106,663	$5,311,585	$4,161,804	0.78
Participant Cost Test (PCT)	9,541,661	6,106,663	$1,452,485	$7,351,883	5.06

Table 18. Cost-Effectiveness Results – 2011-2013 Combined (0.64 NTG)

Benefit/Cost Test Performed	Evaluated Gross kWh Savings	Evaluated Net kWh Savings	Evaluated Costs	Evaluated Benefits	B/C Ratio
Total Resource Cost Test (PTRC)	17,300,277	11,072,177	$3,135,915	$9,118,009	2.91
Total Resource Cost Test (TRC)	17,300,277	11,072,177	$3,135,915	$8,289,099	2.64
Utility Cost Test (UCT)	17,300,277	11,072,177	$2,537,634	$8,289,099	3.27
Rate Impact Test (RIM)	17,300,277	11,072,177	$9,883,615	$8,289,099	0.84
Participant Cost Test (PCT)	17,300,277	11,072,177	$3,486,376	$13,111,094	3.76

Table 19 shows these results with a NTG of 0.80 used during the prior evaluation for the combined PY 2011-2013 for comparison purposes.

Table 19. Cost-Effectiveness Results– 2011-2013 Combined (0.8 NTG)

Benefit/Cost Test Performed	Evaluated Gross kWh Savings	Evaluated Net kWh Savings	Evaluated Costs	Evaluated Benefits	B/C Ratio
Total Resource Cost Test (PTRC)	17,300,277	13,840,222	$3,693,735	$11,397,511	3.09
Total Resource Cost Test (TRC)	17,300,277	13,840,222	$3,693,735	$10,361,374	2.81
Utility Cost Test (UCT)	17,300,277	13,840,222	$2,537,634	$10,361,374	4.08
Rate Impact Test (RIM)	17,300,277	13,840,222	$11,720,110	$10,361,374	0.88
Participant Cost Test (PCT)	17,300,277	13,840,222	$3,486,376	$13,111,094	3.76

4 Process Evaluation Findings

This section describes the findings from Wyoming's Energy FinAnswer process evaluation data collection activities including participant surveys and near-participant interviews.

4.1 Participant Findings

The evaluation team surveyed four 2012-2013 participants, and nine near-participants in August 2014, but no 2011participants responded to the survey.[24]

4.1.1 Program Satisfaction

The majority of respondents reported being very satisfied with multiple aspects of the program. Surveys polled satisfaction of the pre-installation inspection and report, installed measures, initial equipment status, energy savings benefits, non-energy benefits, and overall project satisfaction.[25]

- Three out of the four respondents surveyed indicated being "very satisfied" with the program overall and all four were "very satisfied" with the performance of their new energy efficiency measures.
- Only two of the four participants received a pre-installation inspection and report describing the energy analysis of the project. One of the two reported being very satisfied with the inspection and both saw the report as valuable.
- Only three of the four participants answered specific questions regarding the installed energy efficiency measures.
    - These three participants installed a total of six EEMs.
    - Five of the six measures replaced existing equipment that was working with no problems, while one replaced equipment that was working but had problems.
    - All three of these respondents reported that the energy savings related to each measure met their expectations.

