REPORT

Nexant

Reimagine tomorrow.

EM&V of Residential Air Conditioning, Pool Pump, Sunscreen, and Whole House Fan Programs

Submitted to Roseville Electric

November 30, 2016

Principal authors:

Jason Hinsey, Senior Consultant

Cher Seruto, Project Analyst

Patrick Burns, Vice President

Contents

1 Introduction

Nexant, Inc. (Nexant) has been retained by Roseville Electric (RE) to conduct a third party independent evaluation of the Residential Air Conditioner and Heat Pump (Residential AC), Whole House Fan (WHF), Variable Speed Pool Pump (Pool Pump) and Window Sunscreen programs. The evaluation builds on previous research conducted by RE and adheres to the California Energy Commission's (CEC) EM&V Guidelines for Public Owned Utilities (POUs).[1] This evaluation includes both a process and impact evaluation for the 2015-2016 Fiscal Year (FY 15-16), which occurred between July 1, 2015 and June 30, 2016. This report contains the evaluation objectives, methodology, findings, and recommendations for prospective program changes.

1.1 Program Summaries

Roseville Electric offers a variety of DSM programs to its residential customers. Four of these programs offered during program year FY 15-16 were:

1) Air Conditioner & Heat Pump

2) Whole House Fan

3) Sunscreen

4) Pool Pumps

Each of these programs provides incentives in the form of a rebate to residential customers for installing qualifying equipment.

The **Residential AC Program** encourages customers to install higher efficiency air conditioners or heat pumps through tiered incentives based on the equipment's level of efficiency. The program requires that the new air conditioner or heat pump must be controlled via a programmable thermostat for any tier. The requirements for meeting each efficiency tier are shown in the table below.

[1] KEMA, *California Energy Commission EM&V Guidelines, POU Energy Efficiency Programs, Version January 2011*, Draft 12-29-10.

Table 1-1: Minimum Efficiencies for Residential AC Program

Tier	Split Systems	Packaged Systems
Saver	15 SEER/ 12.5 EER/ 8.5 HSPF	14 SEER/ 12 EER/ 8 HSPF
Premium	16 SEER/ 13 EER/ 9 HSPF	16 SEER/ 12.5 EER/ 8.4 HSPF
Elite	14.5 EER	

The **Whole House Fan Program** incentivizes the installation of whole house fans, which reduce the load on the home's air conditioner when it is cooler outside. The program requires that each new fan have minimum airflow of 2000 cubic feet per minute (CFM) and have a performance of at least 15 CFM/Watt.

The **Sunscreen Program** offers rebates for the installation of permanent sunscreens on residential windows. Sunscreens help reduce a building's solar heat gain, thereby reducing the amount of cooling needed during the summertime. The program requires that the windows with sunscreens be located on conditioned spaces on the south, east, or west sides of the building and have no existing exterior shading device. The sunscreens must also have a maximum shading coefficient of 0.40 or solar heat gain coefficient of 0.35.

The **Pool Pump Program** incentivizes customers to upgrade from a single or dual speed to a variable speed pool pump. Only pumps serving in-ground pools with a programmable controller unit are eligible.

Participation and reported savings varied significantly between the four programs. Below is a table showing the FY 15-16 participation and reported savings by program.

Table 1-2: 2016 Program Year Participation and Savings by Program

Program	# of Participants	Reported kWh Savings	Reported kW Savings
Residential AC*	303	518,433	117.0
Whole House Fan	500	753,603	0.0
Sunscreen	143	14,111	1.4
Pool Pump	393	357,260	216.1
Total	**1,339**	**1,643,407**	**334.4**

* Program participants upgrading to 14 SEER units were dropped from the population

1.2 Objectives

RE tasked Nexant with performing the EM&V of the 4 residential programs noted above (Air Conditioning, Whole House Fan, Sunscreen, and Pool Pump) for FY 15-16. The specific objectives of this evaluation included the following:

- Verify the energy and demand savings achieved
- Update equivalent full load hours for AC units using metering study results from Phase 1
- Determine net-to-gross ratios and corresponding net savings
- Provide feedback on program effectiveness aimed at future program improvements

2 Evaluation Approach

Nexant completed gross impact, net impact, and process evaluations for each of the four programs. Below are high level descriptions of each of these types of evaluations.

Gross impact evaluations are a systematic assessment of the amount of energy saved (e.g., kWh, kW, and therms) by the program.

Net impact evaluations provide an adjustment factor (known as the net-to-gross ratio) that accounts for free-ridership and spillover and is applied to the gross savings determined in the gross impact evaluation.

Process evaluations are a systematic assessment of an energy efficiency program to document and identify recommendations for improving the program's effectiveness.

The data sources and activities performed varied between each portion of the evaluation. Table 2-1 shows the source of the data by evaluation type.

Table 2-1: Data Sources by Evaluation Type

Evaluation type	Activity				
	Database and engineering review	Phone surveys		Phone Interviews	On-site inspections
		Participant	Installer	Program staff	
Gross impact	✓	✓			✓
Net impact		✓	✓*		
Process		✓	✓	✓	

*Not used to directly calculate net-to-gross ratio but used to qualitatively inform findings

The following sections document the primary steps taken to perform the complete evaluation.

2.1 Sampling

From RE's anticipated kWh savings for FY14-15, Nexant anticipated that the four programs' combined reported kWh savings would contribute to about 8% of RE's 2016 savings target of 8,037,000 kWh.[1] Because each of the four programs had a relatively small contribution to the overall portfolio, Nexant designed the evaluation sample to achieve +/- 10% precision at the 90% confidence level among all four programs.

[1] California Municipal Utilities Association, Energy Efficiency in California's Public Power Sector Status Reports, A 2014 Status Report, Appendix B

The level of rigor was selected based on guidance provided in the CEC Guidelines.[2] The savings from the measures in these programs are typically consistent and assumed savings reliable. Further, each project's contribution to the program level savings was small. Therefore, this evaluation used the 'verification with deemed savings' approach.

Table 2-2 shows the quantity of completed surveys by program. Installer surveys were also conducted for each program to collect process evaluation data as well as qualitatively enhance the net-to-gross evaluation. On-site inspections were not performed for the Sunscreen program due to the program's relatively low savings contribution, which accounted for less than one percent of the savings reported for the four programs evaluated.

Table 2-2: Completed Surveys by Program

Phone surveys			
Program	**Installers**	**Participants**	**On-site inspections**
Residential AC	7	25	4
Whole House Fan	6	17	4
Sunscreen	5	11	
Pool Pump	5	31	4
Total	**23**	**84**	**12**

2.2 Database and Engineering Review

Nexant received remote access to the EnergyOrbit database, which RE uses as the system of record for capturing program implementation data. Through the system, Nexant was able to review project documentation supplied by customers and installers in support of its activities and access the deemed savings values used to generate reported savings for the program.

Nexant found savings amounts reported by the system were generally in agreement with supporting project documentation and applicable TRM assumptions.[3] However, there were a few projects in the Whole House Fan program that were found to either use the wrong CFM or quantity of fans. Both of these errors were confirmed to be simple data entry mistakes.

Nexant also conducted an engineering review of the savings values used in EnergyOrbit and the corresponding TRM values and assumptions. This review found no discrepancies between the savings values used in EnergyOrbit and the values listed in the Energy Efficiency Reporting Tool ("E3 Tool"), but did find three discrepancies between the E3 Tool, the TRM written document, and the TRMs supporting measure-specific spreadsheets. Table 2-3 below presents these discrepancies.

[2] *California Energy Commission EM&V Guidelines POU Energy Efficiency Programs* ,Version January 2011, pg. 12.

[3] *Savings Estimation Technical Reference Manual for the California Municipal Utilities Association*, energy & resource solutions, 6/9/2016 http://cmua.org/wpcmua/wp-content/uploads/2016/06/2016-CMUA-POU-TRM_Final_v692016.pdf

Table 2-3: Discrepancies Found Between Governing Documentation

Measure	Energy Efficiency Reporting Tool	Written TRM Document	Supporting TRM Spreadsheets
Variable Speed Pool Pump deemed kW savings	0.386 kW/pump (early replacement baseline)	"No peak demand reduction for this measure"	0.386 kW/pump (early replacement baseline)
Residential Solar Screen	1 kWh/sq. ft.	References TRM219 spreadsheet	0.82 kW/h/sq. ft.
Split System Air Conditioner – 16 SEER, Climate Zone 11	0.026 kW/ton (natural replacement baseline)	References TRM200 spreadsheet	0.006 kW/ton (natural replacement baseline)*

* This value is believed to be a typographical error and was assumed to be 0.026 for this analysis.

2.3 Phone Surveys and Interviews

Nexant conducted phone surveys with participants and installers, and in-depth interviews with program staff members to generate feedback for assessment of Roseville Electric's residential energy efficiency programs. The purpose of conversing with each population is described below.

Program staff in-depth interviews were designed to investigate insights into how the program is designed, implemented, and delivered to customers. These interviews were used to assess effectiveness of the management team and tools, program components, and any programmatic changes and associated rationale.

The participant survey was designed to address questions that inform both impact and process evaluation activities through the following research objectives:

- Assess participant satisfaction and awareness of programs
- Assess installer performance
- Assess value and benefits customers gain from the service
- Assess opportunities for process improvement
- Obtain data for net-to-gross analysis; and
- Verify measure installation, quantity, and other assumptions as needed.

For reference, the complete participant survey is included in Appendix A.

The installer survey was designed to address process evaluation topics specifically with the following research objectives:

- Assess installer awareness of and satisfaction with the programs
- Understand installer motivations for participation
- Understand installer sales practices; and
- Obtain data on installers' perspective of what participants would have done in the absence of the program to contrast with participant responses.

For reference, the complete installer survey is included in Appendix B.

2.4 On-site Inspections

As shown in Table 2-2, 12 site visits were performed as part of the gross impact evaluation. The primary purpose for these site visits was verification that the measure was installed and operating as intended. For each program, specific key data were collected that are pertinent to determining the measure savings. Table 2-4 below presents the key data fields collected on site for each program. On-site inspections were not performed for the Sunscreen program due to the program's relatively low savings contribution.

Table 2-4: Key Data Fields Collected During Site Visits by Program

Program	Key Data Collected
Residential AC	▪ Make/model ▪ Cooling capacity ▪ Efficiency
Whole House Fan	▪ Make/model ▪ Motor horsepower ▪ Airflow (CFM) ▪ Control type
Pool Pump	▪ Make/model ▪ Motor horsepower

2.5 Verified Savings Calculation

Gross verified savings were determined through a combination of engineering analyses, telephone surveys, and site visits for a sample of program participants. A verified savings estimate was developed for each project in the sample based on observed parameters unique to each of the four programs. For example, the verified savings estimates for new air conditioners were based on the efficiency of the new unit, cooling capacity (in tons), and vintage of the baseline (natural replacement or early retirement). Similarly, whole house fan measure savings estimates were a function of the fan's verified airflow.

The ratio of gross verified savings to reported savings within the sample is referred to as the realization rate. The realization rate calculated from the sample is applied to the remaining

population for each program using Equation 2-1.The same calculation applies to both kWh and kW savings.

Equation 2-1: Gross Verified Savings Calculation

$$kWh_{Verified} = (kWh_{Claimed}) * (Realization\ Rate)$$

Where:

$kWh_{Verified}$ = kWh verified by the evaluation team for the program ('verified' or '*ex post*' savings)

$kWh_{Claimed}$ = kWh claimed by the program reflecting any QA/QC adjustments ('claimed', 'reported' or '*ex ante*' savings)

Realization Rate = $kWh_{Verified}$ / $kWh_{Claimed}$ for the research sample

In accordance with CEC EM&V Guidelines, this evaluation utilized a simple verification approach for each of the measures studied. This approach was chosen primarily for two reasons. First, the measures studied in this evaluation typically yield relatively consistent, predictable savings. For this reason, each of these measures are included as a deemed measure in the TRM. Additionally, the combined savings for all four programs included in this evaluation have a relatively low contribution to RE's overall EE portfolio, producing only approximately 8% of RE's kWh savings in its EE program portfolio.

2.6 Net-To-Gross, Free-ridership, and Spillover Self-report Method

Net savings are the savings directly attributable to the intervention of the utility company on the customer's decision to participate in the program. Net savings are determined through the application of the net-to-gross ratios, which are applied to the gross verified savings. Net-to-gross (NTG) ratios are estimated through 2 components: free-ridership and spillover. Free-ridership (FR) refers to the portion of energy savings that participants would have achieved in the absence of the program through their own initiatives and expenditures. Spillover (SO) refers to the program-induced adoption of additional energy-saving measures by participants who did not receive financial incentives or technical assistance for the additional measures installed. Nexant used the following formula to calculate the NTG ratio for each program:

$$NTG=1-FR + SO$$

The following subsections outline Nexant's approach to estimate the direct impacts of RE's evaluated residential energy efficiency programs.

2.6.1 Participant Free-ridership and Spillover

Nexant estimated free-ridership by separately assessing the participant's intention and the program's influence.

- To assess intention, Nexant asked participants about the likelihood they would have replicated their program activity in absence of an incentive.
- To assess influence, Nexant asked respondents to rate the influence of various program components on their decision to install the measure.
- The total free-ridership score ranges from zero (not a free-rider) to 1 (total free-rider) and is the sum of the intention score and influence score as follows:

Free-ridership = Intention + Influence

For 'don't know' responses it is considered these respondents have an equal likelihood of being free-riders given a lack of other information. Therefore they are given the average score between a total free-rider and not a free-rider.[4]

The intention questions and their respective scores are outlined in Table 2-5:

Table 2-5: Participant Intention Response Options Scoring

Intention Response Options – what participants would likely have done in the absence of the program	Intention Score
Put off buying a new [Measure] for at least one year	0
Bought a new [Measure] that was less expensive or less energy efficient	0.25
Bought the exact same [Measure] anyway, and paid the full cost yourself	0.5
Don't know, Refused	0.25

To assess the influence component, the following list is read to the respondent, and they are asked to indicate how important it was in their decision to buy the equipment on a scale of 1 to 5 where "1" means "not at all important" and "5" means "extremely important."

