

# FINAL EVALUATION REPORT FOR CALIFORNIA'S FINANSWER EXPRESS PROGRAM (PY 2009-2011)

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February 4, 2013



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## 1. Executive Summary

This report provides findings and recommendations from the impact and process evaluation of California’s FinAnswer Express program for program years 2009 through 2011. These results serve to validate reported savings and inform improvements anticipated for future program cycles.

### 1.1 Program Background

The FinAnswer Express program offers prescriptive incentives to commercial, industrial and irrigation customers for the implementation of Energy Efficiency Measures (EEMs) resulting in improved efficiencies in lighting, HVAC, and other measures in existing facilities or new construction projects. The program also includes a provision for custom incentives for EEMs that are not listed in the program’s prescriptive incentives tables; custom incentives are considered on a case-by-case basis.

From 2009 through 2011, Nexant, Inc. and its subcontractors, Evergreen Consulting and Cascade Energy, provided trade ally coordination and application processing for the program.<sup>1</sup> This trade ally network, known as the *Energy Efficiency Alliance* (EEA), along with Pacific Power project managers working with a network of energy engineering consultants contracted directly by Pacific Power function as the primary channels for program delivery.

Further information regarding California’s FinAnswer Express program, its program theory, program delivery methods, and program participation is addressed in Section 2: FinAnswer Express Program Introduction.

### 1.2 Evaluation Objectives

The Impact and Process Evaluation of California’s FinAnswer Express program serve to validate reported savings for program years 2009 through 2011 and inform improvements anticipated for future program cycles. This evaluation addresses the following objectives:

- » Verifying *gross* and *net* site-level savings for completed projects;<sup>2</sup>
- » Reviewing and documenting program operations/structure;
- » Understanding motivations of participants and non-participants;
- » Providing data to support program cost-effectiveness assessments; and
- » Identifying market and customer barriers, areas for potential delivery improvements.

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<sup>1</sup>Cascade Energy began working directly as a third-party administrator in May 2011. Prior to that, Cascade Energy was a subcontractor to Nexant.

<sup>2</sup> Site-level savings as opposed to generation-level, which takes into consideration transmission and distribution line loss savings.

### 1.3 Impact Evaluation

Evaluation metrics and parameters reported through this study include:

- » Gross and Net *evaluated* program demand and energy savings estimates and realization rates for completed projects; and
- » Energy usage profiles for Commercial and Industrial (C&I) technologies metered through on-site Measurement and Verification (M&V) activities.

The evaluation team characterized savings as “reported” and “evaluated.” Reported savings present project savings estimated at the time of measure installation. Evaluated savings present energy savings verified in a facility at the time of this evaluation, with modifications for California sites that faced drastic operational changes due to the economic downturn or other factors. Section 3.1: Impact Evaluation Methodology details the savings calculation methodology.

#### 1.3.1 Key Program Findings

In aggregate, the California FinAnswer Express program achieved lower demand (kW) and energy (kWh) savings than is reported in the program tracking database.

The 2009 through 2011 *gross* program demand savings realization rate is 91 percent, and the *gross* program energy savings realization rate is 85 percent. Table 1 details the evaluated gross realization rates for California’s FinAnswer Express program from 2009 through 2011. Realization rate details can be found in Section 4.2: On-Site Verification Results.

**Table 1. Program-Level Gross Realization Rates for California FinAnswer Express (2009-2011)**

Program Year	Reported Demand Savings (kW)	Evaluated Demand Savings (kW)	Evaluated Demand Realization Rate	Reported Energy Savings (kWh)	Evaluated Energy Savings (kWh)	Evaluated Energy Realization Rate
2009	116.4	101.7	87%	997,735	985,862	99%
2010	110.7	118.6	107%	958,483	698,194	73%
2011	211.3	179.2	85%	904,926	746,997	83%
All	438.3	399.5	91%	2,861,144	2,431,053	85%

The Evaluation Team calculated a Net-to-Gross (NTG) ratio of 0.88 for the FinAnswer Express program, for program years 2009 through 2011. The methodology used in this calculation is provided in detail in Section 3.1.5: Net-to-Gross (NTG) Estimates. Table 2 details the evaluated net realization rates for California’s FinAnswer Express program from 2009 through 2011 with the calculated NTG ratio.

**Table 2. Program-Level Net Realization Rates for California FinAnswer Express (2009-2011)**

Program Year	Reported Demand Savings (kW)	Evaluated Demand Savings (kW)	Evaluated Demand Realization Rate	Reported Energy Savings (kWh)	Evaluated Energy Savings (kWh)	Evaluated Energy Realization Rate
2009	116.4	89.9	77%	997,735	871,694	87%
2010	110.7	104.8	95%	958,483	617,340	64%
2011	211.3	158.5	75%	904,926	660,491	73%
All	438.3	353.2	81%	2,861,144	2,149,525	75%

Table 3 shows the distribution of reported energy savings across all measure categories, and the savings accounted for in the stratified randomly-drawn sample. An 'N/A' indicates that the measure category was not part of the evaluation sample. These measure categories sampled accounted for over 95 percent of all reported savings. These measure-level realization rates are illustrative and do not represent statistically significant results; these measure level realization rates should not to be used for future planning purposes.

**Table 3. Measure-Level Realization Rates for California FinAnswer Express (2009-2011)**

Measure Category	2009-2011 Reported Energy Savings (kWh)	2009-2011 Realization Rate
Lighting	2,719,163	84%
HVAC	90,405	N/A
Irrigation	20,601	N/A
Refrigeration	17,885	N/A
Motors	13,091	101%

### 1.3.2 Cost-Effectiveness

Using the Company’s model for calculating the program’s benefit-cost ratios, the evaluation team calibrated and updated cost-effectiveness models using 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). Details regarding cost-effectiveness calculation methodology and the E3 model can be found in Section 3.1.6: Program Cost-Effectiveness.

California’s FinAnswer Express program did not pass the TRC and PTRC tests in 2009 due to one site that closed down two years after completing a large lighting retrofit. While savings were accounted for the years that the facility was open, the TRC and PTRC takes into account lifetime savings, which fell short of total costs, thus making the program not cost-effective. It did not pass the TRC in 2011 due to participation; savings did not exceed the costs of implementing the program. The program also did not pass the RIM test for the individual or combined years. It is rare for the RIM test result to have a cost-benefit ratio greater than 1.0 for DSM programs as RIM tests measure the effect of DSM program implementation on customer (average) rates, and DSM programs cause average customer rates to increase slightly.

Detailed cost-effectiveness tables for each program year and the combined 2009 through 2011 evaluation period are provided in Table 4 through Table 7. Cost-effectiveness results are also provided from the E3 Model.<sup>3</sup>

<sup>3</sup> Navigant utilized an energy efficiency calculator, E3 Calculator developed by Energy+Environmental Economics (E3) as a comparison for the benefit/cost test results performed using the Company’s custom approach. The E3 Calculator is used by all California investor-owned utilities to compute the cost-effectiveness of energy efficiency programs. The Company originally used the version *Pacific Gas and Electric (PG&E\_10-12 4g5)* for program design; consequently, Navigant felt this version was appropriate for an accurate comparison.

**Table 4. 2009 California FinAnswer Express Benefit-Cost Ratios**

Benefit/Cost Test Performed	Evaluated Gross Savings (kWh)	Evaluated Net Savings (kWh)	PacifiCorp Evaluated Costs	PacifiCorp Evaluated Benefits	PacifiCorp Model B/C Ratio	E3 Model B/C Ratio <sup>4</sup>
Total Resource Cost Test (PTRC)	985,862	871,502	\$528,295	\$498,960	0.94	N/A
Total Resource Cost Test (TRC)	985,862	871,502	\$528,295	\$453,600	0.86	0.74
Utility Cost Test (UCT)	985,862	871,502	\$167,136	\$453,600	2.71	2.35
Rate Impact Test (RIM)	985,862	871,502	\$708,031	\$453,600	0.64	0.62
Participant Cost Test (PCT)	985,862	871,502	\$480,759	\$675,705	1.41	N/A

**Table 5. 2010 California FinAnswer Express Benefit-Cost Ratios**

Benefit/Cost Test Performed	Evaluated Gross Savings (kWh)	Evaluated Net Savings (kWh)	PacifiCorp Evaluated Costs	PacifiCorp Evaluated Benefits	PacifiCorp Model B/C Ratio	E3 Model B/C Ratio <sup>5</sup>
Total Resource Cost Test (PTRC)	698,194	617,204	\$353,899	\$702,651	1.99	N/A
Total Resource Cost Test (TRC)	698,194	617,204	\$353,899	\$638,774	1.80	2.05
Utility Cost Test (UCT)	698,194	617,204	\$211,384	\$638,774	3.02	3.50
Rate Impact Test (RIM)	698,194	617,204	\$865,285	\$638,774	0.74	0.71
Participant Cost Test (PCT)	698,194	617,204	\$242,528	\$811,586	3.35	N/A

**Table 6. 2011 California FinAnswer Express Benefit-Cost Ratios**

Benefit/Cost Test Performed	Evaluated Gross Savings (kWh)	Evaluated Net Savings (kWh)	PacifiCorp Evaluated Costs	PacifiCorp Evaluated Benefits	PacifiCorp Model B/C Ratio	E3 Model B/C Ratio <sup>6</sup>
Total Resource Cost Test (PTRC)	746,997	660,345	\$688,534	\$729,585	1.06	N/A
Total Resource Cost Test (TRC)	746,997	660,345	\$688,534	\$663,259	0.96	1.04
Utility Cost Test (UCT)	746,997	660,345	\$365,179	\$663,259	1.82	2.00
Rate Impact Test (RIM)	746,997	660,345	\$1,203,788	\$663,259	0.55	0.58
Participant Cost Test (PCT)	746,997	660,345	\$489,474	\$1,057,992	2.16	N/A

<sup>4</sup> The E3 model does not calculate the PTRC or the PCT.

<sup>5</sup> The E3 model does not calculate the PTRC or the PCT.

<sup>6</sup> The E3 model does not calculate the PTRC or the PCT.

**Table 7. 2009-2011 Combined California FinAnswer Express Benefit-Cost Ratios**

Benefit/Cost Test Performed	Evaluated Gross Savings (kWh)	Evaluated Net Savings (kWh)	PacifiCorp Evaluated Costs	PacifiCorp Evaluated Benefits	PacifiCorp Model B/C Ratio	E3 Model B/C Ratio <sup>7</sup>
Total Resource Cost Test (PTRC)	2,431,053	2,149,051	\$1,570,728	\$1,931,196	1.23	N/A
Total Resource Cost Test (TRC)	2,431,053	2,149,051	\$1,570,728	\$1,755,633	1.12	1.17
Utility Cost Test (UCT)	2,431,053	2,149,051	\$743,698	\$1,755,633	2.36	2.50
Rate Impact Test (RIM)	2,431,053	2,149,051	\$2,777,103	\$1,755,633	0.63	0.64
Participant Cost Test (PCT)	2,431,053	2,149,051	\$1,212,761	\$2,545,283	2.10	N/A

## 1.4 Process Evaluation

The process evaluation sought to characterize the FinAnswer Express program from the perspective of program staff, participants, near-participants, and trade allies in order to identify both existing strengths and areas for refinement that may better serve the California C&I market in future years. It also included consideration of the perspective of non-participants to identify the level of program awareness and the barriers experienced.

From May through August 2012, the evaluation team surveyed or interviewed 29 participants, one near participant, and 170 non-participants from program-qualifying rate schedules. The evaluation team also conducted in-depth telephone interviews with 10 trade allies – active firms in the Energy Efficiency Alliance. These surveys and interviews provided data that were combined with information from program staff interviews and project file reviews to create a comprehensive view of the FinAnswer Express program from 2009 to 2011.

### 1.4.1 Overall Process Evaluation Findings

*The program is based on sound theory and design.* The FinAnswer Express program in California seeks to improve energy efficiency at commercial, irrigation, and industrial sites. The concept is that providing a quick, prescriptive incentive will help customers overcome cost barriers. The design is indicated in the program logic model in the program overview. The program concept and design are based on sound theory and practice in line with best practices for non-residential incentive program design. These practices include: establishing a trade ally network, making incentive tables available, updating incentives with changes in markets and codes, and having quality control measures in place.<sup>8</sup>

*The program was close to energy savings targets and goals for PY 2009 through PY 2011.* In 2009 and 2010, the program did not have overall savings goals, but had contract targets with the third party administrator. The third party administrator reached 98 percent of the savings target in 2009, and

<sup>7</sup> The E3 model does not calculate the PTRC or the PCT.

<sup>8</sup> Quantum Consulting. 2004. National Energy Efficiency Best Practices Study Vol. NR-1 Non-Residential Lighting Best Practices Report. Submitted to California Best Practices Project Advisory Committee.



exceeded savings targets in 2010. In 2011, the program introduced an overall energy savings goal of 958,484 kWh; reported savings of 904,926 kWh are 94 percent of this goal.

***Program administrators and managers have the resources and capacity to implement the program as planned.***<sup>9</sup> Program administrators and managers indicated that they had the resources and capacity to implement the program as planned. Program participants and the near participant did not identify communication delays that might indicate resource or capacity constraints. Participants who sought Pacific Power assistance indicated that the representatives were timely and knowledgeable. Similarly, trade allies indicated that they had a primary program contact to which they could reach out and receive prompt and knowledgeable assistance.

***The program is working as intended for participants.*** Both participants and trade allies describe the program operating as expected from the logic model. Participants mostly find out about the program from trade allies or directly from Pacific Power representatives. Participants are influenced by Pacific Power incentives, saving energy, and saving money on energy bills.

***Program awareness is low for non-participants.*** Only one non-participant was specifically aware of FinAnswer Express, and only 14 percent of non-participants were aware that Pacific Power offers incentives for high efficient equipment. The program is not expected to have high name recognition due to the intentional choice by Pacific Power to market the two commercial programs as a portfolio and then match customers with the program that best fits their needs. Less than half of non-participants in California (42 percent) were aware that Pacific Power offers any programs or services to help them improve energy efficiency. Low awareness that Pacific Power offers any assistance and specifically incentives for high efficient equipment may limit participation by eligible customers.

***Participants are mostly satisfied, keeping their equipment in operation, and achieving expected energy savings.*** When asked to rate their overall satisfaction with the program, 24 out of 29 (83 percent) respondents were at least somewhat satisfied. The majority of respondents indicated that the equipment was meeting energy savings expectations (23 out of 29) and also providing other non-energy benefits (21 out of 29). The most commonly cited non-energy benefit was improved lighting quality.

***Customers identify high costs and lack of access to capital as barriers to further action to reduce energy consumption and demand.*** Customers (non-participants and participants) who thought there were further actions that their firm could take to improve electric efficiency were asked what might prevent them from moving forward. The majority of responding customers identified high costs. The next most common barrier was lack of access to capital.

More telling is the portion of respondents who stated that there were *not* further actions that their firm could take to improve efficiency: half of participants and three-quarters of non-participants. These responses indicated that one barrier might be that the intended target population truly does not have additional energy efficiency actions or is not aware of possible additional actions. Given that they believe there are no other opportunities, it may be a challenge to gain their attention and educate them otherwise.

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<sup>9</sup> Program administrator in the case of this program refers to contractors who provide trade ally coordination and application processing.

*Trade ally activity does not reflect growth in active allies.* In total, four trade allies completed projects in 2011, compared to ten in 2010 and ten in 2009. One of the trade allies completed projects during all three years, three completed projects in two years, and fifteen completed projects during just one of the three years.

### 1.5 Program Evaluation Recommendations

The evaluation team suggests the following to continue to enhance the efficiency and effectiveness of the FinAnswer Express Program in future program cycles, as well as improve the experience for participants, trade allies, and program staff:

- » **Recommendation 1. Do follow-up reviews with program participants.** During site visits, the Evaluation Team noted some sites in which customers had removed or replaced rebated lighting due to dissatisfaction. At other sites, customers inquired regarding new technologies available for rebates and whether there were any changes to the current program. Pacific Power should follow up to discuss satisfaction with the program/technology installed and to update customers on program and technology changes.
- » **Recommendation 2. Utilize email as a marketing strategy, and make a concerted effort to obtain email addresses for all participants, and (more generally) for as many customers as possible.** Non-participants indicated that their three most preferred methods of learning about programs and opportunities from Pacific Power were: email, mail, and printed materials and brochures. However, only printed material and brochures were identified as a common way that non-participants became aware of these programs. Extending the campaign to customer email may provide an additional avenue to generate program participation leads and may also be the most cost-effective method of directly reaching out to the rural California territory.
- » **Recommendation 3. Develop deeper trade ally relationships.** Data indicate that only a few of the trade allies completed more than one project. Vendors are a critical program delivery mechanism for post-purchase incentive programs like FinAnswer Express. Pacific Power should nurture less active allies so they become more active players. When a larger group of trade allies take the time to market the program effectively, program savings will increase.
- » **Recommendation 4. Modify reported operating hours in project files to specify lighting hours, specific holidays, and effects of seasonality. This will help clarify the analysis process and result in better estimates of actual savings.** The following modifications would clarify the analysis process and create less variation in realization rates in future program cycles:
  - Operation schedules should reflect lighting schedules for specific parts of the building, by lighting group. The hours of operation should specifically reflect the hours that lights are on in a certain schedule group since business hours don't always reflect lighting hours.
  - Instead of asking whether the business is open for major holidays as a yes/no question, Pacific Power should consider asking customers the specific holidays in a year that lights are not operational. For example, a store could be closed for Thanksgiving but open on Christmas and New Year's Day.
  - When listing the hours of operation, Pacific Power should reflect changes in operating hours due to seasonality.

Expanded recommendations are available in Section 6: Program Evaluation Recommendations.

## 2. FinAnswer Express Program Introduction

This chapter describes in detail the FinAnswer Express program as delivered in California from 2009 through 2011. The different models for participation are described and then program theory and a logic model are discussed. Changes that have occurred over the last three years to the California program are also explained in this chapter.

### 2.1 Program Description

The FinAnswer Express program offers prescriptive incentives to commercial, industrial and irrigation customers for the implementation of Energy Efficiency Measures (EEMs) resulting in improved efficiencies in lighting, HVAC, and other measures in existing facilities or new construction projects. The program also includes a provision for custom incentives for EEMs that are not listed in the program's prescriptive incentives tables; custom incentives are considered on a case-by-case basis. Customers are eligible if served under Pacific Power's commercial, industrial or irrigation general service rate schedules: A-25, A-32, A-33, A-36, AT-47, AT-48, LS-53, LS-58, OL-42, PA-20. In 2009 and 2010, the program had contract savings targets with the third party administrator, and the program set an overall savings goal in 2011 of 958,484 kWh (at site).

From 2009 through 2011, Nexant, Inc. and its subcontractors, Evergreen Consulting and Cascade Energy, provided trade ally coordination and application processing for the program.<sup>10</sup> This trade ally network, known as the *Energy Efficiency Alliance* (EEA), along with Pacific Power project managers working with a network of energy engineering consultants contracted directly by Pacific Power, function as the primary channels for program delivery.

Within the FinAnswer Express program in California there are two distinct project paths: the post-purchase incentive path and the project manager path. The most common path is through the post-purchase incentive path (details are provided in the next sub-sections).

Qualifying equipment and services, incentive amounts, and other terms and conditions are listed on the Pacific Power California energy efficiency program website.<sup>11</sup> The specific eligibility criteria and requirements for each type of equipment incentivized under this program are provided through program brochures and online tables. For lighting and chillers, project pre-approval is recommended but not required. Incentives are paid upon completion of project and may be capped so that simple payback is not less than one year.<sup>12</sup>

#### 2.1.1 Trade Ally Coordination

From 2009 through 2011, Nexant, Inc. and its subcontractors, provided trade ally coordination and application processing for the program as the program Trade Ally Coordinators; in May 2011, Cascade

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<sup>10</sup>Cascade Energy began working directly as a third-party administrator in May 2011. Prior to that, Cascade Energy was a subcontractor to Nexant.

<sup>11</sup> Qualifying equipment and services, incentive amounts, and other terms and conditions may be changed by Pacific Power with at least 45 days' notice; changes are prominently displayed on the website and include a minimum 45 day grace period for processing prior offers.

<sup>12</sup> The incentive tables include notes where caps apply, by measure.

became a direct contractor to Pacific Power providing trade ally coordination services for irrigation, dairy/farm, and small compressed air projects.<sup>13</sup> The Trade Ally Coordinator recruits, trains, and maintains a network of trade ally vendors and contractors, who submit a participation agreement to request to become an approved vendor. Upon approval, trade allies can promote the program and are listed on the Pacific Power website as a participating trade ally. Some trade allies will work with the program for multiple measures, such as contractors that install both lighting and HVAC; other allies specialize in just one area. This trade ally network, known as the *Energy Efficiency Alliance* (EEA), along with Pacific Power project managers working with a network of energy engineering consultants contracted directly by Pacific Power, function as the primary channels for program delivery.

### 2.1.2 Program Participation

The specific eligibility criteria and requirements for each type of equipment incentivized under this program are provided through program brochures and tables. Incentives are paid upon completion of the project. For retrofit lighting and custom incentive measures, incentives are capped so that simple payback is not less than one year; if incentives for these measures would reduce simple payback to less than one year, incentives are adjusted to a simple payback of one year.

Pacific Power project managers work directly with customers who need additional engineering assistance; engineering consultants are contracted to support these projects and ensure that savings are properly estimated. Pacific Power seeks to match customer projects with the most appropriate program. Thus, these customers may have started projects within another program offered by Pacific Power, but in the process, it was determined that the customer's project was a better fit with the FinAnswer Express program. During the program period evaluated, 2009 to 2011, one of the completed projects followed the project manager path.

When customers do not work directly with a Pacific Power project manager, the customer makes an efficient purchase that meets the program requirements and applies for an incentive through Pacific Power after the purchase has been made. Customers can work with a trade ally or other vendor.

There are specific tools, such as a lighting calculator, developed and distributed by Pacific Power, to enable the trade allies to accurately estimate savings and potential incentives to aid in customer decision-making. If the estimated incentive exceeds a specified threshold, the project may be flagged for pre-inspection. The pre-inspection serves as a baseline to ensure quality savings estimates by verifying the number and operation of currently installed equipment. For example, a lighting project pre-inspection would entail a walkthrough at the customer site to document the location and current lighting ballasts and bulbs of all lights as well as operating hours. Both the customer and Pacific Power then sign an Incentive Agreement and the customer completes the project. The customer or trade ally then submits project documentation noting completion of the project to the Trade Ally Coordinator.

Post-inspections are completed for any project that exceeds the inspection threshold. This post-inspection verifies that incentivized equipment is installed and operating as proposed. All final project documentation is reviewed and processed before a check for the incentive amount is sent to the customer.

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<sup>13</sup> Evergreen Consulting is a subcontractor to Nexant for Trade Ally Coordination. Until April 30, 2011, Cascade was also a subcontractor to Nexant. Cascade Energy began working directly as a third-party administrator in May 2011. Prior to that, Cascade Energy was a subcontractor to Nexant.

## **2.2 Program Changes from 2009 to 2011**

FinAnswer Express was launched in May 2008 upon approval by the California Public Utilities Commission (CPUC).

The Company proposed changes to the FinAnswer Express (Schedule A-115) Commercial and Industrial program in October 2009. These changes became effective on January 1, 2010. The primary changes included:

- » Addition of new measure categories (Food service, Dairy and Farm Equipment, and Compressed Air);
- » Addition of new measures to existing categories (Lighting and Lighting Controls, Motors, HVAC, Building Envelope, Appliances, Irrigation and Network PC Power Management);
- » Incentives for NEMA (National Electrical Manufacturers Association) Premium Efficiency Motors ended December 19, 2010;
- » Green Motor Rewind incentives became available as of January 1, 2010; and
- » Modifications to certain measures (Lighting, Motors, HVAC, Refrigeration, Irrigation and Custom Measures).

The third party program administrator, Nexant, Inc., had two subcontractors, Cascade Energy and Evergreen Consulting. In 2011, Cascade Energy became a separate third party program administrator, in addition to Nexant, Inc., who retained Evergreen Consulting as a subcontractor. The three (Nexant, Inc., Cascade Energy, and Evergreen Consulting) serve as Trade Ally Coordinators and provide application processing for the program.

On November 4, 2011, Pacific Power submitted planned changes to the FinAnswer Express program. The program changes were designed to increase overall participation and energy savings acquired through the program, increase the comprehensiveness of the program and incorporate modifications to federal and state energy codes and standards. (An advance notification of the agreed upon program modifications was posted to Pacific Power's web site on December 5, 2011 and the changes became effective 45 days later on January 19, 2012. Program changes impact lighting, motors, HVAC, building envelope, food services, appliances, irrigation, dairy/farm equipment, compressed air, other energy efficiency measures and custom incentives.)

## **2.3 Program Participation**

From 2009 to 2011, there were 88 unique FinAnswer Express projects completed in California: 33 projects in 2009, 32 projects in 2010, and 23 projects in 2011. Through 2011, the program reported 2,861 MWh in energy savings; Table 8 summarizes the 94 measures installed through the 88 projects from 2009 through 2011.

**Table 8. FinAnswer Express Project Details (2009-2011)**

Measure Category	Number of Measures	2009-2011 Reported Energy Savings (kWh)
Lighting	61	2,719,163
Irrigation	11	20,601
HVAC	9	90,405
Motors	9	13,091
Refrigeration	4	17,885
All	94	2,861,144

## 2.4 Program Theory and Logic Model

Program logic models depict the primary program activities, the outputs that will result from each activity, and the expected short-, mid- and long-term outcomes of those activities. Program *activities* depict the primary actions that are required to implement the program. This includes marketing, participant recruitment, training, etc. The *outputs* depict the tangible “product” resulting from each primary activity. For example, marketing materials, training documents, and databases of recruited participants can all be outputs of primary program activities. Outputs are typically identified as “things” that can be tracked and tallied. *Outcomes* represent the intended results of successful deployment of the identified activities.

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.’<sup>14</sup> Program logic models provide a framework for an evaluation because they highlight 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 which linkages in the program logic model are working properly and which linkage(s) may be weak or broken. Thus, if the program falls short of achieving its intended short, mid, or long-term outcome(s), the source of the shortfall can be pinpointed and remedied. Logic models are often developed as a visual tool to document the program theory. The creation of such a model serves to develop a common understanding of program activities and intended outcomes among program staff, Pacific Power, and the evaluator. With this foundation, the evaluation team can then make informed choices related to the prioritization and focus of evaluation resources.

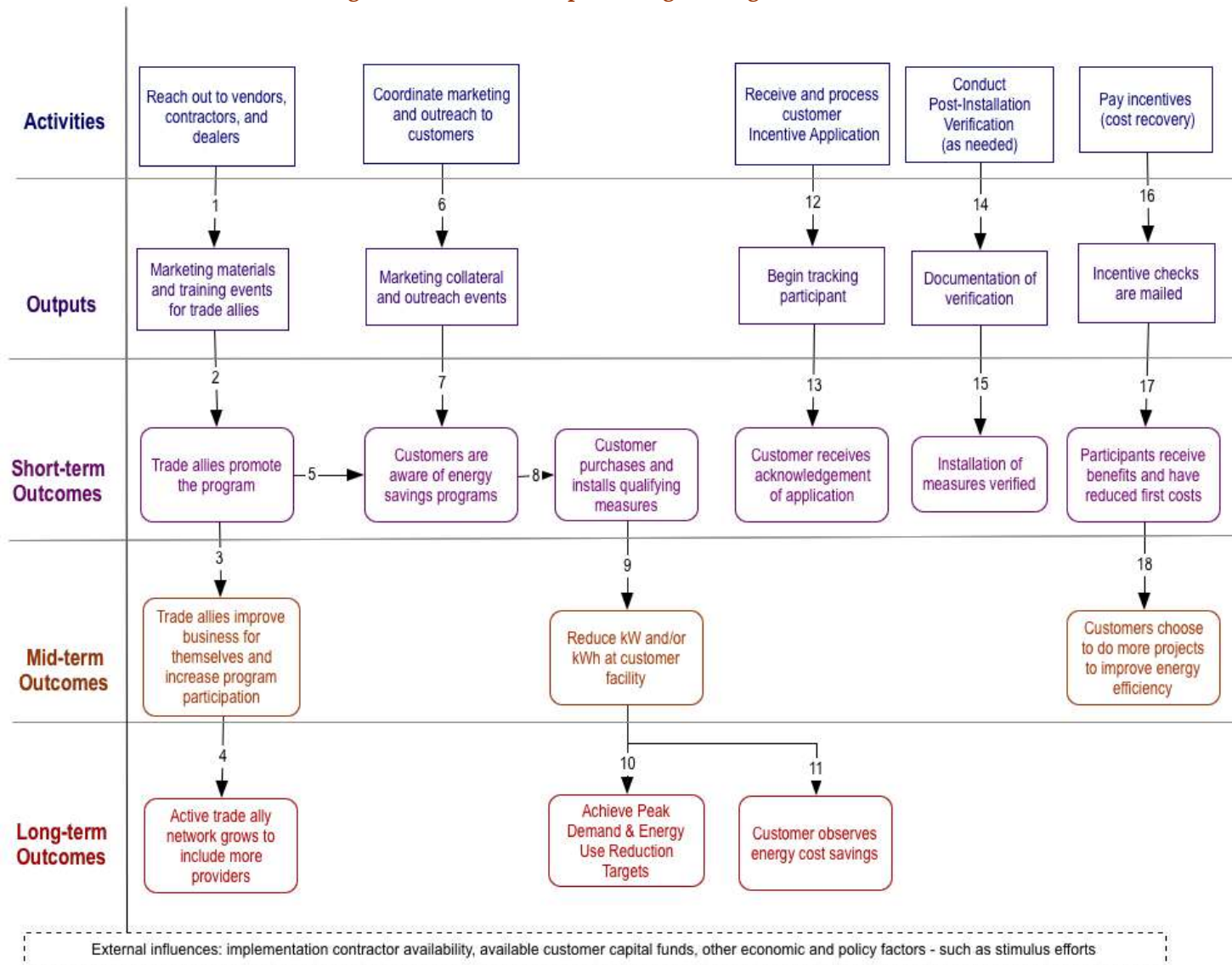
The underlying theory for the FinAnswer Express Program is articulated in the Logic Model provided in Figure 1. The evaluation team created the logic model based on a review of program documentation and discussions with program management and implementers.

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<sup>14</sup> Funnell, Sue and Patricia Rogers. 2011. Purposeful Program Theory: Effective Use of Theories of Change and Logic Models. John Wiley & Sons.



**Figure 1. FinAnswer Express Program Logic Model (2011)**



The FinAnswer Express program is designed to overcome commercial and industrial customer barriers to implementing energy efficiency projects of high upfront capital costs and long payback periods through incentives. Linkages within the program logic are described here with numbers related to those shown in the logic model figure.

1. Pacific Power and Trade Ally Coordinators (Nexant, Evergreen Consulting and Cascade Energy) reach out to trade allies to develop an Energy Efficiency Alliance (EEA) that includes allies for all eligible energy efficiency measures (EEMs). Some allies will work with the program for multiple measures, such as contractors that install both lighting and HVAC; other allies specialize in just one area, like shops that provide Green Motor Rewinds. Vendors are recruited, approved and trained on the FinAnswer Express program; they submit a participation agreement to request to become an approved EEA vendor. Upon approval, trade allies are listed on the Pacific Power website as a participating ally.
2. The EEA is armed with marketing materials, estimation software tools (lighting), and training and support on the program. In addition, Pacific Power holds annual vendor meetings and workshops to review the FinAnswer Express program and the support available for participating allies.<sup>15</sup> Newsletters provide allies with program information between meetings and workshops. In addition to formal meetings and marketing materials, the trade ally coordinators support the EEA. The trade ally coordinator support increases interest, understanding, and success with the program for each individual trade ally.
3. The EEA promotes the program to customers. This can take the form of scoping and proposing lighting upgrades for customers and/or providing information about incentive availability during the purchase decision process. The EEA marketing at the point of purchase is effective because it reaches customers who are ready to do a project.
4. The program, through increased awareness and participation, and the EEA through increased business benefit from the EEA promoting the program.
5. Trade ally success with the program encourages more EEA participation.
6. Pacific Power coordinates marketing efforts with the Trade Ally Coordinator, company marketing campaigns, and outreach through account managers. By design, individual programs are not marketed to customers. Instead, Pacific Power markets the portfolio of energy efficiency programs.
7. Customers become aware of the program or general energy efficiency assistance through marketing and trade allies. Some customers, especially large customers working with a Pacific Power customer account manager, may come into the program without working with a trade ally and instead receive information about the program from a Pacific Power project manager (and consultant).
8. Customers purchase and install (as required) qualifying EEMs.<sup>16</sup> EEMs reduce energy consumption and/or energy demand at the facility.

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<sup>15</sup> These events are held at least annually; vendors are not required to attend. The public is welcome at vendor events.

<sup>16</sup> The vast majority but not all EEMs must be installed to qualify for incentives (e.g. green motor rewinds may be installed or placed in inventory).



9. Reduced energy consumption (and, in some case, demand) contribute to meeting annual program reductions.
10. Customers experience reduced energy costs.
11. Customers submit completed Incentive Application (available on the web) and invoices, and other submittals as required by the program. Incentive Applications are processed.
12. The customer's project is added to program project tracking database, and the customer is notified that the application has been received.
13. If it is deemed necessary based on the project, the Trade Ally Coordinator verifies proper installation of measures.
14. Verification confirms whether expected savings occur.
15. The Company processes incentives after the final incentive calculation, and incentive checks are mailed.
16. The customer receives the incentive. Incentives reduce customer costs for the project.
17. Successful project completion encourages additional energy efficiency action on the part of the customer.

As part of the program evaluation, the evaluation team compares program outcomes in place with the outcomes expected in the logic model. In order to make this comparison, indicators for each expected outcome as well as sources of indicator data must be identified. In some cases, these indicators are directly observable from program tracking data or other archives; in other cases, indicators can be observed through analysis of survey or interview responses.

Table 9 identifies key indicators and data sources for FinAnswer Express program outcomes (short, medium, and long-term) shown in the logic model, above.

**Table 9. Indicators and Data Sources for Program Outcomes**

Outcome	Indicator	Data Source
<b>Short-term Outcomes</b>		
Trade allies promote the program	Trade ally behavior Customer awareness	Trade ally interviews Customer surveys
Customers are aware of the program	Non-participant awareness	Customer surveys
Customer purchases and installs qualifying measures	Invoices; lighting worksheets; verification; customer reports installation	Program tracking data; project files; customer surveys
Customer receives acknowledgement of application	Letter in project file; customer reports receipt of acknowledgement	Project files; customer surveys
Installation of measures verified	Verification in project file	Project files; customer surveys
Customers receive benefits and have reduced first costs	Customer's receipt of benefits and reduced first costs	Cost-recovery in program tracking data; Customer surveys
<b>Mid-term Outcomes</b>		
Trade allies improve business for themselves and increase participation	Trade ally business impact Customer participation	Trade ally interviews; program tracking data
Improve efficiency at customer facility	Customers realize expected savings	Customer surveys
Customers choose to do more projects to increase energy efficiency	Repeat participation; spillover	Customer surveys; program tracking data
<b>Long-term Outcomes</b>		
Trade ally network grows to include more active providers	EEA activity	Program tracking data
Achieve peak demand and energy use reduction targets	Reported program savings meet savings targets	Program savings targets; third-party administrator contracts; Program tracking data
Customers observe energy cost savings	Customers realize expected savings	Customer surveys

### 3. Evaluation Methodology

The following subsections provide a detailed description of the evaluation methodologies used in the impact evaluation of California’s FinAnswer Express program.

#### 3.1 Impact Evaluation Methodology

This section summarizes the impact evaluation methods used to develop project and program level realization rates for the FinAnswer Express Program for program years 2009 through 2011. The impact evaluation of California’s FinAnswer Express Program aimed to achieve the following objectives:

- » Quantifying the *gross* and *net* impacts of the program through annual gross energy and demand savings.
- » Establishing post-implementation performance profiles 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 study include:

- » Gross and net *evaluated* program demand and energy savings estimates and realizations rates for completed projects
- » Energy usage profiles for C&I technologies metered through on-site Measurement and Verification (M&V) activities

The impact evaluation methodology included the following steps:

- » Evaluation Approach
- » Project File Review
- » Sampling Framework Development
- » Gross Energy & Demand Realization Rate Calculation
- » Net-to-Gross Estimates
- » Program Cost-Effectiveness Calculation

##### 3.1.1 Evaluation Approach

FinAnswer Express project evaluations were conducted using the International Performance Measurement and Verification Protocols (IPMVP) Options A or B.<sup>17</sup> The projects in the sample consisted of lighting and motor measures.

Use of option A was limited to situations where the installed equipment operates at a fairly constant power level, such as NEMA Premium™ efficiency motors. Specifically, for premium efficiency motor measures, the evaluation team verified equipment purchase through the project file review process. Subsequent interviews with facility staff on-site confirmed that the motors were in place and operating.

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<sup>17</sup> 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](http://www.evo-world.org/index.php?option=com_content&view=article&id=272&Itemid=397&lang=en).

Though the team could not always verify the exact location and loading factors for each motor, the project file input assumptions were *conservative* relative to secondary literature on prescriptive motor performance.<sup>18</sup> Overall, any differences between the reported and evaluated savings estimates were attributed to rounding differences.

The evaluation team used option B to estimate savings for lighting projects. The evaluation team verified fixture counts and used logged data over a period of one to two weeks to verify operating hours.

No other measure categories were included in the sample. Details on the selection of the sample are presented in Section 3.1.3.

### 3.1.2 Project File Reviews

A thorough review of the FinAnswer Express project files allowed the evaluation team to understand and verify the accuracy of Pacific Power’s energy savings calculation methodology and develop on-site M&V (Measurement and Verification) plans for projects included in the on-site M&V sample.

For each project file reviewed, the evaluation team characterized any data gaps, inconsistencies, and inaccuracies in estimating project level savings. The evaluation team also assessed the variability/uncertainty between Pacific Power’s input assumptions and those of secondary studies, along with the relative impact on energy and demand savings. This type of sensitivity analysis was crucial in prioritizing and aligning task resources. The results of this effort were used to develop recommendations for input assumption revisions based on prior evaluation studies, upcoming policy requirements, and geographic factors. Examples of *secondary resources* that were leveraged through this task include:

- » Regional Technical Forum (RTF)<sup>19</sup>
- » Commercial and Institutional Building Energy Use Survey (CIBEUS)<sup>20</sup>
- » Database for Energy Efficient Resources (DEER)<sup>21</sup>
- » Buildings Energy Data Book (BEDB)<sup>22</sup>
- » Commercial Buildings Energy Consumption Survey (CBECS)<sup>23</sup>

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

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<sup>18</sup> Motor loading factor was assumed to be 0.68. Source: “Quality Motor Rewinding an Energy Efficiency Measure.” – Green Motors Practices Group.

<sup>19</sup> Regional Technical Forum, RTF Unit Energy Savings (UES) Measures and Supporting Documentation. <http://www.nwcouncil.org/energy/rtf/measures/Default.asp>.

<sup>20</sup> Demand Policy and Analysis Division of the Office of Energy Efficiency, Commercial and Institutional Building Energy Use Detailed Statistical Report, December 2002.

<sup>21</sup> California Public Utilities Commission, Database for Energy Efficient Resources, 2008.

<sup>22</sup> U.S. Department of Energy, 2008 Buildings Energy Data Book, 2008.

<sup>23</sup> Energy Information Administration, Commercial Buildings Energy Consumption Survey, 2003.