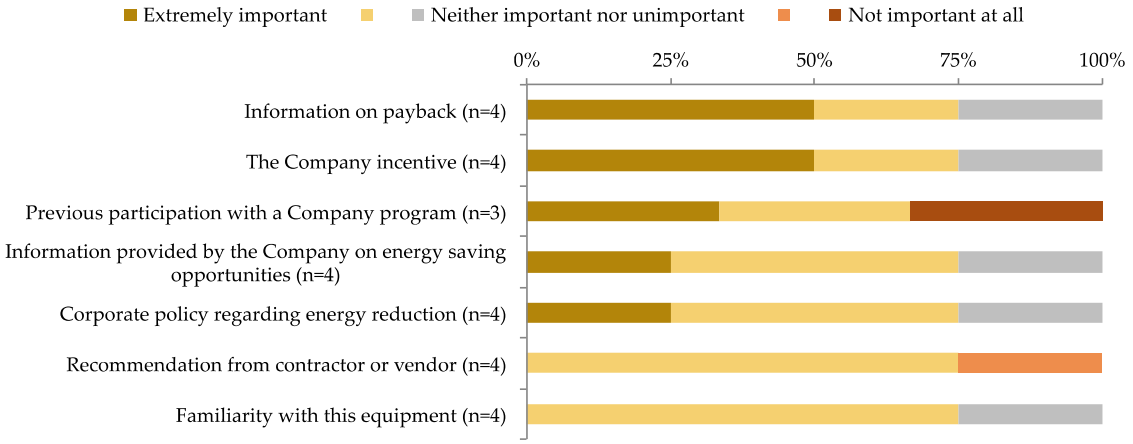
[24] All four participants surveyed completed projects from July 2012 through June 2013 and received surveys that lacked process questions. The team attempted a third survey that included process questions with participants completing projects from January 2011 through June 2012 and from July 2013 through December 2013; however, no participants responded to this survey.

[25] The team used a satisfaction scale from one to five, where 1= Very Dissatisfied, 2= Somewhat Dissatisfied, 3= Neutral, 4= Somewhat Satisfied, and 5= Very Satisfied.

4.1.2 Program Influence

Respondents ranked the importance of certain factors in deciding which equipment to install for each project specified. The most important factors (shown in Figure 3) include Information on Payback and the Company Incentive.

Figure 3. Importance of Factors for Participants to Decide to Install Equipment



4.1.3 Further Energy Efficiency Opportunities and Barriers

Participant surveys provided insight into the barriers that prevented participants from taking action and about future plans for energy efficiency projects. Respondents shared their current plans, potential future plans, and whether current plans included assistance from Rocky Mountain Power. Respondents also listed specific examples for energy-efficient plans and selected factors that may prevent them from making these plans.

Three of the four respondents indicated no potential to implement current or future energy-efficient projects. The last respondent indicated having current plans for energy efficiency projects, which included assistance from Rocky Mountain Power.

One of the respondents who indicated no potential for current or future energy efficiency potential indicated the lack of access to capital as the primary barrier.

4.2 Near-Participant Findings

The process evaluation team conducted nine in-depth telephone interviews with near-participants in Wyoming for years 2012 and 2013.[26] Forty-four unique customers who attempted participation in the Energy FinAnswer program in Wyoming during these years were listed as near participants at the end of 2013.

[26] No data was collected for program year 2011.

4.2.1 Causes of Non-Completion

Interviewees described a variety of situations leading to the "on-hold" or "canceled" status of their Energy FinAnswer projects, including reasons unrelated to program processes. Table 20 summarizes the status of all nine near-participant projects and the detailed reasoning behind them.

Table 20. Summary of Near-Participants' Project Status

Project Status	Count (*n = 9*)	Reasons
Canceled	3	Program burden Facility to be closed Technological challenges
On hold (indefinitely)	1	Facility temporarily closed
On hold (delayed)	2	Funding cycle timeline Low ROI - prioritizing higher return investments
Completed (without program support)	1	Purchased equipment before approval
Completed after evaluation period (through Rocky Mountain Power program)	2	Completed through Energy FinAnswer

- **Canceled Projects –** Three interviewees definitively canceled their projects. One interviewee reported canceling the project because the program was too burdensome and that his company had limited staffing to follow through with the project. He expressed frustration with the amount of time and staffing resources necessary to participate. Another interviewee canceled because their facility was slated to go out of commission; however it ended up staying open longer than expected and that if his company had known, then they would have pursued the project. The last interviewee reported technological challenges during the installation phase as the cause of the canceled project.
- **Projects Indefinitely on Hold –** One interviewee reported putting a project on hold indefinitely due to the closing of the facility, but noted that his company would pursue the project if the facility re-opened in the future.

» **Projects on Hold due to Delay –** Two interviewees reported placing their projects were on hold awaiting funding, but that their organizations did plan to complete the projects. One of the two reported that the company had decided to pursue other non-energy capital improvements with higher return on investment before moving forward with the Energy FinAnswer project.