- The rebate received
- Information on Roseville Electric's website
- Advertising and other information from Roseville Electric
- A salesperson or installer
- Other

The maximum rank of factors asked to respondents is used to select the influence score. 'Other' responses may be used to adjust the influence ranking if their statement indicates a programmatic influence that contraindicates given rankings. The influence scores are outlined in Table 2-6:

[4] *Energy Trust of Oregon Free Ridership Methodology*, Phil Degens and Sarah Castor, June 4, 2008

Table 2-6: Participant Influence Response Options Score

Maximum Influence Ranking	Influence Score
1 – not at all important	0.5
2	0.38
3	0.25
4	0.13
5 – extremely important	0
Don't know, Refused	0.25

To assess spillover, participants were asked about any additional energy saving improvements they may have made to their home since participation in Roseville Electric's program for which they did not receive a rebate. If they answer yes, participants are asked a series of questions about the item, which helped inform an estimate of energy saving potential of the item, and participants are asked to rate how important their participation in the Roseville Electric program was on their decision to implement the energy efficiency measure or action. The influence of the Roseville Electric program is rated on a scale of 1 to 5 where one means "not at all important" and five means "extremely important". For 'don't know' responses, it is considered these respondents have an equal likelihood of being influenced given a lack of other information. Therefore they are given the average score between zero and one (0.5).[5]

2.6.2 Installer Assessment of Participant Free-ridership

As an additional input to free-ridership assessment, installers were asked a series of questions to assess their perspective of participant intention in the absence of the program, and the influence of the program on the participant's decision making process.

Nexant first gauged the influence of the installer on the participant's decision to install a program-qualifying measure. We designed a two-part influence battery, first assessing the influence of Roseville Electric on the installer's promotion of energy efficient products (I_{rc}), then assessing the installers perspective on their influence on the participant (I_{cp}). The average of these two scores is the final installer influence score.

$$\text{Installer Influence} = (I_{rc} + I_{cp}) / 2$$

In both instances we asked installers to rate influence on a scale of one to five where one equals "not at all influential" and five equals "very influential."

[5] *Energy Trust of Oregon Free Ridership Methodology*, Phil Degens and Sarah Castor, June 4, 2008

Table 2-7: Installer Influence Response Options Score

Influence Ranking	Influence Score
1 – not at all influential	0.5
2	0.38
3	0.25
4	0.13
5 – very influential	0
Don't know, Refused	0.25

To gauge the installer's assessment of the participant's intention, we then asked installers what they think their client most likely would have done if the Roseville Electric rebate did not exist. We scored the given rankings as follows:

Table 2-8: Installer Intention Response Options Scoring

Intention Response Options	Intention Score
Canceled or postponed the upgrade	0
Done an upgrade with standard-efficiency product(s)	0.25
Installed a less energy efficient product or reduced the scope of the job	0.25
Done the exact same upgrade	0.5
Don't know	0.25

This installer's perspective of free-ridership is tallied by the addition of the installer intention and influence questions:

Installer perspective of free-ridership = intention + influence

Installers may have worked on different kinds of projects (i.e., a general installer may have installed an A/C system, pool pump, and sunscreen throughout the program duration); therefore the installer perspective on free-ridership is not separated by program category.

3 Impact Evaluation

3.1 Residential Air Conditioner

3.1.1 Results from Phase 1 Study

In 2015, Nexant conducted a metering study of residential air conditioning equipment throughout RE's service territory. The primary focus of this effort was to update the assumed equivalent full load hour (EFLH) value RE uses to determine annual kWh savings for its Residential AC Program. RE previously used 871 EFLH, referencing ENERGY STAR Central Air Conditioner Calculator, which RE believed was too large and likely overstated savings. The 2015 study found an average EFLH of 518 hours.

Using 518 EFLH, the resulting kWh savings per ton of air conditioning would be less than the TRM deemed values, but still reasonably close for 'early replacement' vintage measures, at 14% and 6% difference for 15 SEER and 16 SEER measures, respectively. RE assumed all measures in the Residential AC program to be early replacement vintage and used the existing deemed TRM values for that vintage when reporting savings.

Table 3-1: Comparison between 2016 TRM and Nexant Study kWh Savings

	Natural Replacement			Early Retirement		
Measure	**2016 TRM**	**Nexant Study**	**% Difference**	**2016 TRM**	**Nexant Study**	**% Difference**
Split system air conditioner 15 SEER	60	30	-50%	243	208	-14%
Split system air conditioner 16 SEER	65	56	-14%	249	234	-6%

3.1.2 Gross Savings

Nexant completed 25 phone surveys and 4 on-site visits of Residential AC program participants. The two primary goals for the surveys and site visits were first to verify that the new air conditioner was installed and operational and secondly, understand the baseline condition. The on-site surveys also collected and verified pertinent equipment specifications such as efficiency and cooling capacity. All sampled projects were given an engineering desk review, which compared equipment specifications and baseline assumptions used in EnergyOrbit against those found in the project documentation.

The program population initially included 436 units, which represented 1,532 tons of cooling. A small portion of the incentivized units were found to be 14 SEER efficiency. Since the beginning of 2015, 14 SEER has been the code minimum residential air conditioner baseline efficiency in

California.[1] Therefore, these 33 projects were removed from the population as non-eligible measure which also led to removing two projects in the evaluation sample. These projects were removed from the population and evaluation sample rather than assigning them zero savings because if the 14 SEER projects remained in the population and sample, the true Residential AC program realization rate (the realization rate calculated for only the eligible measures) would be incorrectly biased downwards to account for ineligible measures that should be removed from the program altogether. The evaluation results without the 14 SEER units are shown in Table 3-2.

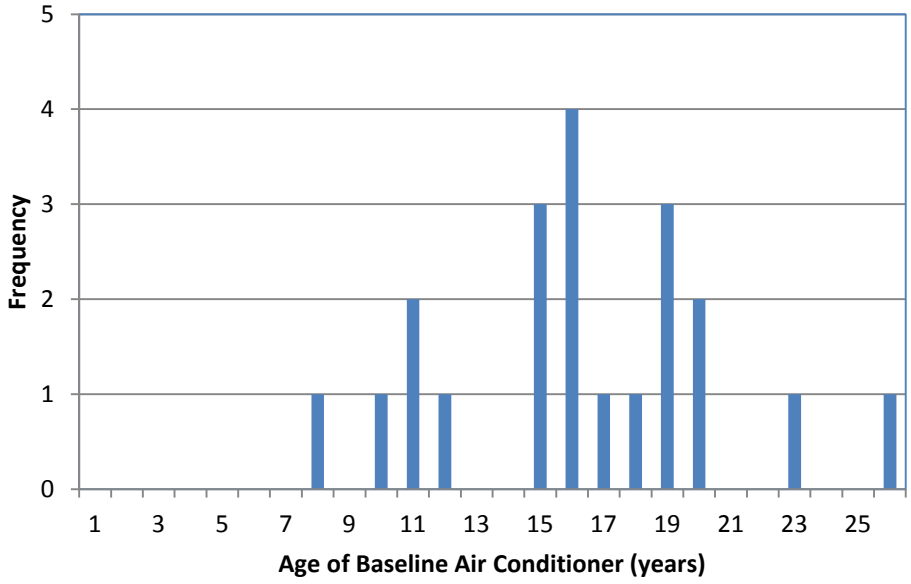
Table 3-2: Residential AC Program Findings

Program	Population Count	Sample Size	Population Reported Savings (kWh)	Verified Gross Savings (kWh)	Realization Rate	Population Reported Savings (kW)	Verified Gross Savings (kW)	Realization Rate
Residential AC	393	23	357,260	209,264	58.6%	216.1	114.9	53.2%

The low kWh and kW realization rates were primarily due to incorrect baseline vintage assumptions. RE assumed all projects in this program to be 'early retirement' vintage. The TRM estimates the useful life of a residential air conditioner to be 15 years. Therefore, the verified savings analysis used a 'natural replacement' vintage for projects where the baseline air conditioner was reported to be 15 years or more years old. Of the sampled projects, customer interview and rebate form data showed that the average baseline unit age was 16.5 years old and 16 out of the 21 reported baseline unit ages were 15 years or older. Figure 3-1 below displays the distribution of the baseline air conditioner ages collected from this evaluation.

[1] *2016 Residential Compliance Manual For The 2016 Building Energy Efficiency Standards,* California Energy Commission, November 2015, http://www.energy.ca.gov/2015publications/CEC-400-2015-032/CEC-400-2015-032-CMF.pdf

Figure 3-1: Surveyed Baseline Air Conditioner Ages



3.1.3 Net Savings

Nexant calculated free-ridership and spillover survey responses uniquely to the Residential Air Conditioning program. Scored response values were inserted into the NTG formula (NTG=1-FR+SO), which included a portfolio-level participant spillover estimate gleaned from survey responses. High free-ridership scores assessed during the participant self-report survey resulted in a final NTG ratio for the Residential Air Conditioning program of 58% as shown in Table 3-3. The intention component of free-ridership has the most significant negative impact on the net-to-gross ratio. The intention component asks what participants would have done in the absence of the program. A majority (72%) of air conditioning participants agreed with the statement that in the absence of the program they would have "bought the exact same equipment . . . and paid the full cost themselves", which is reflected in the intention score of 41%. This high intention score is tempered by a low influence score, which indicates participants felt the program influenced their decision to purchase a high efficiency air conditioner for a combined free-ridership score of 50%. Respondents accredit the salesperson or contractor as being most influential aspect of this program. Installer responses to free-ridership questions mimic participant responses, with a 31% intention and 15% influence score resulting in a 46% installer estimate of participant free-ridership. The installers demonstrated modesty in their responses with a lower estimate of their influence on the participant than the participants reported, and installers also estimate more participants would not have installed as efficient of a product without the incentive.

Table 3-3: Residential Air Conditioner Net-to-gross Findings

Residential Program	Number of Respondents	Intention Score	Influence Score	Estimated Free-ridership (Intention Score + Influence Score)	Estimated Participant Spillover	NTG Ratio	Net Savings (kWh)
Residential AC	25	41.0%	9.0%	50.0%	8.0%	58.0%	70,989

3.2 Whole House Fan

3.2.1 Gross Savings

Nexant completed 17 phone surveys and 4 on-site visits of Whole House Fan program participants. The primary goal for the surveys and site visits were to verify that the new whole house fan was installed and operational. The on-site surveys also collected and verified pertinent equipment specifications such airflow capacity (in cubic feet per minute or CFM). All sampled projects were given an engineering desk review, which compared equipment specifications and TRM assumptions used to derive savings reported in EnergyOrbit against those found in the project documentation.

The results of the Whole House Fan program's evaluation are shown in Table 3-4 below. The program population included 500 fans, which represented an estimated 3,038,723 CFM. For the first 2 months of FY15-16, RE only collected CFM information for only about 40% of the rebated fans. To estimate the CFM capacities of the fans with unknown CFMs, RE used the average of the known CFMs during that time span - 5200 CFM - which Nexant believes to be a reasonable approach and value. Starting in September 2015, RE has since recorded a CFM for each rebated fan.

The TRM gives 0 kW savings for this measure and there are therefore no reported or verified peak demand savings. For kWh savings, the TRM deems a savings of 496 kWh per 2000 CFM of fan installed for Roseville's climate zone - Climate Zone 11. Therefore, the CFM for each rebated fan was required to estimate kWh savings. Generally, this evaluation found that the CFM and corresponding savings for each project were correct. In 7 of the sampled projects, the fan CFM listed in the manufacturer's specifications was found to be a little different than what was recorded in EnergyOrbit. The net effect of these CFM adjustments was a slightly lower overall savings, yielding a 99% realization rate for the program.

Table 3-4: Whole House Fan Program Findings

Program	Population Count	Sample Size	Population Reported Savings (kWh)	Verified Gross Savings (kWh)	Realization Rate	Population Reported Savings (kW)	Verified Gross Savings (kW)	Realization Rate
Whole House Fan	500	17	753,603	746,417	99.0%	0.0	0.0	-

3.2.2 Net Savings

Nexant inserted Whole House Fan free-ridership and spillover scored values into the NTG formula (NTG=1-FR+SO) and included the portfolio-level participant spillover estimate. The final NTG ratio for the Whole House Fan program is 81.6% as shown in Table 3-5. Whole house fan survey respondents rated the incentive as the most important factor in their decision to install the product, the resulting influence score is 4.4%. Combined responses to the intention question regarding what participants would likely have done in the absence of the program resulted in a final intention score of 22.1%, for a total estimated free-ridership of 26.5%. Installer responses to intention and influence questions resulted in a free-ridership score of 59% for the whole house fan program. Installers felt most participants would have installed new equipment without the incentive, though likely the equipment would have been a lower efficiency level. Installers also demonstrated a modesty in responses by self-rating their influence in the participants' decision to install the product as lower than the participant rating, resulting in a higher relative free-ridership score. Installer responses to free-ridership questions mimic participant responses, with a 29% intention and 16% influence score resulting in a 45% installer estimate of participant free-ridership. The installers demonstrate modesty in their responses with a lower estimate of their influence on the participant than the participants reported, and installers also estimate more participants would not have installed as efficient of a product without the incentive.

Table 3-5: Whole House Fan Net-to-gross Findings

Residential Program	Number of Respondents	Intention Score	Influence Score	Estimated Free-ridership (Intention Score + Influence Score)	Estimated Participant Spillover	NTG Ratio	Net Savings (kWh)
Whole House Fan	17	22.1%	4.4%	26.5%	8.0%	81.6%	518,828

3.3 Variable Speed Pool Pump

3.3.1 Gross Savings

Nexant completed 31 phone surveys and 4 on-site visits of Pool Pump program participants. The two primary goals for the surveys and site visits were first to verify that the new pool pump was installed and operational and, second, understand the baseline condition. The on-site surveys also collected and verified pertinent equipment specifications such as motor horsepower. All sampled projects were given an engineering desk review, which compared equipment specifications and TRM assumptions used to derive savings reported in EnergyOrbit against those found in the project documentation.