**Figure 2. Parameters Verified through Project File Reviews (Example)**

Project Name	
Customer Name	
Project Number	61572
Energy Savings Claimed (kWh)	325,100.00
Verified Energy Savings (kWh)	350,453.96
Energy Savings Realization Rate	108%
Demand Savings Claimed (kW)	64.40
Verified Demand Savings (kW)	69.25
Demand Saving Realization Rate	108%
Total Project Cost	\$ 183,046.00
Verified Total Project Cost	\$ 162,794.58
Reported Incentive	\$ 29,751.00
Verified Incentive	\$ 26,865.00
Notes	Loggers showed that some areas were 8760 operating hours rather than the claimed hours, causing the higher energy realization rate. Higher Demand Realization Rate is caused by a our estimated demand diversity factor being .85 rather than the claimed .78

Continuing to understand and document the available data and considerations within each unique project file allowed the evaluation team to make informed recommendations for future evaluation cycles and custom calculation revisions.

### 3.1.3 Sampling Frame Development

For the evaluation of the California FinAnswer Express program, the evaluation team developed a sampling framework that provides 90/10 confidence/precision level at the program level<sup>24</sup>. The 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.

As an example, consider the FinAnswer Express program project savings that may range anywhere from 500 kWh to 530,000 kWh based on the size of each participating facility and measures installed. Both the average size and the average savings for this group of customers have very large coefficients of variation, thereby increasing the sample size required to achieve a specific confidence/precision threshold if the evaluation aims to estimate the *magnitude* of program savings. However, evaluation experience has demonstrated that a majority of customers have a ratio of actual savings to program reported savings

<sup>24</sup> Navigant planned for 90/10 by program and state; the final confidence/precision for CA FX is 90/13.2. Industry standard is a minimum of 80/20.

between 70 to 100 percent regardless of the *magnitude* of each individual project’s energy savings. This ratio is the *realization rate* for gross verified savings and a core objective of this impact evaluation. As such, the standard deviation of the realization rate is generally much smaller than that of the magnitude of individual project savings. It follows that the sample sizes required to achieve a specific confidence/precision threshold may be greatly improved by estimating the realization rate instead of total energy savings.

The 2004 California Evaluation Framework provides industry accepted guidance on developing sample size.<sup>25</sup> Per this framework, sample sizes developed using the Stratified Ratio Estimation approach comply with the following equation:

$$n = \frac{\left(\frac{Z * \epsilon}{rp}\right)^2}{1 + \left(\frac{Z * \epsilon}{rp}\right)^2 / N}$$

Where:

- n = Sample Size
- Z = Z-Score for Desired Confidence Level
- ε = Assumed Error Ratio (0.4 Based on Prior Evaluation Studies)
- rp = Desired Relative Precision
- N = Population Size

Moreover, the evaluation team proportionately stratified the sample by program reported savings. Under this approach, the sample population was divided into subgroups by reported savings (i.e., strata). The evaluation team selected projects proportionately within each stratum to ensure:

1. The largest projects and contributors to program performance are evaluated, and
2. The medium and smaller projects receive fair representation in the evaluation. (Collectively, these projects also reflect a large percentage of program level savings.)

For California FinAnswer Express Program, the evaluation team assumed a conservative error ratio of 0.4 for developing the sample framework. The error ratio corresponds to the expected standard deviation of the realization rate for the program and was selected based on Navigant’s experience with similar commercial and industrial energy efficiency program evaluation results.

Additionally, the evaluation team took care to sample complete FinAnswer Express projects rather than individual measures. As an example, if the unique project number CAL00045, was selected as part of the evaluation sample, all measures installed through that project were evaluated.

The final impact evaluation sample achieved 90/13.2 confidence and precision across the 2009 through 2011 program years by energy savings (kWh). Table 10 provides an overview of the impact evaluation framework representing 75 percent (20) of the reported FinAnswer Express Program savings for the 2009 through 2011 program years. The 20 projects sampled included 18 lighting projects and two motors projects.

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<sup>25</sup> TecMarket Works, The California Evaluation Framework, June 2004.

**Table 10. Overview of the California FinAnswer Express Impact Evaluation Sampling Frame**

Projects in the 2009-2011 Program Year	Program Population Savings (kWh)	Projects in Evaluation Sample	Sample Savings (kWh)	% of Population Savings Verified
88	2,861,144	20	2,146,275	75%

### 3.1.4 Gross Energy and Demand Realization Rate Calculation

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

- » Determining the appropriateness of the pre-installation technology performance baseline via project file and secondary literature review.
- » Verifying installation and quantity of reported energy efficiency measures.
- » Verifying the baseline and measure performance characteristics of the measures installed, and revising or computing performance variables as needed (e.g. operating hours were updated for sites that the evaluation team installed lighting data loggers in).
- » Estimating the load shapes for the energy efficiency measures installed through the programs to calculate maximum demand savings realized by the customer. For lighting projects, this included calculating a diversity factor per site. This diversity factor was calculated by determining a typical load shape, which was used to determine the diversity factor and the maximum demand savings realized by a customer.
- » Determining the demand savings (kW) and energy savings (kWh) impacts of the energy efficiency measures installed for projects sampled. This was accomplished by first 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.<sup>26</sup>

The program level realization rate was then calculated as the ratio between the product of case weights and *verified* savings estimates and the product of case weights and *reported* savings estimates. This is illustrated in the equation below:

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

<sup>26</sup> The TecMarket Works Team, The California Evaluation Framework, Prepared for the California Public Utilities Commission and the Project Advisory Group, June 2004.

In California, the evaluation sample contained two facilities that shut down during 2009 through 2011 due to the economic downturn. For facilities that were found to be closed at the time of the evaluation, Navigant calculated “first year” energy and demand savings. “First year” savings calculate the annual savings that the project achieved upon measure installation before the facility shut down, so as to avoid evaluating the facility with zero verified savings. This “first year” energy and demand savings were used to calculate project and program level realization rates. A detailed explanation of the “first year” energy and demand savings calculation can be found in the appendices.

### 3.1.5 Net-to-Gross (NTG) Estimates

Using self-reported responses, the evaluation team’s estimation of net savings first attempted to assess the program’s influence on the participants’ decision to implement an energy efficiency project and 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 and is often referred to as “free-ridership.”

The team’s measurement of net savings then estimated program influence on the broader market as a result of the indirect effects of the program’s activities. This estimate, often referred to as “spillover,” represents the amount of savings that occurred because of the program’s intervention and influence but that is not currently reported by the program. Spillover savings can be broken into two categories of savings: “participant” spillover and “non-participant” spillover. Participant spillover savings occur directly (i.e., program participants install additional energy efficient equipment), while non-participant spillover savings occur indirectly (i.e., market allies install additional energy efficient equipment to customers that choose not to participate as a result of the program).

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, or:

$$\text{Net Program Savings} = \text{Gross Program Savings} - \text{Free-Ridership Savings} + \text{Spillover Savings}$$

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:

$$\text{Net-to-Gross (NTG) Ratio} = \text{Net Program Savings} / \text{Gross Program Savings}$$

The California FinAnswer Express NTG ratio was calculated using a different sample of 29 self-reported responses than the sample of 20 used to calculate energy and demand realization rates or cost-effectiveness. These 29 projects represent close to 30 percent of total reported savings for 2009 through 2011. A more detailed explanation of net savings calculations can be found in the appendices. The findings of the NTG analysis are presented in Section 4.3: Program-Level Net Savings Results.



### 3.1.6 Program Cost-Effectiveness

The cost-effectiveness of utility funded programs in California is analyzed using cost-effectiveness tests prescribed by the California Standard Practice Manual.<sup>27</sup> For the purposes of this evaluation, Pacific Power specifically required the following cost-effectiveness tests:

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

With the exception of the PTRC, all other tests are explained in the California Standard Practices Manual. The evaluation team worked with Pacific Power to understand the PTRC and construct a tool that calculates the PTRC at measure, program and portfolio level.<sup>28</sup> Table 11 presents details of the cost-effectiveness tests accepted by Pacific Power.

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<sup>27</sup> The California Standard Practice Manual identifies the cost and benefit components and cost-effectiveness calculation procedures. Definitions and methodologies can be found at [http://www.energy.ca.gov/greenbuilding/documents/background/07-J\\_CPUC\\_STANDARD\\_PRACTICE\\_MANUAL.PDF](http://www.energy.ca.gov/greenbuilding/documents/background/07-J_CPUC_STANDARD_PRACTICE_MANUAL.PDF).

<sup>28</sup> Navigant utilized an energy efficiency calculator, E3 Calculator developed by Energy+Environmental Economics (E3) as a comparison for the benefit/cost test results performed using the Company's custom approach. The E3 Calculator is used by all California investor-owned utilities to compute the cost-effectiveness of energy efficiency programs. The Company originally used the version *Pacific Gas and Electric (PG&E\_10-12 4g5)* for program design; consequently, Navigant felt this version was appropriate for an accurate comparison.

**Table 11. Details of Cost-Effectiveness Tests<sup>29</sup>**

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?	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.

Cost-effectiveness inputs include program cost inputs, program savings by measure, measure effective useful life, and utility-level inputs such as avoided costs and retail rates. The evaluation team worked through a range of cost input assumptions pertaining to discount and escalation rates, avoided cost data formats, and participant costs and benefits. Table 12 provides an overview of cost-effectiveness input values used by the evaluation team in the cost-effectiveness analysis.

**Table 12. Cost-Effectiveness Evaluation Input Values**

Input Description	2009	2010	2011	2009-2011
Discount Rate	7.4%	7.4%	7.2%	7.3%
Inflation Rate	1.9%	1.9%	1.8%	1.9%
Commercial Line Loss	10.9%	8.9%	8.9%	9.5%
Industrial Line Loss	9.9%	8.1%	8.1%	8.7%
Commercial Retail Rate	\$0.1046	\$0.1016	\$0.1185	\$0.1082
Industrial Retail Rate	\$0.0947	\$0.0956	\$0.1139	\$0.1014
Gross Customer Costs	\$480,759	\$242,528	\$489,474	\$1,212,761
Program Costs	\$167,136	\$211,384	\$365,179	\$743,698
Utility Administrative	\$53,669	\$38,504	\$64,104	\$156,278
Program Delivery	\$49,634	\$101,000	\$191,735	\$342,369
Incentives Costs	\$63,832	\$71,879	\$109,340	\$245,051

To calculate avoided costs, the team used the 2008 IRP West System load shape decrement at \$45 Carbon Stream for program years 2009 and 2010. For program year 2011, the evaluation team used the 2011 IRP West System load shape decrement at Medium Carbon Stream to calculate avoided costs.

<sup>29</sup> "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>.

Each measure’s effective useful life (EUL) was derived from DEER (Database of Energy Efficiency Resources), which is the source for deemed measure characteristics in California (as per the California Public Utilities Commission).<sup>30</sup> For the facilities that were shut down at the time of the evaluation, lifetime savings took into account only the time between measure installation and facility closure.

### 3.2 Notes on Validity and Reliability of Impact M&V Findings

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

- » Sample selection bias;
- » Physical measurement bias (e.g., meter bias, sensor placement, non-random selection of equipment or circuits to monitor); and
- » Engineering analysis error (e.g., baseline construction, engineering model bias, 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. Key uncertainty sources and mitigation strategies are discussed further below.

#### 3.2.1 Reducing Uncertainty from Sample Selection Bias

The problem that selection bias creates for program evaluation is recognized in the evaluation industry. Although projects were chosen in the impact evaluation sample according to prescribed protocols, bias may have been introduced 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 inform 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.

In the event that a non-respondent was encountered,<sup>31</sup> the evaluation team first identified the nature of the project (i.e., measure type). Non-response for non-certainty projects was addressed by oversampling projects within each of the original stratum. These “alternative” projects were substituted into the impact sample in the event that a project did not respond to evaluation requests. Non-response for certainty projects were generally addressed by choosing similar projects (i.e., measure technologies) with

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<sup>30</sup> More information on DEER can be found at <http://www.deeresources.com/>.

<sup>31</sup> The impact evaluation only encountered two non-respondents in this study which is lower than what is generally observed for C&I program evaluations.

equivalent, or larger savings. Collectively, this effort ensured that precision levels were met within the overall impact evaluation sample.

### 3.2.2 Reducing Uncertainty from Physical Measurement Error

There is inevitably some error associated with all physical measurement. For the impact evaluation of the FinAnswer Express program, a large measurement effort involved installing lighting/current/power loggers to determine the operating characteristics of rebated technologies across a broad range of applications. Several steps were taken to minimize the uncertainty resulting from bias/error that may have been introduced in this process:

- » **Back-up Loggers:** Prior evaluation experience indicates that lighting loggers sometimes fail in the field due to flickering or battery issues.<sup>32</sup> To account for the possibility that some of these loggers might fail in this evaluation, the evaluation team deployed backup loggers for each site.<sup>33</sup> This ensured that the sample size requirements would be met even if a percentage of the loggers failed.
- » **Logger Calibration:** To minimize measurement error from improper calibration of the lighting/current/power loggers, the evaluation team checked all loggers used in the field to ensure that they were properly calibrated prior to being deployed. Field staff was also trained to use consistent measurement intervals whenever possible, and to synchronize the logger deployment activities (e.g., time delay). This ensured that the data could be compared across a uniform time period.
- » **Logger Placement:** To minimize biases arising because of improper placement of the loggers, field staff was given a prescribed protocol for the placement and installation of loggers on circuits (e.g., CT placement) and fixtures (e.g., uniform distance from the lamps).
- » **Logging Period:** Usage patterns for retrofit measures may vary from month-to-month. Sampling for a short duration could therefore introduce a degree of error into the overall results. To reduce this type of error, loggers were typically deployed for a minimum of two weeks and supplemented with available facility records (e.g., EMS trends, production logs, etc.). The logged data was used to calibrate the facility records which spanned multiple months or years. These extended logging intervals minimized the bias introduced from extrapolating short term metering results to longer periods of time.
- » **Logged Data Quality:** Poor quality data can also be a significant source of error and uncertainty. To minimize the potential impact of this problem, various quality assurance checks were applied to the logger results. This included consistent spot measurements that could be compared against logger data. Additionally, qualified analysts reviewed all logger files to ensure that the results were representative of the technology being investigated:
  - Lighting loggers were reviewed to identify inconsistencies in operating characteristics and/or extended periods of inactivity. If a particular file was deemed

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<sup>32</sup> Evaluation experience has found that ‘typical’ failure rates generally range between 5 percent – 10 percent. For this evaluation, there was a logger failure rate of approximately 9 percent (nine out of 104 loggers placed).

<sup>33</sup> Although nine lighting loggers failed in the field, the backup loggers ensured no data was lost in the impact evaluation of the FinAnswer Express Program.

suspicious, the evaluation team followed up with field staff and facility managers to ensure that the findings were reasonable. Inaccurate results were removed from the analysis.

### 3.2.3 Reducing Uncertainty from Engineering Analysis Error

There are several opportunities for biases in engineering analyses that may compound the error and uncertainty of *evaluated* savings estimates. The evaluation team adopted the following protocols to minimize uncertainty from engineering analysis error in this study:

- » All project analysis findings were peer reviewed to ensure that consistent methods and assumptions were used throughout the impact evaluation.
- » The evaluation team developed data collection protocols that yielded appropriate inputs into the analysis models and reviewed all field observations with the evaluation team. Collectively, this served to reduce potential modeling error in this study.

## 3.3 Process Methodology

This section describes the methodology used to complete the process evaluation. First, the section describes a high-level overview of the steps taken to collect and analyze the data for this evaluation. This is followed by a list of the research questions that guided the evaluation. Next, a detailed description of the data collection activities is provided, and this section concludes by describing the methods used to analyze the process data.

### 3.3.1 Overview of Steps in the Process Evaluation

To meet the objectives of this evaluation, the evaluation team undertook the following activities:

- » **Process Evaluation Research Question Development.** Key evaluation questions were established from the development of the 2009 - 2011 evaluation plan with Pacific Power staff.
- » **Program Documentation Review.** The evaluation team reviewed program documentation, including regulatory filings, brochures, application forms, and website.
- » **Logic Model Development.** The evaluation team worked with program staff to define a logic model for the program that described the intended program design, activities, outputs, and outcomes.
- » **Process Data Collection Activities.** Primary data collection was performed through interviews with program staff, trade allies working with the program, and near-participants who did not finish projects with the program as well as telephone surveys with participating customers and with non-participating customers.
- » **Process Data Analysis and Synthesis.** The effectiveness of the program processes was assessed by analyzing program tracking data, in-depth interview data, non-participant survey data, and participant survey data.

### 3.3.2 Process Evaluation Research Questions

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

1. What are the program goals, concept, and design? Are they based on sound theory and practice, and, if not, where are the gaps?
2. Do program administrators and managers have the resources and capacity to implement the program as planned, and if not, what is needed?
3. Is the program being delivered as planned, and if not, how and why?
4. Is the program reaching the intended target population, and if not, why? Specifically, are eligible customers aware of the program, how are they becoming aware, and what is the program influence on their actions?
5. What barriers are preventing customers from taking actions to reduce energy consumption and demand, and which jeopardize program cost-effectiveness?
6. Are participants achieving desired outcomes, and if not, how and why? (Program outcomes and key indicators are identified in Table 9.)

These questions were explored through a mixed-methods approach. Table 13 shows the overarching research questions and associated data collection activities used to answer them. Data collection activities were analyzed to identify findings, which were then used to answer the overarching research questions.

**Table 13. Approaches to Answer Research Questions (RQ)**

Activity	RQ 1	RQ 2	RQ 3	RQ 4	RQ 5	RQ6
Program Documentation Review	X	X	X			
Program Staff Interviews	X	X	X			
Participant Surveys			X	X	X	X
Near Participant Interviews			X	X	X	X
Non-Participant Surveys				X	X	
Trade Ally Interviews			X	X		

### 3.3.3 Program Documentation Review

The evaluation team reviewed program regulatory filings, marketing materials, program website, program manuals, application materials, annual reports, previous evaluations, and project tracking data. This archival data review identified how the program is marketed, how trade allies are supported, and how the process works for enrollment, administration, and tracking.

### 3.3.4 Logic Model Development

Based on the program documentation review and interviews with program managers and administrators, the evaluation team developed a draft logic model, representing the program theory. The program theory explains how it is designed to overcome the barriers that the program is targeting. Logic models illustrate the flow of activities that create needed behavioral outputs, which in turn achieve desired outcomes over the course of the program. Activities are actions taken by the program managers and administrators or implementation contractors, as part of the program, such as: reviewing applications, developing and presenting reports to customers, or verifying installations. Outputs are measurable or verifiable tasks that result directly from the program activities. Outcomes can be in the short, medium, or long-term, and they are the result of the activities and outputs. The logic model was reviewed with program staff and revised with program staff input. The logic model is included in this report in Section 2.4: Program Theory and Logic Model.

### **3.3.5 Process Data Collection Activities**

The process data collection activities are described in this section. Program staff interviews were used to support development of the program overview and logic model. Findings from the other four data collection activities are presented in the findings section and then synthesized to draw overall conclusions and recommendations for the program.

#### **3.3.5.1 Program Staff Interviews**

The evaluation team interviewed two program managers and administrators. The objectives of interviews with key program administration staff were to:

- » Understand the design and goals of the program;
- » Understand any program changes that have been implemented in California going into the 2009 through 2011 cycle, and changes occurring during this cycle;
- » Identify program strengths from program staff perspective;
- » Identify program weaknesses and opportunities for improvement from the program staff perspective; and
- » Identify other actionable ideas the program staff hoped to gain from the evaluation.

#### **3.3.5.2 Participant Surveys**

Participants are commercial and industrial class customers who completed a FinAnswer Express project between 2009 and 2011. Surveys with participants specifically addressed the following questions in support of addressing the process evaluation research questions:

- » How do customers come to participate in the program?
- » How satisfied are customers overall with the program, including application materials, inspections, and the incentive?
- » What is the extent of program influence on customer actions, including free-ridership and spillover?
- » What barriers are customers facing that prevent increasing energy efficiency?
- » What kinds of commercial and industrial customers are participating?

The evaluation team defined the unit of analysis for FinAnswer Express as a project. For each project, the evaluation team examined all measures included and focused the participant survey on the two measures that were associated with the greatest savings in the tracking data. There were 88 completed projects with the California FinAnswer Express program during program years 2009 through 2011. From May through August of 2012, the evaluation team attempted to reach 39 participants and was able to complete surveys with 29 participants. At 90 percent confidence, this represents a minimum precision of +/- 12.6 percent.

#### **3.3.5.3 Near-Participant Surveys**

Near-participants were defined as commercial and industrial class customers who began working on a project with the FinAnswer Express program between 2009 and 2011 but had not completed the project. Interviews with near-participants specifically addressed the following questions in support of addressing the process evaluation research questions:



- » How do customers come to begin working with the program?
- » What would they change in order to participate?
- » What energy efficient projects are near-participants installing (outside the program)?
- » What barriers are customers facing that prevent increasing energy efficiency?

The evaluation team defined the unit of analysis for FinAnswer Express near-participants as a project at a site. The evaluation team selected near-participants from all projects for which the status was listed as “on hold” with a last update date before June of 2011; sites with multiple projects that met the criteria for inclusion were only asked about one project that they did not complete. This focus on earlier projects ensured that the evaluation team did not reach out to participants whose projects were still on track for completion in 2012. In May of 2012, the evaluation team completed an interview with one out of the two near-participants in California.

#### **3.3.5.4 Non-Participant Surveys**

Non-participants are commercial and industrial (C&I) customers in qualifying rate classes who did not participate in any Pacific Power C&I demand side management program during the 2009 through 2011 program years. Non-participant surveys targeted C&I portfolio level considerations through the following questions:

- » Are non-participating customers aware of the programs?
- » Why are they not participating (if they are aware of the programs)?
- » What energy efficient projects are non-participants installing (outside the programs)?
- » What barriers are customers facing that prevent increasing energy efficiency?

The population of C&I customers was grouped into three strata by customer sector (Commercial, Industrial, and Irrigation) and a target number of completes was set for each of the three sectors to allow for results that are statistically valid at the 90 percent confidence level with +/-10 percent precision. As presented in Table 14 while these targets were met for the commercial and irrigation sectors, due to the small population size of industrial customers, this target was not met for the industrial sector. This table also shows the design weights, which are the relative population to sample size for each class; design weights ensure that averages across the sample are representative of the population.<sup>34</sup>

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<sup>34</sup> The non-participants included in the sample frame were drawn from a database of non-participating customers provided by the Company as a subset of the population of non-participants; design weights are based on the total number of customers per class (provided by the Company) minus the number of participants per class.



**Table 14. Non-Participant Population and Contacts**

Customer Class	Population Size (N)	Completes (n)	Precision at 90% Confidence	Design Weight
Commercial	7,530	74	10%	1.825
Industrial	115	23	16%	0.090
Irrigation	1,833	73	10%	0.450
All CA Non-Participants	9,478	170	6%	--

**3.3.5.5 Trade Ally Interviews**

Trade allies were defined as vendors, contractors, or distributors that have signed a participation agreement with the Company to become part of the Energy Efficiency Alliance (EEA). Active trade allies were defined as members of the EEA that completed at least one FinAnswer Express project between 2009 and 2011. Interviews with active trade allies specifically addressed the following questions in support of addressing process evaluation research questions:

- » How are trade allies becoming aware of the program?
- » How well does the trade ally participation agreement meet their needs?
- » How are program operations communicated to trade allies? How is training provided? Is this communication and training effective (do they understand the program)?
- » How satisfied are trade allies with their role in the program? What would they do to improve it?
- » Do trade allies who participate see value to their business? Can they describe the effect on their operations?
- » What kind of energy efficient sales are they seeing outside of the program (spillover)?

The evaluation team identified active trade allies using information from the program tracking database, program staff interviews, and participant surveys. Senior evaluation team staff who were knowledgeable about the program and appropriate technologies interviewed ten active trade allies between June and July of 2012.<sup>35</sup> A breakdown of the trade allies that were interviewed is shown below:

- » Five lighting vendors and/or distributors
- » One dairy/agricultural vendor
- » Three HVAC contractors
- » One motor vendor

**3.3.6 Process Data Analysis and Synthesis**

The process data collection activities included both quantitative and qualitative data. The evaluation team used statistical software, specifically SPSS™ (originally, Statistical Package for the Social Sciences), to analyze the survey responses from participants and non-participants. Interview responses from near-

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<sup>35</sup> A \$50 gas card incentive was offered to trade allies who agreed to participate in the interview.

participants and energy engineers were analyzed directly as textual data. In both cases, the evaluation team reviewed data for missing or erroneous entries. Analysis included recoding data in some instances to disaggregate “other” responses or to combine similar responses into one category. Where appropriate, the evaluation team tabulated frequencies of responses. After data from each data collection activity were analyzed individually for findings, the evaluation team identified common process findings across activities.

## 4. Impact Evaluation Findings

Leveraging the evaluation strategies previously discussed for the FinAnswer Express program, this section summarizes the impact evaluation findings for each project included in the 2009 through 2011 evaluation sample.

The evaluation team distinguished savings into “gross” and “net.” The methodology for calculating net savings from gross savings is detailed in Section 3.1.5: Net-to-Gross (NTG) Estimates.

The evaluation team further characterized savings as “reported” and “evaluated.” Reported savings present project savings estimated at the time of measure installation. Evaluated savings present energy savings verified in a facility at the time of evaluation, with modifications for California sites that faced drastic operational changes due to the economic downturn or other factors. See Section 3.1.4: Gross Energy and Demand Realization Rate Calculation for details regarding the savings calculation methodology.

### 4.1 Program-Level Gross Savings Results

In aggregate, the FinAnswer Express program achieved lower demand (kW) and energy (kWh) savings than was reported through project files and the program tracking database.

The 2009 through 2011 gross program demand savings realization rate was 91 percent, and the gross program energy savings realization rate was 85 percent. Table 15 details the demand and energy realization rates for California’s FinAnswer Express program from 2009 through 2011.

**Table 15. Program-Level Realization Rates for California FinAnswer Express (2009-2011)**

Program Year	Reported Demand Savings (kW)	Evaluated Demand Savings (kW)	Evaluated Demand Realization Rate	Reported Energy Savings (kWh)	Evaluated Energy Savings (kWh)	Evaluated Energy Realization Rate
2009	116.4	101.7	87%	997,735	985,862	99%
2010	110.7	118.6	107%	958,483	698,194	73%
2011	211.3	179.2	85%	904,926	746,997	83%
All	438.3	399.5	91%	2,861,144	2,431,053	85%

Table 16 shows the distribution of reported energy savings across all measure categories, and the realization rates for those measure types accounted for in the stratified randomly-drawn sample. An ‘N/A’ indicates that the measure category was not part of the evaluation sample. These measure-level realization rates are illustrative and do not represent statistically significant results; these measure level realization rates should not to be used for future planning purposes.

**Table 16. Measure-Level Realization Rates for California FinAnswer Express (2009-2011)**

Measure Category	2009-2011 Reported Energy Savings (kWh)	2009-2011 Realization Rate
Lighting	2,719,163	84%
HVAC	90,405	N/A
Irrigation	20,601	N/A
Refrigeration	17,885	N/A
Motors	13,091	101%

#### 4.2 On-Site Verification Results

Final realization rates for program-level demand (kW) and energy (kWh) savings were applied from on-site field verification. The evaluation team visited 20 sites, representing 75 percent of the total reported savings. The 20 projects sampled included 18 lighting and two motor projects. Although realization rates were calculated for every project site visited, note that only program-level, not measure-level, realization rates are statistically significant.

The 2009 through 2011 gross sample demand (kW) and energy (kWh) savings realization rates are detailed in

Table 18.

**Table 17. Sample-Level Gross Realization Rates for California FinAnswer Express (2009-2011)**

Program Year	Sample Reported Savings (kW)	Sample Evaluated Savings (kW)	Evaluated Demand Realization Rate	Sample Reported Savings (kWh)	Sample Evaluated Savings (kWh)	Evaluated Energy Realization Rate
2009	66.5	58.1	87%	628,296	620,819	99%
2010	73.9	79.2	107%	757,812	552,018	73%
2011	178.6	151.5	85%	760,167	627,501	83%

#### 4.2.1 Demand Savings Results

Table 18 provides project-level demand realization rates for the projects in the impact evaluation sample that achieved an overall realization rate in 2009 of 87 percent, in 2010 of 107 percent, and in 2011 of 85 percent.

Lighting projects’ realization rates vary due to the difference between assumed and evaluated demand diversity factors. Project files assumed average ASHRAE-recommended diversity factors to calculate demand savings per project. The evaluation team replaced these average diversity factors with calculated diversity factors for sites that the evaluation team installed loggers in.

Motor projects’ realization rates achieved approximately 100 percent realization rate (one achieved 101 percent).

**Table 18. California FinAnswer Express Project-Level Demand (kW) Realization Rates**

Project ID	Year	Measure Group	Reported kW	Evaluated kW	Realization Rate
CAL00012	2009	Lighting	5.6	5.3	95%
CAL00014	2009	Lighting	2.1	2.1	99%
CAL00022	2009	Lighting	45.3	45.3	100%
CAL00023	2009	Lighting	1.4	0.5	36%
CAL00025	2009	Lighting	2.8	1.9	67%
CAL00029	2009	Lighting	9.3	3.0	33%
CAL00033a	2010	Lighting	1.4	1.0	72%
CAL00037	2010	Lighting	33.2	37.5	113%
CAL00038	2010	Lighting	10.9	12.2	112%
CAL00039	2010	Lighting	0.6	0.6	100%
CAL00045	2010	Lighting	12.0	12.0	100%
CAL00049	2010	Lighting	13.0	13.0	100%
CAL00053	2011	Lighting	35.1	26.1	74%
CAL00060	2011	Lighting	33.3	30.7	92%
CAL00062	2011	Lighting	42.8	37.5	88%
CAL00068	2011	Lighting	47.7	37.7	79%
CAL00069	2011	Lighting	19.1	19.1	100%
CAL00070	2011	Lighting	0.6	0.4	73%
CAN00021	2010	Motors	0.2	0.2	100%
CAN00026	2010	Motors	2.6	2.6	101%

#### 4.2.2 Energy Savings Results

Table 19 details the energy savings realization rate for all projects in the evaluation sample that yielded an overall realization rate in 2009 of 99 percent, in 2010 of 73 percent, and in 2011 of 83 percent.

Lighting projects’ realization rates vary due to a difference in operating hours or a count of fixtures installed. Details for each project that did not achieve a 100 percent realization rate are explained below this table.

The two motors projects reviewed yielded around 100 percent energy savings realization rate.). The realization rate relied on a desk review of the motors project files.

**Table 19. California FinAnswer Express Project-Level Energy (kWh) Realization Rates**

Project ID	Year	Measure Group	Reported kWh	Evaluated kWh	Realization Rate
CAL00012	2009	Lighting	11,333	13,273	117%
CAL00014	2009	Lighting	9,400	7,074	75%
CAL00022	2009	Lighting	531,493	531,493	100%
CAL00023	2009	Lighting	4,256	2,728	64%
CAL00025	2009	Lighting	9,959	5,044	51%
CAL00029	2009	Lighting	61,855	61,207	99%
CAL00033a	2010	Lighting	9,109	8,894	98%
CAL00037	2010	Lighting	362,023	211,210	58%
CAL00038	2010	Lighting	119,241	64,680	54%
CAL00039	2010	Lighting	2,768	2,768	100%
CAL00045	2010	Lighting	109,885	109,584	100%
CAL00049	2010	Lighting	145,854	145,854	100%
CAL00053	2011	Lighting	126,944	90,562	71%
CAL00060	2011	Lighting	106,034	93,767	88%
CAL00062	2011	Lighting	148,383	121,361	82%
CAL00068	2011	Lighting	176,519	145,004	82%
CAL00069	2011	Lighting	200,439	173,350	86%
CAL00070	2011	Lighting	1,848	3,457	187%
CAN00021	2010	Motors	713	713	100%
CAN00026	2010	Motors	8,219	8,315	101%

In select cases, lighting project evaluation yielded significant differences between the reported and verified energy savings estimates. Specifically, while four of the 18 lighting projects sampled yielded energy realization rates around 100 percent, two yielded realization rates above 100 percent and 12 yielded realization rates below 100 percent. Table 20 lists the projects that yielded energy realization rates above or below 100 percent with explanations as to whether the resulting realization rates can be attributed to a verified fixture count or a difference in operating hours. The table further explains whether the difference in operating hours is due to:

- » **Difference in Reported Operating Hours:** The customer reported different operating hours to Navigant than was reported on the original project file;
- » **Reported Operation Change:** The customer reported that business (and lighting, as a result) operating hours specifically changed since the project was completed;
- » **Difference in Logged Operating Hours:** Navigant’s lighting data loggers captured different annual operating hours than was originally reported in the project file; and/or
- » **All of the above**

**Table 20. California FinAnswer Express Lighting Programs with Realization Rates Explanations**

Project ID	Energy Realization Rate	Operating Hours/Fixture/ Both	Difference in Operating Hours	Notes
CAL00012	117%	Both	Reported Operation Change	Verified fewer fixtures, and operating hours have increased due to change in operation.
CAL00014	75%	Operating Hours	Difference in Reported Operating Hours	Customer reported 29% less hours of operation during onsite visit than Navigant found reported in project file.
CAL00023	64%	Operating Hours	Difference in Logged Operating Hours	Logged operating hours are less than claimed operating hours, specifically in the lobby and office areas.
CAL00025	51%	Operating Hours	Difference in Reported and Logged Operating Hours	Project file indicated one operating schedule of 11 hours per day five days a week. However, customer reported and Navigant logged multiple operating schedules that varied significantly by area type.
CAL00029	99%	Operating Hours	Difference in Logged Operating Hours	Minor difference between claimed and logged operating hours.
CAL00033a	98%	Both	Difference in Logged Operating Hours	Minor difference between claimed and logged operating hours.
CAL00037	58%	Both	Difference in Reported and Logged Operating Hours	Project file indicated one operating schedule of 8,497 hours per year. However, customer reported and Navigant logged multiple operating schedules that varied significantly by area type.
CAL00038	54%	Both	All	Project file indicated one operating schedule of 8,497 hours per year. However, customer reported and Navigant logged multiple operating schedules that varied significantly by area type.
CAL00053	71%	Operating Hours	Difference in Reported and Logged Operating Hours	Project file indicated one operating schedule for three areas: classroom, gym, and cafeteria. However, customer reported and Navigant logged lower annual operating hours for the three areas.
CAL00060	88%	Both	Difference in Reported and Logged Operating Hours	Project file indicated one annual operating schedule for all interior space types, including classrooms, hallways, storage, and restrooms. However, customer reported and Navigant logged multiple operating schedules that varied by area.

Project ID	Energy Realization Rate	Operating Hours/Fixture/Both	Difference in Operating Hours	Notes
CAL00062	82%	Operating Hours	Difference in Logged Operating Hours	Logged operating hours are less than claimed operating hours, especially in areas like the kitchen and teacher's lounge.
CAL00068	82%	Operating Hours	Difference in Logged Operating Hours	Logged operating hours are less than claimed operating hours, specifically in the gym.
CAL00069	86%	Operating Hours	Difference in Reported Operating Hours	Customer reported fewer hours of operation in certain areas, such as the Warden's Office, during phone interview than claimed in project file.
CAL00070	187%	Operating Hours	Difference in Logged Operating Hours	Logged operating hours are nearly double the claimed operating hours since a few lights are always on for security purposes.

In addition, the verified savings estimates and realization rates for lighting projects are *conservative* due to:

- » Pacific Power does not credit savings towards HVAC Interactive Effects, which may be substantial.
- » Pacific Power assumes a conservative baseline of energy efficient lamps and magnetic ballast combinations for completed T12 linear fluorescent lighting projects (except where the existing equipment was already more efficient than this). In light of Energy Policy Act (EPACT) and Energy Independence and Security Act (EISA) legislation increasing the minimum efficacy (lumens per watt) standards of linear fluorescent lamps, the evaluation team accepted this baseline while recognizing Pacific Power's efforts to lay the groundwork for future changes in federal standards. However, the evaluation team also acknowledged that the verified savings for projects involving the replacement of T-12 fixtures less efficient than the assumed program baseline may be understated.

### 4.3 Program-Level Net Savings Results

The evaluation team calculated a Net-to-Gross (NTG) ratio of 0.88 for the FinAnswer Express program, for program years 2009 through 2011, through self-reports. Table 21 provides evaluated program-level demand and energy savings with the NTG ratio of 0.88 applied. With the application of the NTG ratio, overall realization rates for the program fall between 75 percent and 82 percent.



**Table 21. Program-Level Net Realization Rates for California FinAnswer Express (2009-2011)**

Program Year	Reported Demand Savings (kW)	Evaluated Demand Savings (kW)	Evaluated Demand Realization Rate	Reported Energy Savings (kWh)	Evaluated Energy Savings (kWh)	Evaluated Energy Realization Rate
2009	116.4	89.9	77%	997,735	871,694	87%
2010	110.7	104.8	95%	958,483	617,340	64%
2011	211.3	158.5	75%	904,926	660,491	73%
All	438.3	353.2	81%	2,861,144	2,149,525	75%

NTG ratios were calculated for 29 projects that contribute to approximately 30 percent of total reported savings based on questions asked during participant surveys. Of the 29 projects that reported responses, seven had NTG ratios below 0.75. 16 projects reported NTG ratios of 1.0. The program-weighted NTG ratio of 0.88 was calculated by weighting the sample of project-level NTG ratios by their reported energy savings values. The evaluation team found that 24 percent of respondents qualified as full free riders; 52 percent of respondents qualified as non free riders; and 24 percent of respondents qualified as partial free riders. Section 5.1.4: Program Influence provides more detail on participant responses.

Further details regarding NTG ratio calculation methodology (and what makes a customer a free rider) can be found in Section 3.1.5: Net-to-Gross (NTG) Estimates. The appendices include a table that provides project-level NTG ratios along with reported energy savings.

#### **4.4 Cost-Effectiveness Calibration and Analysis**

Using the Company’s model for calculating the program’s benefit-cost ratios, the evaluation team calibrated and updated cost-effectiveness models using 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). Details regarding cost-effectiveness calculation methodology and the E3 model can be found in Section 3.1.6: Program Cost-Effectiveness.

California’s FinAnswer Express program did not pass the TRC and PTRC tests in 2009 due to one site that closed down two years after completing a large lighting retrofit. While savings were accounted for the years that the facility was open, the TRC and PTRC takes into account lifetime savings, which fell short of total costs, thus making the program not cost-effective. It did not pass the TRC in 2011 due to participation whose savings did not exceed the costs of implementing the program. The program also did not pass the RIM test for the individual or combined years. It is rare for the RIM test result to have a cost-benefit ratio greater than 1.0 for DSM programs as RIM tests measure the effect of DSM program implementation on customer (average) rates, and DSM programs cause average customer rates to increase slightly.

Detailed cost-effectiveness tables for each program year and the combined 2009 through 2011 evaluation period are provided in Table 22 through Table 25. Cost-effectiveness results are also provided from the E3 Model.