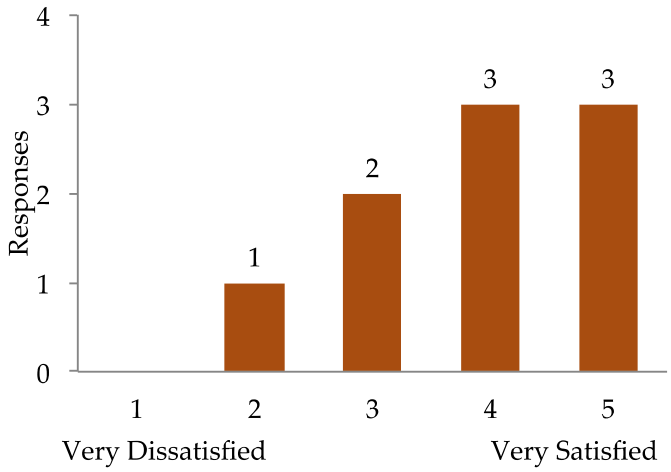
» **Projects Completed without Program Support –** Three interviewees reported completing their projects outside of the Energy FinAnswer program. One interviewee had already made the equipment purchase, so they were ineligible to receive incentives for the equipment. The other two did not elaborate on the subject.

» **Projects Completed through Rocky Mountain Power –** Two interviewees reported completing their projects through Rocky Mountain Power programs even though the database listed them as near-participants. One interviewee reported that his project took longer than expected, but he eventually completed it; at the time of the interview, the project was installed but paperwork had not been completed. The other project carried an "on-hold" status but the interviewee reported, to the best of his knowledge, completing the project through the Energy FinAnswer program.

4.2.2 Near-Participant Program Satisfaction

Most near-participants interviewed reported being very or somewhat satisfied with the program. Interviewees rated their overall experiences and interactions with the program on a scale from one to five, where 1= Very Dissatisfied, 2= Somewhat Dissatisfied, 3= Neutral, 4= Somewhat Satisfied, and 5= Very Satisfied. Figure 4 provides the overall satisfaction results.

Figure 4. Near-Participant Overall Satisfaction with Energy FinAnswer (*n* = 9)



Interviewees who were very satisfied (i.e., reported a rating of 5) with the program expressed satisfaction with Rocky Mountain Power representatives and program staff (*n* = 2) as well as the outcome of their previous projects (*n*=1).

Two of the interviewees who rated their experience as less than satisfactory explained that the program was burdensome and difficult to track. One of these two interviewees canceled the project specifically because of the program requirements. The final interviewee reported that he was dissatisfied with the program because he was "rather torn with government giveaways we have to pay for in the end anyway." Even so, he described every individual experience and interaction with the program positively. This interviewee was more dissatisfied with the existence of the program than the program design or processes.

The evaluation team asked interviewees for suggestions to improve the program for future participants. Four interviewees gave no suggestions. The other interviewees recommended the following:

- Simplify the program process and/or requirements (n = 2)
- Increase communications, outreach, or promotion (n = 2)
- Add programs for energy demand savings or peak savings (n = 1)

4.2.3 Program Awareness and Motivation

Many near-participants in Wyoming only recently became aware of the Rocky Mountain Power energy efficiency offerings. Six of the nine interviewees had never participated in any Rocky Mountain Power energy efficiency program. These interviewees reported hearing about Energy FinAnswer from the following sources:

- Rocky Mountain Power account representative (n = 3)
- Word of mouth (n = 2)
- Equipment dealer (n = 1)

The three interviewees who had previously participated in Rocky Mountain Power's energy efficiency programs found out about them through their jobs. Two interviewees learned about the programs when they started working at the firm and their employer instructed them to pursue energy efficiency efforts. The other interviewee participated in the programs at his previous job.

The evaluation team also asked interviewees why they initially decided to enroll in the program. Overall, Wyoming near-participants focused on cost reductions associated with the program, specifically energy cost savings (n = 6) and incentives or cost-sharing assistance (n = 4).