The results of the Pool Pump program's evaluation are shown in Table 3-6 below. For all but one sampled project, the verified savings matched the reported savings. The difference between reported and verified savings for the one project was due to the assumed baseline.

The TRM deems an 'early retirement' vintage savings for singe speed pumps replacement and a 'natural replacement' vintage savings for dual speed pumps replacement. RE's assumption of 'early retirement' was verified for 30 of the projects while the one remaining project was verified to have a dual speed pump baseline. This slight adjustment to the verified sample is reflected in the 98% kWh and 97.1% kW realization rates.

During Nexant's EnergyOrbit database review, it was noted that any projects with incentives distributed prior to 5/12/2016 had a reported savings of 1,249 kWh while projects with incentives distributed starting on 5/12/2016 primarily had reported savings of 1,711 kWh. The TRM deemed kWh savings for 'early retirement' and 'natural replacement' are 1,711 and 674, respectively. After speaking with RE staff, it was revealed that the 1,249 kWh value used prior to 5/12/2016 was outdated and the correction was later made when entering program level savings into the Energy Efficiency Reporting (E3) Tool.

Table 3-6: Pool Pump Program Findings

Program	Population Count	Sample Size	Population Reported Savings (kWh)	Verified Gross Savings (kWh)	Realization Rate	Population Reported Savings (kW)	Verified Gross Savings (kW)	Realization Rate
Pool Pump	303	31	518,433	508,297	98.0%	117.0	113.5	97.1%

3.3.2 Net Savings

Variable Speed Pool Pump free-ridership and spillover scored values, along with the portfolio-level participant spillover estimate, result in a final NTG ratio of 68.9% for the Pool Pump program as shown in Table 3-7. This NTG value is a result of high free-ridership, as over half (55%) of respondents stated they would have bought the exact same equipment and paid the full cost themselves in the absence of the program. About one third (32%) stated they would not have installed the pool pump in the absence of the program. All scored responses to this question resulted in a combined intention score of 30.6%. These respondents also stated the program was influential in their decision to install a whole house fan, rating the information on Roseville Electric's website as the most influential on their decision to install the pool pump, closely followed by the rebate and information given by a salesperson or contractor. Installer responses to free-ridership questions mimic participant responses, with a 28% intention and 19% influence score resulting in a 47% installer estimate of participant free-ridership. The installers demonstrated modesty in their responses with a lower estimate of their influence on the participant than the participants reported, and displayed uncertainty regarding what the participants would have done in absence of the incentive.

Table 3-7: Variable Speed Pool Pump Net-to-gross Findings

Residential Program	Number of Respondents	Intention Score	Influence Score	Estimated Free-ridership (Intention Score + Influence Score)	Estimated Participant Spillover	NTG Ratio	Net Savings (kWh)
Pool Pump	31	30.6%	8.5%	39.1%	8.0%	68.9%	341,875

3.4 Window Sunscreen

3.4.1 Gross Savings

Nexant completed 11 phone surveys of Window Sunscreen program participants. The primary goal for the surveys was to verify that the sunscreens were installed and operational. All sampled projects were given an engineering desk review, which compared equipment specifications and TRM assumptions used to derive savings reported in EnergyOrbit against those found in the project documentation. Verified measure parameters included the approximate area of the sunscreens and which direction the sunscreens faced (e.g., south, west, etc.)

The results of the Sunscreen program's evaluation are shown in Table 3-8 below. The verified savings perfectly matched the reported savings so no adjustments were needed.

Table 3-8: Sunscreen Program Findings

Program	Population Count	Sample Size	Population Reported Savings (kWh)	Verified Gross Savings (kWh)	Realization Rate	Population Reported Savings (kW)	Verified Gross Savings (kW)	Realization Rate
Sunscreen	143	11	14,111	14,111	100.0%	1.4	1.4	100.0%

3.4.2 Net Savings

The Window Sunscreen final NTG ratio is 61.4% as shown in Table 3-9. This NTG ratio is strongly influenced by the intention component of the free-ridership score, with 74% of responding participants agreeing with the statement that they would have installed the exact same equipment without an incentive. This result is tempered by the influence score, as the majority of respondents state the program was highly influential on their decision to install the sunscreen. These respondents rated the salesperson or contractor as the most influential aspect of their decision to install the sunscreen. Installer responses to free-ridership questions mimic participant responses, with a 44% intention and 20% influence score resulting in a 64% installer estimate of participant free-ridership. The installers demonstrated modesty in their responses with a lower estimate of their influence on the participant than the participants reported, and installers also estimate more participants would have installed the product without the incentive.

Table 3-9: Window Sunscreen Net-to-gross Findings

Residential Program	Number of Respondents	Intention Score	Influence Score	Estimated Free-ridership (Intention Score + Influence Score)	Estimated Participant Spillover	NTG Ratio	Net Savings (kWh)
Sunscreen	11	38.6%	8.0%	46.6%	8.0%	61.4%	8,072

3.5 Combined Results

Table 3-10 and Table 3-11 below show a summary of the gross and net impact findings for all four programs discussed above as well as the total portfolio impacts.

Table 3-10: Program and Portfolio Level kWh Impact Findings

Program	Population Count	Sample Size	Reported Savings	Realization Rate	Verified Gross Savings	NTG Ratio	Net Verified Savings
Pool Pump	303	31	518,433	98.0%	508,297	68.9%	350,217
Whole House Fan	500	17	753,603	99.0%	746,417	81.6%	609,076
Sunscreen	143	11	14,111	100.0%	14,111	61.4%	8,664
Air Conditioning	392	23*	356,246	58.6%	208,670	58.0%	121,373
Portfolio	**1,338**	**82**	**1,642,393**	**90.0%**	**1,477,495**	**73.7%**	**1,089,330**

*Total projects sampled for the air conditioning program was 25 but 2 samples were dropped due to all 14 SEER upgrades being dropped from the program population

Table 3-11: Program and Portfolio Level kW Impact Findings

Program	Population Count	Sample Size	Reported Savings	Realization Rate	Verified Gross Savings	NTG Ratio	Net Verified Savings
Pool Pump	303	31	117.0	97.1%	113.5	68.9%	78.2
Whole House Fan	500	17	-	-	-	81.6%	-
Sunscreen	143	11	1.4	100.0%	1.4	61.4%	0.9
Air Conditioning	392	23*	215.4	53.2%	114.5	58.0%	66.6
Portfolio	**1,338**	**82**	**334**	**68.3%**	**229.4**	**63.5%**	**145.7**

*Total projects sampled for the air conditioning program was 25 but 2 samples were dropped due to all 14 SEER upgrades being dropped from the program population

As mentioned in Section 2.1, the sample was designed to meet the CEC Guidelines and achieve +/- 10% precision at the 90% confidence level among all four programs. Table 3-12 shows that 90/10 confidence/precision was achieved for the energy savings but not for the demand savings. The majority of the variance stemmed from changing the assumed baseline vintage in the Air Conditioning program.

Table 3-12: Achieved Precisions for Gross Savings at the 90% Confidence Level

Program	Precision at 90% confidence level	
	kWh	kW
Pool Pump	3.1%	4.7%
Whole House Fan	5.1%	-
Sunscreen	0.0%	0.1%
Air Conditioning	21.0%	26.3%
Portfolio	**4.1%**	**13.3%**

4 Process Evaluation

4.1 Approach

Data collection for the process evaluation included a mix of qualitative and quantitative approaches. Qualitative data include information obtained from in-depth interviews and from reviews of program documentation. Survey data are generally quantitative and were analyzed to create survey response tabulations. Open-ended survey responses were coded for analysis. Nexant conducted in-depth interviews with 3 program staff, and conducted phone surveys with 84 participants and 23 installers. The following subsections outline the methodological approaches for each of the activities conducted.

4.1.1 Participant Surveys

As summarized in Section 2.3, Nexant conducted telephone surveys of program participants that addressed questions to inform both impact and process evaluation activities with the following research objectives:

- Assess participant satisfaction and awareness with programs
- Assess installer performance
- Assess value and benefits customers gain from the energy efficiency upgrade
- Assess opportunities for program improvement
- Obtain data for net-to-gross analysis; and
- Verify measure installation, quantity, and other assumptions as needed.

4.1.1.1 Disposition

We called 624 randomly selected participants and ultimately completed the survey with 84 respondents for a response rate of 14% (Table 4-1).

Table 4-1: Disposition of Participant Phone Surveys

Mode	Count	Percent
Incompletes		
Refused	30	2% of participants
Contact Error	84	7% of participants
No response	426	33% of participants
Completes	84	7% of participants
Total Calls	**624**	**14% response rate**
Not Called	652	51% of participants
Total Sample Frame	1,276	

4.1.2 Installers

Installer telephone surveys collected data through outbound calls. The installer survey addressed the following research objectives:

- Assess installer awareness of and satisfaction with the programs
- Understand installer motivations for participation
- Understand installer sales practices; and
- Obtain data on installers' perspective of what participants would have done in the absence of the program to contrast with participant responses.

4.1.2.1 Disposition

We called 71 randomly selected installers and ultimately completed the survey with 23 respondents for a response rate of 32% (Table 4-2).

Table 4-2: Disposition of Installer Phone Survey

Mode	Count	Percent
Incompletes		
Refused	4	5% of participants
Contact Error	7	9% of participants
No response	37	47% of participants
Completes	23	29% of participants
Total Calls	**71**	**32% response rate**
Not Called	7	9% of participants
Total Sample Frame	78	

4.1.3 Program Staff

Nexant interviewed three program staff members to investigate insights into how the program is designed, implemented, and delivered to customers. These interviews were used to assess effectiveness of the management team and tools, program components, and any programmatic changes and associated rationale.

4.2 Findings

4.2.1 Program Administration

Nexant interviewed program staff to assess the implementation function of the residential programs and what tools are used by the team. Nexant also asked about any program changes that have been made over the evaluation period or any upcoming planned program changes.

The following subsections discuss the findings from these interviews.

4.2.1.1 Team Organization

A team of three professionals comprises key aspects of administering the Residential Air Conditioning, Whole House Fan, Pool Pumps, and Window Sunscreen programs:

- The program manager develops and administers the rebate programs, and provides final approval prior to rebate payment processing (40% of time spent on these programs)
- A specified program technician works with customers or installers as they complete rebate application materials. The program technician serves as Roseville Electric's initial contact with customers to provide information on program requirements and enter customer information into the rebate tracking database (75-80% of time spent on these programs).
- Finally, the database administrator works to ensure that the database is functionally intact and is collecting and able to report on the appropriate data variables as requested by staff members (30% of time spent on these programs)

In addition to these team members, residential program staff receives input and support from additional Roseville Electric staff when warranted. For example, many staff answer customer phone inquiries about residential programs.

The program manager and program technician meet regularly every two weeks and conduct informal communications on a regular basis via direct conversation, phone calls, or email. Beyond staff dedicated to residential program operations, all Roseville Electric staff are located in the same office and share customer service responsibilities and therefore must be informed of all programs offered. Therefore, additional meetings with Roseville Electric staff members occur when a program is getting ready to launch, if there are design changes, the end of fiscal years, or if a program is re-starting.

4.2.1.2 Program Administration Tools

Roseville Electric uses program manuals and a tracking database to facilitate administering the program to customers.

Program manuals provide the following purpose:

- describe the program design
- detail expected claimed energy savings with justification
- contain forms and requirements, terms, and conditions of the program
- describe the flow of rebate processing

Roseville Electric maintains one database, EnergyOrbit, which is inclusive of both rebate processing and billing data. The program technician enters required data into the database and rebate status and notifications occur through the database. The database has the functionality for customers to submit rebate forms online and receive status updates online; however, Roseville Electric is currently not using this functionality. When survey respondents were asked if they had any suggestions on how to improve Roseville Electric's programs, three stated they would like to be able to electronically submit rebate application materials. One representative statement from a participant regarding electronic submittals is: "Make all the paperwork available to be submitted online, so you can track it online."

While EnergyOrbit is generally well utilized by RE and staff expressed a high level of satisfaction with the software, one improvement Roseville Electric may consider is to train more individuals in the details of the online portal so participants again can submit and track their rebates electronically.

4.2.1.3 Past or planned updates

There have generally been only negligible changes to each program since inception. One notable change was made to the whole house fan program rebate level. Whole house fan rebates were initially offered at $200 for a lower efficiency fan and $400 for a higher efficiency fan. Roseville removed the $200 option as participants more frequently selected the higher efficiency rebate and thereby made the lower efficiency option unwarranted.

Roseville Electric is considering offering additional rebated measures in the future, which may include double-paned low-e windows, attic insulation, and potentially an HVAC duct test and seal program. The limitations in providing additional programs are the staffing requirements necessary to design and administer the additional programs. Program staff reported that due to current staffing constraints, Roseville Electric will likely maintain, rather than expand, its current program offerings in the near term future.