**Table 22. 2009 California FinAnswer Express Benefit-Cost Ratios**

Benefit/Cost Test Performed	Evaluated Gross Savings (kWh)	Evaluated Net Savings (kWh)	PacifiCorp Evaluated Costs	PacifiCorp Evaluated Benefits	PacifiCorp Model B/C Ratio	E3 Model B/C Ratio <sup>36</sup>
Total Resource Cost Test (PTRC)	985,862	871,502	\$528,295	\$498,960	0.94	N/A
Total Resource Cost Test (TRC)	985,862	871,502	\$528,295	\$453,600	0.86	0.74
Utility Cost Test (UCT)	985,862	871,502	\$167,136	\$453,600	2.71	2.35
Rate Impact Test (RIM)	985,862	871,502	\$708,031	\$453,600	0.64	0.62
Participant Cost Test (PCT)	985,862	871,502	\$480,759	\$675,705	1.41	N/A

**Table 23. 2010 California FinAnswer Express Benefit-Cost Ratios**

Benefit/Cost Test Performed	Evaluated Gross Savings (kWh)	Evaluated Net Savings (kWh)	PacifiCorp Evaluated Costs	PacifiCorp Evaluated Benefits	PacifiCorp Model B/C Ratio	E3 Model B/C Ratio <sup>37</sup>
Total Resource Cost Test (PTRC)	698,194	617,204	\$353,899	\$702,651	1.99	N/A
Total Resource Cost Test (TRC)	698,194	617,204	\$353,899	\$638,774	1.80	2.05
Utility Cost Test (UCT)	698,194	617,204	\$211,384	\$638,774	3.02	3.50
Rate Impact Test (RIM)	698,194	617,204	\$865,285	\$638,774	0.74	0.71
Participant Cost Test (PCT)	698,194	617,204	\$242,528	\$811,586	3.35	N/A

**Table 24. 2011 California FinAnswer Express Benefit-Cost Ratios**

Benefit/Cost Test Performed	Evaluated Gross Savings (kWh)	Evaluated Net Savings (kWh)	PacifiCorp Evaluated Costs	PacifiCorp Evaluated Benefits	PacifiCorp Model B/C Ratio	E3 Model B/C Ratio <sup>38</sup>
Total Resource Cost Test (PTRC)	746,997	660,345	\$688,534	\$729,585	1.06	N/A
Total Resource Cost Test (TRC)	746,997	660,345	\$688,534	\$663,259	0.96	1.04
Utility Cost Test (UCT)	746,997	660,345	\$365,179	\$663,259	1.82	2.00
Rate Impact Test (RIM)	746,997	660,345	\$1,203,788	\$663,259	0.55	0.58
Participant Cost Test (PCT)	746,997	660,345	\$489,474	\$1,057,992	2.16	N/A

<sup>36</sup> The E3 model does not calculate the PTRC or the PCT.

<sup>37</sup> The E3 model does not calculate the PTRC or the PCT.

<sup>38</sup> The E3 model does not calculate the PTRC or the PCT.

**Table 25. 2009-2011 Combined California FinAnswer Express Benefit-Cost Ratios**

Benefit/Cost Test Performed	Evaluated Gross Savings (kWh)	Evaluated Net Savings (kWh)	PacifiCorp Evaluated Costs	PacifiCorp Evaluated Benefits	PacifiCorp Model B/C Ratio	E3 Model B/C Ratio <sup>39</sup>
Total Resource Cost Test (PTRC)	2,431,053	2,149,051	\$1,570,728	\$1,931,196	1.23	N/A
Total Resource Cost Test (TRC)	2,431,053	2,149,051	\$1,570,728	\$1,755,633	1.12	1.17
Utility Cost Test (UCT)	2,431,053	2,149,051	\$743,698	\$1,755,633	2.36	2.50
Rate Impact Test (RIM)	2,431,053	2,149,051	\$2,777,103	\$1,755,633	0.63	0.64
Participant Cost Test (PCT)	2,431,053	2,149,051	\$1,212,761	\$2,545,283	2.10	N/A

<sup>39</sup> The E3 model does not calculate the PTRC or the PCT.

## 5. Process Evaluation Findings

This section describes the findings from the process evaluation data collection activities, including the FinAnswer Express participant surveys, near participant interviews, California non-participant surveys, and trade ally interviews. For each data collection activity, this report provides a description of the sample followed by findings from that activity. At the end of this section, findings from these four data collection activities are synthesized into key process findings and recommendations for the FinAnswer Express program in California.

### 5.1 Participant Findings

In May through August of 2012, the evaluation team surveyed respondents representing 29 of 88 total completed projects in the California FinAnswer Express program from 2009 to 2011.

These respondents represented firms across several industries. The majority of respondents (25 out of 29) indicated that they employed between three and 2000 people with a mean of 194 employees; the other four respondents did not know. Participating firms represented educational services, retail, government/public administration, service and repair, manufacturing, and other industries, as listed in Table 26.

**Table 26. Primary Industry of FinAnswer Express Survey Respondents**

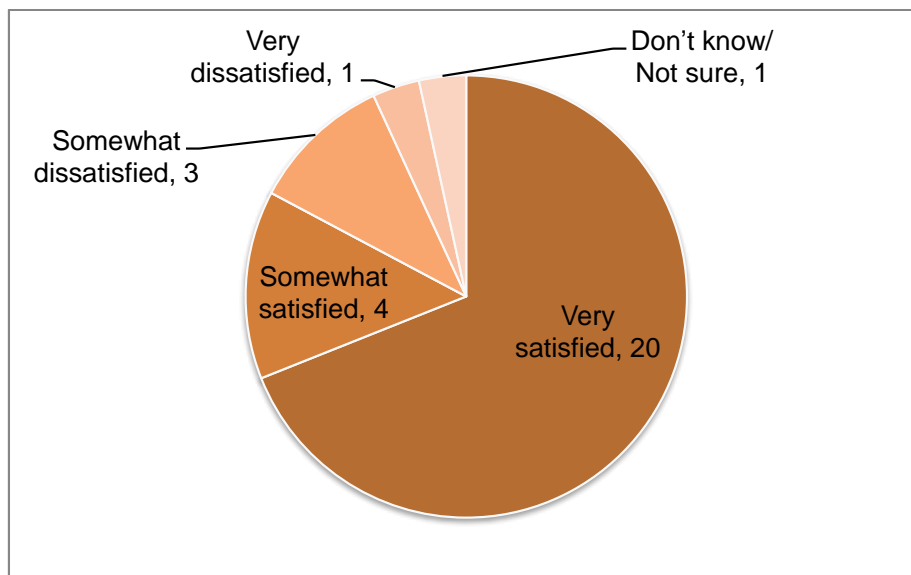
Primary Industry	Respondents
Educational Services	12
Retail	4
Government/Public Administration	4
Service and Repair	3
Manufacturing	2
Other (industries having a single respondent)	4
Total	29

Electricity represents less than 10 percent of operating costs, on average, for these participants. Eight respondents were able to estimate electricity costs; for these eight, electricity represented between one and 15 percent of operating costs, with a mean of 8.6 percent.

#### 5.1.1 Program Satisfaction

When asked to rate their overall satisfaction with the FinAnswer Express program, 20 respondents were very satisfied, four were somewhat satisfied, and four were dissatisfied, as shown in Figure 3.

**Figure 3. Participant Satisfaction with the FinAnswer Express Program Overall**



Two of the four respondents who were not satisfied with the program provided reasons for their dissatisfaction; one said that they were not realizing expected savings while the other said that there was too much paperwork involved in program participation.

When asked what changes they would like to see in the FinAnswer program, 20 respondents had no suggestions. The other nine respondents offered the following suggestions:

- » Increase awareness of the program (identified by four respondents)
- » Decrease paperwork (identified by three respondents)
- » Improve access to program documentation (identified by one respondent)
- » Increase incentives (identified by one respondent)

Fifteen respondents reported contacting Pacific Power with questions or requests for assistance at some point during their participation in the program. All 15 found Pacific Power staff/representatives knowledgeable about program requirements and timely in addressing their questions.

### **5.1.2 Program Awareness and Motivation**

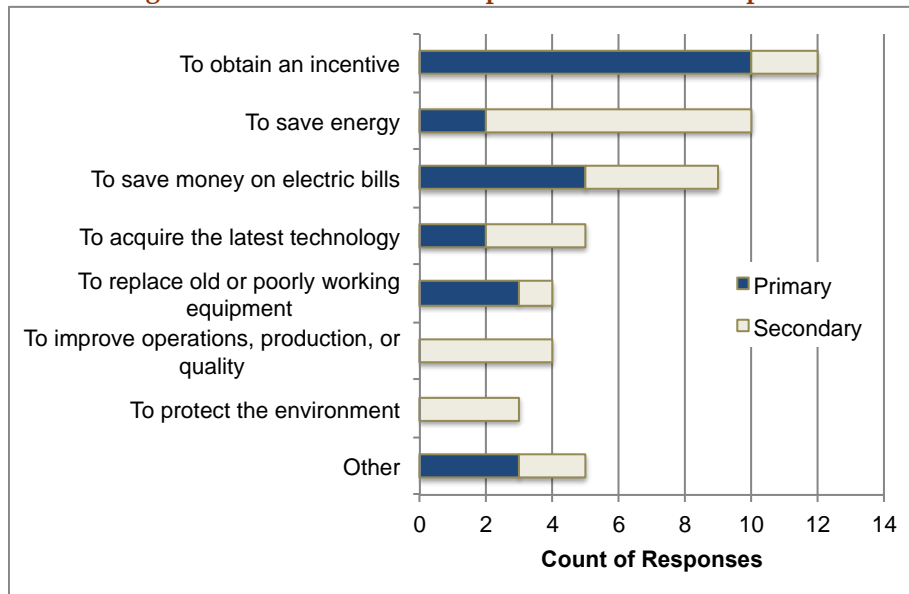
Participants found out about the FinAnswer Express program mostly from trade allies (41 percent) or program representatives (30 percent) as expected from the program logic model. Word of mouth, previous participation, and online advertisements were also noted as sources of awareness (see Table 27).

**Table 27. How Participants Became Aware of the FinAnswer Express Program**

	Number of Responses	Percent of Responses
Trade Ally, Vendor, or Contractor	11	38%
Program Representative	8	28%
Another Business Colleague	4	14%
Previous Participation in Pacific Power Programs	3	10%
Pacific Power Online Advertisement	1	3%
Don't Know/Not Sure	2	7%
Total	29	100%

When asked what motivated them to participate in FinAnswer Express, 25 out of 29 participants were able to identify their motivation. Participants report a variety of motivations for their involvement with the FinAnswer Express program, as indicated in Figure 4. The most common motivators were: obtaining an incentive, saving energy, and saving money on electric bills.

**Figure 4. Motivation to Participate in FinAnswer Express**



### 5.1.3 Program Process and Satisfaction

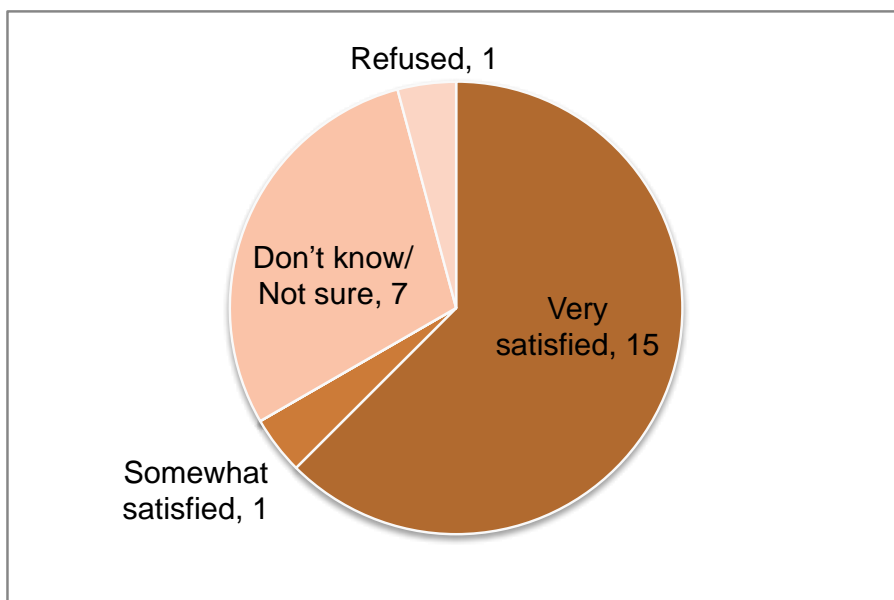
Participant responses indicate that the FinAnswer Express program is working well. The participation process will be discussed here in three steps: pre-installation, measure installation, and post-installation.

#### 5.1.3.1 Pre-Installation

Before participants install equipment with the FinAnswer Express program, they will work with a Pacific Power project manager or a vendor, depending on the participation path. One respondent had worked with a Pacific Power project manager instead of through a vendor on their project. This respondent did not recall the energy analysis report, and could not speak to the value of the report. The other 28 respondents worked with a vendor on their project. The majority of these post-purchase incentive path

projects (24 out of 28) were completed through a vendor who was part of the Pacific Power EEA, also known as a “trade ally.” As shown in Figure 5, respondents were asked to rate their satisfaction with the trade ally with whom they worked.<sup>40</sup> For those respondents who answered this question, all were satisfied with the ally; however, nearly one-quarter of respondents (seven out of 24) indicated they did not know or were unsure.

**Figure 5. Satisfaction with FinAnswer Express Trade Ally**



When requested by the program managers and administrators, an inspector will conduct a pre-installation inspection. This inspection is intended to document the equipment that will be replaced to ensure that savings are calculated appropriately. Three respondents recalled an inspector’s visit to their site before installation, and all three were “very satisfied” with the inspector conducting the visit.

**5.1.3.2 Installed Energy Efficiency Measures**

Installation of energy efficiency measures can include totally new installations or retrofits of existing equipment. Seven projects discussed with respondents involved totally new installations. Another 21 project measures replaced existing equipment. One respondent did not indicate whether the measures replaced existing equipment. For the projects that replaced existing equipment, the majority of equipment (62 percent) was working with no problems, as shown in Table 28.

<sup>40</sup> The evaluation team identified projects completed with an Energy Efficiency Alliance ally based on the program tracking database which indicates allies through a “Yes/No” response and also identifies the ally by name.



**Table 28. Status of Existing Equipment Replaced by Project Equipment**

	Count of Projects	Percent of Projects
Existing equipment working with no problems	13	62%
Existing equipment working but with problems	5	24%
Existing equipment had failed	3	14%
Total	21	100%

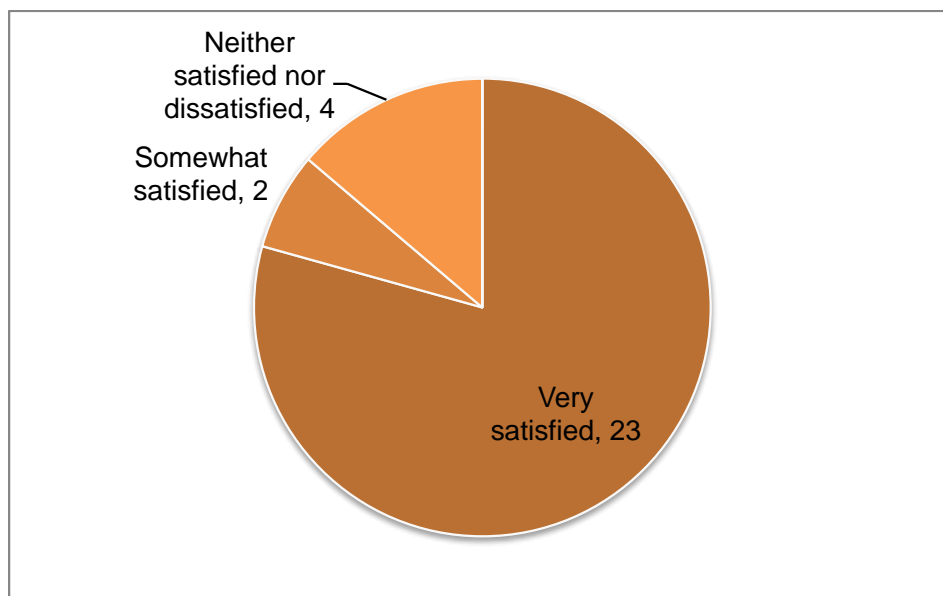
Respondents were asked about the benefits of the energy efficiency measures that they installed with the program, both expected energy benefits and other potential benefits. The majority of respondents indicated that the equipment was meeting energy savings expectations and also providing other non-energy benefits. The project equipment is meeting the energy savings expectations for most (23 out of 29) respondents, while four respondents indicated the equipment was not meeting energy savings expectations. One respondent did not know and one refused to answer this question. Twenty-four respondents indicated that the equipment was providing other benefits besides energy savings; however, two of these respondents indicated energy savings when asked what the benefit was, and one respondent indicated that the energy bills were now higher. As shown in Table 29, 11 of the 21 respondents with non-energy benefits indicated higher quality of lighting. Four respondents indicated that they were saving money; one of these was saving money on water.

**Table 29. Non-Energy Benefits of FinAnswer Express Projects**

	Number of Respondents	Percent of Respondents
Better lighting	11	52%
Saving money	4	19%
Quality job for customer	3	14%
More efficient operation	1	5%
More sales	1	5%
Looks like a star to parent company	1	5%
Total	21	100%

Respondents were asked about their satisfaction with the measures that they installed through the program. Nearly 80 percent (23 out of 29) of respondents indicated that they were “very satisfied;” two were “somewhat satisfied,” and four were “neither satisfied nor dissatisfied,” as shown in Figure 6. The four who were “neither satisfied nor dissatisfied” indicate the measure cost as their reason for being neutral rather than satisfied with the measure.

**Figure 6. Participant Satisfaction with Installed Measures**



**5.1.3.3 Post-Installation**

After the measures are installed through the program, the program administrator may send a representative to verify the installation. Nine of the surveyed projects had post-installation inspections. When asked about the post-installation inspection, seven respondents were very satisfied, one respondent was very dissatisfied, and one respondent was not sure. The dissatisfied respondent did not provide a reason for his/her assessment.

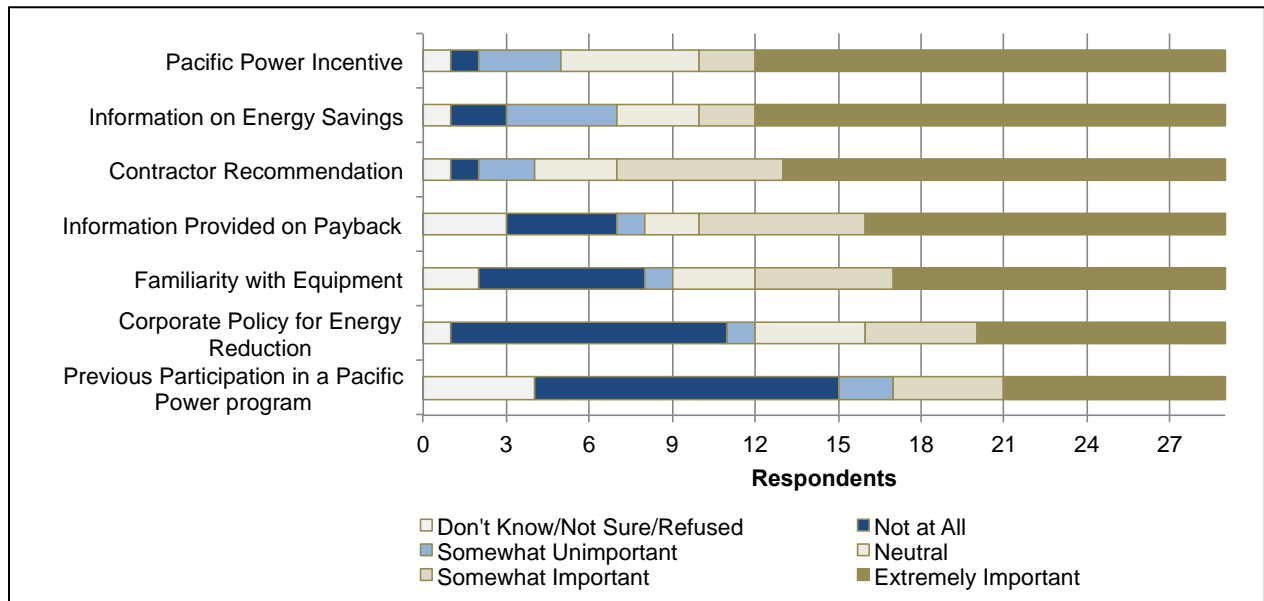
**5.1.4 Program Influence**

The evaluation team asked participants several questions about the program influence on the project that they completed with the FinAnswer Express program. These questions can be grouped into three general areas of influence: Factors influencing the actual equipment installed as part of the project (Influential factors), what would have happened in the absence of the program (Free-ridership), and the program influence on future energy efficiency purchases (Spillover).

**5.1.4.1 Influential factors**

Respondents were asked how influential seven factors were in their decision to purchase the actual equipment installed through the FinAnswer Express program. They were asked to rate the importance of each factor on a scale of one to five, with one being “not at all important” and five being “extremely important.” As shown in Figure 7 the Pacific Power incentive, information on energy savings, and contractor recommendations are most influential on customer decisions for the equipment that they installed through the program. Corporate policies on energy savings and previous participation in Pacific Power programs appear to be least influential on the decision of which equipment to purchase.

**Figure 7. Factors Influencing Project Decisions**

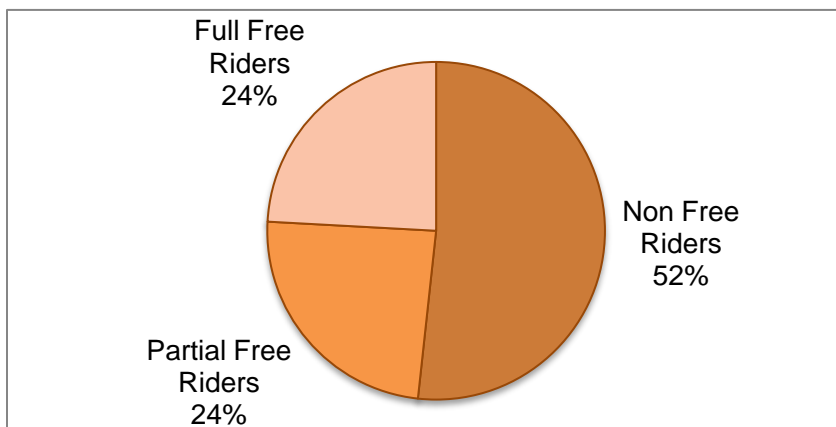


**5.1.4.2 Free-ridership**

In order to determine to what extent the FinAnswer Express program affected installation decisions, the survey team asked respondents what would have been different about their installations were the program not an option. Just under half (13) of the projects would have been installed at the same time while about one-third (10) would have not been installed at all. The other six projects would have been different in time, scope or efficiency. Ten of the 13 respondents who said that they would have installed the same project at the same time had previously said that the incentive or the technical assistance was important to their decision to install the equipment. These respondents were asked to describe the program influence in their own words. Three of these respondents indicated that the program had influenced their decision, and they would not have installed the same measure at the same time without the program. Because the program had enabled these respondents to complete the project within the current budget, they may have been completed later than 12 months after actual installation.

Based on participant responses and after adjusting for inconsistencies and prior program experience, the evaluation team determined that half of participants (15 out of 29) were not free riders, as shown in Figure 8.

**Figure 8. Free Ridership**



**5.1.4.3 Spillover**

There is no quantifiable spillover from this program at this time. Participant responses indicate that there is repeat program participation, for both “like” and “unlike” projects. In addition, one participant completed an “unlike” project without assistance from Pacific Power or other entities and credited the program with some influence on that decision. Because the project was “unlike” the project completed with the program, the savings cannot be quantified for program attribution.

Five respondents installed another similar, or “like” project since the one discussed in the survey; one of these projects was completed without assistance from Pacific Power or any other entity. This respondent indicated that the project (parking lighting and outside lighting) was of the same efficiency and that they “somewhat agreed” with the statement, “My experience with Pacific Power’s FinAnswer Express program influenced me to install high efficiency equipment on my own.” However, this respondent was considered a free-rider on the project measure, so it does not make sense to attribute these savings to the program.

Eight respondents installed other projects that were not similar to the ones installed through the program; five of these respondents indicated that these “unlike” projects were completed without assistance from Pacific Power or any other entity. When asked how much they agreed with the statement, “My experience with Pacific Power’s FinAnswer Express program influenced me to install high efficiency equipment on my own,” four respondents indicated that they “somewhat disagreed” and one “somewhat agreed.” The one who “somewhat agreed” was not sure why they had not applied for incentives for the unlike project. The project included 20 lights and new microwave appliances. Savings from this project cannot be quantified.

**5.1.5 Further Energy Efficiency Opportunities and Barriers**

When asked whether there were additional energy efficiency improvements their organizations could make, 13 respondents affirmed there were. When asked what these improvements might be, 12 respondents indicated the 17 measures listed in Table 30. The other respondent was not sure. Respondents most commonly mentioned exterior lighting improvements or distributed generation.

**Table 30. Potential Further Energy Efficiency Measures**

Measure	Number of Responses	Percent of Responses
Exterior Lighting	5	29%
Distributed generation	5	29%
Additional Lighting	3	18%
HVAC	2	12%
Building Shell (Insulation & Windows)	1	6%
General EE improvements (not specified)	1	6%
Total	17	100%

Of 13 respondents who identified additional energy efficiency improvements, three indicated that plans were in place to make these changes. One of these three said that incentives from Pacific Power were part of their plans. When asked about factors preventing them from making these changes, respondents identified high upfront costs (eight) and their lack of access to the necessary capital (five) as primary barriers. Two of the five respondents who indicated lack of access to capital as a primary barrier also indicated that high upfront costs prevented them from making changes.

### 5.2 *Near Participant Findings*

The evaluation team interviewed one FinAnswer Express near participant in California. Near-participants are those customers who have a project in the FinAnswer Express 2009 -2011 project tracking system but are identified as cancelled or on hold as of the end of 2011. In total there were two near-participants in California in the 2009 through 2011 period; however, the other near participant was considered ineligible for the interview because this firm had completed a different project with FinAnswer Express.

The respondent’s organization falls in the public administration category (a municipality), employing forty people with electricity bills making up approximately 10 percent of total operating costs. This respondent learned about FinAnswer Express from Pacific Power staff and chose to participate to install new pumps as part of a large project. The respondent reported being “very satisfied” with his program participation, but also commented that he “didn’t really have much involvement” with the program. When asked, he reported never contacting Pacific Power directly with questions or requests for assistance, but said that all of his organization’s interactions with Pacific Power had been very good.

When asked about the current status of the project, this respondent indicated his project was in progress. When asked about its “on hold” status he explained that it was “not really delayed,” but that due to the large project size there were many people involved and consequently coordination seems to have been a problem. He expressed some uncertainty about whether or not they would be able to get the program incentive, and he was unsure whether or not the project would be completed under a Pacific Power program.

When asked whether there were other electric efficiency improvements his organization could make, the respondent said there were none: while there might be some advantageous changes, the benefits are not significant enough to make the changes worthwhile in the short run.

### 5.3 *Non-Participant Findings*

In May and June of 2012, the evaluation team surveyed 170 California firms that did not participate in any Pacific Power programs between 2009 and 2011, according to program tracking data. These firms represent commercial (74 respondents), irrigation (73 respondents), and industrial (23 respondents) class

customers.<sup>41</sup> All of these survey respondents were eligible for the program, based on the rate schedules identified in the tariff. Most of the respondents were on the non-residential rate schedules A-25 or PA-20, as shown in Table 31.

**Table 31. Non-Participant Survey Respondents by Rate Schedule**

Rate Schedule	Irrigation	Commercial	Industrial	Total
A-25	-	63	12	75
A-32	-	11	7	18
A-33	-	-	-	-
A-36	-	-	4	4
AT-47	-	-	-	-
AT-48	-	-	-	-
LS-53	-	-	-	-
LS-58	-	-	-	-
OL-42	-	-	-	-
PA-20	73	-	-	73
Total	73	74	23	170

In order to understand the importance of electricity to non-participants, the evaluation team asked respondents to identify the portion of operating expenses represented by electricity costs. Similar to participating firms, non-participating firms had difficulty with this question; only 59 out of 170 respondents were able to answer this question. Fifty-six percent of respondents indicated that their firms' electric bills comprise 20 percent or less of their total annual operating expenses while less than 19 percent (11 of 59) have electric bills that comprise 50 percent or more of such expenses. The mean value is for electricity costs is 24 percent of annual operating expenses; this is much higher than the mean value for participants (about 9 percent of operating expenses).

The majority of non-participant firms are small, with 57 percent of responding firms (139 of 170 firms responded to this question) employing fewer than three people; however three firms are larger enterprises, employing more than 100 people (see Table 32). The majority of participating firms had few employees, as well.

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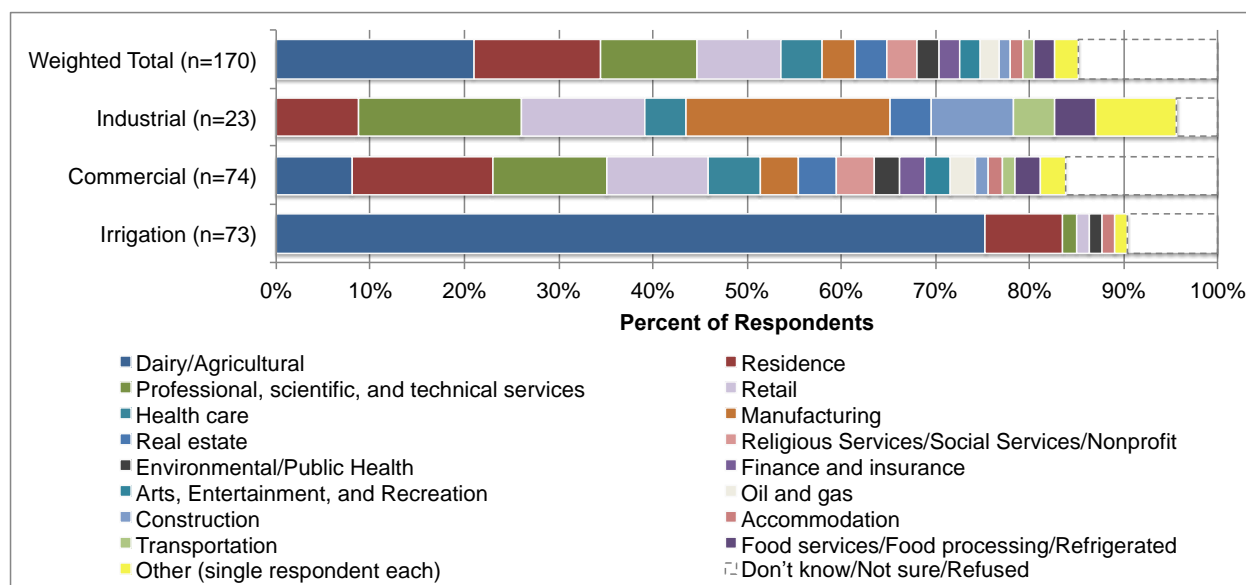
<sup>41</sup> Recall from the methodology that generalizations to all non-participants are design weighted. This is because the distribution of customers by class is not the same as the distribution of respondents by class.

**Table 32. Size of Non-Participant Firms, by Number of Employees**

Number of Employees	Irrigation	Commercial	Industrial	Weighted Percent of Total
Less than 3	36	33	11	33%
3 to less than 10	17	15	3	24%
10 to less than 100	7	8	6	24%
100 to less than 1000	0	1	1	3%
Greater than 1000	1	0	0	0%
Not sure/Don't Know/Refused	12	17	2	16%
Total	73	74	23	--

These respondents represent diverse industries with the most common responses being agriculture or dairy. The second most common response was “residence” - these respondents may have non-residential meters because of irrigation wells or shops on their property. Figure 9 shows the distribution of primary activities for the surveyed non-participants.

**Figure 9. Primary Activity for Non-Participating Respondents, by Customer Class**

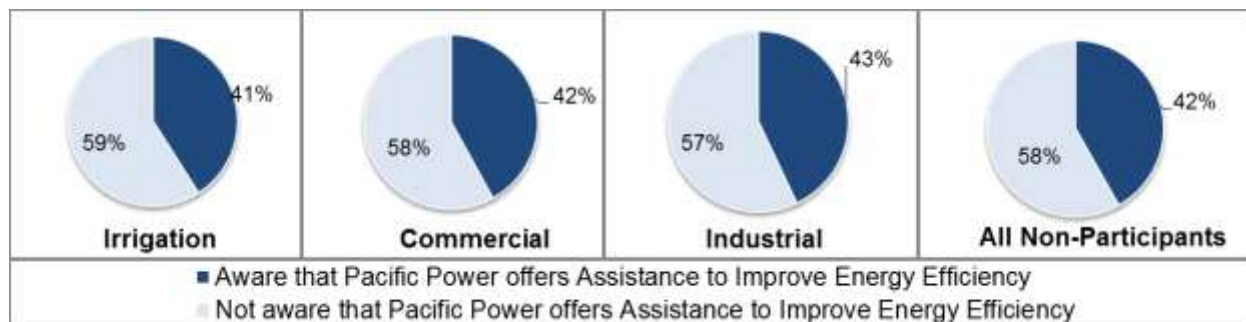


### 5.3.1 Awareness of Pacific Power Programs

About 42 percent of program non-participants across all Pacific Power customer classes said they were aware of Pacific Power assistance aimed at helping consumers reduce electricity usage. Awareness does not vary greatly across customer classes, as shown in Figure 10.



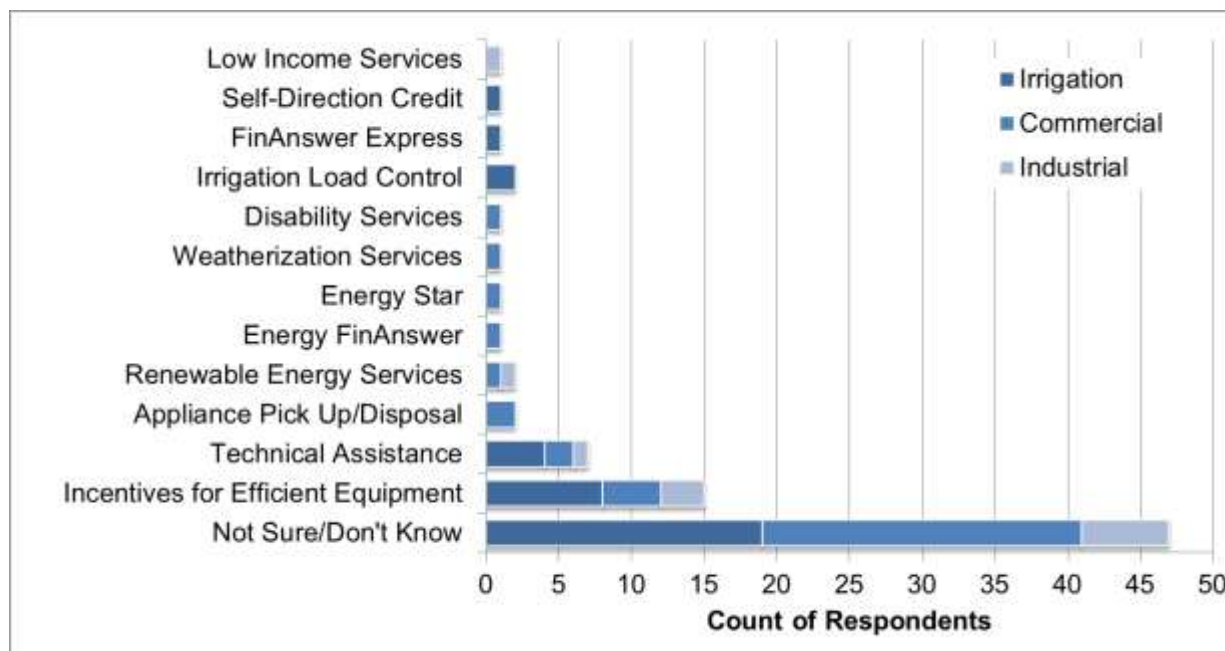
**Figure 10. Non-Participant Awareness of Pacific Power Programs and Services**



Those respondents who were aware that Pacific Power offers incentives and technical assistance aimed at helping customers reduce electricity usage were asked to identify what programs or services Pacific Power offers customers in their class. This was an open-ended question, and customers were not prompted with a list of programs and were allowed to name as many programs or services that they could.

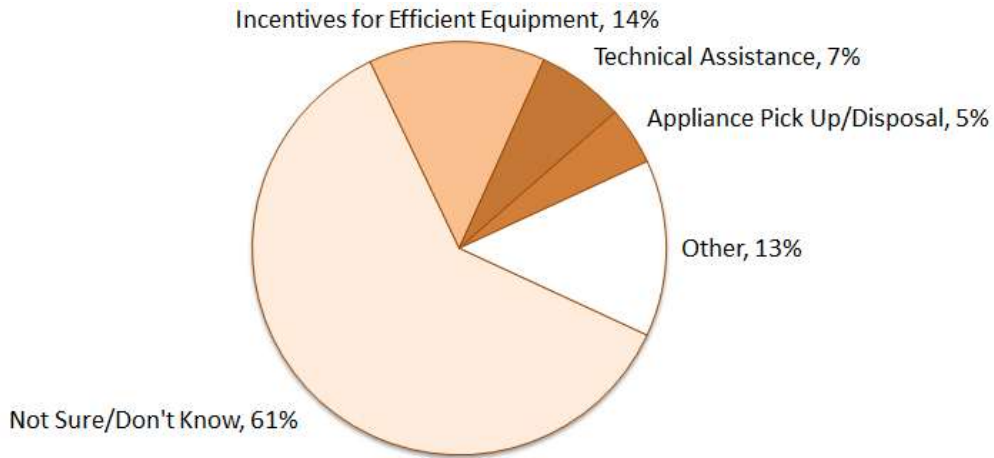
More than half of the respondents who were aware that Pacific Power offers incentives and technical assistance were not able to identify a particular Pacific Power program or service that would be available to them. For those that could identify specific programs or services, the most common responses were incentives for efficient equipment and technical assistance, as shown in Figure 11. One respondent identified the FinAnswer Express program directly.

**Figure 11. Non-participant Awareness of Programs and Services, by Customer Class**



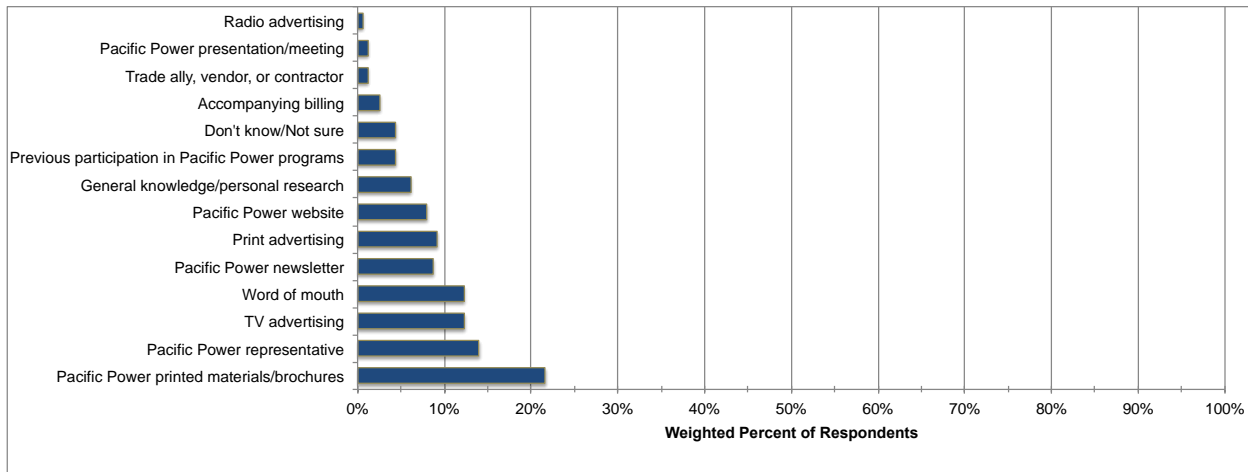
When these responses are weighted to represent the population of non-respondents, it is clear that only very small percentages of non-participants are aware of any specific programs, as shown in Figure 12. FinAnswer Express makes up less than 0.5 percent of responses and is included in "Other." Nearly two-thirds of all non-participants (61 percent) who were aware that Pacific Power provides some assistance for improving customer efficiency were not sure of any specific examples.