4.2.4 Further Energy Efficiency Opportunities and Barriers

The evaluation team asked interviewees about additional energy efficiency opportunities at their facilities and, as Table 21 shows, only one respondent reported having no additional opportunities whatsoever.

Table 21. Awareness of Additional Opportunities for Energy Efficiency

Reported Awareness	Count (*n = 9*)
Yes and pursuing additional measures	4
Yes but not planning on pursuing additional measures	4
No	1

The four interviewees with no plans for pursuing their additional opportunities described a variety of preventative barriers. One stated that the facility consumed more energy in the form of steam, and that pursuing steam efficiency would produce higher energy and cost savings. Another said that he was not satisfied with the light output and quality of new efficient lighting options, and that he wanted to wait until the technology improved. The third interviewee believed the remaining opportunities for efficiency were not cost effective, and the final interviewee said that energy efficiency was not a high priority for his company.

Interviewees aware of additional energy efficiency opportunities, and planned to pursue them, provided the following project examples:

- Lighting (n = 4)
- Energy management (n = 1)
- Compressors (n = 1)
- Variable frequency drives (n = 1)

The same interviewees indicated the following possible barriers to pursuing those opportunities:

- Upfront costs or finding financing (n = 2)
- Relatively small savings for electric efficiency projects compared to other (n = 1)
- Quality of efficient lighting options (n = 1)

5 Program Evaluation Recommendations

5.1 PY 2011-2013 Recommendations

The evaluation team recommends that Rocky Mountain Power consider undertaking the following steps to improve the program experience for participants, engineers, and program staff as the Energy FinAnswer program transitions to the *wattsmart* Business program.

- **Recommendation 1: Increase project scrutiny on Wastewater Treatment facilities.** Rocky Mountain Power should apply heightened scrutiny to wastewater treatment projects for quality, permanence, and reasonableness. Navigant's experience with wastewater treatment sites in general, beyond PacifiCorp's programs, shows these projects to have a record of poor realization rates and frequent shutdowns. Wastewater treatment plants must prioritize continuous, reliable operation over energy savings. Projects that involve new processes or equipment that has not been proven to work reliably under the harsh wastewater conditions is likely to result in reduced measure life and savings.
- **Recommendation 2: Consider leak detection incentives.** The program should consider incentives for leak detection training of facility staff for large compressed air users.
- **Recommendation 3: Ensure measure classifications in database are correct.** Impact evaluation activities found incorrect measure classifications in the Rocky Mountain Power program database for some of the measures in completed projects. Proper measure tracking is essential to accurately estimate program savings.

5.2 PY 2009-2011 Recommendation Review

The evaluation team reviewed the recommendations made in the prior 2009-2011 program evaluation to track any progress made by Rocky Mountain Power. The following lists the prior recommendations and the results of this review.

- **Recommendation 1.** In order to facilitate a comprehensive and informed Impact Evaluation effort, the evaluation team recommended that all project files include energy and demand savings calculations in spreadsheet format. The evaluation team encountered select project files that included only calculation summaries and descriptions. In some cases it was difficult to determine reasons for discrepancies between the observed operation and savings and the values provided in the project file.
  Review Results *– The evaluation team found only slight improvement to the inclusion of calculation spreadsheets in the project files.*
- **Recommendation 2.** In some project files, the evaluation team found it difficult to locate both the baseline and replacement energy and demand usage. Going forward, the evaluation team recommended that the final Energy Savings table summary be included in the Executive Summary at the beginning of all Final Inspection Reports and should include both baseline and current energy usage as well as savings estimates. This should have improved the transparency of project expectations for participants while streamlining evaluation efforts.