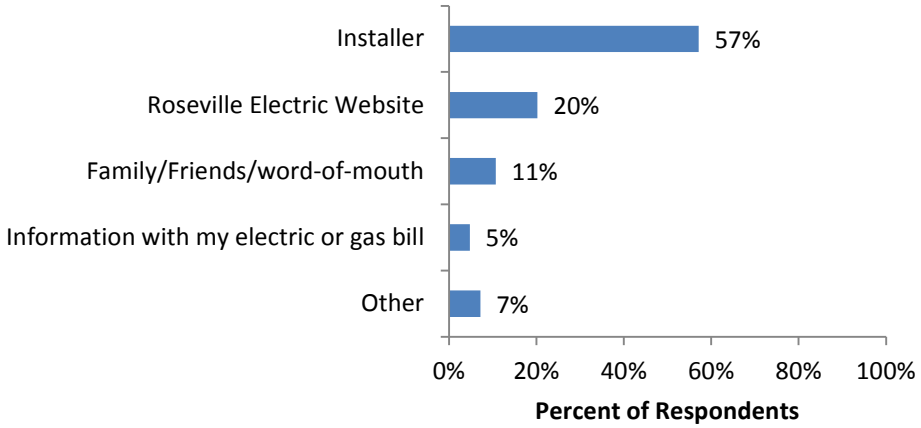
4.2.2 Awareness, Marketing, and Outreach

Marketing and outreach for these four programs is mostly conducted via bill-insert advertisements. Roseville Electric staff also mentioned they utilize social media campaigns as well as home energy reports to advertise rebate and energy saving opportunities (approximately half of their customer population receives a home energy report). To assess how well marketing activities are performing, Roseville Electric conducts awareness and satisfaction surveys and tracks the level of participation in programs and the flow of rebate processing. This section addresses awareness, marketing and outreach perspectives among Roseville Electric residential rebate participants and installers.

4.2.2.1 Awareness

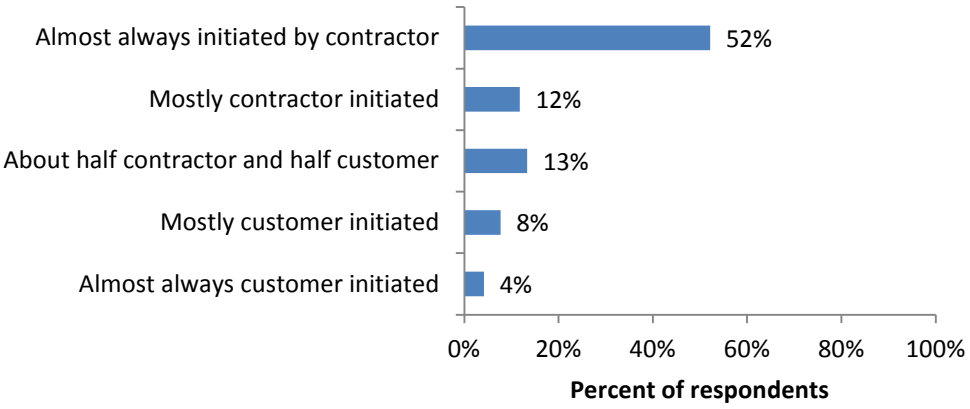
While bill insert notification is the prime marketing strategy mentioned by program staff, participants did not recall first hearing about their Roseville Electric rebate through this mechanism. The majority of participants (57%) state they first heard about Roseville Electric rebates from an installer. While Roseville Electric does not provide distinct installer engagement activities with residential programs addressed in this evaluation, participant responses indicate installers are effective spokespeople for engagement in Roseville Electric rebate programs. The second most frequent method of hearing about the rebate is Roseville Electric's website (20%), followed by word-of-mouth (11%) and via information on their bill (5%). Additional responses categorized under 'other' include social media (n=2), through the newspaper (n=1), a utility fair (n=1), and Roseville Electric's newsletter (n=1). One 'don't know' response is also categorized under 'other' in Figure 4-1 below.

Figure 4-1: How participants first heard about the Roseville Electric Rebate they received (n=84)



Surveyed installer responses are in agreement with this participant perspective with over half of installers concurring with statements that awareness of utility rebates is almost always initiated by the installer (Figure 4-2).

Figure 4-2: Installer agreement with initiation of the topic of utility rebates (n=23)

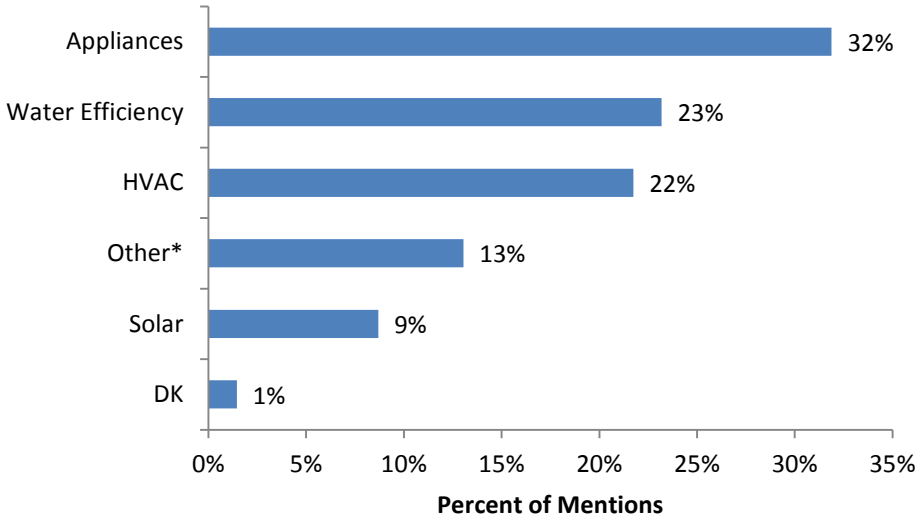


To assess participants' level of awareness of other Roseville Electric programs, Nexant asked respondents to name additional energy-efficiency rebates and/or programs with which they are familiar. Fifty-one percent (43 of 84 surveyed participants) of respondents stated they were aware of other Roseville Electric programs. When asked to elaborate on the names of the programs they are familiar with, these 43 respondents mentioned 64 energy efficiency items, averaging a recall of 1.5 programs per respondent. Nexant re-coded stated items into four relevant program categories. As shown in Figure 4-3, appliances were mentioned most frequently[1] followed by water efficiency and HVAC programs[2]. In the solar category, responses

[1] Respondents provided 16 mentions of refrigerators or refrigerator replacement, 3 mentions of washer/dryer programs, and 3 generic references to appliances and included 8 references to a "cash for grass" program, 4 mentions of low-flow toilets, 2 mentions of sprinkler heads, and one each of water drip systems and sprinkler controllers.

collected by Nexant were too vague to differentiate between references to solar energy production versus solar sunscreens.

Figure 4-3: Frequency respondents recalled awareness of other programs beyond the one they participated in (count of mentions, 43 respondents mentioned 64 program types)**



* Other responses include 4 mentions of hot water heaters, 2 mentions of pool pumps, 2 mentions of light bulbs, and 1 mention of planting trees.
** One 'don't know' response not included in graphic

Over 75% of installers state most of the equipment they sold in the past two years is "high-efficiency" or "energy star qualified". However these same installers report small portions of their jobs actually receive Roseville Electric incentives (Table 4-3).

Table 4-3: Installers stated portion of equipment installed receiving rebates*(n=23)

Portion of Jobs	"Received Roseville Electric Incentive"
>75%	1
50-75%	-
25-50%	4
0-25%	18

* Two "don't know" responses not shown

[2] HVAC mentions include 9 generic references to heating and cooling systems, 5 mentions of a whole house fan, and one mention of a heat pump

In a follow-up question, 78% of installers strongly agreed with the statement "I always tell Roseville Electric customers about Roseville Electric incentives". The following installer comments may be an indication that a portion of customers are eligible for a rebate but are not applying for or receiving the incentive:

- "Maybe if you mail me some applications, it would make it easier for the clients that don't have internet access, they would be more inclined to apply for it."
- "With PG&E and SMUD, we offer the rebate immediately, and those sell a lot more pumps. Maybe RE could do the same."
- "We have to remind customers to get paperwork to us and time runs out. Maybe extend the time or have another way to remind them [customers]."

With regard to actually completing application materials, 13 of the 23 surveyed installers stated they typically prepare most or all of the application, whereas six of the installers stated the participant typically prepares most of all of the application.

The majority of participants hear about Roseville Electric incentives from an installer, and installers report that most of their jobs are high efficiency equipment, yet most of their jobs do not receive incentives. This could partially be because the majority of their jobs don't qualify for incentives due to equipment type or efficiency. However installer comments indicate the projects likely qualify for incentives but their customers may not feel it worthwhile to submit a rebate. Installer suggestions include Roseville Electric make it easier for their clients to receive rebates, either by mailing installers paper rebate applications to have on-hand, or allowing installers to offer rebates immediately at the point of sale. Roseville Electric could gain further insight by discussing their application process with installers to better understand why their customers are not applying for rebates, and to determine what motivating factors installers are using to incentivize customer to install high efficiency measures without a rebate.

4.2.2.2 Marketing Materials

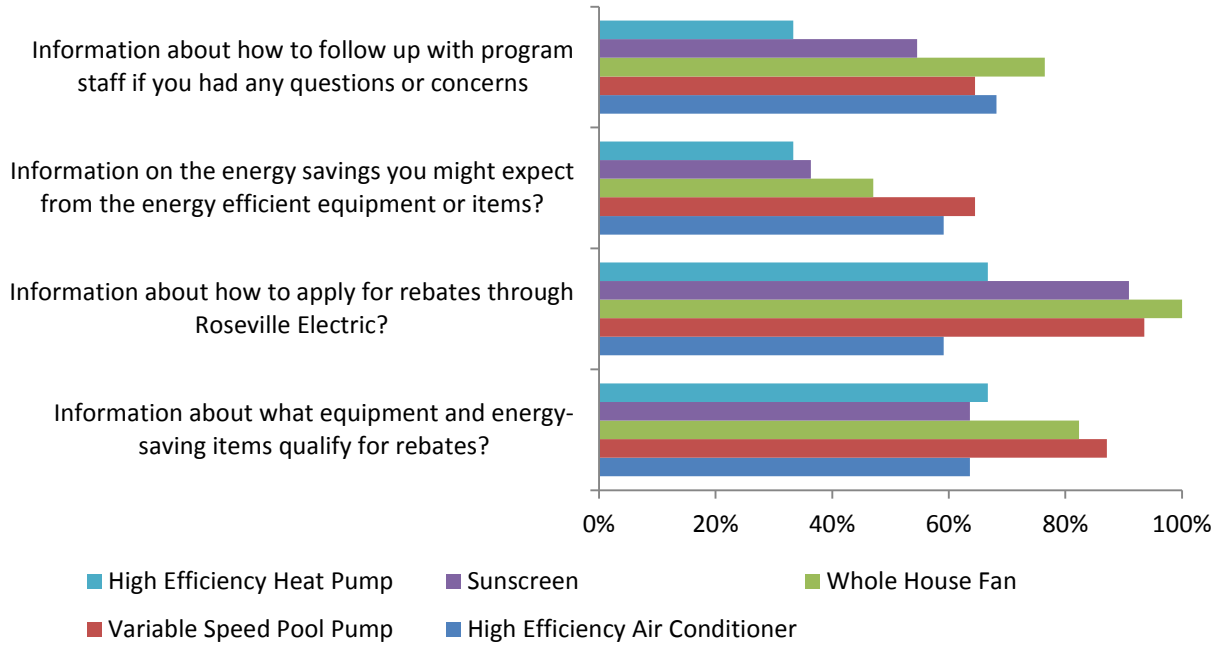
Nexant surveyed participants and installers to identify the effect of Roseville Electric's marketing efforts on customers' program awareness and participation. Clarity of information received and concerns or questions about program offerings are covered in this section.

Respondents rated the clarity of information they received on the measure they installed. Based on awareness feedback presented in Figure 4-1, respondents received most of this information from installers and the Roseville Electric program website. Respondents rated each item on a scale of one to five where "1" indicated the information was not at all clear, and "5" indicated the information was very clear. The percent of surveyed participants rating the information as clear (a "4" or "5") are summarized in Figure 4-4 below. Clarity of information about the equipment that qualifies for rebates and how to apply for those rebates was rated the highest across all measures, followed by how to contact program staff with any questions or concerns. Participants reported the lowest clarity for information on energy savings that might be expected from the energy efficient equipment (low clarity responses are not shown in Figure 4-4 below). Overall, heat pump participants felt the least clear about following up with program staff and

expected energy savings. Air conditioning participants felt the least clear about how to apply for the rebates and what equipment qualifies.

Program staff commented that they do realize heat pump, air conditioning, and whole house fan energy savings and requirements can be difficult for the layperson to navigate. Because of this, Roseville Electric relies on installers to explain program requirements and energy saving expectations to participants, but the program staff are available for support phone calls from customers as well. Because participant and installer satisfaction levels are high, and participation levels are steady, Roseville Electric staff believes this strategy to be effective.

Figure 4-4: Percent of Participants reporting high clarity of marketing information (4&5 ratings on 1-5 scale)



To determine if marketing materials or strategies accurately address customer questions or concerns, Nexant asked participants if any questions or concerns were raised when contemplating program participation. Most respondents (79 of 84) stated nothing raised any questions or concerns. However, five participants did provide the following feedback:

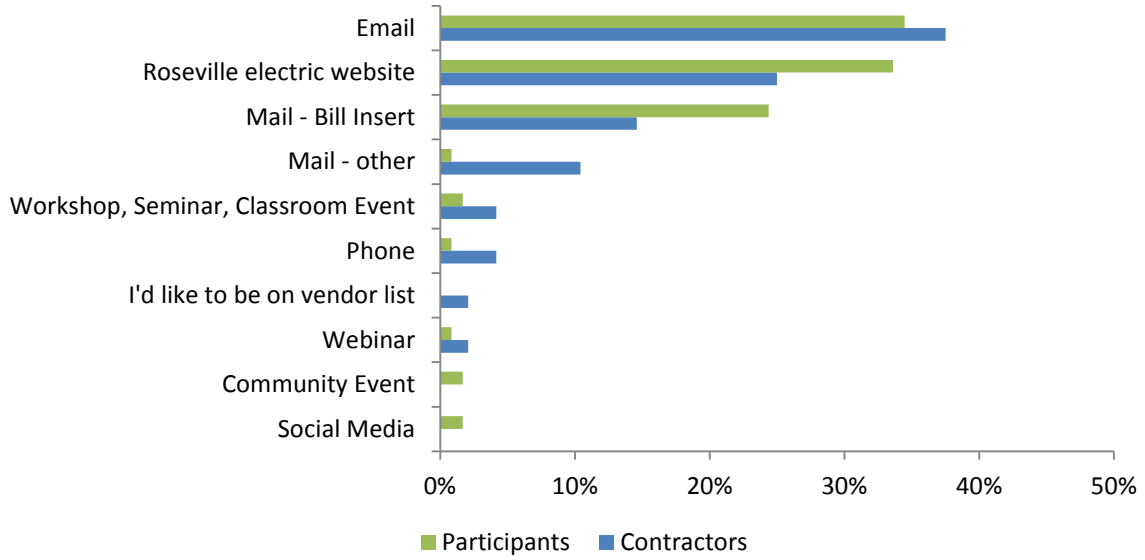
- Concerns about rebate participation causing delays in project installation (2 participants)
- Unsure about whether or not a permit was needed
- Not sure what equipment was eligible
- Concern that the money would run out.