**Figure 12. Non-participant Awareness of Programs and Services, Overall**



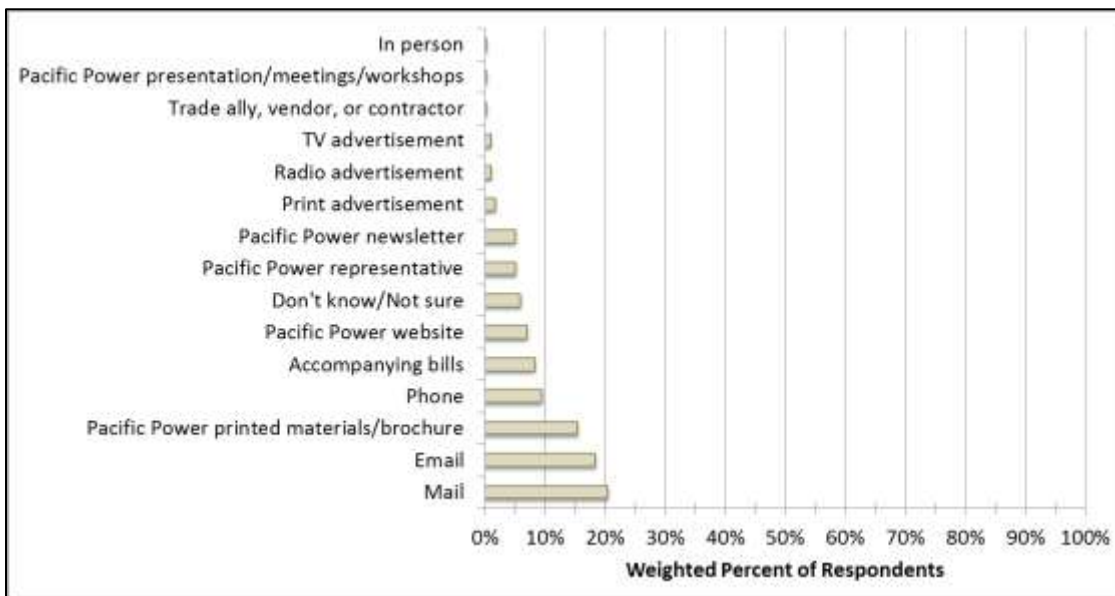
Of those who were aware that Pacific Power offers programs, the most common source of program information was from Pacific Power printed materials – forms or brochures. The next most common response was from Pacific Power representatives. Figure 13 shows how non-participants indicated hearing about the programs.

**Figure 13. How Non-Participants Heard about Pacific Power Programs, Overall**



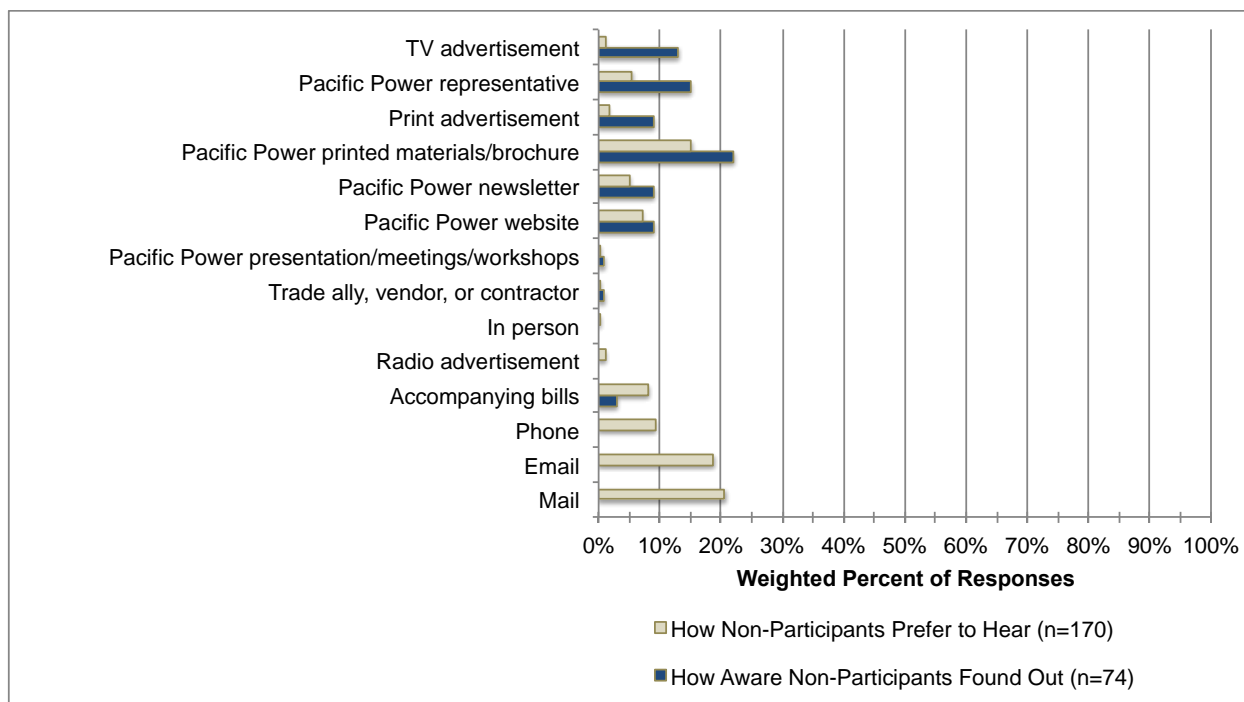
Respondents were also asked how they would prefer to learn about Pacific Power programs. The most commonly preferred methods were mail (20 percent) and email (18 percent). Respondents are also receptive to learning about programs through printed materials (15 percent). Other methods to reach customers were identified by fewer than 10 percent of respondents, as shown in Figure 14.

Figure 14. Preferred Methods to Learn of Pacific Power Programs, Overall



When the preferred methods to learn about programs were compared to the actual methods that non-participants had heard about Pacific Power assistance, as shown in Figure 15, three things stand out. Firstly, non-participants are learning about programs through Pacific Power TV and print advertising, even though they do not seek these methods out. Secondly, non-participants want to learn about programs through mail and email, but they are not currently learning through those. Lastly, Pacific Power newsletters and the website are reaching about the same percentage of non-participants as would like to learn of the programs through that method. These findings suggest that non-participants prefer more personal forms of communication, but they are receptive to advertising.

**Figure 15. Preferred versus Actual Methods to Learn about Pacific Power Programs, Overall**



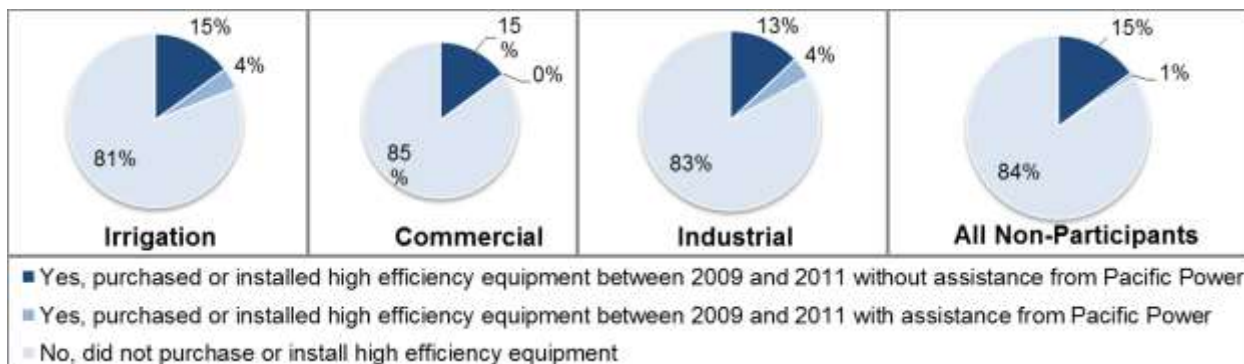
### 5.3.2 Non-Participant Energy Efficiency Improvements

Non-participants were asked a series of questions about energy efficiency actions or improvements that they may have taken during the program years of 2009 to 2011. These questions were in regards to: High efficient equipment purchases, load or demand reduction efforts, systematic evaluations or energy analyses of existing facilities<sup>42</sup>. None of the respondents indicated that their facilities were constructed since 2009, so all were assumed to be existing facilities.

Of the 170 non-participants with existing facilities in 2009, 16 percent overall indicated that their firms installed high efficiency equipment between 2009 and 2011, as shown in Figure 16. A few irrigation and industrial class customers (4 percent each) indicated that they had assistance from Pacific Power when they installed high efficiency equipment. The high efficient equipment installed by non-participants included lighting, appliances, HVAC, irrigation equipment, air compressors, and solar panels.

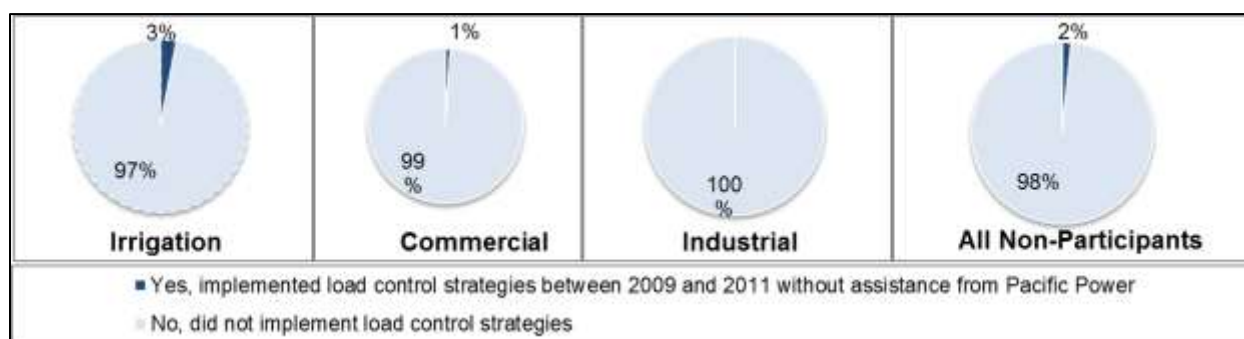
<sup>42</sup> Respondents were asked if they had received assistance from Pacific Power if they reported taking energy efficiency actions or improvements. The evaluation team assumes that this assistance is not in the form of program participation because the non-participant list was crosschecked with the participant tracking data by Pacific Power.

**Figure 16. Non-participant High Efficiency Equipment Purchases in Existing Facilities**



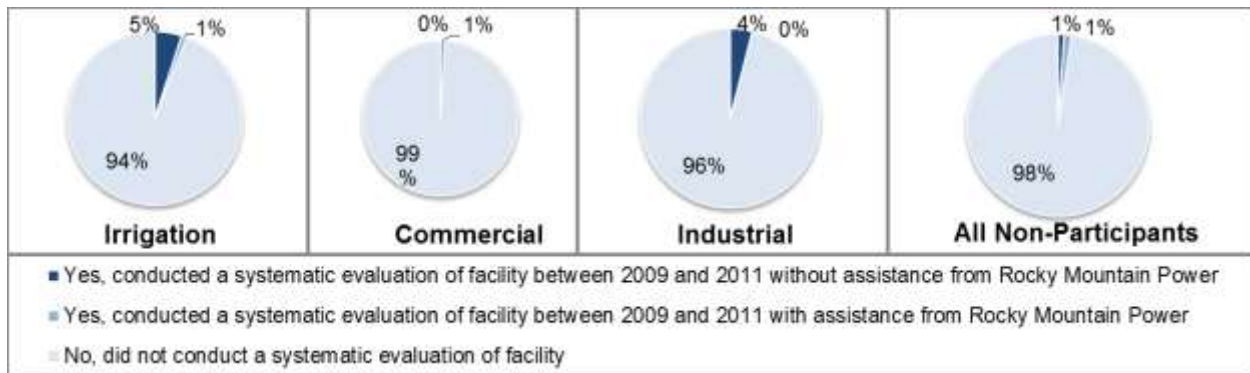
As indicated in Figure 17, about 2 percent of non-participants indicated that they implemented load control strategies for their facilities. No industrial customers indicated that they had implemented load control strategies between 2009 and 2011. Respondents who said that they had implemented load control strategies indicated that they were controlling motors and miscellaneous loads (not lighting, HVAC, motors, etc.). The responses were not clear enough to determine if the strategies taken by these customers actually are reducing the load at peak periods.

**Figure 17. Non-participant Load Control Strategies in Existing Facilities**



About 2 percent of non-participants conducted systematic evaluations of their facilities between 2009 and 2011, as shown in Figure 18. Half of these indicated having assistance from Pacific Power. There was variation across classes in systematic evaluations. For irrigation, 6 percent of irrigation class customers indicated conducting systematic evaluations – 5 percent without Pacific Power help and 1 percent with Pacific Power assistance. In the commercial class, 1 percent indicated conducting a systematic evaluation with Pacific Power assistance. The industrial class had 4 percent of respondents indicate conducting systematic evaluations without Pacific Power assistance.

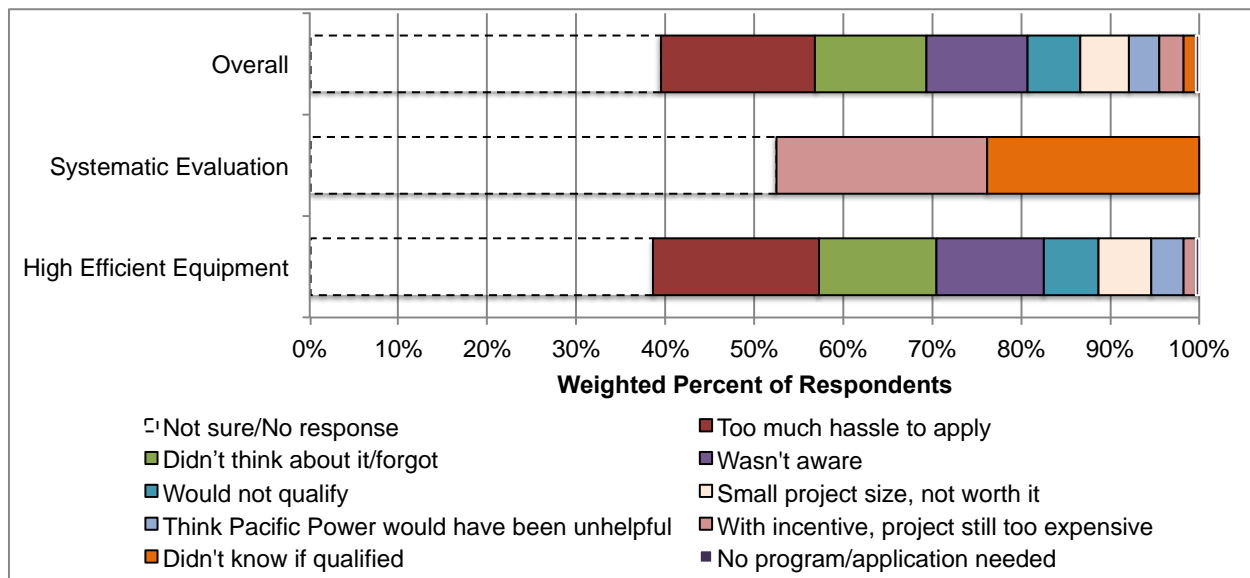
**Figure 18. Non-participant Systematic Evaluations of Existing Facilities**



Those respondents who had installed high efficiency equipment or conducted a systematic evaluation – but did not apply for assistance from Pacific Power were asked why they had not. While this evaluation is focused on the FinAnswer Express program, which is mostly providing incentives to install efficient equipment, Pacific Power also offers the Energy FinAnswer program which provides systematic evaluations and incentives to install efficient equipment. Customers who implemented load control strategies were not asked why they did not seek assistance from Pacific Power because Pacific Power does not operate load control programs in California.

The most common response was that the respondent did not know or was not sure why they had not applied. The next most common responses were that the respondent was not aware that there was assistance available or that they perceived it to be too much hassle. Figure 19 shows that others did not think they would qualify, forgot, thought the project was too small to be worth applying, or had another reason. Reasons provided by respondents varied by the type of action that they had taken.

**Figure 19. Why Didn't Non-Participants Apply for Assistance from Pacific Power**

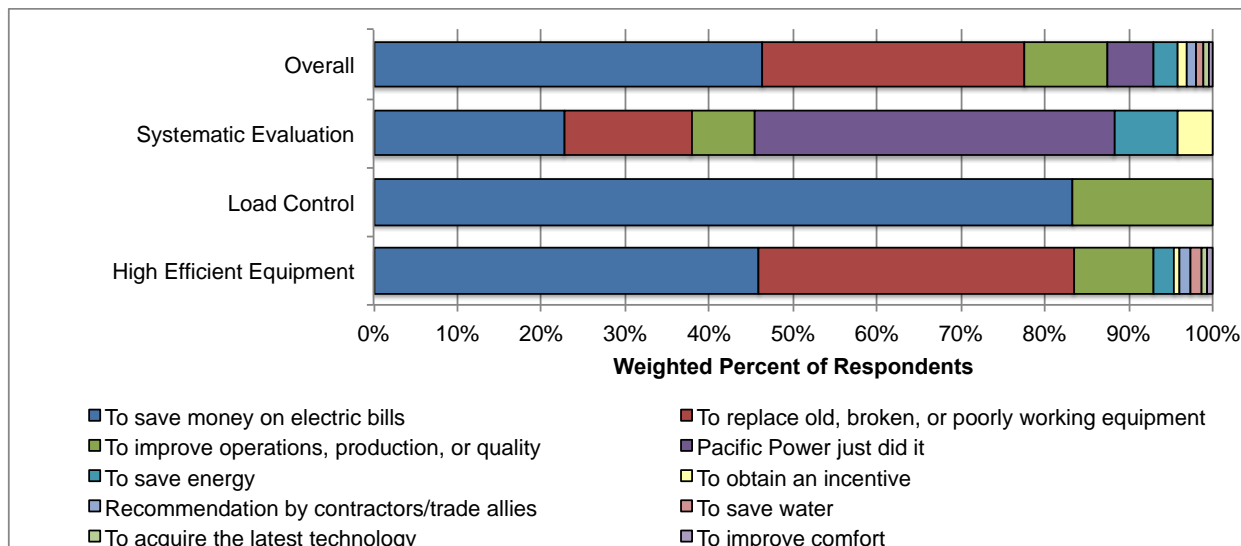




### 5.3.3 Motivations for Pursuing Efficiency Improvements

Non-participants who indicated that their firms installed high efficiency equipment, implemented load control strategies, or undertook systematic evaluations of existing facilities between 2009 and 2011 were asked what motivated them to take that action. Across all three activities, the most frequently cited reasons for making efficiency improvements were “to save money on electric bills” (46 percent of responses overall) and “to replace old, broken, or poorly working equipment” (31 percent of responses overall, as shown in Figure 20.

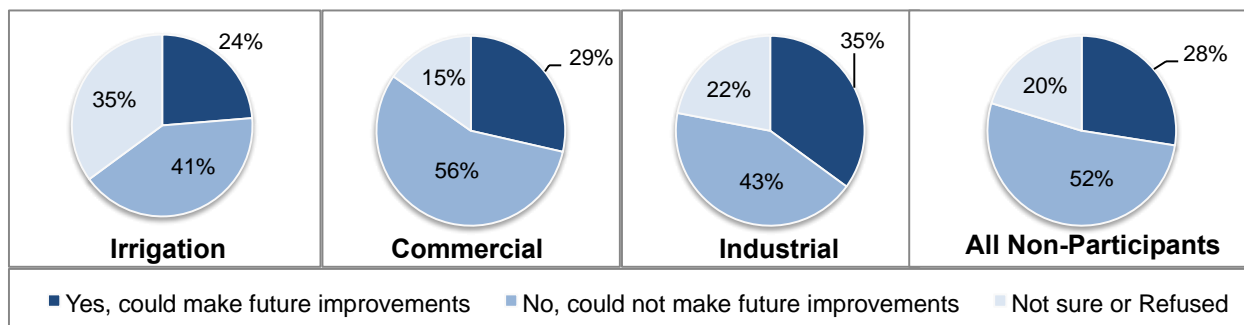
**Figure 20. Non-Participant Motivations for Pursuing Efficiency Improvements**



### 5.3.4 Further Energy Efficiency Opportunities and Barriers

Nearly three-quarters of all non-participants (72 percent) do not believe their firms could take additional steps to increase electric efficiency, as shown in Figure 21. Half (52 percent) expressly stated that they did not believe there were further opportunities while 20 percent were not sure. The portion of non-participants indicating that there were further energy efficiency opportunities their firm could take varied across customer classes – 24 percent of irrigation customers, 29 percent of commercial customers, and 35 percent of industrial customers.

**Figure 21. Non-Participant Indication of Further Energy Efficiency Opportunities**



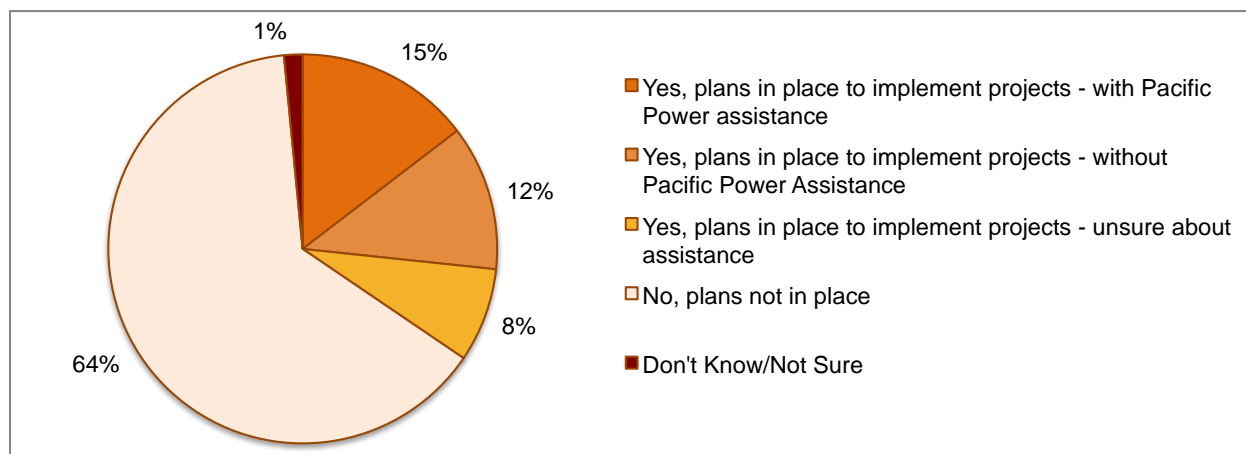
When asked for examples of measures that the responding firms could implement in order to increase electric efficiency, respondents offered the following:



- » Purchase more efficient equipment/appliances/lighting
- » Make upgrades in efficiency of equipment parts
- » Introduce/improve demand management/load control
- » Improve building envelope
- » Conduct/contract for technical assessment or energy analysis
- » Install distributed generation/small-scale renewable energy
- » Improve system and operation processes
- » Improve physical infrastructure (wiring, metering, etc.)

Nearly two-thirds of those respondents across all classes who indicated that they believed their firms could take additional steps to improve electric efficiency did not have plans in place at their firms to implement such projects (see Figure 22). About one-third of respondents indicated that they did have plans in place. Some of those respondents who had plans in place (14 percent of all respondents) stated that assistance from Pacific Power was part of their plans.

**Figure 22. Indication of Plans to Implement Electric Efficiency Projects for Non-Participants who believe their Firm has Further Efficiency Opportunities**



These same non-participants who had indicated they believed their firms could take additional steps to improve electric efficiency were also asked what might prevent them from implementing electric efficiency improvements. The most common potential barrier, noted by 56 percent of all respondents, was “high upfront costs.” Non-participants next most common potential barrier was a “lack of access to capital, noted by 9 percent of respondents. Table 33 shows barriers identified by California non-participants.

**Table 33. Barriers to Implementing Electric Efficiency Improvements**

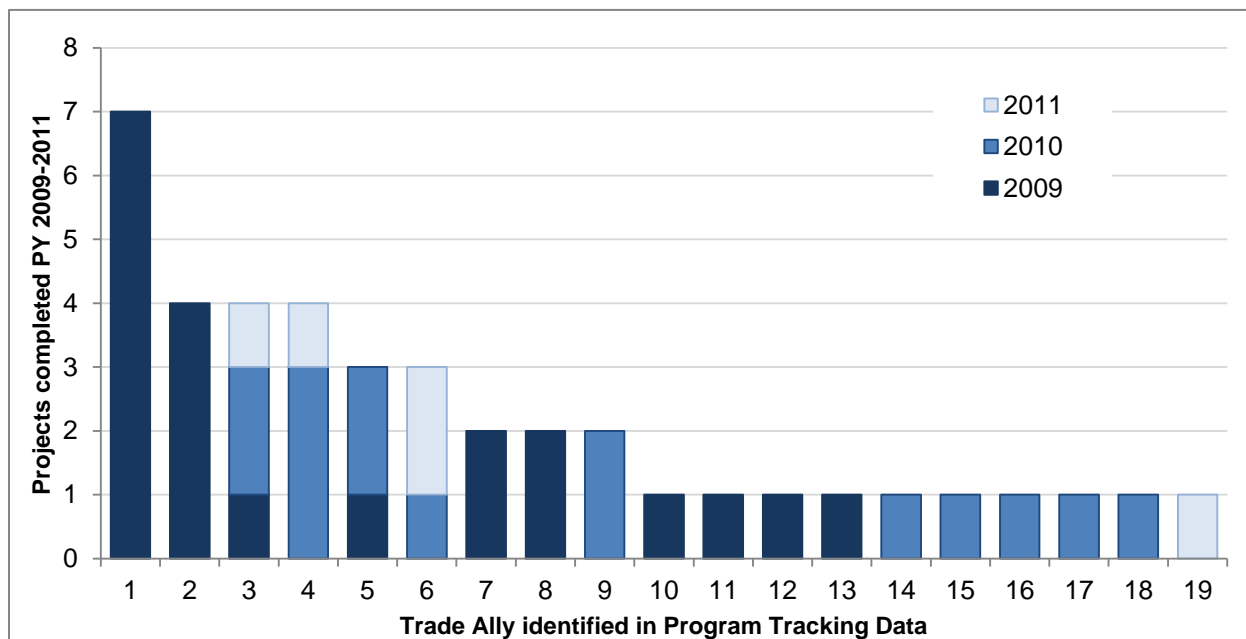
Barrier	Percent of Respondents
High upfront costs	56%
Lack of access to capital	10%
Low priority/Lack of interest of senior management/ building owner	7%
Government/legal permitting/rules	7%
Lack of information about savings and performance	5%
Time/convenience for schedule	3%
Long payback period; slow rate of return	1%
Currently going out of business	1%
Nothing	0%
Don't know/Not sure	9%
Total	100%

#### 5.4 Trade Ally Findings

In July and August of 2012, the evaluation team interviewed 10 vendors and contractors who had signed up to be part of the Energy Efficiency Alliance, including two that performed work in Pacific Power territory in California for projects completed between 2009 and 2011.<sup>43</sup> In the program tracking data, 19 vendors are identified as trade allies and partners on projects in California. More than half of these allies completed just one project, as shown in Figure 23. One of the trade allies completed projects during all three years, three completed projects in two years, and 15 completed projects during just one of the three years. In total, four trade allies completed projects in 2011, compared to 10 in 2010 and 10 in 2009.

<sup>43</sup> Additional trade allies were not interviewed in California because data saturation was reached, and findings did not vary geographically.

**Figure 23. Trade Ally Activity by Vendor 2009-2011**



The findings from interviews with all 10 of the trade allies are provided below related to the following six topics:

- » Overall satisfaction
- » Program awareness and motivation
- » Training, roles, and communication
- » Marketing
- » Customer involvement
- » Effects of the program

**5.4.1 Overall Satisfaction**

Nine of the trade allies interviewed reported being at least somewhat satisfied (three were very satisfied) with their experience with the program and the remaining trade ally was neither satisfied nor dissatisfied.

Trade allies see the program as an opportunity to help customers and have a favorable view of their role in the program. Three trade allies had suggestions for improving the program. These included be more discerning on including firms in the alliance, provide special advantages for allies over other vendors, and provide more frequent contact between program staff and trade allies.

Most trade allies were not able to identify similar programs to compare their experience between FinAnswer Express and others. One trade ally who works with FinAnswer Express and also incentive programs for public utility districts noted that the FinAnswer Express program was, “always the cleanest, simplest, and most straightforward.”

#### **5.4.2 Program Awareness and Motivation**

Trade allies are finding out about the program through several avenues; no particular avenue appears to be the most effective. Two learned directly from the Company, two learned through a customer, three found out about it through word of mouth, and one searched for it. Two trade allies did not remember how they first became aware of the program.

Trade allies are motivated to work with the program because they see it as an opportunity to provide value to their customers. About half of the trade allies described their motivation as a win for all parties: themselves, the customer, and the Company.

#### **5.4.3 Training, Roles, and Communication**

About half of the trade allies interviewed had some kind of training from the Company when they first started working with the alliance. Others had on the job training. Most allies (6 of 10) attend annual workshops, while two indicated that other people in their shop attend. All trade allies indicate that they understand their role in the program.

All trade allies noted that they had a primary contact with the program and they prefer email communications – which they get from their trade ally coordinator contacts. Eight trade allies described communications as good or very good, while two described contact as minimal and would prefer more contact from the program representatives. All 10 of the trade allies agreed that their contact could answer questions that they had or get them to someone who could do so. When asked to rate their satisfaction with their primary contact, four trade allies were somewhat satisfied and six were very satisfied.

#### **5.4.4 Marketing**

Trade allies use the program to market their services to customers. Mostly, this is in the form of letting customers know about the program and associated incentives when discussing project options. The program eligible equipment is often more expensive than the standard equipment, and the incentive can influence customer’s purchasing decision. Trade allies were asked how the program helped their sales. Six trade allies said that the program helped customers choose to buy more premium equipment; one stated that it was hard to tell what drove customer decision-making, and three trade allies said they did not know.

All but one of the trade allies indicated having program-marketing materials, either brochures or other printed materials. Five trade allies indicated that they use these marketing materials to highlight the incentives available on higher efficiency equipment; the other half did not use the marketing materials. Two offered suggestions to improve the program marketing: one would prefer materials that did not highlight a project by a competitor; the other would appreciate inclusion of local trade ally names in radio marketing.

The lighting trade allies all agreed that they, or others at their firm, use the FinAnswer Express lighting tool when selling projects. Most lighting trade allies used the lighting tool to show customers the potential savings from participating in the program, but one trade ally noted that he/she would only use the lighting tool for customers who were interested in the program. The lighting tool output summary helps them sell projects because it is essential to the application for the incentive, but also because it identifies the estimated energy savings and incentive. All but one of the lighting trade allies is happy with the performance of the tool. The trade ally that was not happy with the performance of the lighting

tool prefers to use another spreadsheet tool that he/she used before working with the FinAnswer Express program.

### 5.4.5 Customer Involvement

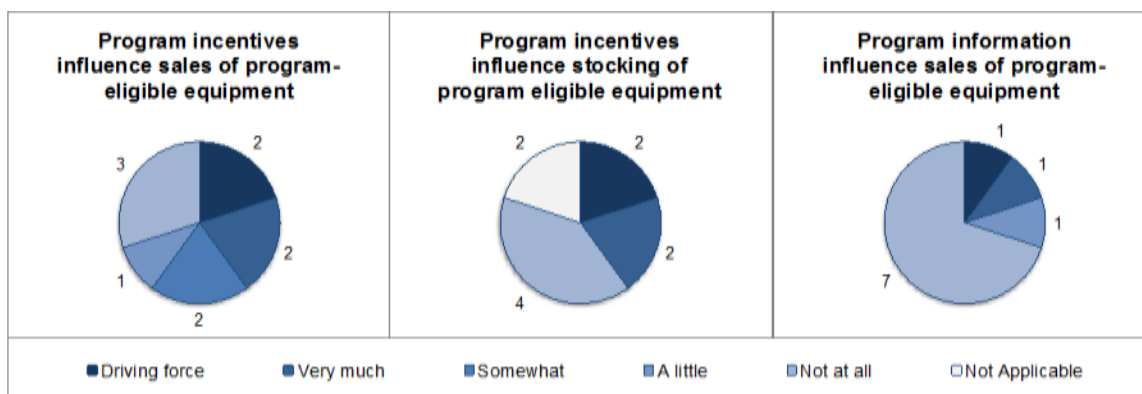
The trade allies state that customers typically find out about the program from them, with about 10 percent to 50 percent of customers have some idea about incentives being available for efficient equipment before they engage the trade ally. Most projects start with the customer contacting the trade ally; however, trade allies note that customers, especially for lighting projects, do not have complete projects in mind. Half of the trade allies indicated that they are able to suggest changes to projects to increase the efficiency of what the customer envisioned. Some technologies do not have a range of efficiencies with which to adjust, such as: automatic milker takeoffs, green motor rewinds, and variable speed pumps.

Trade allies do not identify any differences in their work with customers working with the program and those not working with the program outside of explaining program specific details. Trade allies describe similar sales strategies and customer service actions for both groups. For customers working with the program, trade allies often need to explain the program steps to the participant. Customers mostly ask trade allies about the size of the incentive and how long it will take to get the incentives. Most trade allies also fill out the incentive forms for the customer, so that the customer only needs to add identifying information and sign the form. Only one trade ally identified having challenges in addressing customer concerns towards the program; this trade ally stated that customers find delamping difficult to understand, so he/she will often have to demonstrate the idea by delamping a portion of their facility.

### 5.4.6 Effects of the Program

Trade allies were able to describe the program influence on their activities, as shown in Figure 24. Trade allies find the program incentives most influential, and seven trade allies agreed that the program incentives had influenced their selling of program-eligible equipment. For the eight trade allies who stock equipment, four indicated that the program incentives had influenced their stocking practices. Trade allies do not attribute much influence to program information; seven of 10 trade allies said that the information provided to them by the program did not influence their sales of program-eligible equipment at all.

**Figure 24. Program Influence on Trade Ally Sales and Stocking**



When asked how their sales of program-eligible equipment would change if the FinAnswer Express program did not exist, eight trade allies indicated that sales would decline and two were not sure. Four of the eight indicated that their sales would be dramatically lower, with two of these indicating that their business would be severely diminished or no longer in existence.

The majority of trade allies (7 of 10) indicated that they did not sell any program-eligible equipment in 2011 outside of the program. The three that indicated that they did sell some program-eligible equipment without incentives stated that they were small projects; two trade allies reasoned that customers did not participate because the incentive was not worth the effort of the paperwork while the other did not identify a reason.

Four trade allies noted more program-eligible equipment sold in 2011 than in previous years; one stated that this was due to a large project and another said that their business was growing. When asked about trends over time related to the efficiency of purchases, half of the trade allies indicated greater awareness of energy efficient options, such as LED lighting and variable speed drives. One trade ally summed up the sentiment, “We have two different kinds of customers: Those that want the cheapest product, and those that want the most efficient; we [are] seeing more of the latter now due to increasing efficient options.” The other half had not noticed any trends in purchases.

## 5.5 Overall Process Findings

From May through August 2012, the evaluation team surveyed or interviewed 200 customers: 29 participants, one near participant, 170 non-participants. The evaluation team also interviewed 10 trade allies in the EEA. This section summarizes answers to the research questions for this process evaluation.

The evaluation team sought to answer six process evaluation research questions. These questions are listed here along with short summary answers.

### 1. What are the program goals, concept and design? Are they based on sound theory and practice, and, if not, in what respects?

The FinAnswer Express program in California seeks to improve energy efficiency at commercial, irrigation, and industrial sites. The concept is that providing a quick, prescriptive incentive will help customers overcome cost barriers. The design is indicated in the program logic model in the program overview. The program concept and design are based on sound theory and practice in line with best practices for non-residential incentive program design. These practices include: establishing a trade ally network, making incentive tables available, updating incentives with changes in markets and codes, and having quality control measures in place.<sup>44</sup> Energy savings targets were set for the third party administrators under contract to deliver the program in 2009, 2010, and 2011. The program also had overall energy savings goals in 2011.

### 2. Do program managers and administrators have the resources and capacity to implement the program as planned, and if not, what is needed?

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<sup>44</sup> Quantum Consulting. 2004. National Energy Efficiency Best Practices Study Vol. NR-1 Non-Residential Lighting Best Practices Report. Submitted to California Best Practices Project Advisory Committee.

Yes. Program managers and administrators indicated that they had the resources and capacity to implement the program as planned. Program participants and the near participant did not identify communication delays that might indicate resource or capacity constraints. Participants who sought Pacific Power assistance indicated that the representatives were timely and knowledgeable. Similarly, trade allies indicated that they had a primary program contact to which they could reach out and receive prompt and knowledgeable assistance.

**3. Is the program being delivered as planned, and if not, how and why?**

Mostly, both participants and trade allies describe the program operating as expected from the logic model, and 13 of 16 outcomes from the logic model were positively affirmed during this evaluation. Table 34 lists the program outcomes indicated in the logic model along with findings based on the key indicators and data sources reviewed in the process evaluation (refer to Table 9 for key indicators and data sources).

One outcome that was not affirmed was “trade ally network grows to include more active providers.” The trade ally network has signed on a few new allies from 2009 to 2011--growing from 18 to 20 vendors, and 19 of these vendors completed at least one project from 2009 to 2011. However, more than half of these (10) completed only a single project. In total, four trade allies completed projects in 2011, compared to 10 in 2010 and 10 in 2009. Another outcome that was not affirmed was “achieve peak demand and energy use savings targets;” the program exceeded targets in 2010, but reported savings met 98 percent of savings targets in 2009 and 94 percent in 2011. The other outcome that was not affirmed was “customers are aware of program;” this is discussed in the next question.

**4. Is the program reaching the intended target population, and if not, why? Specifically, are eligible customers aware of the program, how are they becoming aware, and what is the program influence on their actions?**

All C&I customers in California are eligible for the FinAnswer Express program. From 2009 to 2011, there were 88 participating projects from 60 unique customers and two near participant customers from a base of approximately 9,550 customers. This implies an estimated program reach of 0.6 percent of eligible customers (62 out of 9,550).

**Are eligible customers aware of the program?** To understand if eligible customers are aware of the program, the evaluation team relies on non-participant responses. Of a representative sample of eligible non-participants, 42 percent affirmed that they were aware that Pacific Power offers incentives and technical assistance to customers in their class to help them reduce electricity usage. When asked what programs or services were offered to customers in their class, 14 percent of non-participants indicated incentives for high efficient equipment, and one non-participant (<1 percent of non-participants) was specifically aware of FinAnswer Express. The program is not expected to have high name recognition due to the intentional choice by Pacific Power to market the commercial programs as a portfolio and then match customers with the program that best fits their needs. However, low awareness that Pacific Power offers incentives for high efficient equipment may limit participation by eligible customers. Several non-participants (11 percent overall) who took efficient



actions between 2009 and 2011 indicated that they did not seek Pacific Power assistance because they were not aware of programs.<sup>45</sup>

**How are they becoming aware?** Customers who do begin working with the program mostly find out about it from trade allies or directly from Pacific Power representatives, as is expected from the program logic model. The logic model also presumes that customers will learn about the program from advertisements which includes print advertisements in addition to a customer efficiency focused website. One participant heard about the program through an online advertisement, but other advertisement media were not identified by participants. Non-participants indicated that they had heard of Pacific Power programs and services through these channels: TV advertisements (12 percent), print advertisements (9 percent), and the website (8 percent). Note, TV advertising was not included as part of the commercial and industrial marketing campaign from 2009 to 2011, but non-participants are noting this channel. Non-participants indicated preference for mail (22 percent), email (18 percent), and print materials (15 percent) as ways that they prefer to learn about programs. Mailings and print materials are already used to reach out to the customer base, but email is not currently used.