Review Results *– The evaluation team found improvement to the Final Inspection Reports but mostly from the EARs.*

» **Recommendation 3**. **Future Net-to-Gross Evaluation Recommendations**:

- The evaluation team recommended increasing the frequency of data collection activities to minimize recall issues. This recommendation had been implemented through quarterly survey efforts.
  Review Results *– the evaluation team increased survey efforts to a semi-annual cycle, however not enough participants answered the key process evaluation questions needed to calculate a NTG ratio.*
- The evaluation team recommended prioritizing quantitative spillover as an area of inquiry on subsequent evaluations to ensure balanced and comprehensive net savings estimates.
  Review Results *– the evaluation team increased the number of survey questions concerning spillover, however not enough participants answered these questions to use them in the NTG calculation.*
- The evaluation team recommended increasing the level of documentation on customer interactions with Rocky Mountain Power. This should have served to better codify the baseline customer situation and enhance the accuracy of net savings estimates.
  Review Results *– the team verified the increase in documentation even within the limited number of program participants.*

» **Recommendation 4:** To reduce the possibility that customers drop out of the program because of a lack of follow up, and to ensure that there is organizational continuity if the Rocky Mountain Power project manager were suddenly unavailable, it may be prudent to use automated or otherwise regularly scheduled notification to achieve close monitoring and management of project progress. Rocky Mountain Power's plan to provide a co-funded Energy Project Manager (EPM) as part of this program, recently approved by the commission, can help significantly toward improved coordination by increasing in-house expertise.
Review Results *– Program staff did not pursue automated monitoring, but project tracking software has been updated.*

» **Recommendation 5:** Revise the engineer report templates and/or the project manager's email template to ensure that customers receive consistent next steps.
Review Results *– The delivery of next steps has been improved and clarified both at the beginning of the project and during each phase.*

» **Recommendation 6:** In the near term, it may be prudent to provide individual counseling, discussing the customer's intention and any challenges with commissioning, and to document the findings from the counseling. This action could inform future program design by identifying customer challenges with commissioning as they arise. Rocky Mountain Power's plan to provide a co-funded Energy Project Manager (EPM) as part of this program, recently approved by the commission, may also ease the difficulties noted with the commissioning step.
Review Results *– With the advent of the wattsmart Business program, approved and in place December*

1, 2014, the program has been changed to provide levels of support depending on the customer's need. Participants get direct contact from program staff at the beginning of the project and at key project milestones to ensure that they are prepared to move forward.

» **Recommendation 7:** Distribute a regular publication (e.g. monthly or semi-annual newsletter) that includes any program changes, progress reports, as well as clearly noting the current templates and rate schedules.
Review Results *– The program has changed its communication approach. A newsletter is offered to business customers. Updates to programs are clearly identified on the website.*

» **Recommendation 8:** The Energy FinAnswer program may benefit from the cultivation of a local engineering skill base. This has already started; Rocky Mountain Power has become involved with local colleges to provide energy education, and some engineering firms have begun hiring in-state talent. However, the evaluation team cautions that developing local talent should not be done to the detriment of providing the industry specific expertise that the currently contracted engineers provide.
Review Results *– Program staff indicated that the previous constraints on engineering talent have somewhat lessened but still exist.*

» **Recommendation 9:** Additional information about customer intentions and knowledge could be gathered, as desired by program staff, during initial visits as long as engineers are on the same page as the program staff. Achieving the appropriate level of detail may require modification of the engineering bid and contract requirements.
Review Results *– Program staff indicated that they do acquire key project details at the beginning of the program. The revised application process with the rollout of the wattsmart Business program should further improve this step.*

» **Recommendation 10:** In order to effectively highlight program influence on efficient equipment purchases and installations by customers participating in the Energy FinAnswer Program, Rocky Mountain Power should clearly document the reasoning supporting the scope of each analysis. This could be as simple as a sentence on the project file cover sheet. An example statement looks like: "Scope Limits: Customer is only interested and able to financially support improvements to pumps A, B, and C in their XYZ building. The customer has been made aware of additional opportunities in systems GHI and will consider moving forward with those opportunities at a later time. Rocky Mountain Power will explore savings opportunities through an Energy Analysis for pumps A, B, and C for this project."
Review Results *– Program staff indicated that customers are only provided engineering support to the extent that they are willing and able to engage in the work. This approach conserved engineering funds for projects that are likely to go forward.*