While the majority of respondents indicated that marketing materials contained clear information, the five participants that responded with questions or concerns gave information that may be useful when crafting future program marketing or outreach materials.

4.2.2.3 Outreach

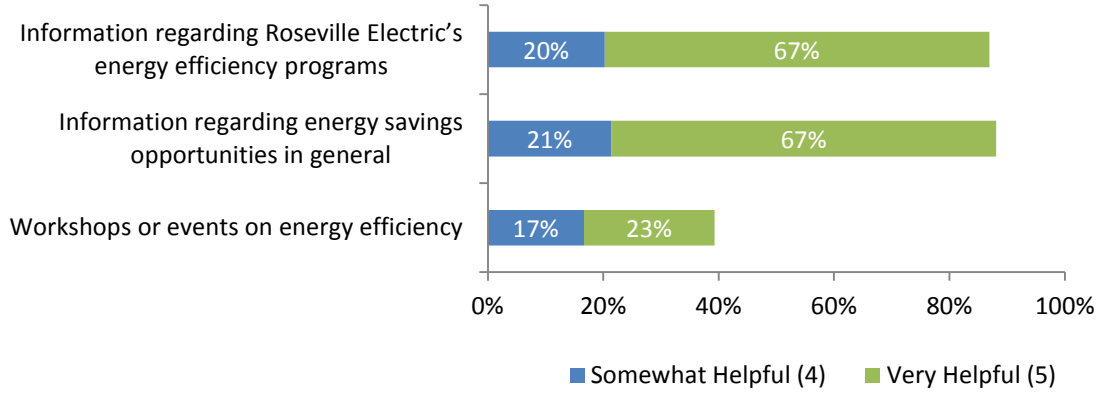
To better understand how customers prefer to receive information from Roseville Electric, Nexant asked participants their preferred method to receive energy efficiency information from Roseville Electric, and which categories of information they are most interested. For both participants and installers, email and the Roseville Electric website are the primary means individuals prefer to be informed (Figure 4-5).

Figure 4-5: Preferred mechanism to receive information from Roseville Electric



To ascertain what energy efficiency related content participants would find most helpful, respondents rated the "helpfulness" of the several items on a scale of 1 to 5, where "1" indicates "not at all helpful" and "5" indicates "very helpful" (Figure 4-6). Participants feel information regarding available energy efficiency programs and energy savings opportunities are equally helpful. Respondents view attendance at workshops or events on energy efficiency less helpful in comparison

Figure 4-6: How helpful (scale of 1-5) is the following item?



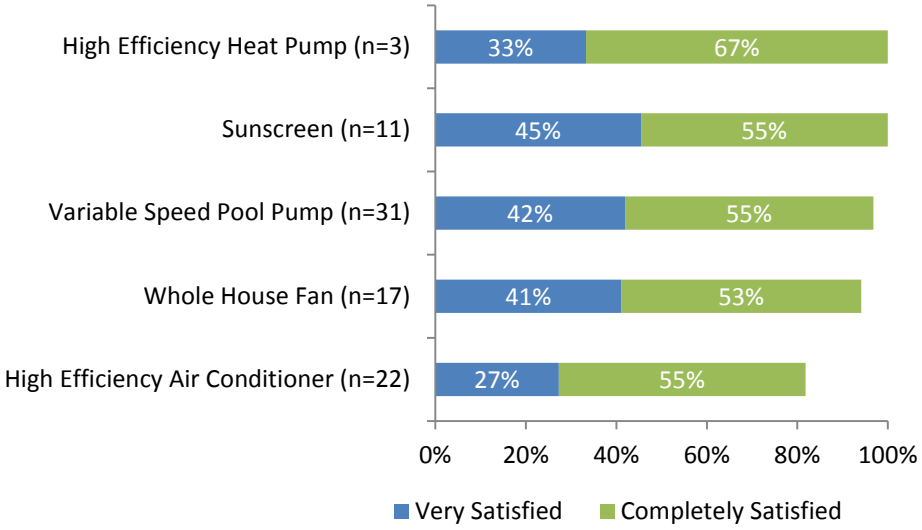
Both installers and participants would prefer to receive information about Roseville Electric rebates via email and through the Roseville Electric website, followed by bill inserts. As bill inserts are currently the primary marketing mechanism utilized by Roseville Electric, a focus on email marketing in the future may be well received by customers and installers alike. Because participants rated information regarding available programs and energy saving opportunities as helpful, Roseville Electric should continue to focus on these topic areas in their marketing activities. Nexant investigated satisfaction rates to better understand participant and installer attitudes toward Roseville Electric's energy efficiency programs. Program staff conduct satisfaction surveys annually and use this data to gauge their effectiveness in the community. During in-depth interviews, program staff reported these customer satisfaction survey results demonstrate high levels of customer satisfaction. Process evaluation activities summarized in this section further analyze customer satisfaction in regard to the specific rebate program the customer participated in.

4.2.3 Satisfaction

4.2.3.1 Participant satisfaction

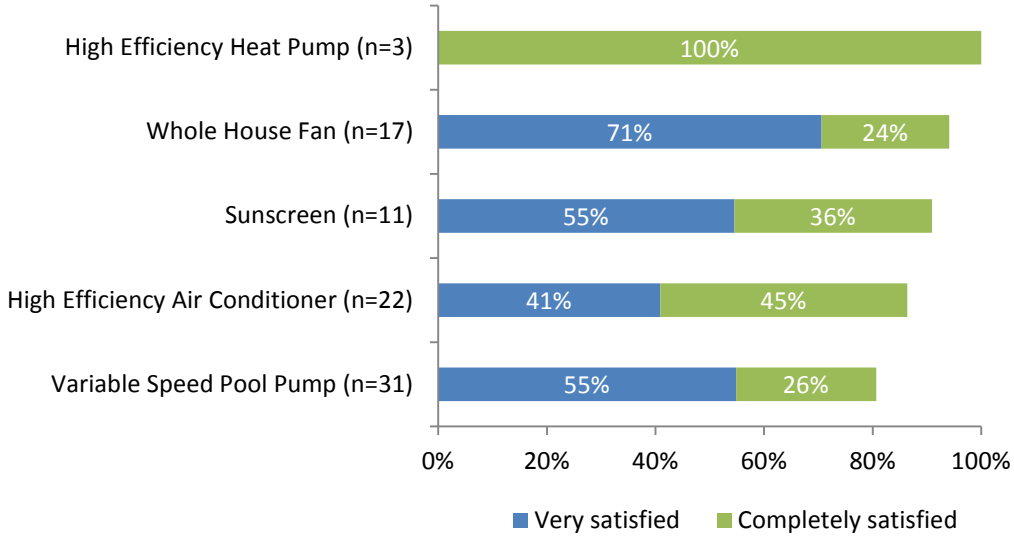
Participant satisfaction ratings are high across each program with over half of respondents stating they are completely satisfied on a scale of one to five where '1' means "not at all satisfied" and '5' means "highly satisfied" (Figure 4-7). Reasons for high satisfaction include satisfaction with the product, the installer's installation work, and the ease of the process. While overall satisfaction rates are high for the air conditioning program, this program received the most moderately satisfied responses (18% reporting moderate satisfaction levels). Four of the 24 respondents receiving AC rebates expressed moderate satisfaction with the rebate due to the ratio of the rebate amount to total project costs. These respondents indicated a desire for a larger rebate amount.

Figure 4-7: Participant satisfaction with their respective program overall



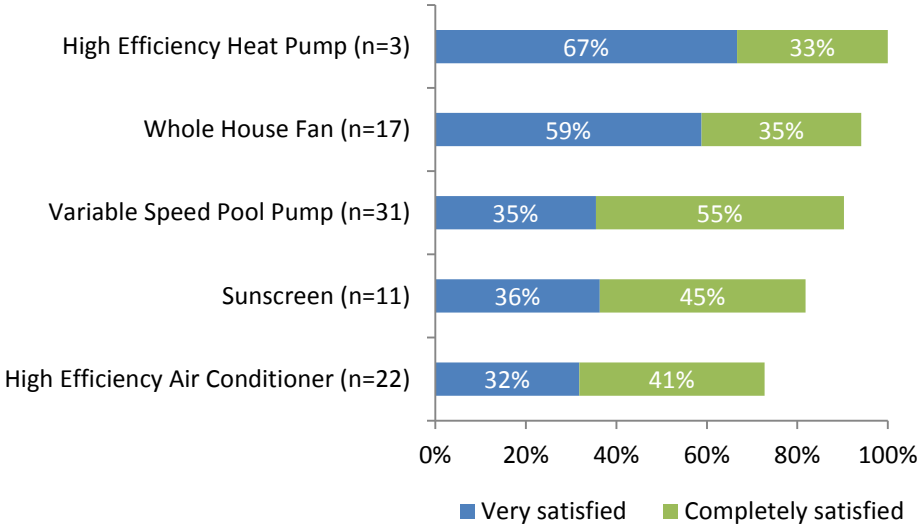
To further understand drivers behind customer satisfaction, Nexant asked participants to rate their satisfaction with the dollar amount of the rebate. Scores dropped slightly with overall satisfaction still high but more respondents in each category stating they are “very satisfied” instead of “completely satisfied” (Figure 4-8). The notable exception is the heat pump for which all surveyed participants reported complete satisfaction with the rebate amount.

Figure 4-8: Participant satisfaction with the dollar amount of the rebate by program



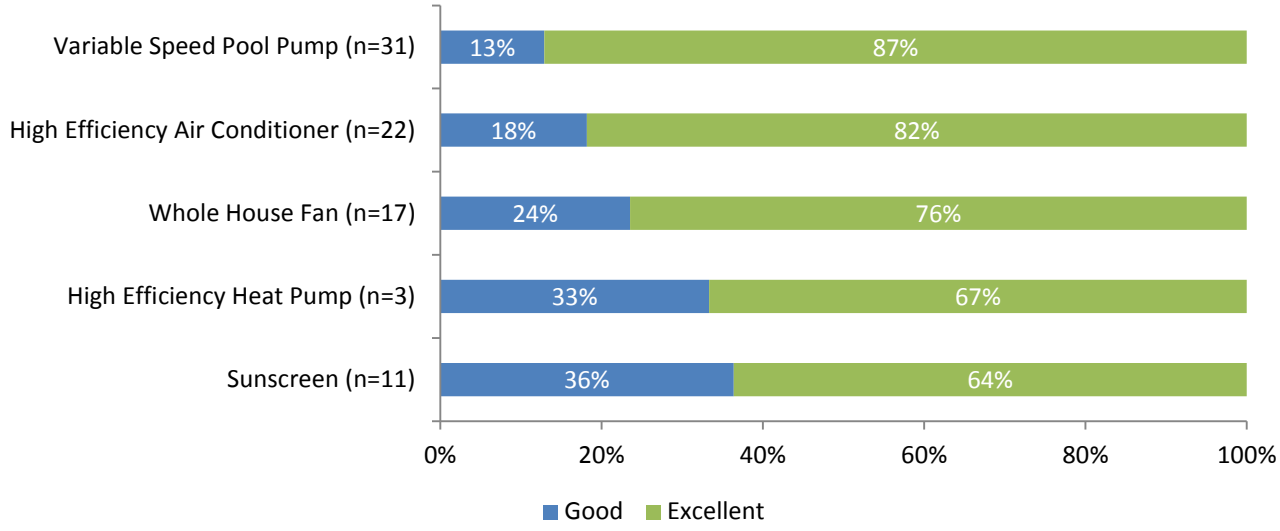
Nexant then asked respondents to rate their satisfaction with the speed with which they received their rebate. The majority of respondents were completely and very satisfied, with lower satisfaction levels (either ‘moderately’ or ‘slightly’ satisfied) reported for 23% of participants in the air conditioner program and 18% of participants in the sunscreen program (Figure 4-9).

Figure 4-9: Participant satisfaction with the speed with which they received the rebate



After asking about satisfaction with the amount of the rebate and the speed with which participants received their rebate, Nexant then inquired about satisfaction with regard to the installed measure. When asked to rate the quality of the measure they installed, respondents were given a five point scale option between very poor '1' and excellent '5'. All respondents rated their measure as good or excellent, indicating a high level of satisfaction with installed measures (Figure 4-10).