**What is the program influence on their actions?** Participants are influenced by Pacific Power incentives, saving energy, and saving money on energy bills. There is some indication of program influence on participant purchases with the program. While one-third of projects would have been completed within the same year without the program, another third would not have been completed at all, and the other third would have been completed later or would not have had as large of energy savings without the program. There is no quantifiable spillover from the program activity from 2009 to 2011, but there is indication of repeat participation.

**5. What barriers are preventing customers from taking actions to reduce energy consumption and demand, and which jeopardize program cost-effectiveness?**

High costs, cited by one-third of participants and half of responding non-participants was the most common barrier to further customer action to reduce energy consumption and demand. The next most common barrier, cited by 17 percent of participants and 10 percent of non-participants was lack of access to capital. The FinAnswer Express program is designed to help customers overcome the high cost barrier by providing incentives for efficient purchases. There are no programs in place to help customers overcome lack of access to capital.

More telling is the portion of respondents who stated that there were *not* further actions that their firm could take to improve efficiency: half of participants and three-quarters of non-participants. These responses indicated that one barrier might be that the intended target population truly does not have additional energy efficiency actions or is not aware of possible additional actions. Given that they believe there are no other opportunities, it may be a challenge to gain their attention and educate them otherwise.

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<sup>45</sup> According to Pacific Power Energy Efficiency Annual Review documents, the program was advertised in print advertisements seasonally in all three program years; advertising included radio and print advertisements in spring 2009, fall 2009, and throughout 2010 and 2011.

**6. Are participants achieving desired outcomes, and if not, how and why? Specifically, are participants feeling satisfied, keeping their efficient equipment in operation, and being more likely to install efficient equipment without incentives?**

Yes. Participants are mostly satisfied, keeping their equipment in operation, and achieving energy savings as expected based on the program logic model. Both participants and trade allies report very little program-eligible equipment being sold outside of the program.

**Table 34. Program Outcomes and Findings**

Outcome	Finding
<b>Short-term Outcomes</b>	
Trade allies promote the program	Yes, trade ally and participant findings indicate that trade allies promote the program.
Customers are aware of the program	No, only one non-participant was aware of the program specifically, and only 14 percent of non-participants were aware of incentives for equipment. 42 percent affirmed they were aware that Pacific Power offers some kind of assistance.
Customer purchases and installs qualifying measures	Yes, customers indicate installing measures.
Customer receives acknowledgement of application	Yes, neither participants nor near-participants indicated confusion with the status of applications.
Installation of measures verified	Yes, post-installation inspections are occurring according to participants and program tracking data.
Customers receive benefits and have reduced first costs	Yes, participants indicate they find the incentive valuable. Program tracking data include cost-recovery dates.
<b>Mid-term Outcomes</b>	
Trade allies improve business for themselves and increase participation	Yes, trade allies indicate benefits of participating in the EEA.
Reduce kW and/or kWh at customer facility	Yes, most customers indicate that energy savings are meeting expectations.
Customers choose to do more projects to increase energy efficiency	Yes, program-tracking data indicate repeat participation.
<b>Long-term Outcomes</b>	
Trade ally network grows to include more active providers	No, more trade allies have signed on over time (20 in 2011 compared to 18 in 2009), but activity has declined. Just four trade allies completed projects in 2011 compared to 10 in both 2009 and 2010. One ally completed projects in all three years.
Achieve energy use reduction targets	Partially. Savings targets were met in 2010 but not in 2009 (program reported 91 percent of the target) or 2011 (program reported 94 percent of the target).
Customers observe energy cost savings	Yes, most customers indicate that energy savings are meeting expectations.

Outcome	Finding
<b>Short-term Outcomes</b>	
Trade allies promote the program	Yes, trade ally and participant findings indicate that trade allies promote the program.
Customers are aware of the program	No, only one non-participant was aware of the program specifically, and only 14 percent of non-participants were aware of incentives for equipment.
Customer purchases and installs qualifying measures	Yes, customers indicate installing measures.
Customer receives acknowledgement of application	Yes, neither participants nor near-participants indicated confusion with the status of applications.
Installation of measures verified	Yes, post-installation inspections are occurring according to participants and program tracking data.
Customers receive benefits and have reduced first costs	Yes, participants indicate they find the incentive valuable. Program tracking data include cost-recovery dates.
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Trade allies improve business for themselves and increase participation	Yes, trade allies indicate benefits of participating in the EEA.
Reduce kW and/or kWh at customer facility	Yes, most customers indicate that energy savings are meeting expectations.
Customers choose to do more projects to increase energy efficiency	Yes, program-tracking data indicate repeat participation.
<b>Long-term Outcomes</b>	
Trade ally network grows to include more active providers	Yes, more trade allies are active over time. 18 trade allies were listed in the EEA at the end of 2009, and 20 trade allies were listed at the end of 2011.
Achieve peak demand and energy use reduction targets	Partially. Savings targets were met in 2010 but not in 2009 (program reported 91 percent of the target) or 2011 (program reported 94 percent of the target).
Customers observe energy cost savings	Yes, most customers indicate that energy savings are meeting expectations.

## 6. Program Evaluation Recommendations

The evaluation team suggests the following to continue to enhance the efficiency and effectiveness of the FinAnswer Express Program in future program cycles, as well as improve the experience for participants, trade allies, and program staff:

- » **Recommendation 1. Do follow-up reviews with program participants.** This would provide Pacific Power a channel for further program communication, and help to mitigate other program-related issues. Within a year of measure installation and receipt of program incentives, Pacific Power should follow up to discuss satisfaction with the program/technology installed and to update customers on program and technology changes. During site visits, the Evaluation Team noted 5 of 18 lighting sites in which customers had removed, replaced, or disabled rebated lighting due to unknown reasons which could include dissatisfaction with lighting levels, controls, etc. At one lighting site, the customer inquired regarding LED upgrade options eligible for rebates through the FinAnswer Express program. Pacific Power should send short follow up emails to customers to touch base on their satisfaction with the program and recommend new ways to participate in the program. These actions could also help to mitigate issues regarding updated addresses, equipment mismatches, and lack of program awareness. For example, if program contact staff has changed, or customers feel like the equipment installed was not a good match in the end for their needs, it is important for program staff to know in order to modify future offerings for that customer or similar businesses.
- » **Recommendation 2. Utilize email as a marketing strategy, and make a concerted effort to obtain email addresses for all participants, and (more generally) for as many customers as possible.** Non-participants indicated that their three most preferred methods of learning about programs and opportunities from Pacific Power were: email, mail, and Pacific Power printed materials and brochures. However, only printed material and brochures were identified as a common way that non-participants who were aware of Pacific Power program offerings became aware of these programs. The program already sends mailings in the form of newsletters and bill inserts. Extending the campaign to customer email may provide an additional avenue to generate program participation leads. This may also be the most cost-effective method of directly reaching out to the rural California territory. Pacific Power can adapt current marketing materials to email, and point customers to the general energy savings website, <http://www.pacificpower.net/wattsmart>. From there, customers can easily find more information about specific energy savings actions that they can take and services offered by Pacific Power to help them. The outcome should be higher participation rates in programs and potentially lower marketing costs, as email is generally less expensive than mailing printed materials.
- » **Recommendation 3. Develop deeper trade ally relationships.** The program logic indicates that one long-term outcome expected is expansion of active vendors and contractors in the trade ally network. The program has added some vendors and contractors over time: 18 trade allies were listed in the EEA at the end of 2009, and 20 trade allies were listed at the end of 2011. However, this growth indicates little change in numbers since the initial program ramp-up in 2008. Vendors are a critical program delivery mechanism for this post-purchase incentive programs, like FinAnswer Express. Data indicate that only a few of the trade allies completed more than one project. Pacific Power should investigate further what program criteria or ally characteristics led the most active trade allies to keep participating while others did not, and nurture other allies so

they also become active players. When a larger group of trade allies take the time to market the program effectively, program savings will increase.

- » **Recommendation 4. Modify customer-reported operating hours in project files to specify lighting hours, number of holidays, and seasonality. This will help clarify the analysis process and result in better estimates of actual savings.** The current FinAnswer Express application is one of the better designed applications that the Evaluation Team has observed. It collects essential information in a simple and concise manner. However, there is some room for improvement in capturing customer-reported operating hours. The following modifications would clarify the analysis process and create less variation in realization rates in future program cycles:
  - Operation schedules should reflect lighting schedules for specific parts of the building, by lighting group. The hours of operation should specifically reflect the hours that lights are on in a certain schedule group since business hours don't always reflect lighting hours. For example, if the front office is occupied nine hours a day M-F, Pacific Power should ask the customer whether the lights are also on for nine hours a day. Sometimes asking that clarification question will result in drastically different annual operating hours for an area.
  - Instead of asking whether the business is open for major holidays as a yes/no question, Pacific Power should consider asking customers the number of holidays in a year that lights are not operational. For example, a store could be closed for Thanksgiving but open on Christmas and New Year's Day.
  - When listing the hours of operation, Pacific Power should add two more "Hours of Operation" matrices to reflect changes in operating hours due to seasonality. For example, an elementary school might run on one schedule for most of the year, except for three months in the summer when only half the lights are on. This seasonality adjustment allows for a more accurate characterization of annual operating hours.

# Final Evaluation Report for California's FinAnswer Express Program (PY 2009-2011)

## APPENDICES

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January 28, 2013

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## Appendix A. Closed Facilities Savings Calculation Methodology

**To:** Shawn Grant, Esther Giezendanner; PacifiCorp

**From:** Kevin Cooney, Matt Haakenstad, and Mohit Singh-Chhabra; Navigant Consulting

**Date:** October 17, 2012

**Re:** Program Evaluated Savings Presentation Methodology

### ***Introduction***

This memorandum presents a proposed methodology to calculate evaluated energy savings realization rates and evaluated lifetime energy savings for programs where the evaluation team found facilities that were closed/ not operational at the time of the evaluation.

For facilities that were found to be closed at the time of the evaluation, Navigant will calculate first year energy savings. First year energy savings represent the annual energy savings that the project achieved before the facility was closed down. This first year energy and demand savings will be used to calculate realization rates for the program. Cost effectiveness tests will be calculated based on lifetime savings for all evaluated projects; lifetime savings will take into account the time period for which closed facilities savings were realized in facilities that closed down.

### ***Methodology***

#### **Energy and Demand Savings Realization Rate Calculation**

Navigant will evaluate projects in facilities that were found to be closed at the time of evaluation by calculating the first year energy savings that were realized by the project prior to facility closure. These savings will be referred to as *first year* savings.

To evaluate first year savings for projects with closed facilities, Navigant will conduct the following steps:

- Identify the estimated date of closure for the facility in question through facility billing data
- Conduct an engineering review of the submitted project files.
- Review customer specific monthly electric billing data and if possible, use billing data to calculate evaluated savings
- Navigant will take partial year operation into account for plants which close in the same year project was implemented while calculating first year savings.
- The evaluated savings for these facilities will be clearly labeled as first year savings in the evaluation reports.

Projects in facilities that were operational at the time of the evaluation will be evaluated based on data collected on-site.

Hence,

$$\text{Total Program Evaluated Savings} = \text{EESO} + \text{EESC}$$

Where,

*EESO* = Evaluated savings of projects in facilities that are still operational at time of evaluation



*EESC* = Evaluated first year savings for facilities that were closed at time of evaluation

**Lifetime Energy Savings Calculation for Cost Effectiveness**

Cost effectiveness tests require evaluated lifetime savings of measures installed as an input. To calculate lifetime savings attributable to PacifiCorp’s programs, Navigant will do the following:

- For projects in facilities that were operational at the time of the evaluation, lifetime savings are the product of evaluated savings and the EUL (Effective Useful Life) of the measure.
- For projects in facilities that were closed at the time of the evaluation, lifetime savings equal the product of evaluated first year savings and the time period for which the facility was operating after the project was installed.

*Evaluated Lifetime Savings* = (*EUL* \* *EESO*) + (*TP* \* *EESC*) for cumulative savings cost effectiveness

Where,

*EUL* = Effective Useful Life of the project being evaluated

*EESO* = Evaluated savings of projects in facilities that are still operational at time of evaluation

*TP* = Time Period from project installation through which the facility being evaluated was still operating

*EESC* = Evaluated first year savings for facilities that were closed at time of evaluation

These Evaluated Lifetime Savings represent the sample of projects evaluated. These will then be extrapolated to the population to represent program level lifetime savings.

## Appendix B. Glossary of Frequently-Used Evaluation Terms

### B.1 Glossary<sup>1</sup>

**Adjustments:** For M&V analyses, factors that modify baseline energy or demand values to account for independent variable values (conditions) in the reporting period.

**Allowances:** Allowances represent the amount of a pollutant that a source is permitted to emit during a specified time in the future under a cap and trade program.. Allowances are often confused with credits earned in the context of project-based or offset programs, in which sources trade with other facilities to attain compliance with a conventional regulatory requirement. Cap and trade program basics are discussed at the following EPA Web site: <<http://www.epa.gov/airmarkets/cap-trade/index.html>>.

**Assessment boundary:** The boundary within which all the primary effects and significant secondary effects associated with a project are evaluated.

**Baseline:** Conditions, including energy consumption and related emissions, that would have occurred without implementation of the subject project or program. Baseline conditions are sometimes referred to as “business-as-usual” conditions. Baselines are defined as either project-specific baselines or performance standard baselines.

**Baseline period:** The period of time selected as representative of facility operations before the energy efficiency activity takes place.

**Bias:** The extent to which a measurement or a sampling or analytic method systematically underestimates or overestimates a value.

**Co-benefits:** The impacts of an energy efficiency program other than energy and demand savings.

**Coincident demand:** The metered demand of a device, circuit, or building that occurs at the same time as the peak demand of a utility’s system load or at the same time as some other peak of interest, such as building or facility peak demand. This should be expressed so as to indicate the peak of interest (e.g., “demand coincident with the utility system peak”) Diversity factor is defined as the ratio of the sum of the demands of a group of users to their coincident maximum demand. Therefore, diversity factors are always equal to one or greater.

**Comparison group:** A group of consumers who did not participate in the evaluated program during the program year and who share as many characteristics as possible with the participant group.

**Confidence:** An indication of how close a value is to the true value of the quantity in question. Confidence is the likelihood that the evaluation has captured the true impacts of the program within a certain range of values (i.e., precision).

---

<sup>1</sup> Glossary definitions are provided to assist readers of this report, and are adapted from the Model Energy Efficiency Program Impact Evaluation Guide, US Environmental Protection Agency, November 2007.

**Cost-effectiveness:** An indicator of the relative performance or economic attractiveness of any energy efficiency investment or practice. In the energy efficiency field, the present value of the estimated benefits produced by an energy efficiency program is compared to the estimated total costs to determine if the proposed investment or measure is desirable from a variety of perspectives (e.g., whether the estimated benefits exceed the estimated costs from a societal perspective).

**Database for Energy-Efficient Resources (DEER):**

A California database designed to provide well-documented estimates of energy and peak demand savings values, measure costs, and effective useful life.

**Demand Side Management (DSM):** See “Energy efficiency.”

**Deemed savings:** An estimate of an energy savings or energy-demand savings outcome (gross savings) for a single unit of an installed energy efficiency measure that (a) has been developed from data sources and analytical methods that are widely considered acceptable for the measure and purpose and (b) is applicable to the situation being evaluated.

**Demand:** The time rate of energy flow. Demand usually refers to electric power measured in kW (equals kWh/h) but can also refer to natural gas, usually as Btu/hr, kBtu/ hr, therms/day, etc.

**Direct emissions:** Direct emissions are changes in emissions at the site (controlled by the project sponsor or owner) where the project takes place. Direct emissions are the source of avoided emissions for thermal energy efficiency measures (e.g., avoided emissions from burning natural gas in a water heater).

**Effective Useful Life (EUL):** An estimate of the median number of years that the efficiency measures installed under a program are still in place and operable.

**Energy efficiency:** The use of less energy to provide the same or an improved level of service to the energy consumer in an economically efficient way; or using less energy to perform the same function. “Energy conservation” is a term that has also been used, but it has the connotation of doing without a service in order to save energy rather than using less energy to perform the same function. Demand Side Management (DSM) is also frequently used to refer to actively-managed energy efficiency initiatives.

**Energy Efficiency Measure (EEM):** A permanently installed measure which can improve the efficiency of the Customer's electric energy use.

**Engineering model:** Engineering equations used to calculate energy usage and savings. These models are usually based on a quantitative description of physical processes that transform delivered energy into useful work such as heat, lighting, or motor drive. In practice, these models may be reduced to simple equations in spreadsheets that calculate energy usage or savings as a function of measurable attributes of customers, facilities, or equipment (e.g., lighting use = watts × hours of use).

**Error:** Deviation of measurements from the true value.

**Evaluation:** The performance of studies and activities aimed at determining the effects of a program; any of a wide range of assessment activities associated with understanding or documenting program performance, assessing program or program-related markets and market operations; any of a wide range

of evaluative efforts including assessing program-induced changes in energy efficiency markets, levels of demand or energy savings, and program cost-effectiveness.

**Evaluation, Measurement and Verification (EM&V):** Data collection, monitoring, and analysis associated with the calculation of gross and net energy and demand savings from individual sites or projects which is performed in conjunction with a program or portfolio evaluation (see Evaluation).

**Evaluated savings estimate:** Savings estimates reported by an evaluator after the energy impact evaluation has been completed. Often referred to as *Ex Post Savings* (From the Latin for “from something done afterward.”)

**Free driver:** A non-participant who has adopted a particular efficiency measure or practice as a result of the evaluated program.

**Free rider:** A program participant who would have implemented the program measure or practice in the absence of the program. Free riders can be total, partial, or deferred.

**Gross savings:** The change in energy consumption and/or demand that results directly from program-related actions taken by participants in an efficiency program, regardless of why they participated.

**Impact evaluation:** An evaluation of the program-specific, directly induced changes (e.g., energy and/or demand usage) attributable to an energy efficiency program.

**Independent variables:** The factors that affect energy use and demand, but cannot be controlled (e.g., weather or occupancy).

**Interactive factors:** Applicable to IPMVP Options A and B; changes in energy use or demand occurring beyond the measurement boundary of the M&V analysis.

**Load shapes:** Representations such as graphs, tables, and databases that describe energy consumption rates as a function of another variable such as time or outdoor air temperature.

**Market effect evaluation:** An evaluation of the change in the structure or functioning of a market, or the behavior of participants in a market, that results from one or more program efforts. Typically the resultant market or behavior change leads to an increase in the adoption of energy-efficient products, services, or practices.

**Market transformation:** A reduction in market barriers resulting from a market intervention, as evidenced by a set of market effects, that lasts after the intervention has been withdrawn, reduced, or changed.

**Measurement:** A procedure for assigning a number to an observed object or event.

**Measurement and Verification (M&V):** Data collection, monitoring, and analysis associated with the calculation of gross energy and demand savings from individual sites or projects. M&V can be a subset of program impact evaluation.

**Measurement boundary:** The boundary of the analysis for determining direct energy and/or demand savings.

**Metering:** The collection of energy consumption data over time through the use of meters. These meters may collect information with respect to an end-use, a circuit, a piece of equipment, or a whole building (or facility). Short-term metering generally refers to data collection for no more than a few weeks. End-use metering refers specifically to separate data collection for one or more end-uses in a facility, such as lighting, air conditioning or refrigeration. Spot metering is an instantaneous measurement (rather than over time) to determine an energy consumption rate.

**Monitoring:** Gathering of relevant measurement data, including but not limited to energy consumption data, over time to evaluate equipment or system performance, e.g., chiller electric demand, inlet evaporator temperature and flow, outlet evaporator temperature, condenser inlet temperature, and ambient dry-bulb temperature and relative humidity or wet-bulb temperature, for use in developing a chiller performance map (e.g., kW/ton vs. cooling load and vs. condenser inlet temperature).

**Net savings:** The total change in load that is attributable to an energy efficiency program. This change in load may include, implicitly or explicitly, the effects of free drivers, free riders, energy efficiency standards, changes in the level of energy service, and other causes of changes in energy consumption or demand.

**Net-to-gross ratio:** A factor representing net program savings divided by gross program savings that is applied to gross program impacts to convert them into net program load impacts.

**Non-participant:** Any consumer who was eligible but did not participate in the subject efficiency program, in a given program year. Each evaluation plan should provide a definition of a non-participant as it applies to a specific evaluation.

**Normalized annual consumption (NAC) analysis:** A regression-based method that analyzes monthly energy consumption data.

**Participant:** A consumer that received a service offered through the subject efficiency program, in a given program year. The term “service” is used in this definition to suggest that the service can be a wide variety of services, including financial rebates, technical assistance, product installations, training, energy efficiency information or other services, items, or conditions. Each evaluation plan should define “participant” as it applies to the specific evaluation.

**Peak demand:** The maximum level of metered demand during a specified period, such as a billing month or a peak demand period.

**Persistence study:** A study to assess changes in program impacts over time (including retention and degradation).

**Portfolio:** Either (a) a collection of similar programs addressing the same market (e.g., a portfolio of residential programs), technology (e.g., motor efficiency programs), or mechanisms (e.g., loan programs)

or (b) the set of all programs conducted by one organization, such as a utility (and which could include programs that cover multiple markets, technologies, etc.).

**Potential studies:** Studies conducted to assess market baselines and savings potentials for different technologies and customer markets. Potential is typically defined in terms of technical potential, market potential, and economic potential.

**Precision:** The indication of the closeness of agreement among repeated measurements of the same physical quantity.

**Primary effects:** Effects that the project or program are intended to achieve. For efficiency programs, this is primarily a reduction in energy use per unit of output.

**Process evaluation:** A systematic assessment of an energy efficiency program for the purposes of documenting program operations at the time of the examination, and identifying and recommending improvements to increase the program’s efficiency or effectiveness for acquiring energy resources while maintaining high levels of participant satisfaction.

**Program:** A group of projects, with similar characteristics and installed in similar applications. Examples could include a utility program to install energy-efficient lighting in commercial buildings, a developer’s program to build a subdivision of homes that have photovoltaic systems, or a state residential energy efficiency code program.

**Project:** An activity or course of action involving one or multiple energy efficiency measures, at a single facility or site.

**Rebound effect:** A change in energy-using behavior that yields an increased level of service and occurs as a result of taking an energy efficiency action.

**Regression analysis:** Analysis of the relationship between a dependent variable (response variable) to specified independent variables (explanatory variables). The mathematical model of their relationship is the regression equation.

**Reliability:** Refers to the likelihood that the observations can be replicated.

**Remaining Useful Life (RUL):** An estimate of the remaining number of years that a technology being replaced under an early retirement program would have remained in place and operable. Accurate estimation of the RUL is important in determining lifetime program savings and cost effectiveness.

**Reported savings estimate:** Forecasted savings used for program and portfolio planning purposes. Often referred to as *Ex Ante Savings* (From the Latin for “beforehand.”)

**Reporting period:** The time following implementation of an energy efficiency activity during which savings are to be determined.

**Resource acquisition program:** Programs designed to directly achieve energy and or demand savings, and possibly avoided emissions

**Retrofit isolation:** The savings measurement approach defined in IPMVP Options A and B, and ASHRAE Guideline 14, that determines energy or demand savings through the use of meters to isolate the energy flows for the system(s) under consideration.

**Rigor:** The level of expected confidence and precision. The higher the level of rigor, the more confident one is that the results of the evaluation are both accurate and precise.

**Spillover:** Reductions in energy consumption and/or demand caused by the presence of the energy efficiency program, beyond the program-related gross savings of the participants. There can be participant and/or nonparticipant spillover.

**Statistically adjusted engineering (SAE) models:** A category of statistical analysis models that incorporate the engineering estimate of savings as a dependent variable.

**Stipulated values:** See “deemed savings.”

**Takeback effect:** See “rebound effect.”

**Uncertainty:** The range or interval of doubt surrounding a measured or calculated value within which the true value is expected to fall within some degree of confidence.

## Appendix C. Net Savings Methodology

### *C.1 Measurement of Net Savings Memo – January 27, 2012*

To: Shawn Grant, Esther Giezendanner, PacifiCorp  
 From: Kevin Cooney, Matt Haakenstad, and Mike Yim, Navigant; Ellen Steiner, Jess Chandler, and Jeremy Kraft, Energy Market Innovations, Inc  
 Date: January 27, 2012  
 Subject: Measurement of Net Savings

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This memorandum provides context and suggested approaches for estimating net savings so that the team can decide whether to move forward with this approach or continue to make changes.

Estimation of net savings attempts first to assess program influence on the participants' decision to implement an energy efficiency project. This estimation includes an examination of the program's influence on three key characteristics of the decision related to the project: timing, scope, and extent. Measurement of net savings then attempts to estimate program influence on the broader market with respect to non-program actions (free-ridership and spillover). These two efforts are combined for an overall estimate of net savings. First, the previous method is briefly described for context followed by our proposed method moving forward.

#### *Previous method for measurement*

The approach used in past evaluations for estimating program influence consisted of presenting program participants a battery of six core questions, used in combination, to derive free-ridership scores included in net-to-gross calculations. The six core questions were:

- Would the participant have installed the equipment without the program?
- Had the participant already ordered or installed the equipment before learning about the program?
- Would the participant have installed the equipment to the same level efficiency without the program incentive?
- Would the participant have installed the same quantity of equipment without the program?
- In absence of the program, when would the participant have installed the equipment; were they planning to install the equipment in the same year?
- Was the equipment included in the participant's most recent capital budget?

Responses to these survey questions were evaluated using a scoring matrix (for an example of this matrix see Appendix G.1 in Final Evaluation Report For Wyoming's FinAnswer Express Program<sup>2</sup>) to

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<sup>2</sup> Navigant and EMI. *Final Evaluation Report For Wyoming's FinAnswer Express Program*. Prepared for Rocky Mountain Power. October 25, 2011.



determine each participant’s free-ridership score. Spillover was not quantitatively assessed in past evaluations.

### ***Reasons for proposing a new method***

Though a consistent net savings estimation technique across programs is desirable to ensure comparability, our experience with the previous method provided several “lessons learned.” Based on this experience, we believe a more rigorous approach is advisable and that the benefits of improved validity outweigh the benefits of a consistent methodology between program years.

The changes recommended result in a more granular and holistic approach to assessing program influence. First, the previous method did not adjust the questions to get meaningful responses by measure type from the participants. This absence was particularly apparent on large custom projects, such as Energy FinAnswer. For Wyoming, the savings by measure could be accomplished only for lighting, and for previous evaluations, no attempt was noted in the reports to attempt to describe net savings by measure. Also, our methodology did not include any estimation of spillover savings attributed to the program and only assessed free-ridership. The absence of spillover in our net savings estimation results in a conservative estimate of program impacts.

Our recommended changes to the free-ridership battery are based on recent research conducted in Massachusetts on best practices in free-ridership and spillover estimation techniques<sup>3</sup>. This research is not only timely, but it has also been rigorously reviewed. The report was created by a team of experienced evaluators (Tetra Tech, KEMA, and NMR) and reviewed by program staff at eight utilities operating in Massachusetts including National Grid and NSTAR, two of the largest investor-owned utilities in New England both with long histories of energy efficiency programs. Members of the PacifiCorp’s evaluation team were integral to both the development and implementation of these methodologies in 2007, 2009, and again in 2011. Implementing these recommendations provide the following benefits to the evaluation:

- Targeted questions improve internal validity of free-ridership estimates.
- The methodology creates a calculated estimate of free-ridership savings compared with the scored estimate previously used.

In addition to estimating program free-ridership, we also recommend that the evaluation quantitatively assess participant spillover. As programs mature and transform their target market, quantifying spillover allows for evaluators to recognize the programs’ market effects<sup>4</sup>. Spillover savings can be classified into two categories based on measure types: “like” spillover and “unlike” spillover.

- “Like” spillover savings are the 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 PacifiCorp but influenced by program activity. This type of spillover is quantifiable using program tracking savings as a proxy.

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<sup>3</sup> Tetra Tech, KEMA, and NMR. *Cross-Cutting C&I Free-Ridership and Spillover Methodology Study Final Report*. Prepared for the Massachusetts Program Administrators. April 18, 2011.

<sup>4</sup> Saxonis, William P. New York State Department of Public Service. *Free-Ridership and Spillover: A Regulatory Dilemma*. IEPEC. 2007

Historically, spillover results in a small portion of the overall program attribution (in the Massachusetts studies cited above, it represented 8.8 percent of the overall attribution score).

- “Unlike” spillover savings are 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 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.

Spillover savings can come from participants, who are influenced by their program participation to conduct further energy efficiency improvements, known as “participant” spillover. Spillover questions can be added to the participant surveys conducted for projects completed at least 6 months prior. Asking participants who have just completed a project with the program about spillover from that program may not be productive, since participants are unlikely to have the opportunity to install any spillover measures.

Spillover savings can also come from non-participants. Non-participants may be influenced by program advertisements or other program actions (like contractor training, upstream buy-downs, etc.) and make energy efficiency improvements without assistance from any program. This is known as “non-participant” spillover. Non-participant spillover can be most easily quantified by interviewing participating vendors and other supply chain actors. During these interviews, the evaluation team can assess the amount of measure adoption that occurred outside of the program compared to what occurred through the program. Again, using program-tracking data as a proxy, we can estimate outside sales. This estimate of outside sales will capture both “like” and “unlike” spillover savings. We will remove “like” spillover estimates as reported by participants to avoid double-counting.

### *Limitations*

There are limitations with our proposed changes (these limitations were also present in our previous methodology). Our participant estimates are still limited to self-reported responses to a hypothetical situation (i.e., what would have happened absent the program). However, we feel that proper survey design and fielding protocols can mitigate the problems associated with self-report<sup>5,6</sup> In addition, without detailed market level baseline data, the self-report methodology is still the most appropriate and cost-effective way to estimate program influence at the detail needed to assist in program design<sup>7</sup>. Likewise, our experience in Wyoming indicated that it was not fruitful or cost-effective to review project file text for the purposes of enhancing the self-reported responses.

Figure 1 illustrates the adjustment steps taken when evaluating net savings. In contrast with the gross savings, which usually can be directly measured with instrumentation, the adjustments made to reach net savings are measured indirectly. This is important to keep in mind as the farther from the actual measure we get, the less precise findings can be.

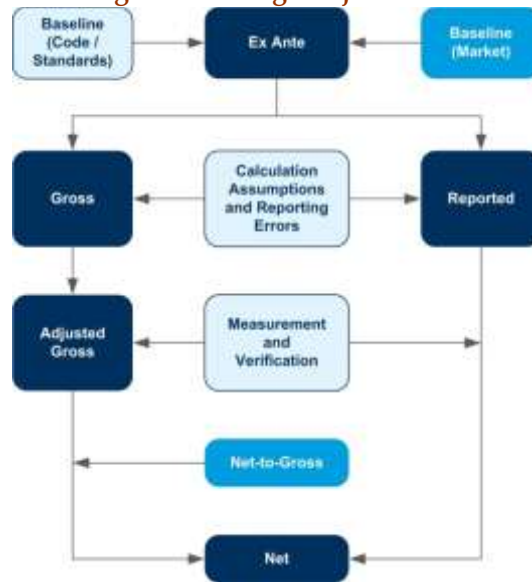
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<sup>5</sup> Keating, Kenneth M., PhD. Free-Ridership Borscht: Don’t Salt the Soup. IEPEC. 2009

<sup>6</sup> Megdal, Lori, Megdal & Associates, LLC, Yogesh Patil, Energy & Resource Solutions, Inc., Cherie Gregoire and Jennifer Meissner, New York State Energy Research and Development Authority, and Kathryn Parlin, West Hill Energy & Computing, Inc. Feasting at the Ultimate Enhanced Free-Ridership Salad Bar. IEPEC. 200

<sup>7</sup> National Action Plan for Energy Efficiency (2007). Model Energy Efficiency Program Impact Evaluation Guide. Prepared by Diane Munns and Jim Rogers. <[www.epa.gov/eeactionplan](http://www.epa.gov/eeactionplan)>

**Figure 1. Savings Adjustments**



For illustration purposes, consider a participant in the FinAnswer Express program:

A participant installs a variable frequency drive on a fan motor with the program and gets an incentive. The program and evaluators can measure the energy consumed by the new variable frequency drive either directly, depending on configuration, or based on the hours it is observed to be operating and its features. This consumption is compared to a baseline estimate of what would have been consumed by a direct drive in the same case. There is high confidence that the savings are accurate.

Then, the evaluators ask the participant if they would have installed the same variable frequency drive at the same time without the incentive; the participant can consider whether the previous drive needed to be replaced at the same time and the relative costs to decide what might have happened. Then, the evaluators ask the participant if they installed any other variable frequency drives since participating in the program and how much the program influenced their choice; the participant can consider the time frame of installation and determine (probably more easily with this equipment type than some others) if something similar was installed.

Exploring still further, the evaluators ask the participant if they installed any other efficient equipment – now the participant has to think about the time frame and relative efficiencies of any equipment purchased since the program involvement. When asked how influential the program was on these purchases, the participant is expected to think through many decisions.

As a thought exercise, we can imagine that gross savings for a program and measure type are estimated to be 100 kWh. Based on participant responses, the free-ridership ratio is estimated to be 20%; the sample was random and drawn to meet 90% confidence and 10% precision, so the range of this estimate is 18% to 22%. Of all the possible spillover, only “like” spillover can be quantitatively assessed, and it is estimated to be 10% with the same confidence and precision leading to an estimate of 9% to 11%. The

unlike participant spillover questions revealed that participants are more likely to install efficient unlike equipment than like equipment and attribute it to program influence, and market allies confirm that they are seeing activity outside of the program.

These adjustments result in net savings of 90 kWh with a range of 87 kWh to 93 kWh. However, these numbers cannot capture the other spillover that we can only qualitatively assess. We may say we think it is closer to the higher number because participant and market ally responses reflect additional program influence, but this is a subjective assessment and may not be appropriate given the need for defensible savings estimates. In some cases, we may find high free-ridership responses and not identify any quantifiable “like” spillover even if much unquantifiable spillover can be described. In these cases, reporting net savings may reflect poorly on the actual program influence.

Though this method provides net savings that are much less precisely estimated than the gross savings, we feel that, given the design of the PacifiCorp programs, it is the most cost-effective and consistent method to assess program attribution.

### ***Proposed method for measurement***

This section includes brief recommendations for measuring free-ridership and spillover to get to a net savings estimate.

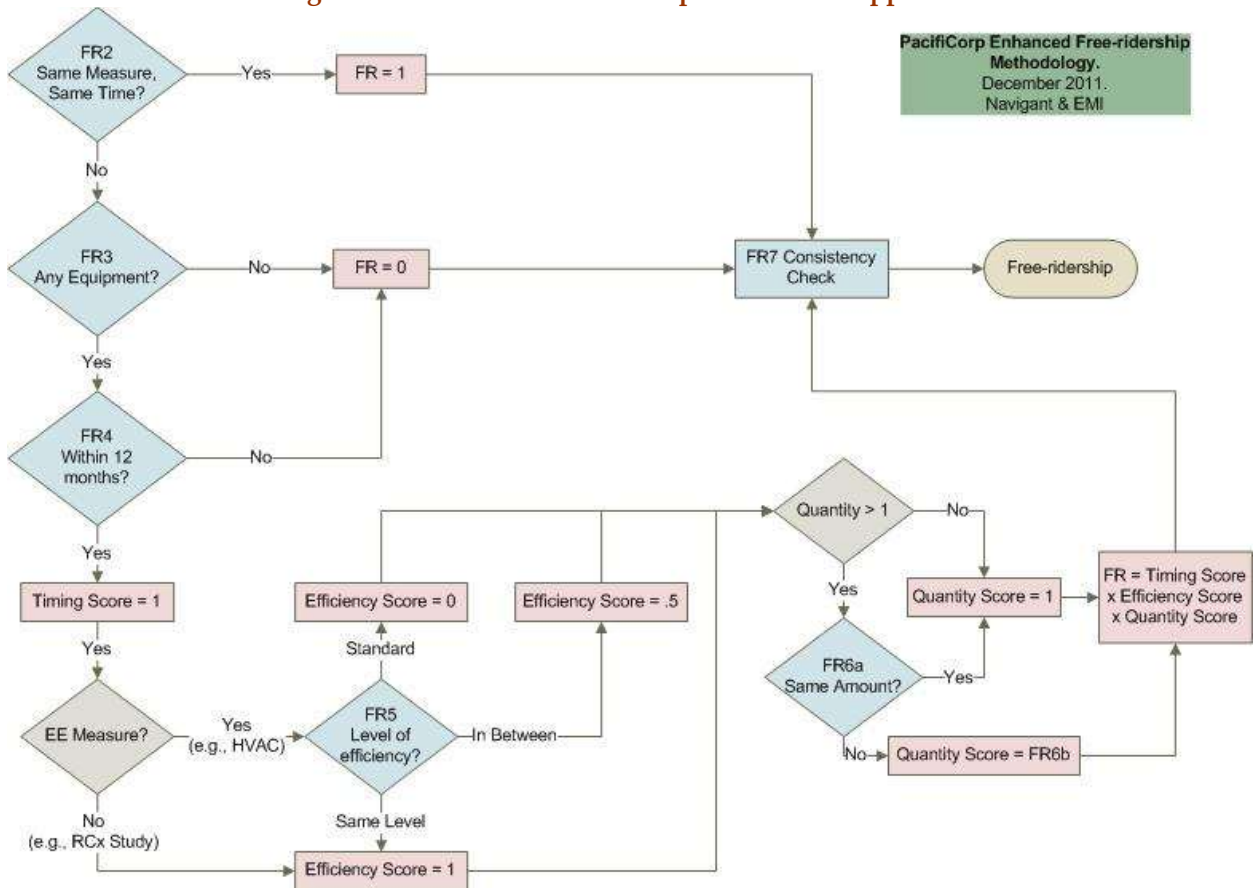
#### ***Free-ridership***

To improve the test of the counterfactual (i.e., what would have the participant done without the assistance of the program), we recommend more targeted free-ridership questions. As a start, we recommend refining the initial free-ridership question (Would the participant have installed the equipment without the program?). This question would be altered to include “at the same time” to clarify the timing component of the decision. It would also be preceded by a brief description of all the assistance the customer received as part of their participation in the program (e.g., technical design assistance, the amount of any monetary incentives, any program-subsidized financing). This description would be customized by program and by project (as data are available). This description is intended to remind the participant of all the ways the program may have influenced their decision to move forward with a specific project.

Then, we recommend asking targeted questions about quantity and efficiency of equipment that would have been installed (or actions that would have been taken) without the program while referencing what the participant did with the program.

Including these revisions in the free-ridership battery will allow the evaluation team to use a calculation approach to estimating the amount of energy savings that may have occurred without the program. This approach is detailed in Figure 2 below.

**Figure 2. Enhanced Free-ridership Calculation Approach**



PacifiCorp Enhanced Free-ridership Methodology. December 2011. Navigant & EMI

Based on the participant’s responses, the team can estimate the percentage of equipment that would have been installed at the same time without the program (the quantity score) and the percentage of that installed equipment that would have been high efficiency equipment (the efficiency score)<sup>8</sup>. The product of these two estimates is the initial free-ridership ratio.

$$\text{Free-Ridership Ratio} = \text{Quantity Score} \times \text{Efficiency Score}$$

For example, a participant that installed four high efficiency HVAC units through the program reports that, without the program, they would have not installed the same measures at the same time. Following up, the respondent states they would have installed some equipment and it would have been installed within 12 months. When probed about the level of efficiency of the equipment that would have been installed absent the program, the participant reports that they would have installed equipment that was more efficient than baseline but not as efficient as the program-eligible equipment. Finally, they report they only would have installed one unit (instead of four). Using the scoring above, this participant’s efficiency score would be set to 0.5 and the quantity score would be set to 0.25. Their initial, unadjusted

<sup>8</sup> Question text will be altered for projects where quantity is not applicable. For example, if a project consisted of the installation of an EMS, the quantity question would be skipped.

free-ridership score is then the product<sup>9</sup> of these two scores or 0.125. This figure indicates that 12.5 percent of the savings attributed to this project would have occurred absent the program.

This ratio can then be adjusted by the responses to other questions already referenced in the battery. These include any reported changes in the timing of projects as a result of the program and the reported influence of various factors on the decision to install the equipment. These adjustments are not detailed in this document, as they will be tailored to individual program design. As part of these adjustments, we recommend that the list of factors be expanded to include “other PacifiCorp program participation.” This addition will allow evaluators to adjust free-ridership based on PacifiCorp’s portfolio level outreach efforts. For example, if a participant received sequential incentives from two different PacifiCorp programs, his or her participation in the first program may have increased their awareness of the secondary program. In this situation, their responses to free-ridership questions regarding the secondary program may present this participant as a free-rider. In this situation, we can use the responses to the influence questions to assess if the secondary project was influenced by PacifiCorp actions from another program. If so, PacifiCorp should receive attribution for those savings and free-ridership would be adjusted downward.

This methodology requires several adjustments when applied to programs that offer custom incentives or to programs that utilize unique mechanisms to achieve savings. First, the self-report survey should include complete and accurate descriptions of what measures were implemented as part of custom projects. Also, as custom programs often work with participants to implement a variety of end-uses under the “custom” umbrella, custom projects should be evaluated holistically and not at the end-use level. Similarly, unique programs may require additional refinements to question wording. For example, when assessing a recommissioning program, the interview may seek to assess the decision to conduct the initial project study instead of the decision to implement the energy-saving opportunities identified. Finally, for complex or large projects, the self-reported estimate can be verified by a review of project documentation (if available) and follow-up interviews with the contractors associated with the project. These additional steps can be costly and should only be considered when the savings of the project make up a significant portion of the program’s overall savings or contractor outreach is a significant part of the program design.

As an example, we provide recommended free-ridership questions for the Energy FinAnswer program in Figure 3.

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<sup>9</sup> This multiplicative approach is appropriate as the score is the result of a product of the quantity installed and not a product of probabilities (Keating. *Free-Ridership Borscht: Don’t Salt the Soup*. IEPEC. 2009).



**Figure 3. Free Ridership Battery Extract from Energy FinAnswer Survey DRAFT<sup>10</sup>**

...[READ: “With the Energy FinAnswer program, FIRM received technical assistance and financial incentives. FIRM installed LIST\_MEASURES with the program.”  
 REPEAT FOR EACH MEASURE\_TYPE\_# LISTED UP TO 2.  
 READ: “For these next questions, please focus on MEASURE\_TYPE\_# which includes MEASURE\_TYPE\_#\_INST for your project.”]

FR2. Without the program, meaning without either the technical assistance or the financial incentive, would you have still installed the exact same MEASURE\_TYPE\_# at the same time?  
 [IF 1=YES] => REPEAT for next MEASURE\_TYPE or go on to spillover  
 [IF 1=NO] => go to 2

FR3. Without the program, would you have installed any MEASURE\_TYPE\_# equipment?  
 [IF 2=YES]=> go to 3  
 [IF 2=NO]=> GO BACK TO 1 for next MEASURE\_TYPE or go on to spillover

FR4. Without the program, would you have installed this equipment within 12 months of when you did with the program?  
 [IF 3=YES]=> go to 4  
 [IF 3=NO]=> GO BACK TO 1 for next MEASURE\_TYPE or go on to spillover

[IF APPLICABLE] FR5. Relative to the energy efficiency of MEASURE\_TYPE\_# installed through the program, how would you characterize the efficiency of equipment you would have installed without the program?  
 a. Just as efficient as installed with the program  
 b. Lower than installed through the program, but better than the standard efficiency  
 c. Standard efficiency

[IF APPLICABLE] FR6. Would you have installed the same amount of MEASURE\_TYPE\_#?  
 a. Yes  
 b. No => FR6a  
     FR6a. More or less?  
     FR6b. How much more or less?  
 GO BACK TO 1 for next MEASURE\_TYPE or go on to consistency or spillover...

<sup>10</sup> Variables and notes to the interviewer are in ALL CAPS. The variable MEASURE\_TYPE is grouped and worded by measure types, such as “lighting equipment” or “HVAC equipment” with specific measures installed identified for the respondent to be sure they understand what is meant.

## Spillover

We recommend asking participants about both “like” and “unlike” spillover with an understanding that the “like” spillover can be quantitatively assessed and the “unlike” spillover will be characterized qualitatively (though efforts will be made to use deemed estimates if possible). With “like” spillover, we can use the gross savings estimates from the program tracking database as a proxy for the “like” equipment. With no savings data to use as comparison, our ability to confidently assign savings to reported “unlike” spillover projects is limited by the amount of data participants are able to provide. For example, if a participant reports that they installed “some high efficiency lighting” but cannot recall how much or what type, we can only qualitatively report that project as spillover. However, if the participant is able to provide detailed specifications about the project (e.g., 40 T8s with ballasts), we can then use deemed savings values as a reference for assigning savings. Savings for measures without deemed values (e.g., recommissioning projects, industrial process improvements) can only be verified via on-site and our spillover assessments will be qualitative in nature.

We also recommend asking market allies about program-eligible sales outside of the programs. Market ally responses and participant “unlike” spillover responses will allow a qualitative discussion about the estimated magnitude of spillover relative to the “like” spillover that can be quantified. In addition, interviews with market allies will provide an assessment of spillover across the entire program year. As we are planning to interview participants quarterly regarding their projects, our estimates of participant-reported spillover savings will under-represent annual savings as potential spillover projects completed after that three month period will not be captured. However, market ally interviews will only be conducted once per evaluation year and cover the entire program year, capturing all spillover projects in the process. Likewise, the spillover reported by market allies will capture “unlike” spillover savings that we were only able to qualitatively assess from the participant reports.

Similar to the free-ridership battery, question wording will be adjusted for unique programs (e.g., recommissioning) or for custom projects. The like spillover questions will be repeated for the same two measure types as used for the free-ridership battery, as applicable.

The participant spillover questions recommended as part of the participant surveys and interviews are listed below for both like and unlike spillover.

### LIKE

- Since participating in this program, have you purchased and installed any additional [measures]?
- What did you purchase or install? How many did you purchase or install?
- Did you receive assistance from [utility] or another organization?
- On a scale from 1 to 5, with 1 indicating that you “strongly disagree” and 5 indicating that you “strongly agree”, please rate the following statement: *My experience with [utility]’s energy efficiency program influenced my decision to install other high efficiency equipment on my own.*
- Why did you not apply for an incentive from [utility] for this equipment?



## UNLIKE

- Since participating in this program, have you purchased or installed any OTHER energy efficiency improvements?
- What did you purchase or install? (PROBE FOR AS MUCH DETAIL AS POSSIBLE)
- How many did you purchase or install?
- Did you receive assistance from [utility] or another organization?
- I'm going to read a statement about the equipment that you purchased on your own. On a scale from 1 to 5, with 1 indicating that you "strongly disagree" and 5 indicating that you "strongly agree", please rate the following statement: *My experience with [utility]'s energy efficiency program influenced my decision to install other high efficiency equipment on my own.*
- Why did you not apply for an incentive from [utility] for this equipment?

The non-participant spillover questions recommended as part of market ally interviews are listed below.

- Approximately what percent of *all* [measure] sales in [state] last year would you estimate was from program-eligible equipment?
- Approximately what percent of *your* [measure] sales in [state] last year was from program-eligible equipment, that is [description of eligibility requirements]?
- Did you sell more program-eligible equipment last year?
- According to our records, you sold [quantity] [measure] as part of projects that received program incentives. To the best of your knowledge, did you complete any [measure] projects with [utility] customers that did **not** receive program incentives? If so, how many?
- Do the [utility] program incentives influence your stocking/selling of program-eligible [measures]?
- Does the [utility] program information influence your stocking/selling of program-eligible [measures]?

### *Net savings*

Spillover savings can be combined with free-ridership savings to create a comprehensive picture of program influence. This combination is often referred to as a net-to-gross ratio and is calculated by adding the spillover ratio to the inverse of the free-ridership ratio or:

$$\text{Net-to-Gross Ratio} = (1 - \text{Free-Ridership Ratio}) + \text{Spillover Ratio}$$

Gross savings are then multiplied by the resulting ratio to find net savings by measure type and program.

## C.2 Net Savings Scoring – June 18, 2012

To: Shawn Grant, Esther Giezendanner, PacifiCorp  
 From: Kevin Cooney, Matt Haakenstad, Mike Yim, and Jeff Erickson, Navigant; Ellen Steiner, Jess Chandler, and Jeremy Kraft, Energy Market Innovations, Inc  
 Date: June 18, 2012  
 Subject: Net Savings Scoring

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This memorandum provides a detailed description of how the evaluation team plans to estimate a net-to-gross (NTG) ratio for the portfolio of the PacifiCorp energy efficiency programs. An NTG ratio is a comprehensive picture of program influence and is the ratio of net savings to gross savings and is an indication of the programs' influence on customers' decision-making regarding energy efficiency at their facility.

### *Overview*

Using self-reported responses, the evaluation team's estimation of net savings first attempts to assess the program's influence on the participants' decision to implement an energy efficiency project and what would have occurred absent the program's intervention. This estimation includes 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 and is often referred to as "free-ridership." The team's measurement of net savings then attempts to estimate program influence on the broader market as a result of the indirect effects of the program's activities. This estimate, often referred to as "spillover," represents the amount of savings that occurred because of the program's intervention and influence but that is not currently claimed by the program. Spillover savings can be broken into two categories of savings: "participant" spillover and "non-participant" spillover. Participant spillover savings occur directly (i.e., program participants install additional energy efficient equipment), while non-participant spillover savings occur indirectly (i.e., market allies install additional energy efficient equipment to customers that choose not to participate as a result of the program).

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, or:

$$\text{Net Program Savings} = \text{Gross Program Savings} - \text{Free-Ridership Savings} + \text{Spillover Savings}$$

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:

$$\text{Net-to-Gross Ratio} = \text{Net Program Savings} / \text{Gross Program Savings}$$

## *Free-ridership Calculation*

To determine free-ridership, the interview presents respondents with a series of questions regarding their decision to install the equipment promoted by the program. The team then scores the responses to these questions to determine the level of free-ridership. A score of 1.0 indicates the respondent is a complete free-rider; they would have installed the exact same equipment at the same time and in the same quantity without the program’s assistance. A score of 0.0 (zero) indicates the respondent is not a free-rider; that is, without the program they either would not have installed any equipment within 12 months of when they did or they would have installed baseline efficient equipment.

As the first step in scoring, the evaluation team reviews the interview responses to determine if the exact same project (in terms of scope and efficiency level) would have occurred at the same time without the program. If so, the respondent is scored as a complete free-rider. If not, the evaluation team reviews the responses to determine whether the project would have occurred at all within the same 12 month period. If not, the respondent is scored as a non-free-rider. If the project would have occurred within the same 12 month period but altered in respect to its size or efficiency level, the respondent is scored as a partial free-rider. To assess the level of partial free-ridership, the evaluation team uses the respondents’ estimates of the percentage of equipment that would have been installed within 12 months without the program (*the quantity score*) and the percentage of the installed equipment that would have been high efficiency equipment (*the efficiency score*)<sup>11</sup>. If the project would have occurred with some changes absent the program, the product of these two estimates is the initial free-ridership ratio or:

$$\text{Initial Free-Ridership Ratio} = \text{Quantity Score} \times \text{Efficiency Score}$$

After scoring the initial free-ridership ratio, a series of consistency check questions is reviewed. These questions ask about the influence of the program’s interventions (e.g., financial incentives, technical assistance) and address the counter-factual (e.g., what would have happened without the program). For example, if the respondent states that the financial incentive was extremely important to their decision (FR1D = 5) but that they would have installed the exact same equipment at the same time without the program (FR2 = 1), the interviewer asks them to describe in their own words what impact the program had on their decision (FR7). During the scoring process, these responses are reviewed by analysts to determine which scenario is correct and are scored accordingly to create an adjusted free-ridership score.

Finally, the free-ridership score is adjusted to account for prior program participation. Given PacifiCorp’s efforts to cross-promote their entire portfolio of energy efficiency programs, a respondent’s prior participation in a PacifiCorp program may have been influential in their decision to participate in the current program. Ideally, this influence would be attributed to the prior program as spillover savings since that program was responsible for the influence. However, given the portfolio-level marketing approach that PacifiCorp implements, respondents are unlikely to be able to identify the prior program by name. Therefore, the evaluation team will attribute the savings credit to the current program. To calculate this credit, the team will review the respondents’ rating of the influence of the prior program. If the respondent rates their previous participation as a “4” or “5,” their adjusted free-ridership is reduced by either 50 percent or 75 percent respectively.

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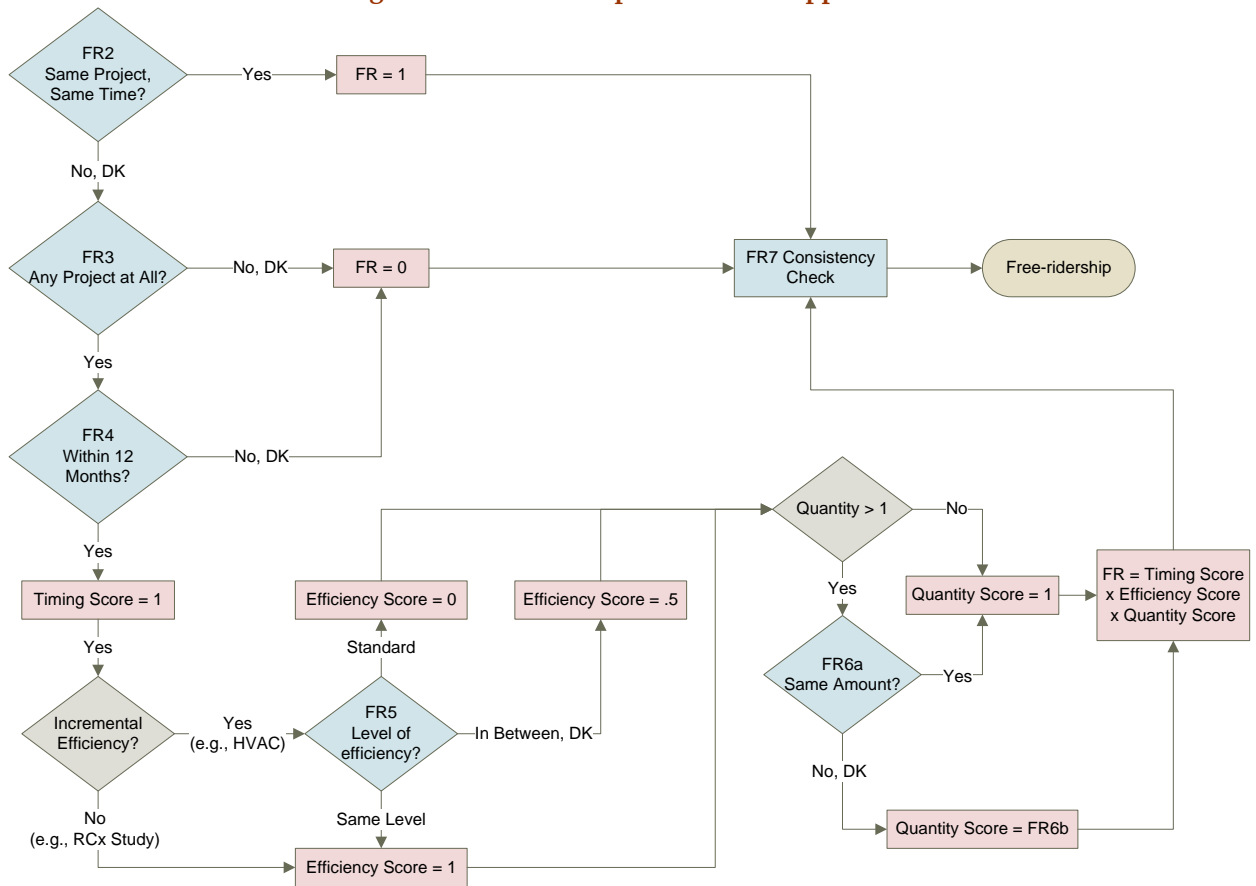
<sup>11</sup> Question text will be altered for projects where quantity is not applicable. For example, if a project consisted of the installation of an EMS, the quantity question would be skipped.

Figure 4 illustrates the series of questions asked to support this calculation while Table 1 provides detailed scoring and descriptions of each question.

**Table 1. Free-ridership Calculation Approach**

Question	Question Text	Scoring
FR1B	On a scale from 1 to 5, with 1 being not important at all and 5 being extremely important, how important were the following factors in deciding which equipment to install: information provided by PacifiCorp on energy saving opportunities	Consistency Check
FR1D	On a scale from 1 to 5, with 1 being not important at all and 5 being extremely important, how important were the following factors in deciding which equipment to install: the PacifiCorp incentive	Consistency Check
FR2	Without the program, meaning without the financial incentive and technical assistance, would you have still installed the exact same [MEASURE] at the same time?	If yes, free-ridership = 1
FR3	Without the program, would you have installed any [MEASURE] equipment?	If no, free-ridership = 0
FR4	Would you have installed this equipment within 12 months of when you did with the program?	If no, free-ridership = 0
FR5	Relative to the energy efficiency of [MEASURE] installed through the program, how would you characterize the efficiency of equipment you would have installed without the program?	If high efficiency, efficiency score = 1 If between high efficiency and baseline, efficiency score = 0.5 If baseline efficiency, efficiency score = 0
FR6a	Would you have installed the same amount of [MEASURE]?	If yes, quantity score = 1
FR6b	Would you have installed more or less equipment?	If less, quantity score = percentage of equipment not installed
FR7	Varies based on inconsistency identified	If inconsistent, adjusted free-ridership = 50% of initial free-ridership
FR1F	On a scale from 1 to 5, with 1 being not important at all and 5 being extremely important, how important were the following factors in deciding which equipment to install: previous participation with a PacifiCorp program	If FR1F = 5, reduce adjusted free-ridership by 75% If FR1F = 4, reduce adjusted free-ridership by 50%

**Figure 4. Free-ridership Calculation Approach**



For example, a participant that installed four high efficiency HVAC units through the program reports that, without the program, they would have not installed the same measures at the same time. Following up, the respondent states they would have installed some equipment and it would have been installed within 12 months. When probed about the level of efficiency of the equipment that would have been installed absent the program, the participant reports that they would have installed equipment that was more efficient than baseline but not as efficient as the program-eligible equipment. Finally, they report they only would have installed one unit (instead of four). Using the scoring above, this participant’s efficiency score would be set to 0.5 and the quantity score would be set to 0.25. Their initial, unadjusted free-ridership score is then the product<sup>12</sup> of these two scores or 0.125. Likewise, they state that the incentive was important and that previous participation was not important. These responses indicate a consistent installation scenario and no further adjustment is necessary.

<sup>12</sup> This multiplicative approach is appropriate as the score is the result of a product of the quantity installed and not a product of probabilities (Keating. *Free-Ridership Borscht: Don’t Salt the Soup*. IEPEC. 2009).

## *Spillover Calculation*

### *Participant-reported Spillover*

Similar to free-ridership, to determine spillover, the interviewer presents respondents with a series of questions regarding their decision to implement projects outside of the program (i.e., projects that did not receive any assistance from the program). These responses are then scored to determine the level of spillover. The evaluation team will ask participants about both “like” and “unlike” spillover projects. “Like” spillover is associated with equipment that is similar to the equipment incented by the program. In comparison, “unlike” spillover is associated with equipment that is not similar to the equipment that was rebated by the program. Using the program-reported per-unit savings as a proxy, “like” spillover savings can be quantitatively assessed. However, as it has no comparative program savings data, “unlike” spillover can only be characterized qualitatively (though efforts will be made to use deemed estimates if possible).

To assess “like” spillover, the evaluation team first reviews interview responses and determines whether the respondent installed any additional equipment similar to what was incented through the program. If additional equipment was installed, the team determines whether it was rebated through a PacifiCorp program. If not, the team then estimates the amount of *potential spillover savings* associated with the project. This estimation is created by using the program-tracking savings as a proxy for per-unit savings and adjusting for the amount of equipment installed. The team will also adjust for equipment similar to that installed through the program but of a lower efficiency. If the respondent states that efficiency level is lower than what was installed through the program but better than standard efficiency, the potential spillover savings are reduced by half. Since the energy savings associated with the reduced efficiency project will be less than the project incented by the program, this adjustment credits the program with some, but not all, of the savings.

In order to account for the program’s influence on the spillover savings, the team then adjusts the quantified spillover savings by the free-ridership rate identified earlier or:

$$\text{Spillover Savings} = \text{Potential Spillover Savings} \times \text{Free-ridership Factor}$$

As a consistency check, the team uses an additional question to check the evaluated free-ridership rate. Respondents are asked to rate the level of influence from the program on their decision to purchase the additional equipment. The team compares these responses to the identified free-ridership rate to identify any contradictory responses (i.e., free-ridership factor of 1.0 but spillover influence is high or free-ridership factor of zero but spillover influence is low). If the responses are contradictory, the potential spillover savings are reduced by 50 percent. Without further evidence, the team cannot objectively determine which statement of influence is correct. Adjusting the potential spillover savings by 50 percent acknowledges this uncertainty without overly penalizing or rewarding the program.

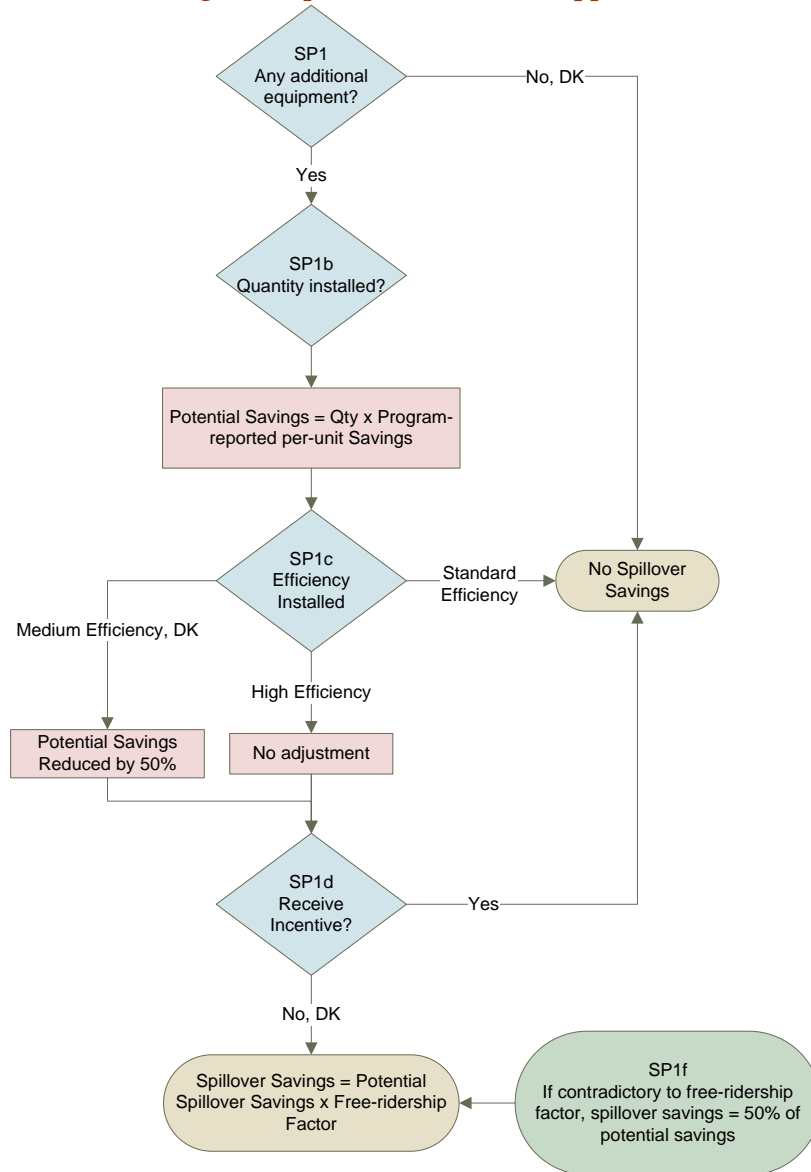
Figure 5 illustrates the series of questions asked to support this calculation while Table 2 provides detailed scoring and descriptions of each question.

**Table 2. Spillover Calculation Approach**

Question	Question Text	Scoring
SP1	Since participating in this program, have you purchased or installed any additional [MEASURE]?	If no, potential spillover savings = 0.
SP1b	How many did you purchase or install?	SP1b x program-reported per-unit savings = potential spillover savings
SP1c	Relative to the energy efficiency of [MEASURE] installed through the program, how would you characterize the efficiency of this equipment?	If lower than program but higher than standard, reduce potential spillover savings by half. If standard efficiency, potential spillover savings = 0.
SP1d	Did you receive an incentive from PacifiCorp or another organization?	If yes, potential spillover savings = 0.
SP1f	On a scale from 1 to 5, with 1 indicating that you “strongly disagree” and 5 indicating that you “strongly agree”, please rate the following statement: <i>My experience with the PacifiCorp program influenced my decision to install this additional high efficiency equipment on my own.</i>	Consistency Check



**Figure 5. Spillover Calculation Approach**



A similar process is used for “unlike” spillover. However, since the measure is not the same as the in-program measure, the team has less information from which to calculate the measure’s savings. Thus the team’s ability to confidently assign savings to reported “unlike” spillover projects is limited by the amount of data participants are able to provide about the measure and its use. For example, if a participant reports that they installed “some high efficiency lighting” but cannot recall how much or what type, we cannot reliably assign any spillover savings to that project. However, if the participant is able to provide detailed specifications about the project (e.g., 40 T8s with ballasts), we can then use values based on savings from similar measures in the program-tracking database as a reference for assigning potential spillover savings. Savings for measures without deemed values (e.g., recommissioning projects, industrial process improvements) can only be verified via on-site and our spillover assessments will be qualitative in nature. If “unlike” spillover projects of significant magnitude

are identified, on-site visits may be cost-effective. In this situation, the team will discuss conducting visits in order to quantify the savings.

***Nonparticipant Spillover***

To capture a comprehensive picture of spillover, the team also asks market allies about program-eligible sales outside of the programs as part of our in-depth interviews with this group. By examining the amount of program-eligible sales occurring outside of the program, the team can create high-level estimates of nonparticipant spillover that can be added to the participant-reported spillover savings.

First, the team determines whether the market ally installed any program-eligible equipment that did not receive incentives from the program. If so, the team compares the quantity of equipment installed outside of the program to the quantity tracked through the program-tracking database. Using the savings associated with that market ally in the program-tracking database, the team can then estimate the amount of savings installed outside of the program. Note that market allies may have difficulty reporting the amount of equipment that did not receive program assistance. As these “don’t know” response will not be used in analysis, our estimate will likely be conservative.

Finally, the team determines the influence of the program on these sales in order to attribute the nonparticipant spillover savings to the program. The team examines responses to three questions regarding the influence of the program incentive and information on the stocking and selling of program-eligible equipment. Respondents are asked to rate the influence of the program on a scale of 1 to 5 where 1 is “no influence” and 5 is “a great deal of influence.” If the average response is greater than 4, 100 percent of the savings installed outside of the program are attributed to the program. If the average response is greater than 3 but less than or equal to 4, 75 percent of the savings are attributed to the program. If the score is greater than 2 but less than or equal to 3, 50 percent of the savings are attributed to the program. None of the savings associated with market allies with average influence scores lower than 2 are attributed to the program.

Table 3 describes in detail the questions asked and their associated scoring.

**Table 3. Nonparticipant Spillover Calculation Approach**

Question	Question Text	Scoring
21	According to our records, you sold [NUMBER OF PROJECTS] of [TYPE] as part of projects that received program incentives. To the best of your knowledge, did you complete any [TYPE] projects [IF LIGHTING OR HVAC: that would have been eligible for the program] that did not receive program incentives? If so, how many?	Projects outside of program/Projects through program) X program savings associated with market ally = potential nonparticipant spillover
22	Do the program incentives influence your selling of program-eligible equipment for [TYPE]?	Average program influence score
23	Do the program incentives influence your stocking of program-eligible equipment for [TYPE]?	
24	Does the program information influence your selling of program-eligible equipment for [TYPE]?	

### *Net-to-Gross Ratio*

The evaluation team will determine measure-specific free-ridership and spillover rates. To determine program-level rates, the team will weigh the rates by savings and for any disproportionate sampling. This weighting ensures that the analysis is representative of the overall program both in terms of its distribution of savings and its mix of measures. For example, projects that account for a larger proportion of the program’s overall savings will have more influence on the final program-level rate. In addition, if projects that are part of certain sub-groups within a program are intentionally selected more frequently (i.e., over-sampled) as part of the sample design, those projects will have less influence on the program-level rate.

Likewise, the team will apply similar weights to the market-ally reported nonparticipant spillover savings to determine measure-level estimates. To avoid double-counting, participant-reported spillover estimates will be subtracted from the market ally-reported estimates. If, at the measure level, the participant-reported spillover estimate is less than the estimate reported by market allies, the team will add the difference to the spillover rate. If the participant-reported estimate is greater than the estimate identified by market allies, the team will not add any nonparticipant spillover savings to the overall estimate.

The team will then create the final net-to-gross ratio. This ratio is the net program savings divided by the gross program savings or:

$$\text{Net-to-Gross Ratio} = \text{Net Program Savings} / \text{Gross Program Savings}$$

The net program savings are the program-reported savings minus any free-ridership savings plus any identified participant and nonparticipant spillover savings or:

$$\text{Net Program Savings} = \text{Gross Program Savings} - \text{Free-Ridership Savings} + \text{Participant Spillover Savings} + \text{Nonparticipant Spillover Savings}$$

Note that as the nonparticipant spillover ratio is created for each market ally and not each participant, the final ratio is adjusted at an aggregated level.

## Appendix D. Process Evaluation Survey Instruments

### D.1 Participant Survey Instrument

*Note: FinAnswer Express Participants are those customers who completed a project through the FinAnswer Express program during 2009-2011. Participants are questioned about up to two measure subtypes based on the largest kWh savings. Measure subtypes will be determined during sampling and will likely be grouped by end-use (e.g., lighting equipment, HVAC equipment).*

#### Objectives

These surveys are designed to meet the following list of objectives.

- To describe how customers come to participate in the program
- To understand overall customer satisfaction with the program, including application materials, inspections, and the incentive
- To understand program influence on customer actions, including free-ridership and spillover
- To understand barriers customers are facing that prevent increasing energy efficiency
- To characterize participating firms

#### Variables

Variable Name	Description	Type
&CONTACT	Respondent name	Text
&FIRM	Company name	Text
&PROGRAM	FinAnswer Express	Text
&SITE	Address	Text
&YEAR	Year of project completion	YYYY
&PACIFICORP	Rocky Mountain Power, Pacific Power	Text
&PREINSPECTDATE	Date of first inspection	Date MMYYYY
&POSTINSPECTDATE	Date of post inspection	Date MMYYYY
&INSTALLED_MEASURES	List of installed measures	Text
&MEASURE_TYPE_1	Name of Measure 1	Text
&MEASURE_TYPE_2	Name of Measure 2	Text
&Vendor	Vendor that completed the project	Text
&INCENTIVE	Amount paid for participation	Numeric
&PM	Flag for PM delivered project	BINARY
&NC	Flag for New construction project	BINARY

## Survey Instrument

### Introduction and Screen

**INTRO1.** Hello, this is INTERVIEWER, calling on behalf of &PACIFICORP. We are conducting an independent evaluation of &PACIFICORP's energy efficiency programs. This is not a sales call. May I please speak with &CONTACT?

1. YES, THAT IS ME → **SKIP TO INTRO3**
2. YES, LET ME TRANSFER YOU
3. NOT NOW → **SCHEDULE APPT AND CALL BACK**
4. NO/REFUSED → **TERMINATE**

**INTRO2.** Hello, this is INTERVIEWER, calling on behalf of &PACIFICORP. We are conducting an independent evaluation of &PACIFICORP's energy efficiency programs. This is not a sales call. &PACIFICORP is evaluating its &PROGRAM program and would appreciate your input."

I'd like to let you know that this call may be monitored or recorded for quality assurance purposes. Also, all of your responses will be kept confidential and will not be revealed to anyone outside of the research team. Do you have a few minutes to answer questions about your experience with the program? **[IF NEEDED, READ: "This survey is for research purposes only and will take about 15 minutes."]**

1. YES → **SKIP TO IS2**
2. NOT NOW → **MAKE APPT. TO CALL BACK**
3. NO/REFUSED → **TERMINATE**

**INTRO3.** &PACIFICORP is evaluating its &PROGRAM program and would appreciate your input. I'd like to let you know that this call may be monitored or recorded for quality insurance purposes. Also, all of your responses will be kept confidential and will not be revealed to anyone outside of the research team. Do you have a few minutes to answer questions about your experience with the program? **[IF NEEDED, READ: "This survey is for research purposes only and will take about 15 minutes."]**

4. YES
5. NOT NOW → **MAKE APPT. TO CALL BACK**
6. NO/REFUSED → **TERMINATE**

**INTRO1.** Hello, this is INTERVIEWER, calling on behalf of &PACIFICORP. We are conducting an independent evaluation of &PACIFICORP's energy efficiency programs. This is not a sales call. May I please speak with &CONTACT?

1. YES, THAT IS ME → **SKIP TO INTRO3**
2. YES, LET ME TRANSFER YOU
3. NOT NOW → **SCHEDULE APPT AND CALL BACK**
4. NO/REFUSED → **TERMINATE**

**INTRO2.** Hello, this is INTERVIEWER, calling on behalf of &PACIFICORP. We are conducting an independent evaluation of &PACIFICORP's energy efficiency programs. This is not a sales call. &PACIFICORP is evaluating its &PROGRAM program and would appreciate your input."

I'd like to let you know that this call may be monitored or recorded for quality assurance purposes. Also, all of your responses will be kept confidential and will not be revealed to anyone outside of the research

team. Do you have a few minutes to answer questions about your experience with the program? **[IF NEEDED, READ: "This survey is for research purposes only and will take about 15 minutes."]**

7. YES → **SKIP TO IS2**
8. NOT NOW → **MAKE APPT. TO CALL BACK**
9. NO/REFUSED → **TERMINATE**

**INTRO3.** &PACIFICORP is evaluating its &PROGRAM program and would appreciate your input. I'd like to let you know that this call may be monitored or recorded for quality insurance purposes. Also, all of your responses will be kept confidential and will not be revealed to anyone outside of the research team. Do you have a few minutes to answer questions about your experience with the program? **[IF NEEDED, READ: "This survey is for research purposes only and will take about 15 minutes."]**

10. YES
11. NOT NOW → **MAKE APPT. TO CALL BACK**
12. NO/REFUSED → **TERMINATE**
- 13.

**[IF VERIFICATION IS NEEDED, TELL THEM THEY CAN CALL SHAWN GRANT AT 801-220-4196].**

**IS2a.** &PACIFICORP records indicate that your firm received an incentive from the &PROGRAM program in &YEAR after installing &INSTALLED\_MEASURES at &SITE, is this correct?

1. YES → **SKIP TO IS3**
2. NO, DID NOT PARTICIPATE
3. NO, ONE OR MORE MEASURES ARE INCORRECT → **SKIP TO IS2d**
4. NO, ADDRESS IS INCORRECT → **SKIP TO IS2e**
88. DON'T KNOW/NOT SURE → **TERMINATE**
99. REFUSED

**IS2b.** Is there someone else that might be familiar with this project?

1. Yes
2. No → **TERMINATE**
88. Don't know → **TERMINATE**

**IS2c.** May I speak with that person?

1. Yes → **RETURN TO INTRO2**
2. Not now → **SCHEDULE CALLBACK**
3. No → **TERMINATE**

**IS2d.** What measures were installed?

1. **[RECORD RESPONSE]**
88. DON'T KNOW/NOT SURE
99. REFUSED

**IS2e.** What is the correct address?

1. **[RECORD RESPONSE]**
88. DON'T KNOW/NOT SURE
99. REFUSED

IS3. Are you the person most familiar with &FIRM's decision to implement this project?

1. YES
2. NO → **SKIP to IS2b**
88. DON'T KNOW/NOT SURE → **SKIP to IS2b**
99. REFUSED → **SKIP to IS2b**

### **Awareness & Participation**

**AP1. How did you first become aware of &PROGRAM? [DO NOT READ RESPONSES; ALLOW MULTIPLE RESPONSES]**

1. ACCOUNT REPRESENTATIVE OR OTHER &PACIFICORP STAFF
2. &PACIFICORP RADIO ADVERTISEMENT
3. &PACIFICORP PRINT ADVERTISEMENT
4. &PACIFICORP PRINTED MATERIALS/BROCHURE
5. &PACIFICORP ONLINE ADVERTISEMENT
6. &PACIFICORP TV ADVERTISEMENT
7. &PACIFICORP NEWSLETTER
8. &PACIFICORP WEBSITE
9. PREVIOUS PARTICIPATION IN &PACIFICORP PROGRAMS
10. CONFERENCE, WORKSHOP, OR EVENT [SPECIFY: \_\_\_\_\_]
11. &PACIFICORP SPONSORED ENERGY AUDIT OR TECHNICAL ASSESSMENT
12. FROM TRADE ALLY, VENDOR OR CONTRACTOR
13. ANOTHER BUSINESS COLLEAGUE
14. FAMILY, FRIEND, OR NEIGHBOR
15. OTHER [SPECIFY]: \_\_\_\_\_
88. DON'T KNOW/NOT SURE
99. REFUSE

**AP2. Why did your firm decide to participate in the program? [DO NOT READ RESPONSES; ALLOW MULTIPLE RESPONSES]**

1. To save money on electric bills.
2. To obtain an incentive.
3. To replace old or poorly working equipment.
4. To replace broken equipment.
5. To acquire the latest technology.
6. To reduce maintenance costs.
7. Because the program was sponsored by &PACIFICORP
8. Previous experience with &PACIFICORP
9. To protect the environment.
10. To save energy
11. Recommendation by contractors/trade allies
12. Recommended by colleague
13. Recommended by family, friend or neighbor
14. To improve operations, production, or quality
15. To improve value of property
16. To improve comfort
17. Other [SPECIFY]: \_\_\_\_\_

- 88. DON'T KNOW/NOT SURE
- 99. REFUSE

**[IF more than one response to AP2]**

**AP2a.**

**Of those reasons, which one was most influential in the decision to participate in the program?**

**[ALLOW ONLY ONE RESPONSE]**

- 1. To save money on electric bills.
- 2. To obtain an incentive.
- 3. To replace old or poorly working equipment.
- 4. To replace broken equipment.
- 5. To acquire the latest technology.
- 6. To reduce maintenance costs.
- 7. Because the program was sponsored by &PACIFICORP
- 8. Previous experience with &PACIFICORP
- 9. To protect the environment.
- 10. To save energy
- 11. Recommendation by contractors/trade allies
- 12. Recommended by colleague
- 13. Recommended by family, friend or neighbor
- 14. To improve operations, production, or quality
- 15. To improve value of property
- 16. To improve comfort
- 17. Other [SPECIFY]: \_\_\_\_\_
- 88. DON'T KNOW/NOT SURE
- 99. REFUSED

### **Pre-Installation Section**

**[IF &PREINSPECTDATE>0] EE1.** When you first became involved with the &PACIFICORP program, an energy engineer came out to your facility to inspect existing equipment. Using a scale of 1 to 5 where 1 indicates 'very dissatisfied' and 5 indicates 'very satisfied', how satisfied were you with the energy engineer who came out to your facility?