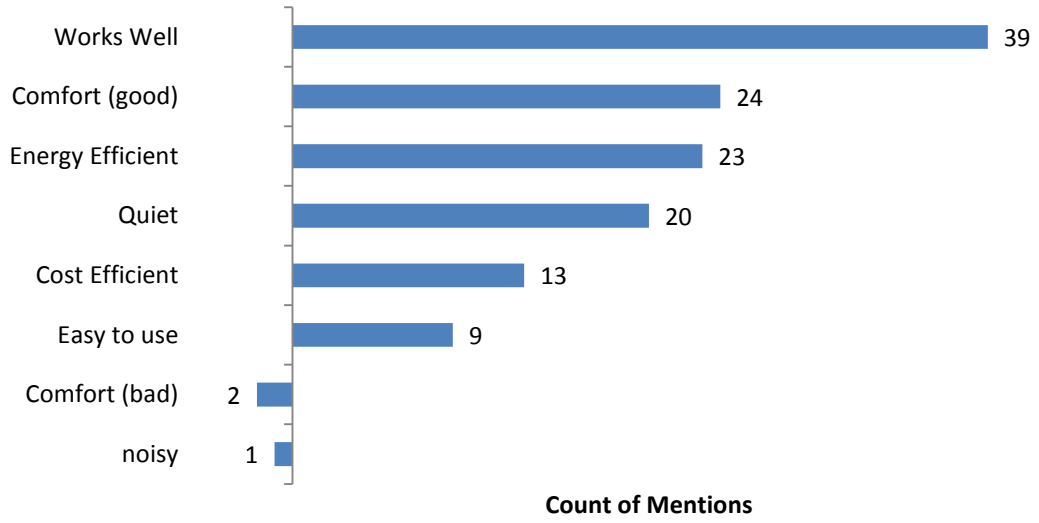
Figure 4-10: Rated quality of measure installed



When asked to explain their given rating, respondents most commonly mentioned that the measure "works well" (Figure 4-11). Additional positive responses include the measure increases the comfort of their home, operates quietly, is easy to use, and provides cost savings.

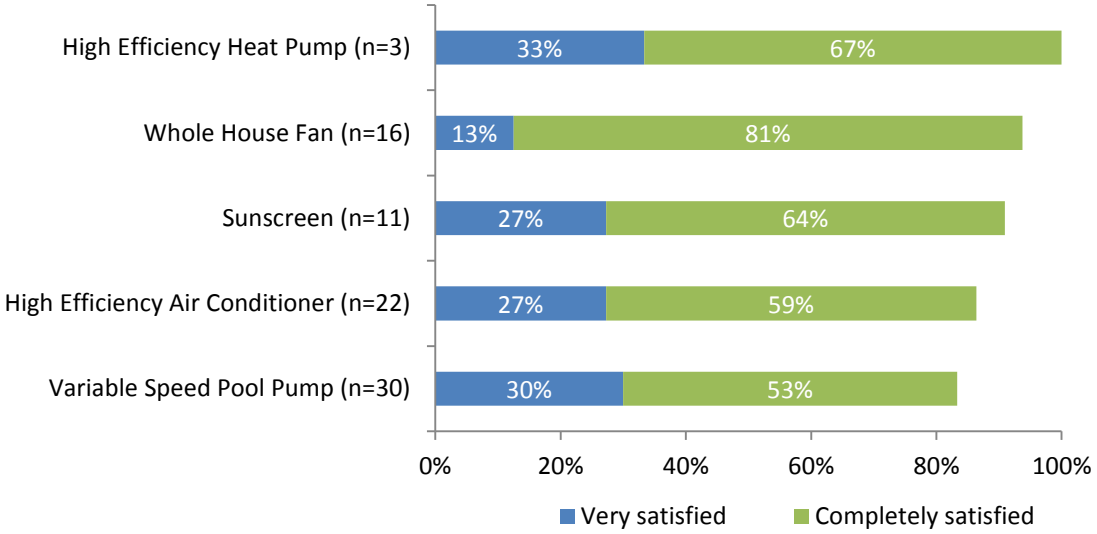
Only three negative responses were recorded. These include a complaint about the noise level of the equipment, and two respondents claiming their home now takes longer to cool down (one whole house fan and one air conditioner recipient).

Figure 4-11: Mentioned rationale for rating measure quality good and excellent (n=84, count of mentions)



Nexant recorded respondent satisfaction rates with their installer. Overall satisfaction rates are high as shown in Figure 4-12. Supporting these high satisfaction rates, 91% of surveyed participants said they would recommend their installer to others. When asked to explain their satisfaction rating, the most positive comments were related to the professionalism of the installer. Specific characteristics mentioned that represent high professionalism to respondents include timeliness, cleanliness, setting of expectations, and completing installation within those expectations. The few negative comments related to sloppy installations and issues with functionality post installation.

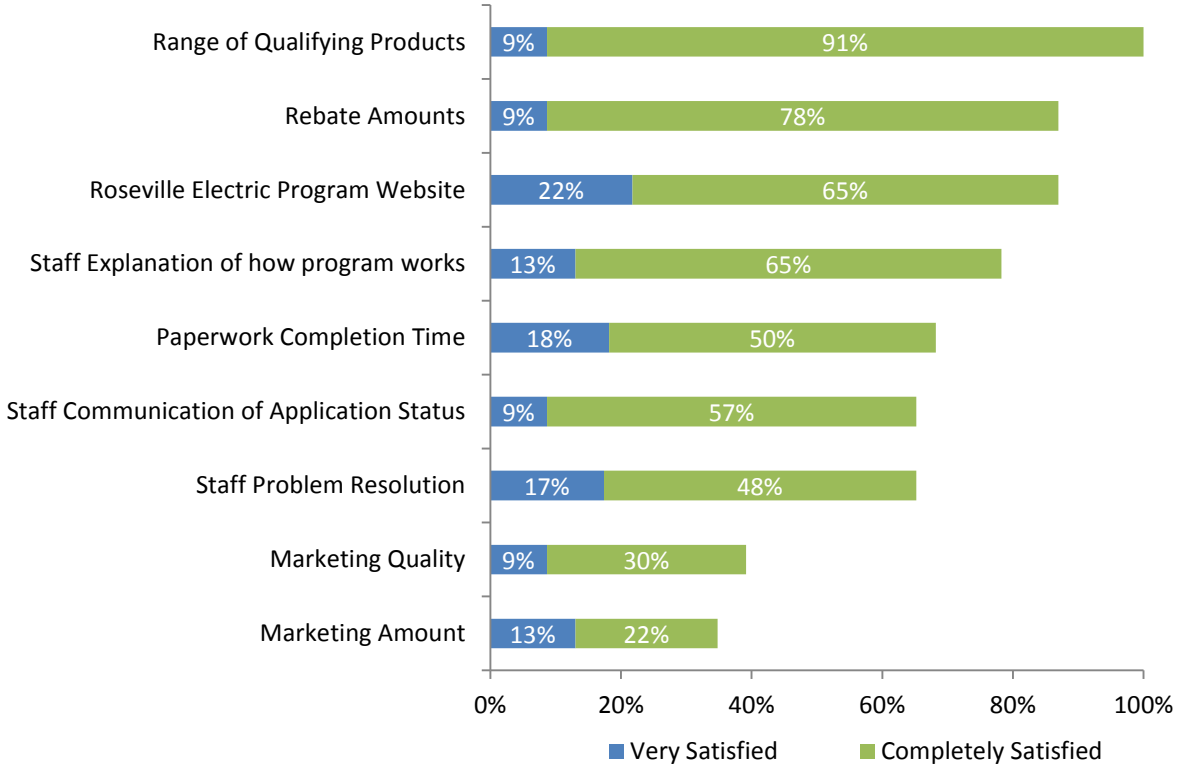
Figure 4-12: Satisfaction with Installer by Program



4.2.3.2 Installer satisfaction

Nexant asked installers to rate their satisfaction with a variety of program components on a scale of one to five where '1' means "not at all satisfied" and '5' means "highly satisfied". As shown in Figure 4-13 below, satisfaction rates are high overall with installers most satisfied with the range of qualifying products and the rebate amounts. Marketing quality and amount are the two categories that stand out with the lowest satisfaction rates.

Figure 4-13: Installer satisfaction with the following prompts (n=23)*



*"Not applicable" and "don't know" responses not shown

Installers were asked to explain lower satisfaction ratings. These are summarized by rebate amount, marketing amount, and paperwork requirements below.

- Rebate amount:
  - "Installers should also get rebate"
  - "Needs to have a good financial return"
  - "Could offer more money"
- Marketing amount
  - I haven't seen any / don't know about it (4 responses)
  - "Would like to see marketing in store"
  - "I see marketing as a residential customer but not as a company"
  - "People see the marketing on the Roseville website but not by chance – increase pamphlets in mail or other 'chance' sighting opportunities. City transit vehicles, maintenance, email".
- Paperwork
  - "I'd like to prefill [the application] so customer only has to sign"

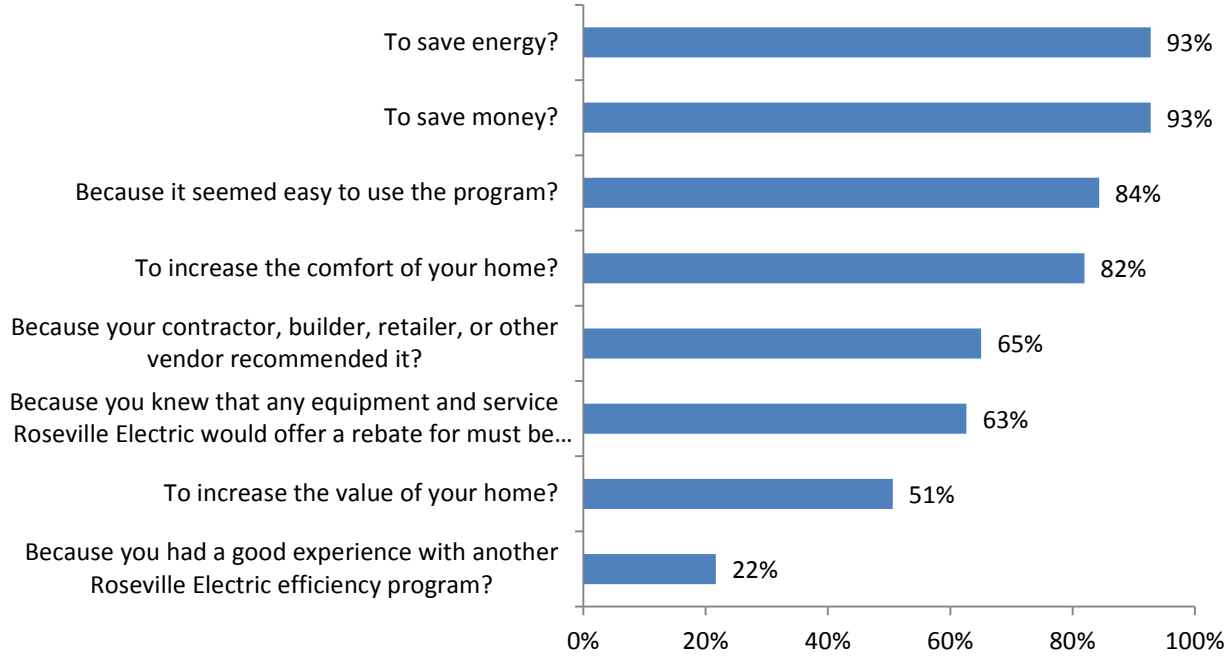
- "Permit must be final before the customer can request rebate, funds could run out. Pre-acceptance before permit finalization?"

4.2.4 Motivation and Value

Nexant assessed what motivates customers to participate in Roseville Electric energy efficiency programs by asking participants direct questions, and surveying installer strategies for communicating with customers.

Respondents noted which of the following motivating factors influenced their decision to apply for a rebate. The four statements most participants agreed with are "to save energy and money", followed by "because it seemed easy to use the program" and "to increase the comfort of their home" (Figure 4-14).

Figure 4-14: Agreement with statements, what motivated customer participation (n=84)



Similarly, Nexant asked installers to rate their level of agreement with statements about how the availability of incentives affects their residential installations on a scale of one to five where '1' means "not at all agree" and '5' means "strongly agree". Seventy percent (16 of 23) of responding installers strongly agree with the statement that "Roseville Electric incentives push customers to install more efficient equipment" (Table 4-4). Installers also strongly agreed with statements that they always tell customers about Roseville Electric incentives, and that the incentives do push customers to install more efficient equipment and help them sell jobs. Installers reported that the program incentives do not help keep themselves knowledgeable about new technologies. This is not an unexpected response as Roseville Electric does not offer an installer training program.

Table 4-4: Installer agreement with the following statements about incentives (n=23*)

Item	Portion Rating Each Item				
	"1" Not at all Agree	"2"	"3"	"4"	"5" Strongly Agree
I always tell Roseville Electric customers about Roseville Electric incentives	4	2	4	4	4
The Roseville Electric incentives push customers to install more efficient equipment	0	0	0	4	16
Roseville Electric incentives help me sell jobs	0	0	0	4	16
Roseville Electric incentives help keep me knowledgeable about new technologies	4	2	4	4	4

*"Not applicable" and "don't know" responses not shown

When bidding on a job for a residential customer, surveyed installers reported presenting two equipment options most frequently (14 of 23 installers), whereas five installers stated they typically present three equipment options, and the remaining three installers reported they typically present only one equipment option. The most frequently cited factors that distinguish the options provided are the efficiency rating (12 mentions), price (8 mentions), and brand (4 mentions). Five of 23 surveyed installers stated they have discouraged a customer from ordering a high efficiency equipment option in the past two years. Stated reasons are:

- Not an appropriate match for their circumstances (3 responses)
- If the cost / ROI doesn't make economic sense (2 responses)

When discussing the benefits of energy efficient equipment with customers, installers most frequently mentioned benefits include lower operation costs over time (11 mentions), improved comfort (8 mentions), and lower maintenance costs (5 mentions). Other benefits noted included a higher quality of equipment, ability to get rebate, environmental benefits, and longevity of product.

Based on these responses Roseville Electric's marketing materials appear to be catering to the appropriate value systems of participants and installers, and installers are communicating the return on investment the customer is likely to receive.

4.2.5 Suggestions for improvement

Installers were asked if they would like to see any equipment added to Roseville Electric's list of rebated equipment. Ten of the 23 installers gave additional equipment suggestions, each bullet represents one installer:

- Gable fans
- Insulation
- Duct insulation
- Awnings and retractable / shade products

- Pool heat pump
- Solar water heating for swimming pool
- Variable speed drives
- Installer's rebate for pool pumps (would like to get an additional rebate aside from homeowner)
- More tiers, two tiers are pretty limited for a package or a split system. Would like a 15 SEER in addition to 14 or 16.
- Keep $200 rebate for whole house fan in addition to $400

These insights may be useful to Roseville Electric when contemplating how to best address installer needs. These comments may also be useful for Roseville Electric to understand installer opinions and determine if further education/engagement opportunities are necessary to ensure installer information is in line with Roseville Electric, especially since installers are the main source of program awareness for participants.