- 1. VERY DISSATISFIED
- 2. SOMEWHAT DISSATISFIED
- 3. NEITHER SATISFIED OR DISSATISFIED
- 4. SOMEWHAT SATISFIED → **SKIP TO EE3**
- 5. VERY SATISFIED → **SKIP TO EE3**
- 88. DON'T KNOW/NOT SURE → **SKIP TO EE3**
- 99. REFUSED → **SKIP TO EE3**

**EE2.** Why were you less than satisfied with the energy engineer?

- 1. **[RECORD RESPONSE]**
- 88. DON'T KNOW/NOT SURE
- 99. REFUSED



[IF &VENDOR>0] EE3. The records we received show that you worked with &VENDOR on this project. Using a scale of 1 to 5 where 1 indicates 'very dissatisfied' and 5 indicates 'very satisfied', how satisfied were you with &VENDOR?

1. VERY DISSATISFIED
2. SOMEWHAT DISSATISFIED
3. NEITHER SATISFIED OR DISSATISFIED
4. SOMEWHAT SATISFIED → SKIP TO IM1
5. VERY SATISFIED → SKIP TO IM1
88. DON'T KNOW/NOT SURE → SKIP TO IM1
99. REFUSED → SKIP TO IM1

EE4. Why were you less than satisfied with the &VENDOR?

1. [RECORD RESPONSE]
88. DON'T KNOW/NOT SURE
99. REFUSED

[IF &PM=1] EE5. As part of the program, you received a report documenting the findings from the energy analysis that included recommended equipment and changes. Did you find this report valuable?

1. YES → SKIP TO IM1
2. NO
3. DON'T RECALL RECEIVING A REPORT → SKIP TO IM1
88. DON'T KNOW/NOT SURE → SKIP TO IM1
99. REFUSED → SKIP TO IM1

EE6. Why not?

1. [RECORD RESPONSE]
88. DON'T KNOW/NOT SURE
99. REFUSED

## Installed Measures

**READ: I'm going to ask a few questions about the equipment that you installed.**

**[REPEAT FOR EACH &MEASURE\_TYPE UP TO TWO MEASURES]**

[IF &NC=1, SKIP to IM3] IM1. Did the &MEASURE\_TYPE# installed through the program replace existing equipment or was it a new installation?

1. REPLACED EXISTING EQUIPMENT → SKIP TO IM2
2. TOTALLY NEW INSTALLATION → SKIP TO IM3
88. DON'T KNOW/NOT SURE → SKIP TO IM1A
99. REFUSED → SKIP TO IM1A

IM1A. Could you please provide contact information for the person who would know about the equipment that was installed with this project, and we can ask them specifically about equipment?

1. [COLLECT: IM\_CONTACT\_NAME, IM\_CONTACT\_PHONE, and IM\_CONTACT\_EMAIL]
- SKIP TO PI1

IM2. What was the operating condition of the equipment that the &MEASURE\_TYPE# replaced?

1. EXISTING EQUIPMENT HAD FAILED

- 2. EXISTING EQUIPMENT WORKING BUT WITH PROBLEMS
- 3. EXISTING EQUIPMENT WORKING WITH NO PROBLEMS
- 4. OTHER [SPECIFY]: \_\_\_\_\_
- 88. DON'T KNOW/NOT SURE
- 99. REFUSED

**IM3.** Have the energy savings related to this equipment met your expectations?

- 1. YES
- 2. NO
- 88. DON'T KNOW/NOT SURE
- 99. REFUSED

**IM4.** What other benefits, if any, have you observed from the &MEASURE\_TYPE#?

- 1. NONE
- 2. YES [RECORD RESPONSE]: \_\_\_\_\_
- 88. DON'T KNOW/NOT SURE
- 99. REFUSED

**IM5.** Using a scale of 1 to 5 where 1 indicates 'very dissatisfied' and 5 indicates 'very satisfied', overall, how satisfied were you with the performance of the &MEASURE\_TYPE#?

- 1. VERY DISSATISFIED
- 2. SOMEWHAT DISSATISFIED
- 3. NEITHER SATISFIED OR DISSATISFIED
- 4. SOMEWHAT SATISFIED → SKIP TO PI1
- 5. VERY SATISFIED → SKIP TO PI1
- 88. DON'T KNOW/NOT SURE → SKIP TO PI1
- 99. REFUSED → SKIP TO PI1

**IM6.** Why were you less than satisfied with the performance of the &MEASURE\_TYPE#?

- 1. [RECORD RESPONSE]
- 88. DON'T KNOW/NOT SURE
- 99. REFUSED

## Post-Installation

**[IF &POSTINSPECTDATE>0] PI1.** After your project was installed, around &POSTINSPECTDATE, a program representative came out to your facility to verify your installation. Using a scale of 1 to 5 where 1 indicates 'very dissatisfied' and 5 indicates 'very satisfied', how satisfied were you with the inspection?

- 1. VERY DISSATISFIED
- 2. SOMEWHAT DISSATISFIED
- 3. NEITHER SATISFIED OR DISSATISFIED
- 4. SOMEWHAT SATISFIED → SKIP TO FR1
- 5. VERY SATISFIED → SKIP TO FR1
- 88. DON'T KNOW/NOT SURE → SKIP TO FR1
- 99. REFUSED → SKIP TO FR1

PI2. Why were you less than satisfied with the inspection?

1. [RECORD RESPONSE]

88. DON'T KNOW/NOT SURE

99. REFUSED

## Free Ridership

FR1. With the &PROGRAM program, &FIRM received [IF &PM=1, add "technical assistance identifying energy saving opportunities and"] financial incentives of &INCENTIVE for installing &INSTALLED\_MEASURES with the program.

On a scale from 1 to 5, with 1 being not important at all and 5 being extremely important, how important were the following factors in deciding which equipment to install.

A. RECOMMENDATION FROM CONTRACTOR OR VENDOR [if &VENDOR >0, replace

"Contractor or vendor" with &VENDOR] \_\_\_\_\_

B. INFORMATION PROVIDED BY &PACIFICORP ON ENERGY SAVING OPPORTUNITIES

\_\_\_\_\_

C. INFORMATION ON PAYBACK \_\_\_\_\_

D. THE &PACIFICORP INCENTIVE \_\_\_\_\_

E. FAMILIARITY WITH THIS EQUIPMENT \_\_\_\_\_

F. PREVIOUS PARTICIPATION WITH A &PACIFICORP PROGRAM

G. CORPORATE POLICY REGARDING ENERGY REDUCTION \_\_\_\_\_

[REPEAT FR2-FR7 FOR EACH &MEASURE\_TYPE# UP TO TWO MEASURES]

[READ: "When answering these next questions, think specifically about &MEASURE\_TYPE># installed through the program."]

FR2. Without the program, meaning without the financial incentive [IF &PM=1, add "and technical assistance"], would you have still installed the exact same &MEASURE\_TYPE\_# at the same time?

1. YES → SKIP TO FR7a

2. NO

88. DON'T KNOW/NOT SURE

99. REFUSED

FR3. Without the program, would you have installed any &MEASURE\_TYPE\_# equipment?

1. YES

2. NO → SKIP TO FR7a

88. DON'T KNOW/NOT SURE

99. REFUSED

FR4. Would you have installed this equipment within 12 months of when you did with the program?

1. YES

2. NO → SKIP TO FR7a

88. DON'T KNOW/NOT SURE → START NEXT MEASURE

99. REFUSED → START NEXT MEASURE

**FR5.** Relative to the energy efficiency of &MEASURE\_TYPE\_# installed through the program, how would you characterize the efficiency of equipment you would have installed without the program?

1. Just as efficient as installed with the program
2. Lower than installed through the program, but better than the standard efficiency
3. Standard efficiency

**FR6a.** Would you have installed the same amount of &MEASURE\_TYPE\_#?

1. YES → **START NEXT MEASURE**
2. NO
88. DON'T KNOW/NOT SURE → **START NEXT MEASURE**
99. REFUSED → **START NEXT MEASURE**

**FR6b.** Would you have installed more or less equipment?

1. MORE → **How much more?**
2. LESS → **How much less?**
88. DON'T KNOW/NOT SURE
99. REFUSED

[IF FR1D < 3 AND FR3 = 2]

**FR7a.** Previously, you said that the incentive was not important in your decision to install the &MEASURE\_TYPE#. However, you also said that without the program, you would not have installed any equipment. In your own words, can you please describe what impact the program had on your decision to install the equipment?

1. **[RECORD RESPONSE]**
88. DON'T KNOW/NOT SURE
99. REFUSED

[IF FR1D < 3 AND FR4 = 2]

**FR7b.** Previously, you said that the incentive was not important in your decision to install the &MEASURE\_TYPE#. However, you also said that without the program, you would not have installed any equipment with 12 months of when you did. In your own words, can you please describe what impact the program had on your decision to install the equipment?

1. **[RECORD RESPONSE]**
88. DON'T KNOW/NOT SURE
99. REFUSED

[IF FR1D > 3 AND FR2 = 1]

**FR7c.** Previously, you said that the incentive was important in your decision to install the &MEASURE\_TYPE#. However, you also said that without the program, you would have installed the exact same equipment at the same time. In your own words, can you please describe what impact the program had on your decision to install the equipment?

1. **[RECORD RESPONSE]**
88. DON'T KNOW/NOT SURE
99. REFUSED

[IF FR1B < 3 AND FR3 = 2]

**FR7d.** Previously, you said that the technical assistance was not important in your decision to install the &MEASURE\_TYPE#. However, you also said that without the program, you would not have installed any equipment. In your own words, can you please describe what impact the program had on your decision to install the equipment?

1. [RECORD RESPONSE]
88. DON'T KNOW/NOT SURE
99. REFUSED

[IF FR1B < 3 AND FR4 = 2]

**FR7e.** Previously, you said that technical assistance was not important in your decision to install the &MEASURE\_TYPE#. However, you also said that without the program, you would not have installed any equipment with 12 months of when you did. In your own words, can you please describe what impact the program had on your decision to install the equipment?

1. [RECORD RESPONSE]
88. DON'T KNOW/NOT SURE
99. REFUSED

[IF FR1B > 3 AND FR2 = 1]

**FR7f.** Previously, you said that the technical assistance was important in your decision to install the &MEASURE\_TYPE#. However, you also said that without the program, you would have installed the exact same equipment at the same time. In your own words, can you please describe what impact the program had on your decision to install the equipment?

1. [RECORD RESPONSE]
88. DON'T KNOW/NOT SURE
99. REFUSED

## Spillover

**REPEAT SP1 for each &MEASURE\_TYPE#**

**SP1.** Since participating in this program, have you purchased or installed any additional &MEASURE\_TYPE#?

1. YES
2. NO → **START next measure or SKIP TO SP2**
88. DON'T KNOW/NOT SURE → **START next measure or SKIP TO SP2**
99. REFUSED → **START next measure or SKIP TO SP2**

**SP1a.** What did you purchase or install? (PROBE FOR AS MUCH DETAIL AS POSSIBLE)

1. [RECORD RESPONSE]
88. DON'T KNOW/NOT SURE
99. REFUSED

**SP1b.** How many did you purchase or install?

1. [RECORD RESPONSE]
88. DON'T KNOW/NOT SURE
99. REFUSED

SP1c. Relative to the energy efficiency of &MEASURE\_TYPE\_# installed through the program, how would you characterize the efficiency of this equipment?

1. Just as efficient as installed with the program
2. Lower than installed through the program, but better than the standard efficiency
3. Standard efficiency

SP1d. Did you receive an incentive from &PACIFICORP or another organization?

1. YES
2. NO → **SKIP TO SP1f**
88. DON'T KNOW/NOT SURE → **SKIP TO SP1f**
99. REFUSED → **SKIP TO SP1f**

SP1e. What program or sponsor provided an incentive?

1. **&PACIFICORP**
2. **[RECORD RESPONSE]**
88. DON'T KNOW/NOT SURE
99. REFUSED

SP1f. I'm going to read a statement about the additional &MEASURE\_TYPE# that you purchased on your own. On a scale from 1 to 5, with 1 indicating that you "strongly disagree" and 5 indicating that you "strongly agree", please rate the following statement:

*My experience with &PACIFICORP's &PROGRAM program influenced my decision to install additional high efficiency equipment on my own.*

Would you say you...**[READ 1-5]**

1. STRONGLY DISAGREE
2. SOMEWHAT DISAGREE
3. NEITHER AGREE OR DISAGREE
4. SOMEWHAT AGREE
5. STRONGLY AGREE
88. DON'T KNOW/NOT SURE
99. REFUSED

**[IF SP1e not 1] SP1g.** Why did you not apply for an incentive from &PACIFICORP for this equipment?

1. **[RECORD RESPONSE]**
88. DON'T KNOW/NOT SURE
99. REFUSED

SP2. Since participating in this program, have you purchased on installed any OTHER energy efficiency improvements?

1. YES
2. NO → **SKIP TO B1**
88. DON'T KNOW/NOT SURE → **SKIP TO B1**
99. REFUSED → **SKIP TO B1**

SP2a. What did you purchase or install? (PROBE FOR AS MUCH DETAIL AS POSSIBLE)

1. **[RECORD RESPONSE]**

- 88. DON'T KNOW/NOT SURE
- 99. REFUSED

**SP2b.** How many did you purchase or install?

- 1. **[RECORD RESPONSE]**
- 88. DON'T KNOW/NOT SURE
- 99. REFUSED

**SP2c.** How would you characterize the efficiency of this equipment?

- 1. The most efficient or ENERGY STAR certified
- 2. Lower than the most efficient, but better than the standard efficiency
- 3. Standard efficiency

**SP2d.** Did you receive an incentive from &PACIFICORP or another organization?

- 1. YES
- 2. NO → **SKIP TO SP2f**
- 88. DON'T KNOW/NOT SURE → **SKIP TO SP2f**
- 99. REFUSED → **SKIP TO SP2f**

**SP2e.** What program or sponsor provided an incentive?

- 1. **&PACIFICORP**
- 2. **[RECORD RESPONSE]**
- 88. DON'T KNOW/NOT SURE
- 99. REFUSED

**SP2f.** I'm going to read a statement about the other equipment that you purchased on your own. On a scale from 1 to 5, with 1 indicating that you "strongly disagree" and 5 indicating that you "strongly agree", please rate the following statement:

*My experience with &PACIFICORP's &PROGRAM program influenced my decision to install other high efficiency equipment on my own.*

Would you say you...**[READ 1-5]**

- 1. STRONGLY DISAGREE
- 2. SOMEWHAT DISAGREE
- 3. NEITHER AGREE OR DISAGREE
- 4. SOMEWHAT AGREE
- 5. STRONGLY AGREE
- 88. DON'T KNOW/NOT SURE
- 99. REFUSED

**[IF SP2e not 1] SP2g.** Why did you not apply for an incentive from &PACIFICORP for this equipment?

- 1. **[RECORD RESPONSE]**
- 88. DON'T KNOW/NOT SURE
- 99. REFUSED

**Barriers**

**B1.** Do you think there are other changes that you could make to improve electric efficiency at &FIRM?

1. YES
2. NO → **SKIP TO IC1**
88. DON'T KNOW/NOT SURE → **SKIP TO IC1**
99. REFUSED → **SKIP TO IC1**

**B2.** Could you provide some examples of changes you think would improve electric efficiency at &FIRM?

1. **[RECORD RESPONSE: PROBE FOR ADDITIONAL]**
88. DON'T KNOW/NOT SURE
99. REFUSED

**B3.** Are plans in place to make any of those changes?

1. YES
2. NO → **SKIP TO B5**
88. DON'T KNOW/NOT SURE → **SKIP TO B5**
99. REFUSED → **SKIP TO B5**

**B4.** Are incentives from &PACIFICORP or another organization part of those plans?

1. NO
2. YES
88. DON'T KNOW/NOT SURE
99. REFUSED

**B5.** What factors could prevent &FIRM from making these changes? **[DO NOT READ RESPONSES; ALLOW MULTIPLE RESPONSES]**

1. HIGH UPFRONT COSTS
2. LACK OF ACCESS TO CAPITAL
3. LONG PAYBACK PERIOD; SLOW RATE OF RETURN
4. LOW PRIORITY/LACK OF INTEREST OF SENIOR MANAGEMENT IN ENERGY EFFICIENCY
5. LACK OF INFORMATION ABOUT SAVINGS AND PERFORMANCE
6. LACK OF RESPONSIBLE/ACCOUNTABLE ENERGY STAFF
7. OTHER (SPECIFY \_\_\_\_\_)
88. DON'T KNOW/NOT SURE
99. REFUSED

**[IF MORE THAN ONE RESPONSE TO B5] B6.** Which of these do you think is the most challenging factor?

1. HIGH UPFRONT COSTS
2. LACK OF ACCESS TO CAPITAL
3. LONG PAYBACK PERIOD; SLOW RATE OF RETURN
4. LOW PRIORITY/LACK OF INTEREST OF SENIOR MANAGEMENT IN ENERGY EFFICIENCY
5. LACK OF INFORMATION ABOUT SAVINGS AND PERFORMANCE
6. LACK OF RESPONSIBLE/ACCOUNTABLE ENERGY STAFF
7. OTHER (SPECIFY \_\_\_\_\_)



- 88. DON'T KNOW/NOT SURE
- 99. REFUSED

### Satisfaction

**IC1.** Using a scale of 1 to 5 where 1 indicates 'very dissatisfied' and 5 indicates 'very satisfied', how satisfied were you overall with the program?

- 1. VERY SATISFIED
- 2. SOMEWHAT DISSATISFIED
- 3. NEITHER SATISFIED OR DISSATISFIED
- 4. SOMEWHAT SATISFIED → **SKIP TO IC2**
- 5. VERY SATISFIED → **SKIP TO IC2**
- 88. DON'T KNOW/NOT SURE → **SKIP TO IC2**
- 99. REFUSED → **SKIP TO IC2**

**IC1A.** Why were you less than satisfied with the program overall?

- 1. **[RECORD RESPONSE]**
- 88. DON'T KNOW/NOT SURE
- 99. REFUSED

**IC2.** If you could change anything about the &PROGRAM program, what would you change?

- 1. **[RECORD RESPONSE]**
- 88. DON'T KNOW/NOT SURE
- 99. REFUSED

**IC3.** During your involvement with &PROGRAM did you ever contact &PACIFICORP with questions or requests for assistance?

- 1. YES
- 2. NO → **SKIP TO FB1**
- 88. DON'T KNOW/NOT SURE → **SKIP TO FB1**
- 99. REFUSED → **SKIP TO FB1**

**IC4.** Were &PACIFICORP and its representatives timely in addressing your questions in regards to the program?

- 1. YES
- 2. NO
- 88. DON'T KNOW/NOT SURE
- 99. REFUSED

**IC5.** Were &PACIFICORP and its representatives knowledgeable in regards to the program and the program eligibility requirements?

- 1. YES
- 2. NO
- 88. DON'T KNOW/NOT SURE
- 99. REFUSED

## Firmographics

### FB1 INTRO.

Now I have a few final, general questions about your company for comparison purposes only.

**FB1.** Which of the following best describes your company's primary activities?

1. MANUFACTURING
2. RETAIL
3. DAIRY / AGRICULTURAL
4. FINANCE AND INSURANCE
5. FOOD PROCESSING
6. REFRIGERATED WAREHOUSE
7. PROFESSIONAL, SCIENTIFIC, AND TECHNICAL SERVICES
8. EDUCATIONAL SERVICES
9. HEALTH CARE
10. PUBLIC ADMINISTRATION
11. ARTS, ENTERTAINMENT, AND RECREATION
12. ACCOMMODATION
13. FOOD SERVICES
14. REAL ESTATE
15. MINING
16. OIL AND GAS
17. OTHER [SPECIFY] \_\_\_\_\_
88. DON'T KNOW/NOT SURE
99. REFUSED

**FB2.** Approximately, what percent of your total annual operating costs does your electricity bill represent?

1. [RECORD RESPONSE]
88. DON'T KNOW/NOT SURE
99. REFUSED

**FB3.** About how many people does your firm employ?

1. [RECORD RESPONSE]
88. DON'T KNOW/NOT SURE
99. REFUSED

### **End**

**END1.** Those are all of the questions that I have for you. Is there anything about your experiences with &PACIFICORP's &PROGRAM program you'd like to mention that we did not talk about today?

1. [RECORD RESPONSE]
88. DON'T KNOW/NOT SURE
99. REFUSED

**[THANK RESPONDENT AND TERMINATE SURVEY]**

## D.2 Near-Participant Interview Instrument

Note: Energy FinAnswer and FinAnswer Express Near Participants are those customers who are in the project tracking system with a project through the Energy FinAnswer or FinAnswer Express program during 2009-2011 but are identified as cancelled or on hold as of the end of 2011.

### Objectives

These surveys are designed to meet the following list of objectives.

- To describe how customers come to participate in the program
- To characterize the current status of projects identified as on hold or cancelled
- To understand overall customer satisfaction with the program, while participating
- To understand what it would take to motivate near participants to participate
- To understand barriers customers are facing that prevent increasing energy efficiency
- To characterize near-participant firms

### Variables

Variable Name	Description	Type
&CONTACT	Respondent name	Text
&FIRM	Company name	Text
&PROGRAM	Energy FinAnswer, FinAnswer Express	Text
&SITE	Address	Text
&YEAR	Year of project start	YYYY
&PACIFICORP	Rocky Mountain Power, Pacific Power	Text

### Interview Instrument

#### Introduction and Screen

**INTRO1.** Hello, this is INTERVIEWER, calling on behalf of &PACIFICORP. We are conducting an independent evaluation of &PACIFICORP's &PROGRAM and would like to hear about your experiences. This is not a sales call. May I please speak with &CONTACT?

1. YES, THAT IS ME → **SKIP TO INTRO3**
2. YES, LET ME TRANSFER YOU → **SKIP TO INTRO2**
3. NOT NOW → **SCHEDULE APPT AND CALL BACK**
4. NO/REFUSED → **TERMINATE**

**INTRO2.** Hello, this is INTERVIEWER, calling on behalf of &PACIFICORP. We are conducting an independent evaluation of &PACIFICORP's &PROGRAM and would like to hear about your experiences. This is not a sales call."

I'd like to let you know that this call may be monitored or recorded for quality assurance purposes. Also, all of your responses will be kept confidential and will not be revealed to anyone outside of the research team. Do you have a few minutes to answer questions about your experience with the program? **[IF NEEDED, READ: "This survey is for research purposes only and will take about 10 minutes."]**

- 14. YES → **SKIP TO IS2a**
- 15. NOT NOW → **MAKE APPT. TO CALL BACK**
- 16. NO/REFUSED → **TERMINATE**

**INTRO3.** Do you have a few minutes to answer questions about your experience with the program? **[IF NEEDED, READ: “This survey is for research purposes only and will take about 10 minutes.”]** I’d like to let you know that this call may be monitored or recorded for quality assurance purposes. Also, all of your responses will be kept confidential and will not be revealed to anyone outside of the research team.

- 17. YES
- 18. NOT NOW → **MAKE APPT. TO CALL BACK**
- 19. NO/REFUSED → **TERMINATE**

**[IF VERIFICATION IS NEEDED, TELL THEM THEY CAN CALL SHAWN GRANT AT 801-220-4196].**

**IS2a.** &PACIFICORP records indicate that you were considering a project to improve efficiency at &SITE with the &PROGRAM program in &YEAR but did not complete the project and get an incentive, is this correct?

- 5. YES → **SKIP TO AP1**
- 6. NO, DID NOT PARTICIPATE
- 7. NO, COMPLETED PROJECT AND GOT INCENTIVE → **CONFIRM &TERMINATE**
- 89. DON’T KNOW/NOT SURE
- 99. REFUSED

**IS2b.** Is there someone else that might be familiar with this project?

- 1. Yes
- 2. No → **TERMINATE**
- 88. Don’t know → **TERMINATE**

**IS2c.** May I speak with that person?

- 1. Yes → **RETURN TO INTRO2**
- 2. Not now → **SCHEDULE CALLBACK**
- 3. No → **TERMINATE**

**IS3.** Are you the person most familiar with &FIRM’s decision to begin this project?

- 1. YES
- 2. NO → **SKIP to IS2b**
- 88. DON’T KNOW/NOT SURE → **SKIP to IS2b**
- 99. REFUSED → **SKIP to IS2b**

## **Awareness & Participation**

**AP1.** How did you first become aware of &PROGRAM? **[DO NOT READ RESPONSES]**

- 16. ACCOUNT REPRESENTATIVE OR OTHER &PACIFICORP STAFF
- 17. &PACIFICORP RADIO ADVERTISEMENT
- 18. &PACIFICORP PRINT ADVERTISEMENT
- 19. &PACIFICORP PRINTED MATERIALS/BROCHURE

- 20. &PACIFICORP ONLINE ADVERTISEMENT
- 21. &PACIFICORP TV ADVERTISEMENT
- 22. &PACIFICORP NEWSLETTER
- 23. &PACIFICORP WEBSITE
- 24. PREVIOUS PARTICIPATION IN &PACIFICORP PROGRAMS
- 25. CONFERENCE, WORKSHOP, OR EVENT [SPECIFY: \_\_\_\_\_]
- 26. &PACIFICORP SPONSORED ENERGY AUDIT OR TECHNICAL ASSESSMENT
- 27. FROM TRADE ALLY, VENDOR OR CONTRACTOR
- 28. ANOTHER BUSINESS COLLEAGUE
- 29. FAMILY, FRIEND, OR NEIGHBOR
- 30. OTHER [SPECIFY]: \_\_\_\_\_
- 89. DON'T KNOW/NOT SURE
- 99. REFUSE

**AP2. Why did you decide to participate in the program? [DO NOT READ RESPONSES; SELECT ALL THAT APPLY]**

- 1. To save money on electric bills.
- 2. To obtain an incentive.
- 3. To replace old or poorly working equipment.
- 4. To replace broken equipment.
- 5. To acquire the latest technology.
- 6. To reduce maintenance costs.
- 7. Because the program was sponsored by &PACIFICORP
- 8. Previous experience with &PACIFICORP
- 9. To protect the environment.
- 10. To save energy
- 11. Recommendation by contractors/trade allies
- 12. Recommended by colleague
- 13. Recommended by family, friend or neighbor
- 14. Recommended by &PACIFICORP staff
- 15. To improve operations, production, or quality
- 16. To improve value of property
- 17. To improve comfort
- 18. Other [SPECIFY]: \_\_\_\_\_
- 88. DON'T KNOW/NOT SURE
- 99. REFUSE

**[IF more than one response to AP2]**

**AP2a. Of those reasons, which one was most influential in your decision to participate in the program? [ALLOW ONLY ONE RESPONSE]**

- 1. To save money on electric bills.
- 2. To obtain an incentive.
- 3. To replace old or poorly working equipment.
- 4. To replace broken equipment.
- 5. To acquire the latest technology.
- 6. To reduce maintenance costs.
- 7. Because the program was sponsored by &PACIFICORP

- 8. Previous experience with &PACIFICORP
- 9. To protect the environment.
- 10. To save energy
- 11. Recommendation by contractors/trade allies
- 12. Recommended by colleague
- 13. Recommended by family, friend or neighbor
- 14. Recommended by &PACIFICORP staff
- 15. To improve operations, production, or quality
- 16. To improve value of property
- 17. To improve comfort
- 18. Other [SPECIFY]: \_\_\_\_\_
- 88. DON'T KNOW/NOT SURE
- 99. REFUSED

### Near Participant

**NP1.** Thinking back to the project that you started under the &PROGRAM program at this site, how would you characterize its status today? **[IF NECESSARY, READ OPTIONS]**

- 1. NOW DOING PROJECT
- 2. PLANNING TO DO PROJECT /PROJECT ON HOLD
- 3. COMPLETED PROJECT WITHOUT PROGRAM → **SKIP TO NP5**
- 4. NOT DOING PROJECT/ PROJECT CANCELLED → **SKIP TO NP6**
- 5. OTHER[SPECIFY \_\_\_\_\_] → **SKIP TO NP7**
- 88. DON'T KNOW/NOT SURE → **SKIP TO NP7**
- 99. REFUSED → **SKIP TO NP7**

**NP2.** Why did you put the project on hold?

- 1. Not on hold
- 2. Needed to acquire capital funding
- 3. Delays from contractor
- 4. Other **[RECORD RESPONSE]**
- 88. DON'T KNOW/NOT SURE
- 99. REFUSED

**NP3.** Will the project be completed under a &PACIFICORP program?

- 1. YES
- 2. NO → **SKIP TO NP5**
- 88. DON'T KNOW/NOT SURE → **SKIP TO NP5**
- 99. REFUSED → **SKIP TO NP5**

**NP4.** Which program will you complete the project under? **[READ LIST]**

- 1. SELF-DIRECTION CREDIT → **SKIP TO B1**
- 2. ENERGY FINANSWER → **SKIP TO B1**
- 3. FINANSWER EXPRESS → **SKIP TO B1**
- 4. OR SOMETHING ELSE (SPECIFY \_\_\_\_\_) → **SKIP TO B1**
- 88. DON'T KNOW/NOT SURE → **SKIP TO B1**
- 99. REFUSED → **SKIP TO B1**

**NP5.** Why did you decide do the project without participating in any programs?

- 1. **[RECORD RESPONSE] → SKIP TO NP7**
- 88. **DON'T KNOW/NOT SURE → SKIP TO NP7**
- 99. **REFUSED → SKIP TO NP7**

**NP6.** Why did you decide not do to the project?

- 1. **[RECORD RESPONSE] → SKIP TO NP7**
- 88. **DON'T KNOW/NOT SURE → SKIP TO NP7**
- 99. **REFUSED → SKIP TO NP7**

**NP7.** What would need to change for you to participate in &PROGRAM or similar program?

- 1. **[RECORD RESPONSE]**
- 88. **DON'T KNOW/NOT SURE**
- 99. **REFUSED**

## **Barriers**

**B1.** Do you think there are other changes that you could make to improve electric efficiency at &FIRM?

- 1. **YES**
- 2. **NO → SKIP TO IC1**
- 88. **DON'T KNOW/NOT SURE → SKIP TO IC1**
- 99. **REFUSED → SKIP TO IC1**

**B2.** Could you provide some examples of changes you think would improve electric efficiency at &FIRM?

- 1. **[RECORD RESPONSE]**
- 88. **DON'T KNOW/NOT SURE**
- 99. **REFUSED**

**B3.** Are plans in place to make any of those changes?

- 1. **YES**
- 2. **NO → SKIP TO B5**
- 88. **DON'T KNOW/NOT SURE → SKIP TO B5**
- 99. **REFUSED → SKIP TO B5**

**B4.** Are incentives from &PACIFICORP or another organization part of those plans?

- 1. **NO**
- 2. **YES**
- 88. **DON'T KNOW/NOT SURE**
- 99. **REFUSED**

**B5. What factors could prevent &FIRM from making these changes? [DO NOT READ RESPONSES; ALLOW MULTIPLE RESPONSES]**

- 8. HIGH UPFRONT COSTS
- 9. LACK OF ACCESS TO CAPITAL
- 10. LONG PAYBACK PERIOD; SLOW RATE OF RETURN
- 11. LOW PRIORITY/LACK OF INTEREST OF SENIOR MANAGEMENT IN ENERGY EFFICIENCY
- 12. LACK OF INFORMATION ABOUT SAVINGS AND PERFORMANCE
- 13. LACK OF RESPONSIBLE/ACCOUNTABLE ENERGY STAFF
- 14. OTHER (SPECIFY \_\_\_\_\_)
- 88. DON'T KNOW/NOT SURE
- 99. REFUSED

[IF MORE THAN ONE RESPONSE TO B5] **B6. Which of these do you think is the most challenging factor?**

- 8. HIGH UPFRONT COSTS
- 9. LACK OF ACCESS TO CAPITAL
- 10. LONG PAYBACK PERIOD; SLOW RATE OF RETURN
- 11. LOW PRIORITY/LACK OF INTEREST OF SENIOR MANAGEMENT IN ENERGY EFFICIENCY
- 12. LACK OF INFORMATION ABOUT SAVINGS AND PERFORMANCE
- 13. LACK OF RESPONSIBLE/ACCOUNTABLE ENERGY STAFF
- 14. OTHER (SPECIFY \_\_\_\_\_)
- 88. DON'T KNOW/NOT SURE
- 99. REFUSED

## **Satisfaction**

**IC1. Using a scale of 1 to 5 where 1 indicates 'very dissatisfied' and 5 indicates 'very satisfied', how satisfied were you overall with the experience that you had with the program?**

- 1. VERY DISSATISFIED
- 2. SOMEWHAT DISSATISFIED
- 3. NEITHER SATISFIED OR DISSATISFIED
- 4. SOMEWHAT SATISFIED → **SKIP TO IC2**
- 5. VERY SATISFIED → **SKIP TO IC2**
- 88. DON'T KNOW/NOT SURE → **SKIP TO IC2**
- 99. REFUSED → **SKIP TO IC2**

**IC1A. Why were you less than satisfied with the program overall?**

- 1. **[RECORD RESPONSE]**
- 88. DON'T KNOW/NOT SURE
- 99. REFUSED

**IC2. During your involvement with &PROGRAM did you ever contact &PACIFICORP with questions or requests for assistance?**

- 1. YES
- 2. NO → **SKIP TO FB1**



- 88. DON'T KNOW/NOT SURE → SKIP TO FB1
- 99. REFUSED → SKIP TO FB1

**IC3.** Were &PACIFICORP and its representatives timely in addressing your questions in regards to the program?

- 1. YES
- 2. NO
- 88. DON'T KNOW/NOT SURE
- 99. REFUSED

**IC4.** Were &PACIFICORP and its representatives knowledgeable in regards to the program and the program eligibility requirements?

- 1. YES
- 2. NO
- 88. DON'T KNOW/NOT SURE
- 99. REFUSED

### **Firmographics**

**FB1.** Now I have a few final, general questions about your company for comparison purposes only. Which of the following best describes your company's primary activities?

- 1. MANUFACTURING
- 2. RETAIL
- 3. DAIRY / AGRICULTURAL
- 4. FINANCE AND INSURANCE
- 5. FOOD PROCESSING
- 6. REFRIGERATED WAREHOUSE
- 7. PROFESSIONAL, SCIENTIFIC, AND TECHNICAL SERVICES
- 8. EDUCATIONAL SERVICES
- 9. HEALTH CARE
- 10. PUBLIC ADMINISTRATION
- 11. ARTS, ENTERTAINMENT, AND RECREATION
- 12. ACCOMMODATION
- 13. FOOD SERVICES
- 14. REAL ESTATE
- 15. MINING
- 16. OIL AND GAS
- 17. OTHER [SPECIFY] \_\_\_\_\_
- 88. DON'T KNOW/NOT SURE
- 99. REFUSED

**FB2.** Approximately, what percent of your total annual operating costs does your electricity bill represent?

- 1. [RECORD RESPONSE]
- 88. DON'T KNOW/NOT SURE
- 99. REFUSED

**FB3.** About how many people does your firm employ?

- 1. [RECORD RESPONSE]
- 88. DON'T KNOW/NOT SURE
- 99. REFUSED

**End**

**END1.** Those are all of the questions that I have for you. Is there anything about your experiences with &PACIFICORP's &PROGRAM program you'd like to mention that we did not talk about today?

- 1. [RECORD RESPONSE]
- 88. DON'T KNOW/NOT SURE
- 99. REFUSED

**[THANK RESPONDENT AND TERMINATE SURVEY]**

### D.3 Non-Participant Survey Instrument

Note: Non-participants are C&I customers who are not identified as having started participating in any PacifiCorp programs between 2009 and 2011.

#### Objectives

These surveys are designed to meet the following list of objectives.

- To assess awareness of PacifiCorp programs among non-participants
- To identify non-participant efficient purchasing
- To understand barriers customers are facing that prevent increasing energy efficiency
- To characterize non-participant firms

#### Variables

Variable Name	Description	Type
&FIRM	Company name	Text
&PHONE	Phone number	Numeric
&SITE	Address	Text
&PACIFICORP	Rocky Mountain Power, Pacific Power	Text
&CLASS	Revenue Class	Text

#### Survey Instrument

##### Introduction and Screen

**INTRO1.** Hello, this is INTERVIEWER, calling on behalf of &PACIFICORP. We are conducting an independent evaluation of &PACIFICORP’s energy efficiency programs so that they better suit the needs of customers like you. This is not a sales call. May I please speak with the person who is responsible for the \$\_CLASS electric account for \$\_FIRM?

1. YES, THAT IS ME → **SKIP TO INTRO3**
2. YES, LET ME TRANSFER YOU
3. NOT NOW → **SCHEDULE APPT AND CALL BACK**
4. NO/REFUSED → **TERMINATE**

**INTRO2.** Hello, this is INTERVIEWER, calling on behalf of &PACIFICORP. We are conducting an independent evaluation of &PACIFICORP’s efficiency programs so that they better suit the needs of customers like you. This is not a sales call. Do you have a few minutes? **[IF NEEDED, READ: “This survey is for research purposes only and will take about 10 minutes.”]**

20. YES → **SKIP TO IS2a**
21. NOT NOW → **MAKE APPT. TO CALL BACK**
22. NO/REFUSED → **TERMINATE**

**INTRO3.** Great. I’d like to let you know that this call may be monitored or recorded for quality assurance purposes. Also, all of your responses will be kept confidential and will not be revealed to anyone outside of the research team.

[IF NEEDED, READ: “This survey is for research purposes only and will take about 10 minutes.”]

1. CONTINUE WITH INTERVIEW
2. NOT NOW → MAKE APPT. TO CALL BACK
3. NO/REFUSED → TERMINATE

[IF VERIFICATION IS NEEDED, TELL THEM THEY CAN CALL SHAWN GRANT AT 801-220-4196].

V1. First, I'd like to verify my records. Which utility company provides electricity at &SITE?

1. &PACIFICORP
2. OTHER → TERMINATE
88. DON'T KNOW/NOT SURE
99. REFUSE

[IF &\_CLASS “COMMERCIAL” OR “INDUSTRIAL”]V2. Was this facility at &SITE constructed before or after 2009?

1. BEFORE 2009
2. 2009 OR LATER

## Awareness

A1. Are you aware that &PACIFICORP offers incentives and technical assistance to &CLASS customers to help them reduce electricity usage?