5 Recommendations

The evaluation findings described throughout this report led to the following conclusions and recommendations for Roseville Electric's residential program.

5.1 Impact

Observation 1: Equipment vintage is not taken into account when determining measure savings.

Out of the four programs evaluated, two programs (Air Conditioning and Pool Pump) included measures that the TRM deems different savings amounts depending on the baseline vintage. For all projects, RE assumed 'early retirement' baseline vintage. In the case of the Pool Pump program, this assumption was very close to what was found in the evaluation, in that only one of the sampled 31 projects was found to have a dual speed pump prior to the upgrade. However, the evaluation found that the 'early retirement' assumption was not as accurate for the Air Conditioning program, with the average sampled baseline unit's age being 16.5 years old and 16 out of the 21 reported baseline unit ages being 15 years or older.

> **Recommendation:**
>
> In the Air Conditioner Program rebate form, RE already asks program participants to provide details concerning the old equipment, including make/model, efficiency, cooling capacity, and approximate age. Nexant's experience is that it is very often difficult for program participants to provide details of their old equipment besides equipment age. To be conservative when estimating savings, Nexant therefore recommends RE assume that all baseline systems have a 'natural replacement' vintage when there is no available data indicating the baseline unit's age. When the participant self-reports information indicating the baseline system's age is low enough to be considered 'early replacement' (newer model number or low reported unit age), RE would then use the appropriate 'early replacement' savings per the TRM.

Observation 2: RE staff expressed concern over requesting too much documentation from program participants for EM&V purposes.

RE has set up documentation requirements for each of the four evaluated programs and is questioning whether all of the requested information is needed to conduct high quality EM&V. If anything currently expected of program participants is not needed for EM&V, RE would like to stop requesting for that information.

Recommendation:

Program staff must balance the needs of properly documenting incentivized projects and collecting useful information for program planning purposes while minimizing the burden on customers/installers. For EM&V purposes, the object of collecting documentation is to prove, without a doubt, that the measure is installed and operational. Further, particularly for TRM-deemed measures, the purpose of documentation is to show that the reported savings for a particular project aligns with the requirements set forth in the TRM. Therefore, the minimum requirements necessary to evaluate the 4 programs in this report is listed in Table 5-1 below. Please note that these data requirements are the absolute minimum necessary to verify savings per the TRM and do not take into account RE's specific program requirements such as equipment maintenance agreements or administrative requirements such as the date the measure was installed/purchased, RE account holder information, or payee information. Moreover, Nexant recommends RE use the rebate form as an opportunity to collect other pertinent data that could help influence program design such as:

- the approximate age of any replaced equipment (regardless of whether the TRM lists different baseline vintages)
- who installed the measure – customer or contractor
- who selected the equipment – customer or contractor
- what store the equipment was purchased from

Table 5-1: Minimum Documentation Requirements for Evaluated Measures

Measure	Parameter	Expected Data Source(s)
Air conditioning	Cooling capacity (tons) Efficiency level Equipment type (e.g., split system AC, heat pump, ductless mini-split, etc.) Baseline vintage. For 'early retirement' projects, include data to confirm: age, make, model, size, and type of existing unit.	Installer invoice Rebate form Equipment specification sheet
Whole house fan	Confirm dwelling is air conditioned Confirm no other sources of fresh air (i.e., economizer) Fan airflow capacity (CFM)	Installer invoice Rebate form
Pool Pump	Motor size Baseline vintage. For 'early retirement' projects, include data to confirm if existing pump exists and if it is single or dual speed. Confirm pump has programmable VSD controls	Installer invoice Rebate form
Sunscreen	Confirm dwelling is air conditioned Direction windows face (north facing windows are excluded) Solar screen area (sq. ft.)	Installer invoice Rebate form

5.2 Process

Observation 1: Program administration tools are effective, but electronic submittal functionality can improve

Roseville Electric's residential rebate programs are functioning well as indicated by the following factors: employees are aware of program tools, and participants and installers report high satisfaction for the amount of rebates, the turnaround time to receive a rebate, and the rebated equipment installed. However, while installers state they sell a high level of energy efficient equipment, the majority receive rebates for fewer than 25% of their jobs. Installers indicated that easier rebate submittals and processing may result in greater participation. Installers mentioned they would like pre-approval or the ability to submit applications online. Roseville Electric's data management software has the capability for online submittals.

Recommendation:

Take advantage of online rebate submittal software functionality and train enough staff to be able to manage it so that there are not gaps in workload management or functionality due to staff leave schedules.

Observation 2: Participants and installers prefer email as the prime source of receiving energy efficiency information from Roseville Electric

The content of Roseville Electric's marketing materials adequately addresses the needs of participants and installers. The Roseville Electric website is also a prime source of content delivery that both participants and installers appreciate and utilize. However, while Roseville Electric's prime distribution channels are on-bill inserts, both participants and installers stated their highest preference is to receive energy efficiency information via email. Installers also stated they only become aware of Roseville Electric rebate marketing materials through on-bill inserts (if they live within Roseville Electric territory), or visiting Roseville Electric's website, and they would appreciate direct communication from Roseville Electric about current and upcoming programs.

Recommendation:

Participants and installers are requesting Roseville Electric communicate energy efficiency opportunities with them via email as their most preferred source of information. Roseville Electric should use this mechanism and consider maintaining accurate email contact information from both customers and installers.

Observation 3: Measure qualification requirements for whole house fans and variable speed pool pumps can be simplified

Majority of whole house fan energy savings come from using the fan instead of an air conditioning unit, not from the efficiency of the fan itself. Acknowledging this point, whole house fan efficiency levels are not broken out in the TRM.

Currently variable speed pool pumps are required to be on the CEC list to qualify for a rebate. The TRM states the variable speed pump needs to be at least 1HP.

Recommendation:

Roseville Electric can simplify the Whole House Fan rebate application process by not requiring an efficiency value for the whole house fan.

Recommendation:

Roseville Electric may be able to reduce manpower needs in responding to alternate variable speed pumps that are not on the CEC list by allowing variable speed pumps in addition to the CEC list that meet the following requirements:

- Pump is variable speed
- Pump is at least 1HP
- Pump has programmable VSD controls

Appendix A Participant Phone Survey

Screening [ASK ALL]

S1. Hi, my name is ___ and I'm calling on behalf of Roseville Electric. Roseville Electric is evaluating their energy efficiency programs and efforts in order to better serve their customers. We'd like to ask you about the **[Measure Type]** you installed **recently** in your home at **[Address]**. Are you the right person in your household to talk with?

1. Yes
2. No

[IF S1 = 2]

S2. Could you refer me to someone who could answer a few questions about your household's awareness of Roseville Electric's energy efficiency efforts?

[*If asked:*] I am not selling anything.
[*If asked:*] This survey will take about 20 minutes

In exchange for your time in taking this survey, Roseville Electric is offering each survey respondent a $10 Visa gift card, which will be mailed to you at the conclusion of this study. [*interviewer note: this will likely happen in September/October timeframe*]

Program and Energy Efficiency Awareness [ASK ALL]

[ASK ALL]

Q1. How did you first hear about the Roseville Electric rebate for a(n) **[Measure Type]***? [Record first answer, do not read list]*

[SINGLE RESPONSE]

1. Information with my electric or gas bill
2. Roseville Electric Website
3. Other Website
4. Family/friends/word-of-mouth
5. Roseville Electric representative
6. Contractor
7. Newspaper
8. TV
9. Magazine
10. Billboards/Outdoor
11. Radio
12. Events
13. Social media (Facebook, Twitter, etc.)

[*Do not read:*]

96. Other, please specify: [OPEN-ENDED RESPONSE]
98. Don't know
99. Refused

[ASK ALL]
Q2. How do you receive your monthly Roseville Electric bill?

[SINGLE RESPONSE] *[Don't read]*

1. In the mail
2. Paperless billing (electronically)
3. Both in the mail and electronically
4. Not responsible for paying Roseville Electric bill (landlord covers)

[*Do not read:*]

96. Other, please specify: [OPEN-ENDED RESPONSE]
98. Don't know
99. Refused

Q3. Are you familiar with other energy-efficiency rebates that Roseville Electric offers, aside from the one you've already received for a(n) **[Measure Type]***?*

[SINGLE RESPONSE]

1. Yes
2. No

[*Do not read:*]

98. Don't know
99. Refused

[IF Q3 = 1]

Q4. What other energy-efficiency rebates and/or programs are you familiar with? [OPEN-ENDED RESPONSE].

Program Satisfaction/Reason for Participation [ASK ALL]

Now I'd like to ask you a few questions about Roseville Electric's program and the **[Measure Type]** *that you received a rebate for.*

Q5. How satisfied are you overall with Roseville Electric's **[Program]**? Would you say that you are

[SINGLE RESPONSE]

1. Not at all satisfied
2. Slightly satisfied
3. Moderately satisfied
4. Very satisfied
5. Completely satisfied

[*Do not read:*]

98. Don't know
99. Refused

[IF Q5 = 98 OR 99, SKIP]
Q6. Why did you give that rating?

1. [OPEN-ENDED RESPONSE]

[*Do not read:*]
98. Don't know
99. Refused

Q7. Using the same scale, how satisfied are you with the dollar amount of the rebate you received for your **[Measure Type]**? *[Don't read unless needed]*

[SINGLE RESPONSE]

1. Not at all satisfied
2. Slightly satisfied
3. Moderately satisfied
4. Very satisfied
5. Completely satisfied

[*Do not read:*]
98. Don't know
99. Refused

Q8. And how satisfied are you with how quickly you received the rebate for your **[Measure Type]**?

[SINGLE RESPONSE] *[Don't read unless needed]*

1. Not at all satisfied
2. Slightly satisfied
3. Moderately satisfied
4. Very satisfied
5. Completely satisfied

[*Do not read:*]
98. Don't know
99. Refused

Q9. Do you have any suggestions on how to improve the **[Program]**?

1. [OPEN-ENDED RESPONSE]

[*Do not read:*]
98. Don't know
99. Refused

Q10. How would you rate the quality of your **[Measure Type]**? Would you say it was *[read list]*:

[SINGLE RESPONSE]

1. Very poor
2. Poor
3. Fair
4. Good
5. Excellent

[*Do not read:*]
98. Don't know
99. Refused

[IF Q10 = 98 OR 99, SKIP TO Q12]
Q11. Why did you give that rating?

1. [OPEN-ENDED RESPONSE]

[*Do not read:*]
98. Don't know
99. Refused

Q12. Is the **[Measure Type]** still installed or in use in your home?

[SINGLE RESPONSE]

1. Yes
2. No

[*Do not read:*]
98. Don't know
99. Refused

[IF Q12= 1, SKIP]
Q13. Is it… *[read list]*

[SINGLE RESPONSE]

1. Installed or being used somewhere else; or
2. No longer in use at all?

[*Do not read:*]
96. Other, please specify: [OPEN-ENDED RESPONSE]
98. Don't know
99. Refused

[ASK ALL]
Q14. *Next, I'm going to read a list of reasons why your household might have applied for the* **rebate** *for the* **[Measure Type]***Installed in your home. Please let me know with a "yes" or "no" whether each reason applies [Interviewer: prompt with responses for each, do not read 97-99]*

[MATRIX QUESTION] [RANDOMIZE ORDER ASK ALL]

[LOGIC] Item	Yes	No	97 N/A	98 Don't Know	99 RF
Because your contractor, builder, retailer, or other vendor recommended it?					

Because it seemed easy to use the program?					
Because you knew that any equipment and service Roseville Electric would offer a rebate for must be reliable?					
Because you had a good experience with another Roseville Electric efficiency program?					
To increase the comfort of your home?					
To increase the value of your home?					
To save money?					
To save energy?					
Anything else? [OPEN-ENDED RESPONSE]					

[ASK ALL]

Q15. *I have a few questions about the information you may have received on the* **[Measure Type]**. *This information would have been on the rebate form, on the website, or you could have received it another way. For the following questions, please use a 5-point scale, where 1 means "the information was not at all clear" and 5 means "the information was very clear." If you didn't get information on a topic, please let me know… [Interviewer: do not read 97-99]*

[MATRIX QUESTION: SCALE] [ASK ALL]

[LOGIC] Item	1	2	3	4	5	97 NA	98 DK	99 RF
Information about what equipment and energy-saving items qualify for rebates?								
Information about how to apply for rebates through Roseville Electric?								

Information on the energy savings you might expect from the energy efficient equipment or items?								
Information about how to follow up with program staff if you had any questions or concerns								

[ASK ALL]

Q16. When considering the program offer, what, if anything, raised questions or concerns? *[Don't read, code accordingly]*

[MULTIPLE RESPONSE]

1. No, nothing raised questions or concerns
2. Time involved/ possible delays
3. Incentives not enough
4. Difficulty of participating
5. Not sure it would be worth it
6. Confusing
7. Hard to do things a new way

[*Do not read:*]

96. Other, please specify: [OPEN-ENDED RESPONSE]
98. Don't know
99. Refused

[ASK ALL]

Q17. On a 5-point scale where *1 means "I would find the information not at all helpful" and 5 means "I would find the information very helpful.", please rate how helpful the following would be* from Roseville Electric

[MATRIX QUESTION: SCALE] [ASK ALL]

[LOGIC] Item	1	2	3	4	5	97 NA	98 DK	99 RF
Information regarding Roseville Electric's energy efficiency programs								
Information regarding energy savings opportunities in general								
Workshops or events on energy efficiency								

Q18. What are your preferred ways to get energy efficiency information from Roseville Electric?

[MULTIPLE RESPONSE] *[Don't read, probed if needed. Ask: any other ways after first two responses]*
[Interviewer: We are trying to gather a list of all the possible ways respondents would like information. We are trying to go beyond first mention to get a list of all the ways that would be good for them to receive information.]