1. YES
2. NO → SKIP to A4
88. DON'T KNOW/NOT SURE → SKIP TO A4
99. REFUSED → SKIP TO A4

A2. How did you become aware that &PACIFICORP offers energy efficiency program(s)? [DO NOT READ RESPONSES, SELECT ALL THAT APPLY]

31. ACCOUNT REPRESENTATIVE OR OTHER &PACIFICORP STAFF
32. &PACIFICORP RADIO ADVERTISEMENT
33. &PACIFICORP PRINT ADVERTISEMENT
34. &PACIFICORP PRINTED MATERIALS/BROCHURE
35. &PACIFICORP ONLINE ADVERTISEMENT
36. &PACIFICORP TV ADVERTISEMENT
37. &PACIFICORP NEWSLETTER
38. &PACIFICORP WEBSITE
39. PREVIOUS PARTICIPATION IN &PACIFICORP PROGRAMS
40. CONFERENCE, WORKSHOP, OR EVENT [SPECIFY: \_\_\_\_\_]
41. &PACIFICORP SPONSORED ENERGY AUDIT OR TECHNICAL ASSESSMENT
42. FROM TRADE ALLY, VENDOR OR CONTRACTOR
43. ANOTHER BUSINESS COLLEAGUE
44. FAMILY, FRIEND, OR NEIGHBOR
45. OTHER [SPECIFY]: \_\_\_\_\_
90. DON'T KNOW/NOT SURE

99. REFUSE

**A3. Which programs or services can you think of that &PACIFICORP offers to &CLASS customers? [DO NOT READ RESPONSES, SELECT ALL THAT APPLY]**

1. ENERGY FINANSWER
2. FINANSWER EXPRESS
3. SELF-DIRECTION CREDIT
4. RECOMMISSIONING
5. IRRIGATION LOAD CONTROL
6. IRRIGATION ENERGY SAVERS
7. INCENTIVES FOR EFFICIENT EQUIPMENT
8. TECHNICAL ASSISTANCE/ ENERGY ANALYSIS
9. DEMAND RESPONSE / LOAD CONTROL
10. Other [SPECIFY]: \_\_\_\_\_
88. DON'T KNOW/NOT SURE
99. REFUSED

**A4. In the future, what is the best for &PACIFICORP to keep you informed about programs they offer that could help your firm save energy?**

1. ACCOUNT REPRESENTATIVE OR OTHER &PACIFICORP STAFF
2. RADIO ADVERTISEMENT
3. PRINT ADVERTISEMENT
4. PRINTED MATERIALS/BROCHURE
5. ONLINE ADVERTISEMENT
6. TV ADVERTISEMENT
7. NEWSLETTER
8. WEBSITE
9. CONFERENCE, WORKSHOP, OR EVENT [SPECIFY: \_\_\_\_\_]
10. TRADE ALLY, VENDOR OR CONTRACTOR
11. OTHER [SPECIFY]: \_\_\_\_\_
91. DON'T KNOW/NOT SURE
99. REFUSE

### **Energy Efficient Actions by Non-Participants**

**[IF V2=2, SKIP TO EE21]**

**EE1. Between 2009 and 2011, did you have a systematic evaluation or audit of your facility, at &SITE, to identify and implement operational improvements? [IF NEEDED: "this includes building and equipment audits, system analyses, energy engineering analysis, other detailed studies."]**

1. YES
2. NO → SKIP TO EE8
88. DON'T KNOW/NOT SURE → SKIP TO EE8
99. REFUSED → SKIP TO EE8

**EE2. What factor or factors motivated you to have your facility undergo a systematic evaluation? [DO NOT READ RESPONSES; ALLOW MULTIPLE RESPONSES]**

1. To save money on electric bills.
2. To obtain an incentive.
3. To replace old or poorly working equipment.

4. To replace broken equipment.
5. To acquire the latest technology.
6. To reduce maintenance costs.
7. Because the program was sponsored by &PACIFICORP
8. Previous experience with &PACIFICORP
9. To protect the environment.
10. To save energy
11. Recommendation by contractors/trade allies
12. Recommended by colleague
13. Recommended by family, friend or neighbor
14. To improve operations, production, or quality
15. To improve value of property
16. To improve comfort
17. Other [SPECIFY]: \_\_\_\_\_
88. DON'T KNOW/NOT SURE
99. REFUSED

**EE3.** Did you receive assistance from &PACIFICORP or another organization? [IF NEEDED: assistance may include technical assistance or incentives]

1. YES
2. NO → **SKIP TO EE5**
88. DON'T KNOW/NOT SURE → **SKIP TO EE5**
99. REFUSED → **SKIP TO EE5**

**EE4.** What program or sponsor provided assistance?

3. &PACIFICORP → **SKIP TO EE8**
4. **[RECORD RESPONSE]**
88. DON'T KNOW/NOT SURE
99. REFUSED

**EE5.** What opportunities for improvement were identified? [PROBE FOR AS MUCH DETAIL AS POSSIBLE]

1. **[RECORD RESPONSE]**
88. DON'T KNOW/NOT SURE
99. REFUSED

**EE6.** What actions have you taken as a result of the study?

1. **[RECORD RESPONSE]**
88. DON'T KNOW/NOT SURE
99. REFUSED

**[IF EE4 not 1]EE7.** Why did you not apply for assistance from &PACIFICORP?

1. **[RECORD RESPONSE]**
88. DON'T KNOW/NOT SURE
99. REFUSED

**EE8a.** Did you install any high efficiency equipment at this site between 2009 and 2011?

1. YES

- 2. NO
- 88. DON'T KNOW/NOT SURE
- 99. REFUSED

**EE8b.** Did you make any improvements to this site between 2009 and 2011 to help conserve energy?

- 1. YES
- 2. NO
- 88. DON'T KNOW/NOT SURE
- 99. REFUSED

[IF EE8a ≠ 1 and EE8b ≠ 1, SKIP TO EE15]

**EE9.** What did you install? (PROBE FOR AS MUCH DETAIL AS POSSIBLE)

- 1. **[RECORD RESPONSE]**
- 88. DON'T KNOW/NOT SURE
- 99. REFUSED

**EE10.** How many did you purchase or install?

- 1. **[RECORD RESPONSE]**
- 88. DON'T KNOW/NOT SURE
- 99. REFUSED

**EE11.** What factor or factors motivated you to make these changes? **[DO NOT READ RESPONSES; ALLOW MULTIPLE RESPONSES]**

- 1. To save money on electric bills.
- 2. To obtain an incentive.
- 3. To replace old or poorly working equipment.
- 4. To replace broken equipment.
- 5. To acquire the latest technology.
- 6. To reduce maintenance costs.
- 7. Because the program was sponsored by &PACIFICORP
- 8. Previous experience with &PACIFICORP
- 9. To protect the environment.
- 10. To save energy
- 11. Recommendation by contractors/trade allies
- 12. Recommended by colleague
- 13. Recommended by family, friend or neighbor
- 14. To improve operations, production, or quality
- 15. To improve value of property
- 16. To improve comfort
- 17. Other [SPECIFY]: \_\_\_\_\_
- 88. DON'T KNOW/NOT SURE
- 99. REFUSED

**EE12.** Did you receive assistance from &PACIFICORP or another organization?

- 1. YES
- 2. NO → **SKIP TO EE14**
- 88. DON'T KNOW/NOT SURE → **SKIP TO EE14**
- 99. REFUSED → **SKIP TO EE14**



EE13. What program or sponsor provided assistance?

- 5. &PACIFICORP → SKIP TO EE15
- 6. [RECORD RESPONSE]
- 88. DON'T KNOW/NOT SURE
- 99. REFUSED

EE14. Why did you not apply for an incentive from &PACIFICORP for this equipment?

- 1. [RECORD RESPONSE]
- 88. DON'T KNOW/NOT SURE
- 99. REFUSED

EE15. Since 2009, have you implemented any load control strategies at your facility?

- 1. YES
- 2. NO → SKIP TO B1
- 88. DON'T KNOW/NOT SURE → SKIP TO B1
- 99. REFUSED → SKIP TO B1

EE16. What strategies have you implemented?

- 1. [RECORD RESPONSE]
- 88. DON'T KNOW/NOT SURE
- 99. REFUSED

EE17. What factor or factors motivated you to make these changes? **[DO NOT READ RESPONSES; ALLOW MULTIPLE RESPONSES]**

- 1. To save money on electric bills.
- 2. To obtain an incentive.
- 3. To replace old or poorly working equipment.
- 4. To replace broken equipment.
- 5. To acquire the latest technology.
- 6. To reduce maintenance costs.
- 7. Because the program was sponsored by &PACIFICORP
- 8. Previous experience with &PACIFICORP
- 9. To protect the environment.
- 10. To save energy
- 11. Recommendation by contractors/trade allies
- 12. Recommended by colleague
- 13. Recommended by family, friend or neighbor
- 14. To improve operations, production, or quality
- 15. To improve value of property
- 16. To improve comfort
- 17. Other [SPECIFY]: \_\_\_\_\_
- 88. DON'T KNOW/NOT SURE
- 99. REFUSED

EE18. Did you receive assistance from &PACIFICORP or another organization?

- 1. YES
- 2. NO → SKIP TO EE20

- 88. DON'T KNOW/NOT SURE → SKIP TO EE20
- 99. REFUSED → SKIP TO EE20

EE19. What program or sponsor provided assistance?

- 1. &PACIFICORP → SKIP TO B1
- 2. [RECORD RESPONSE]
- 88. DON'T KNOW/NOT SURE
- 99. REFUSED

EE20. Why did you not apply for an incentive from &PACIFICORP for these load control improvements?

- 1. [RECORD RESPONSE]
- 88. DON'T KNOW/NOT SURE
- 99. REFUSED

[IF V2=2] EE21. When constructing this facility, did you install any high efficiency equipment?

- 1. YES
- 2. NO → SKIP TO B1
- 88. DON'T KNOW/NOT SURE → SKIP TO B1
- 99. REFUSED → SKIP TO B1

EE22. What high efficiency equipment did you install? (PROBE FOR AS MUCH DETAIL AS POSSIBLE)

- 2. [RECORD RESPONSE]
- 88. DON'T KNOW/NOT SURE
- 99. REFUSED

EE23. How many did you purchase or install?

- 1. [RECORD RESPONSE]
- 88. DON'T KNOW/NOT SURE
- 99. REFUSED

EE24. What factor or factors motivated you to make these changes? [DO NOT READ RESPONSES; ALLOW MULTIPLE RESPONSES]

- 1. To save money on electric bills.
- 2. To obtain an incentive.
- 3. To replace old or poorly working equipment.
- 4. To replace broken equipment.
- 5. To acquire the latest technology.
- 6. To reduce maintenance costs.
- 7. Because the program was sponsored by &PACIFICORP
- 8. Previous experience with &PACIFICORP
- 9. To protect the environment.
- 10. To save energy
- 11. Recommendation by contractors/trade allies
- 12. Recommended by colleague
- 13. Recommended by family, friend or neighbor
- 14. To improve operations, production, or quality

- 15. To improve value of property
- 16. To improve comfort
- 17. Other [SPECIFY]: \_\_\_\_\_
- 88. DON'T KNOW/NOT SURE
- 99. REFUSED

**EE25.** Did you receive assistance from &PACIFICORP or another organization?

- 1. YES
- 2. NO → **SKIP TO EE27**
- 88. DON'T KNOW/NOT SURE → **SKIP TO EE27**
- 99. REFUSED → **SKIP TO EE27**

**EE26.** What program or sponsor provided assistance?

- 7. **&PACIFICORP → SKIP TO B1**
- 8. **[RECORD RESPONSE]**
- 88. DON'T KNOW/NOT SURE
- 99. REFUSED

**EE27.** Why did you not apply for an incentive from &PACIFICORP for this equipment?

- 1. **[RECORD RESPONSE]**
- 88. DON'T KNOW/NOT SURE
- 99. REFUSED

## **Barriers**

**B1.** Do you think there are other changes that you could make to improve electric efficiency at &FIRM?

- 1. YES
- 2. NO → **SKIP TO FB1**
- 88. DON'T KNOW/NOT SURE → **SKIP TO FB1**
- 99. REFUSED → **SKIP TO FB1**

**B2.** Could you provide some examples of what changes you think you could make?

- 1. **[RECORD RESPONSE]**
- 88. DON'T KNOW/NOT SURE
- 99. REFUSED

**B3.** Are plans in place to make any of those changes?

- 1. YES
- 2. NO → **SKIP TO B5**
- 88. DON'T KNOW/NOT SURE → **SKIP TO B5**
- 99. REFUSED → **SKIP TO B5**

**B4.** Are incentives from &PACIFICORP or another organization part of those plans?

- 1. YES
- 2. NO
- 88. DON'T KNOW/NOT SURE
- 99. REFUSED

**B5. What factors could prevent &FIRM from making these changes? [DO NOT READ RESPONSES; ALLOW MULTIPLE RESPONSES]**

- 15. HIGH UPFRONT COSTS
- 16. LACK OF ACCESS TO CAPITAL
- 17. LONG PAYBACK PERIOD; SLOW RATE OF RETURN
- 18. LOW PRIORITY/LACK OF INTEREST OF SENIOR MANAGEMENT IN ENERGY EFFICIENCY
- 19. LACK OF INFORMATION ABOUT SAVINGS AND PERFORMANCE
- 20. LACK OF RESPONSIBLE/ACCOUNTABLE ENERGY STAFF
- 21. OTHER (SPECIFY \_\_\_\_\_)
- 88. DON'T KNOW/NOT SURE
- 99. REFUSED

[IF MORE THAN ONE RESPONSE TO B5] B6. Which of these do you think is the most challenging factor?

- 15. HIGH UPFRONT COSTS
- 16. LACK OF ACCESS TO CAPITAL
- 17. LONG PAYBACK PERIOD; SLOW RATE OF RETURN
- 18. LOW PRIORITY/LACK OF INTEREST OF SENIOR MANAGEMENT IN ENERGY EFFICIENCY
- 19. LACK OF INFORMATION ABOUT SAVINGS AND PERFORMANCE
- 20. LACK OF RESPONSIBLE/ACCOUNTABLE ENERGY STAFF
- 21. OTHER (SPECIFY \_\_\_\_\_)
- 88. DON'T KNOW/NOT SURE
- 99. REFUSED

### **Firmographics**

**FB1.** Now I have a few final, general questions about your company for comparison purposes only. Could you describe your company's primary activities? (DO NOT READ LIST, CODE AND CONFIRM WITH RESPONDENT)

- 1. MANUFACTURING
- 2. RETAIL
- 3. DAIRY / AGRICULTURAL
- 4. FINANCE AND INSURANCE
- 5. FOOD PROCESSING
- 6. REFRIGERATED WAREHOUSE
- 7. PROFESSIONAL, SCIENTIFIC, AND TECHNICAL SERVICES
- 8. EDUCATIONAL SERVICES
- 9. HEALTH CARE
- 10. PUBLIC ADMINISTRATION
- 11. ARTS, ENTERTAINMENT, AND RECREATION
- 12. ACCOMMODATION
- 13. FOOD SERVICES
- 14. REAL ESTATE
- 15. MINING
- 16. OIL AND GAS
- 17. OTHER [SPECIFY] \_\_\_\_\_

- 88. DON'T KNOW/NOT SURE
- 99. REFUSED

**FB2.** Approximately, what percent of your total annual operating costs does your electricity bill represent? (IF NEEDED: An estimate is fine.)

- 1. [RECORD RESPONSE]
- 88. DON'T KNOW/NOT SURE
- 99. REFUSED

**FB3.** And about how many people does your firm employ at this facility?

- 1. [RECORD RESPONSE]
- 88. DON'T KNOW/NOT SURE
- 99. REFUSED

**End**

**END1.** Those are all of the questions that I have for you. Is there anything about your experiences with &PACIFICORP you'd like to mention that we did not talk about today?

- 1. [RECORD RESPONSE]
- 88. DON'T KNOW/NOT SURE
- 99. REFUSED

**[THANK RESPONDENT AND TERMINATE SURVEY]**

#### D.4 Trade Ally Interview Instrument

*Note: Potential respondents for the purposes of this interview are contractors in the RMP and Pacific Power Energy Efficiency Alliance who have completed at least one FinAnswer Express project between 2009 and 2011. Participant survey responses, tracking data, and suggestions from program staff will be considered before selecting allies to interview.*

#### Objectives

These interviews are designed to meet the following list of objectives.

- How are trade allies becoming aware of the program?
- How well does the trade ally participation agreement meet their needs?
- How are program operations communicated to trade allies? How is training provided? Is this communication and training effective (do they understand the program)?
- How satisfied are trade allies with their role in the program? What would they do to improve it?
- Do trade allies who participate see value to their business? Can they describe the effect on their operations?
- What kind of energy efficient sales are they seeing outside of the program? (Spillover)

#### Variables

Variable	Description	Type
\$_CONTACT	Name of contact	Text
\$_FIRM	Name of vendor company	Text
\$_PACIFICORP	Pacific Power /Rocky Mountain Power	Text
\$_PROJECTS	Completed projects 2009-2011	Number
\$_TYPE	Based on "UtilityMeasureType" and "UtilityMeasureSubtype." Includes: <ul style="list-style-type: none"> <li>• Lighting equipment</li> <li>• HVAC equipment (non VFD)</li> <li>• VFD</li> </ul>	Text
\$_ENROLL_DATE	When they are listed as EEA	Date
\$_STATE	State(s) where active	Text

## *Interview Guide*

Hello, this is <INTERVIEWER NAME>, from Energy Market Innovations. We are conducting an independent evaluation of \$\_PACIFICORP's energy efficiency programs. This is not a sales call. May I please speak with \$\_CONTACT.

I understand that \$\_FIRM is part of \$\_PACIFICORP's Energy Efficiency Alliance. Your feedback can be used to improve Alliance support and the FinAnswer Express program.

- A1. Are you the person that works most closely with the Energy Efficiency Alliance at your company?
- a. Yes
  - b. No → [ask to speak to person most familiar with the program]

I would like to discuss your experiences and perspectives regarding the Energy Efficiency Alliance. This interview will take 30-45 minutes, and as a thank you for taking time to chat with me, I would like to offer you a \$50 gas card.

Is this a good time to talk or would you prefer to schedule a more convenient time?  
[If no, scheduled callback time:] \_\_\_\_\_

With your permission, I'd like to record this interview to ensure that I don't miss any important information and for quality assurance. Your responses will be kept confidential.

A2. In one or two sentences, can you please tell me what \$\_FIRM does?

A3. What is your title/role at \$\_FIRM?

A3a. How long have you been in this position at your company?

### **Section 1: Participation**

1. Our records show that your firm joined the Energy Efficiency Alliance for \$\_TYPE in \$\_ENROLL\_DATE? Is this your understanding as well?
2. How did you first hear about the program? (DO NOT READ, MARK ALL)
  - a. Advertising
  - b. PacifiCorp Representative
  - c. Other Contractor/Vendor
  - d. Customer
  - e. Other (SPECIFY \_\_\_\_\_)
3. What motivated you to participate?

4. Our records show that your firm facilitated \$\_PROJECTS \$\_TYPE projects from 2009 to 2011 in \$\_STATE as part of \$\_PACIFICORP's Energy Efficiency Alliance. (Repeat for each state firm is active in.)
  - a. How were you involved? (E.g. Did they influence the project or just take orders?)

### **Section 2: Training, Roles, and Communication**

5. What kind of training or information about the program were you provided when you first became involved? [MAY HAVE HAD INTERNAL TRAINING.]
  - a) Have you had any follow up or continuing training?
  - b) Have you, or someone from \$\_FIRM attended an alliance workshop?
6. Did you feel like the program was clearly explained? What about your role in the program?
7. How would you describe your communication with the program representatives?
  - a. Is there one key contact you communicate with about the program? Who?
  - b. What might initiate contact?
    - i. Is there a set frequency of contact or an action that would trigger contact?
    - ii. Does he/she contact you or do you contact him/her?
  - c. How often is the contact?
    - i. Does this meet your needs?
  - d. How would you rate your satisfaction with your contact, on a scale of 1 to 5 with 1 being very dissatisfied and 5 being very satisfied?
  - e. Is he/she able to answer your questions or get you to someone who can?
8. How do you prefer to get information about the program? (DO NOT READ, MARK ALL THAT ARE STATED)
  - a) Online, check site often
  - b) Email
  - c) Mail Newsletter
  - d) Phone Call
9. [IF \$\_TYPE = Lighting only] Do you use the program's lighting software tool?
  - a. If so, how does the lighting tool help you?
    - i. [FOLLOW UP] Does the tool output summary help you sell projects?
  - b. If you could change one thing about the lighting tool, what would it be?

### **Section 3: Marketing**

10. Do you use the program as part of your marketing to potential customers?
  - a) [IF YES] how?
  - b) [2<sup>nd</sup> FOLLOW UP]Has it had any effect on your sales?



11. Did the program provide your firm with any marketing materials, such as brochures, flyers, or forms to help promote and explain the program offerings?
  - a) Brochures
  - b) Forms
  
12. Are there changes you would like to see in the marketing materials?
  - a) If yes, what?

**Section 4: Customer Involvement**

13. Is your interaction with customers that are participating in the program different than those that are not part of the program? How?
  
14. Are you able to help customers fill out applications for incentives for equipment purchased through the program?
  - a) Any difficulties?
  - b) Do customers need assistance with the application? How much?
  
15. What questions do customers typically have when you talk to them about the programs? Any concerns?
  
16. What challenges do you face in addressing customer questions or concerns towards the programs?
  
17. How do customers typically find out about the program? [INTERESTED IF CUSTOMERS KNOW ABOUT THE PROGRAM AND BRING IDEA TO THE ALLY OR IF THE ALLY IS ACTIVELY SELLING/ADVERTISING THE PROGRAM; PROBE TO DETERMINE ONE OR THE OTHER.]
  - a) For the projects you completed between 2009 and 2011, what percent were initiated by you contacting the customer to propose the project as compared to the customer contacting you with a project in mind?
  - b) When customers come to you with a project in mind, how often are you able to suggest changes to increase the energy efficiency of what they initially envisioned?
  
18. How many projects do you know of that were started but were not completed (i.e. not installed by anyone to the best of your knowledge)?
  - a) How does that compare, portion wise, to the completed projects?
  - b) What do you see as the primary reasons these projects were not completed? (TIE ANSWERS TO BARRIERS LIST USED IN PARTICIPANT SURVEY: HIGH UPFRONT COSTS, LACK OF ACCESS TO CAPITAL, LONG PAYBACK PERIOD; SLOW RATE OF RETURN, LOW PRIORITY/LACK OF INTEREST OF SENIOR MANAGEMENT IN ENERGY EFFICIENCY, LACK OF INFORMATION ABOUT SAVINGS AND PERFORMANCE, LACK OF RESPONSIBLE/ACCOUNTABLE ENERGY STAFF)?

## Section 5: Effects of the Program

For the next few questions, please consider just 2011, if you can.

19. [IF LIGHTING OR HVAC OR MOTORS] Approximately what percent of your total \$ \_TYPE sales in \$ \_STATE last year was from program-eligible equipment, (IF NEEDED: that is [DESCRIPTION OF ELIGIBILITY REQUIREMENTS, WILL VARY BY TYPE])? [If \$ \_TYPE=VFD], Approximately what percent of drives sold in \$ \_STATE were variable frequency?
  - a. [PROBE FOR MORE THAN ONE TYPE IF APPROPRIATE. WE ARE TRYING TO UNDERSTAND PORTION OF SALES THAT ARE OF EFFICIENT-ENOUGH EQUIPMENT TO QUALIFY FOR THE PROGRAM.]
  - b. To the best of your knowledge, did you complete any \$ \_TYPE projects in 2011 [IF LIGHTING OR HVAC: that would have been eligible for the program and] that did not receive program incentives?
    - i. [IF YES – FOLLOW UP] Thinking of just 2011, about how many projects do you think would qualify that did not receive program incentives? [OR, could you relate the volume of eligible equipment with the volume that you do with the program?]
    - ii. [SECOND FOLLOW UP] Why did those customers not participate in the program?
20. [IF LIGHTING OR HVAC] Did you sell more program-eligible \$ \_TYPE last year, than in previous years?  
[IF VFD] Did you sell more VFD's last year than in previous years?  
[PROBE TO FOCUS ON THE SALES- SHARE OF ENERGY STAR OR OTHER HIGHLY EFFICIENT EQUIPMENT]
  - a. Have you noticed any other trends over time, related to the efficiency of purchases?
21. Do the \$ \_PACIFICORP program incentives influence your selling of program-eligible equipment for \$ \_TYPE? [THIS QUESTION APPLIES TO SERVICES AS WELL AS WIDGETS; IT IS A YES/NO, BUT INTERVIEWER SHOULD PROBE TO FIND OUT WHAT THAT MEANS TO THEM.]
  - a. [IF YES] Please rate the influence on a scale of one to five, where one is no influence at all and five is a driving force in your sales.
22. (IF APPLICABLE) Do the \$ \_PACIFICORP program incentives influence your stocking of program-eligible equipment for \$ \_TYPE? [THIS QUESTION APPLIES TO WIDGETS; IT IS A YES/NO, BUT INTERVIEWER SHOULD PROBE TO FIND OUT WHAT THAT MEANS TO THEM.]
  - a. [IF YES] Please rate the influence on a scale of one to five, where one is no influence at all and five is a driving force in your stocking practices.
23. Does the \$ \_PACIFICORP program information influence your selling of program-eligible equipment for \$ \_TYPE? [INTERVIEWER MAY NEED TO CLARIFY THAT WE ARE DISCUSSING JUST THE INFORMATION PROVIDED TO THEM; PERHAPS AT WORKSHOPS/WEBSITE/ETC.]
  - a. [IF YES] Please rate the influence on a scale of one to five, where one is no influence at all and five is a driving force in your sales.
24. If the FinAnswer Express program did not exist, can you estimate how your sales of this efficient \$ \_TYPE equipment would be different? (PROBE FOR PERCENTAGE CHANGE)

**Section 6: Business Impact**

- 25. Are there any other ways that participation in this program impacted your business, if at all? [IF RESPONDENT ALREADY ANSWERED THIS IN SECTION 5, DON'T ASK AGAIN. Looking for qualitative here – already asked rate]
- 26. How does the FinAnswer Express program differ from other similar programs that you may be involved with at other utilities? (BE SURE TO FOCUS PROBES ON: Is the amount of effort required on your part different? What about the amount of paperwork? The program offer to participants?)

**Section 7: Satisfaction with Program(s)**

[NOW, I HAVE JUST A FEW MORE QUESTIONS.]

- 27. On the whole, are you satisfied with your experience in the Energy Efficiency Alliance, on a scale of 1 to 5 with 1 being very dissatisfied and 5 being very satisfied?
- 28. Do you use the \$\_PACIFICORP vendor website?
  - a. [IF YES, follow up] How often do you visit the website?
  - b. [2<sup>nd</sup> follow up] What kind of information do you look for on the website?
  - c. [IF NO] Did you know that upcoming events as well as archives of alliance newsletters are available on the website?
    - i. How do you find out about events and newsletters?
- 29. When you joined the Energy Efficiency Alliance, you signed a trade ally participation agreement. Do you remember this agreement?
  - a. [IF RECALLS AGREEMENT] Is there anything you would have liked to change about this agreement?
- 30. Is there anything else you'd like to tell us about your experience?

**Section 8: Gas Card Offer/Closing**

As a thank you for your participation in this interview, we'd like to offer you a \$50 gas gift card. Would you like to accept this offer?

(If yes) Which type of gas station would be most convenient for you?

[NOTE: The following do not offer gift cards we can order: Loaf N' Jug, Kum & Go  
 The following companies DO offer gas cards: Exxon-Mobil, Sinclair, Conoco, Pilot-Flying J, Shell, Valero (Diamond Shamrock), Phillips 66, Chevron-Texaco, Maverik]

To what address should we mail the gift card?

Thank you!

*List of Trade Allies Interviewed for FinAnswer Express Evaluation*

All-Seasons

Carrier

Commercial lighting Supply

CraLux Lighting

D & S Electrical

ESCO

Gunthers

H & N Electric

Orange Dairy

Whipple Electric

## Appendix E. Process Evaluation Detailed Findings

### E.1 Participant Results

**Table 4. Overall Participant Satisfaction with the FinAnswer Express Program**

Satisfaction	Count of Respondents	Percentage of Respondents
Very satisfied	20	69.0%
Somewhat satisfied	4	13.8%
Neither satisfied nor dissatisfied	0	0.0%
Somewhat dissatisfied	3	10.3%
Very dissatisfied	1	3.4%
Don't know/ Not sure	1	3.4%
<b>Total</b>	<b>29</b>	<b>100.0%</b>

**Table 5. Motivation to Participate in FinAnswer Express**

	Primary	Secondary	Total Responses	Percent of Total
Other	3	2	5	9.6%
To protect the environment	0	3	3	5.8%
To improve operations, production, or quality	0	4	4	7.7%
To replace old or poorly working equipment	3	1	4	7.7%
To acquire the latest technology	2	3	5	9.6%
To save money on electric bills	5	4	9	17.3%
To save energy	2	8	10	19.2%
To obtain an incentive	10	2	12	23.1%
<b>Total</b>	<b>25</b>	<b>27</b>	<b>52</b>	<b>100.0%</b>

**Table 6. Participant Satisfaction with FinAnswer Express Trade Ally**

Satisfaction	Count of Respondents	Percentage of Respondents
Very satisfied	15	51.7%
Somewhat satisfied	1	3.4%
Neither satisfied nor dissatisfied	0	0.0%
Somewhat dissatisfied	0	0.0%
Very dissatisfied	0	0.0%
Don't know/ Not sure	7	24.1%
Refused	1	340.0%
<b>Total</b>	<b>24</b>	<b>100.0%</b>

**Table 7. Participant Satisfaction with their Installed Measures**

Satisfaction	Count of Respondents	Percentage of Respondents
Very satisfied	23	79.3%
Somewhat satisfied	2	6.9%
Neither satisfied nor dissatisfied	4	13.8%
Somewhat dissatisfied	0	0.0%
Very dissatisfied	0	0.0%
<b>Total</b>	<b>29</b>	<b>100.0%</b>

**Table 8. Factors Influencing Project Decisions**

	Don't Know/ Not Sure/ Refused	Not at All	Somewhat Unimportant	Neutral	Somewhat Important	Extremely Important
Previous Participation in a Pacific Power program	4	11	2	0	4	8
Corporate Policy for Energy Reduction	1	10	1	4	4	9
Familiarity with Equipment	2	6	1	3	5	12
Information Provided on Payback	3	4	1	2	6	13
Contractor Recommendation	1	1	2	3	6	16
Information on Energy Savings	1	2	4	3	2	17
Pacific Power Incentive	1	1	3	5	2	17

## E.2 Non-Participant Results

**Table 9. Size of Non-Participant Firms, by Number of Employees**

Number of Employees	Irrigation	Commercial	Industrial	Weighted Percent of Total
Less than 3	36	33	11	33%
3 to less than 10	17	15	3	24%
10 to less than 100	7	8	6	24%
100 to less than 1000	0	1	1	3%
Greater than 1000	1	0	0	0%
Not sure/Don't Know/Refused	12	17	2	16%
Total	73	74	23	--

**Table 10. Primary Activity for Non-Participating Respondents, by Customer Class**

Primary Activity Characterization	Irrigation (n=73)	Commercial (n=74)	Industrial (n=23)
Dairy/Agricultural	55	6	0
Residence	6	11	2
Professional, scientific, and technical services	1	9	4
Retail	1	8	3
Health care	0	4	1
Manufacturing	0	3	5
Real estate	0	3	1
Religious Services/Social Services/Nonprofit	0	3	0
Environmental/Public Health	1	2	0
Finance and insurance	0	2	0
Arts, Entertainment, and Recreation	0	2	0
Oil and gas	0	2	0
Construction	0	1	2
Accommodation	1	1	0
Transportation	0	1	1
Food services/Food processing/Refrigerated	0	2	1
Other (single respondent each)	1	2	2
Don't know/Not sure/Refused	7	12	1

**Table 11. Non-Participant Awareness of Pacific Power Programs and Services**

Response a	Irrigation	Irrigation (%)	Commercial	Commercial (%)	Industrial	Industrial (%)
Aware	30	41%	31	42%	10	43%
Not Aware	43	59%	43	58%	13	57%
Total	73	100%	74	100%	23	100%

**Table 12. Pacific Power Programs and Services Identified, by Customer Class**

Responses	Irrigation	Commercial	Industrial
Not Sure/Don't Know	19	22	6
Incentives for Efficient Equipment	8	4	3
Technical Assistance	4	2	1
Appliance Pick Up/Disposal	0	2	0
Renewable Energy Services	0	1	1
Energy FinAnswer	0	1	0
Energy Star	0	1	0
Weatherization Services	0	1	0
Disability Services	0	1	0
Irrigation Load Control	2	0	0
FinAnswer Express	1	0	0
Self-Direction Credit	1	0	0
Low Income Services	0	0	1

**Table 13. How Non-Participants Heard about Pacific Power Programs, Overall**

Source of Information	Irrigation	Commercial	Industrial
Pacific Power printed materials/brochures	7	7	1
Pacific Power representative	2	5	4
TV advertising	0	5	0
Word of mouth	4	4	0
Pacific Power newsletter	2	3	1
Print advertising	7	2	0
Pacific Power website	1	3	0
General knowledge/personal research	2	2	0
Previous participation in Pacific Power programs	3	1	1
Don't know/Not sure	3	1	1
Accompanying billing	0	1	1
Trade ally, vendor, or contractor	2	0	0
Pacific Power presentation/meeting	2	0	0
Radio advertising	1	0	0



**Table 14. Preferred Method to Learn about Programs and Opportunities, Overall**

Preferred Method	Irrigation	Commercial	Industrial
Mail	13	17	2
Email	12	15	6
Pacific Power printed materials/brochure	17	11	3
Phone	13	6	4
Accompanying bills	9	6	1
Pacific Power website	4	6	0
Don't know/Not sure	3	5	3
Pacific Power representative	0	5	2
Pacific Power newsletter	4	4	1
Print advertisement	3	1	0
Radio advertisement	0	1	1
TV advertisement	0	1	0
Trade ally, vendor, or contractor	1	0	0
Pacific Power presentation/meetings/workshops	1	0	0
In person	1	0	0

**Table 15. Preferred and Actual Methods of Program Awareness**

Column1	How Aware Non-Participants Found Out (n=74)	How Non-Participants Prefer to Hear (n=170)
Mail	0%	21%
Email	0%	19%
Phone	0%	9%
Accompanying bills	3%	8%
Radio advertisement	0%	1%
In person	0%	0%
Trade ally, vendor, or contractor	1%	0%
Pacific Power presentation/meetings/workshops	1%	0%
Pacific Power website	9%	7%
Pacific Power newsletter	9%	5%
Pacific Power printed materials/brochure	22%	15%
Print advertisement	9%	2%
Pacific Power representative	15%	5%
TV advertisement	13%	1%

**Table 16. Non-Participant High Efficiency Equipment Purchases in Existing Facilities**

Response	Irrigation		Commercial		Industrial	
Yes, without assistance from Pacific Power	11	15%	11	15%	3	13%
Yes, with assistance from Pacific Power	3	4%	0	0%	1	4%
No	59	81%	63	85%	19	83%
Total Respondents	73	100%	74	100%	23	100%

**Table 17. Non-participant Load Control Strategies in Existing Facilities**

Response	Irrigation		Commercial		Industrial	
Yes, without assistance from Pacific Power	2	3%	1	1%	0	0%
Yes, with assistance from Pacific Power	0	0%	0	0%	0	0%
No, did not implement load control strategies	71	97%	73	99%	23	100%
Total Respondents	73	100%	74	100%	23	100%

**Table 18. Non-participant Systematic Evaluations of Existing Facilities**

Response	Irrigation		Commercial		Industrial	
Yes, without assistance from Rocky Mountain Power	4	5%	0	0%	1	4%
Yes, with assistance from Rocky Mountain Power	1	1%	1	1%	0	0%
No, did not conduct a systematic evaluation of facility	68	93%	73	99%	22	96%
Total Respondents	73	100%	74	100%	23	100%

**Table 19. Why Didn't Non-Participants Apply for Assistance from Pacific Power**

	High Efficient Equipment	Systematic Evaluation	Overall
Not sure/No response	41%	52%	39%
Too much hassle to apply	20%	0%	17%
Didn't think about it/forgot	14%	0%	12%
Wasn't aware	13%	0%	11%
Would not qualify	7%	0%	6%
Small project size, not worth it	6%	0%	5%
Think Pacific Power would have been unhelpful	4%	0%	3%
With incentive, project still too expensive	2%	24%	3%
Didn't know if qualified	0%	24%	1%
No program/application needed	0%	0%	0%

**Table 20. Non-Participant Motivation for Pursuing Energy Efficiency Improvements**

Motivation for Making Efficiency Improvements	High Efficient Equipment	Load Control	Systematic Evaluation
To save money on electric bills	46%	83%	23%
To replace old, broken, or poorly working equipment	38%	0%	15%
To improve operations, production, or quality	10%	17%	8%
Pacific Power just did it	0%	0%	43%
To save energy	2%	0%	8%
To obtain an incentive	1%	0%	4%
Recommendation by contractors/trade allies	1%	0%	0%
To save water	1%	0%	0%
To acquire the latest technology	1%	0%	0%
To improve comfort	1%	0%	0%

**Table 21. Non-Participant Indication of Further Energy Efficiency Opportunities**

	Irrigation	Commercial	Industrial
Yes, could make future improvements	23%	28%	35%
No, could not make future improvements	40%	55%	43%
Not sure or Refused	34%	15%	22%

**Table 22. Indication of Plans to Implement Electric Efficiency Projects for Non-Participants who believe their Firm has Further Efficiency Opportunities**

Response	Weighted Count of Respondents	Weighted Percent of Respondents
Yes, plans in place to implement projects - with Pacific Power assistance	7	15%
Yes, plans in place to implement projects - without Pacific Power Assistance	6	12%
Yes, plans in place to implement projects - unsure about assistance	4	8%
No, plans not in place	30	64%
Don't Know/Not Sure	1	2%
<b>Total</b>	<b>47</b>	<b>100%</b>

**Table 23. Barriers to Implementing Electric Efficiency Improvements**

Barriers	% of Respondents
High upfront costs	56%
Lack of access to capital	9%
Low priority/Lack of interest of senior management/ building owner	8%
Government/legal permitting/rules	8%
Lack of information about savings and performance	5%
Time/convenience for schedule	4%
Long payback period; slow rate of return	1%
Currently going out of business	0%
Nothing	0%
Don't know/Not sure	9%
Total	100%

### E.3 Net-to-Gross Project-Level Details

**Table 24. Project-Level NTG Ratios**

Project ID	NTG	Reported Energy Savings (kWh)
CAL00060	1.0	106034
CAL00024	1.0	20429.69657
CAL00028	1.0	3172
CAL00053	1.0	126944
CAL00062	1.0	148383
CAL00032	1.0	4271
CAL00064	1.0	17853
CAL00039	1.0	2768
CAL00051	1.0	2152
CAL00046	1.0	2234
CAL00049	0.9	145854
CAL00055	1.0	8849
CAL00066	1.0	2165
CAN00006	1.0	12856.8503
CAN00008	1.0	12856.8503
CAN00026	1.0	5741.254741
CAL00021	0.75	32563.676
CAL00023	0.00	4256.421428
CAL00026	0.00	0
CAL00036	0.00	2185
CAL00054	0.00	9472
CAL00068	0.75	176519
CAN00011	0.75	178.0281942

Project ID	NTG	Reported Energy Savings (kWh)
CAN00018	0.75	216
CAN00024	0.00	1272
CAN00029	0.00	7700.4
CAN00030	0.75	729
CAN00033	0.75	10720
FE000_000047	0.00	2503