1. Roseville Electric website
2. By phone
3. By US mail via bill insert
4. By US mail separate from bill insert
5. By e-mail
6. At a community event
7. At a workshop, seminar, or classroom event
8. At a webinar

[*Do not read:*]

96. Other, please specify: [OPEN-ENDED RESPONSE]
98. Don't know
99. Refused

Contractor Satisfaction [ASK ALL]

[ASK ALL]
Q19. Did you use a contractor for the installation of your **[Measure Type]**?

[SINGLE RESPONSE]

1. Yes
2. No

[*Do not read:*]

98. Don't know
99. Refused

[IF Q19 = 1, ELSE SKIP]
Q20. How satisfied were you with your contractor?

[SINGLE RESPONSE]

1. Not at all satisfied
2. Slightly satisfied
3. Moderately satisfied
4. Very satisfied
5. Completely satisfied

[*Do not read:*]

98. Don't know
99. Refused

[IF Q19 ≠ 98,99]
Q21. Why do you feel that way?

1. [OPEN-ENDED RESPONSE]

[*Do not read:*]

98. Don't know
99. Refused

[IF Q19 = 1, ELSE SKIP]

Q22. Would you recommend the contractor to others?

[SINGLE RESPONSE]

1. Yes
2. No

[*Do not read:*]

98. Don't know
99. Refused

Freeridership [ASK ALL]

I'd like to ask a few questions about what you most likely would have done had you not received assistance from Roseville Electric for the **[Measure Type]**.

[ASK ALL]

Q23. Which of the following three alternatives is most likely: Would you have:

[SINGLE RESPONSE]

1. Put off buying a new **[Measure Type]** for at least one year [Includes repairing old or buying a used one.]
2. Bought a new **[Measure Type]** that was less expensive or less energy efficient.
3. Bought the exact same **[Measure Type]** anyway, and paid the full cost yourself.

[*Do not read:*]

96. Other, please specify: [OPEN-ENDED RESPONSE]
98. Don't know
99. Refused

[ASK ALL]

Q24. Now I would like to ask about the role that the program played in your decision to purchase the energy efficient **[Measure Type]**. I'm going to read a list of things that may have played a role in your decision to buy the **[Measure Type]**. For each one, please indicate how important it was in your decision, where '1' means it was "not at all important" and "5" means it was "extremely important." Let me know if an item doesn't apply to you. *[Interviewer: do not read 97-99]*

[MATRIX QUESTION: SCALE]

[LOGIC] Item	1	2	3	4	5	97 NA	98 DK	99 RF
The rebate you received								
Information on Roseville Electric's website								

Advertising and other information from Roseville Electric								
A salesperson or contractor								
Anything else, please specify:_____								

Spillover [ASK ALL]

And now I'd like to talk to you about any additional energy saving improvements you may have made to your home since your participation in Roseville Electric's **[PROGRAM]**

[ASK ALL]

Q25. Since receiving your rebate from Roseville Electric for the **[Measure Type]** have you purchased any energy efficiency products or made any changes to your home to save energy for which you *DID NOT* receive a rebate from Roseville Electric?

[SINGLE RESPONSE]

1. Yes
2. No

[*Do not read:*]

98. Don't know
99. Refused

[IF Q25 = 1, ELSE SKIP]

Q26. What changes did you make to save energy in your home? Did you…

[MULTIPLE RESPONSE]

1. Install energy efficient appliances
2. Move into an ENERGYSTAR home *[VERIFY:"Is Roseville Electric still your gas or electricity utility?"]*
3. Install efficient heating or cooling equipment
4. Install efficient windows or additional insulation
5. Seal air leaks

[*Do not read:*]

96. Other, please specify: [OPEN-ENDED RESPONSE]
98. Don't know
99. Refused

[IF QQ26 = 1, ELSE SKIP]

Q27. What kinds of appliances did you buy?

[MULTIPLE RESPONSE]

1. Refrigerator

2. Freezer
3. Dishwasher
4. Clothes washer
5. Water heater
6. Oven
7. Microwave

[*Do not read:*]

96. Other, please specify: [OPEN-ENDED RESPONSE]
98. Don't know
99. Refused

[IF Q26 = 1, ELSE SKIP]

Q28. Was the replacement appliance new or used?

[SINGLE RESPONSE]

1. Brand New
2. Used

[*Do not read:*]

98. Don't know
99. Refused

[IF Q26 = 1, ELSE SKIP]

Q29. Was the replacement appliance an ENERGY STAR or high-efficiency model?

[SINGLE RESPONSE]

1. Yes
2. No

[*Do not read:*]

98. Don't know
99. Refused

[IF Q26 = 1, ELSE SKIP]

Q30. What did you do with your old appliance?

[SINGLE RESPONSE]

1. Kept it as a backup
2. Sold it
3. Gave it away for free
4. Had it removed by the dealer you got your replacement **appliance** from
5. Took it to a dump or recycling center
6. Hired someone else to haul it away
7. Recycled as part of RE Appliance Recycling Program

[*Do not read:*]

96. Other, please specify: [OPEN-ENDED RESPONSE]
98. Don't know
99. Refused

[IF Q26 = 3, ELSE SKIP]

Q31. Can you please describe the heating or cooling equipment that you bought?

[MULTIPLE RESPONSE]

1. A/C (Air Conditioner) replacement
2. Heat pump
3. Gas high efficiency boiler
4. Gas high efficiency furnace
5. Variable speed motor for furnace (air handler fan)
6. Electric to gas wall unit conversion
7. Gas programmable thermostat with A/C

[*Do not read:*]

96. Other, please specify: [OPEN-ENDED RESPONSE]
98. Don't know
99. Refused

[IF Q26 = 4, ELSE SKIP]

Q32. Did you install insulation, windows, or both?

[MULTIPLE RESPONSE]

1. Insulation
2. Windows
3. Both insulation and windows

[*Do not read:*]

96. Other, please specify: [OPEN-ENDED RESPONSE]
98. Don't know
99. Refused

[IF Q25 = 1, ELSE SKIP]

Q33. On a scale of 1 to 5, where one means "not at all important" and 5 means "extremely important", how important was your participation in the Roseville Electric [PROGRAM] on your decision to install the additional energy efficient product or complete the energy efficiency upgrade in your home without a Roseville Electric incentive?[RESPONSE BETWEEN 1 AND 5]

Impact Questions: HVAC System Specifications [ASK IF PROGRAM = RESIDENTIAL HIGH EFFICIENCY AC, ELSE SKIP]

Q34. What is the primary method you use to cool your home?

[SINGLE RESPONSE]

1. Split System AC (i.e "central air" or "forced air" system)
2. Evaporative-cooled split-system AC
3. Ductless mini-split
4. Air Source Heat Pump

[*Do not read:*]

96. Other, please specify: [open ended response]
98. Don't know
99. Refused

Q35. What percent of your home is cooled by your [pipe SELECTED text 1, 2, 3, 4 or 96 from Q34]?

[SINGLE RESPONSE]

1. [Selection boxes, 1-100%, 10 point increments]

Q36. How old is your [pipe text 1-96 from Q34]?

[SINGLE RESPONSE]

1. [numeric response] years old

[*Do not read:*]

98. Don't know
99. Refused

Q37. What is the efficiency rating of your [pipe text 1-96 from Q34]?

[SINGLE RESPONSE]

1. Response Text [FORCE NUMERIC RESPONSE] [ADD SECOND RESPONSE FIELD TO SELECT EFFICIENCY RATING UNIT: EER OR SEER]

[*Do not read:*]

98. Don't know
99. Refused

Q38. Is your [pipe text 1-96 from Q34] Energy Star rated?

[SINGLE RESPONSE]

1. Energy Star [
2. Not Energy Star
3. Unknown if Energy Star

[*Do not read:*]

98. Don't know
99. Refused

[DISPLAY IF Q35< 100%]

Q39. You mentioned earlier that your primary cooling system accounts for less than 100% of the cooling needs for your house. What type of secondary cooling system do you use in your home?

[SINGLE RESPONSE]

1. Split System AC
2. Evaporative-cooled split-system AC
3. Ductless mini-split
4. Air Source Heat Pump
5. Window / Room A/C
6. Whole house fan

7. Space fan / Ceiling Fan
8. Geothermal
9. None, that part of home is not cooled.

[*Do not read:*]

96. Other, please specify: [open ended response]
98. Don't know
99. Refused

[If Q39 =9, 98 or 99, skip to END OF SECTION OTHERWISE DISPLAY]

Q40. What percent of your home square footage does your [pipe 1-96 from Q39] cool?

[SINGLE RESPONSE]

1. [Selection boxes, 1-100%, 10 point increments]

[*Do not read:*]

98. Don't know
99. Refused

[If Q39=9, 98 or 99, skip to END OF SECTION OTHERWISE DISPLAY]

Q41. How old is your [pipe 1-96 from Q39]?

[SINGLE RESPONSE]

1. [numeric response]

[*Do not read:*]

98. Don't know
99. Refused

[IF Q27 = 1-5, 8, 96, ELSE SKIP]

Q42. What is the efficiency rating of your [pipe 1-96 from Q39]?

[SINGLE RESPONSE]

1. Response Text [FORCE NUMERIC RESPONSE] [ADD SECOND RESPONSE FIELD TO SELECT EFFICIENCY RATING UNIT: EER OR SEER]

[*Do not read:*]

98. Don't know
99. Refused

[If Q39= 1-8, ELSE SKIP]

Q43. Is your [pipe 1-96 from Q39] Energy Star rated?

[SINGLE RESPONSE]

1. Energy Star
2. Not Energy Star
3. Unknown if Energy Star

[*Do not read:*]

98. Don't know

99. Refused

Impact Questions: Pre- and Post-HVAC System Specifications [ASK IF PROGRAM = RESIDENTIAL HIGH EFFICIENCY AC, ELSE SKIP]

Q44. What was the primary method you used to cool your home prior to your upgrade?

[SINGLE RESPONSE]

1. Split System AC
2. Evaporative-cooled split-system AC
3. Ductless mini-split
4. Air Source Heat Pump
5. Window / Room A/C
6. Whole house fan
7. Space fan / Ceiling Fan
8. Geothermal

[*Do not read:*]

96. Other, please specify: [open ended response]
98. Don't know
99. Refused

Q45. What percent of your home is/was cooled by your [pipe SELECTED text 1, 2, 3, 4, 5, 6, 7, 8 or 96 from Q44]?

[SINGLE RESPONSE]

1. [Selection boxes, 1-100%, 10 point increments]

Q46. How old is/was your [pipe text 1-96 from Q44]?

[SINGLE RESPONSE]

1. [numeric response] years old

[*Do not read:*]

98. Don't know
99. Refused

[IF Q32 = 1-5, 8, 96, ELSE SKIP]

Q47. What is/was the efficiency rating of your [pipe text 1-96 from Q44]

[SINGLE RESPONSE]

1. Response Text [FORCE NUMERIC RESPONSE] [ADD SECOND RESPONSE FIELD TO SELECT EFFICIENCY RATING UNIT: EER OR SEER]

[*Do not read:*]

98. Don't know
99. Refused

Q48. Is/was your [pipe text 1-96 from Q44] Energy Star rated?

[SINGLE RESPONSE]

1. Energy Star
2. Not Energy Star
3. Unknown if Energy Star

[*Do not read:*]

98. Don't know
99. Refused

[DISPLAY IF Q45< 100%]

You mentioned earlier that your primary cooling system accounts for less than 100% of the cooling needs for your house.

Q49. Do you still use a secondary system to cool your home?

[SINGLE RESPONSE]

1. Yes
2. No

[*Do not read:*]

98. Don't know
99. Refused

[If Q49 = 1, else skip to END OF SECTION]

Q50. What type of secondary cooling system do you use in your home?

[SINGLE RESPONSE]

1. Split System AC
2. Evaporative-cooled split-system AC
3. Ductless mini-split
4. Air Source Heat Pump
5. Window / Room A/C
6. Whole house fan
7. Space fan / Ceiling Fan
8. Geothermal
9. None, that part of the house is not cooled

[*Do not read:*]

96. Other, please specify: [open ended response]
98. Don't know
99. Refused

[If Q50=9, 98 or 99, skip to END OF SECTION OTHERWISE DISPLAY]

Q51. What percent of your home square footage does your [pipe 1-8, or 96 from Q50] cool?

[SINGLE RESPONSE]

1. [Selection boxes, 1-100%, 10 point increments]

[*Do not read:*]

98. Don't know
99. Refused

Q52. How old is your [pipe 1-8, or 96 from Q50]?

[SINGLE RESPONSE]

1. [numeric response] years old

[*Do not read:*]

98. Don't know
99. Refused

[IF Q50 = 1-8, OR 96, ELSE SKIP]

Q53. What is the efficiency rating of your [pipe 1-8, or 96 from Q50]?

[SINGLE RESPONSE]

1. Response Text [FORCE NUMERIC RESPONSE] [ADD SECOND RESPONSE FIELD TO SELECT EFFICIENCY RATING UNIT: EER OR SEER]

[*Do not read:*]

98. Don't know
99. Refused

[If Q50= 1-7, OR 96, ELSE SKIP]

Q54. Is [pipe 1-8, or 96 from Q50] Energy Star rated?

[SINGLE RESPONSE]

1. Energy Star
2. Not Energy Star
3. Unknown if Energy Star

[*Do not read:*]

98. Don't know
99. Refused

Impact Questions – Thermostat Setpoints [ASK IF PROGRAM = RESIDENTIAL HIGH EFFICIENCY AC]

Q55. Is/are your cooling system(s) controlled by manual or programmable thermostats?

[SINGLE RESPONSE]

1. Manual
2. Programmable
3. Smart or learning thermostats

[*Do not read:*]

96. Other, please specify: [OPEN-ENDED RESPONSE]
98. Don't know
99. Refused

[DISPLAY IF Q55 =2, OTHERWISE SKIP]

Q56. **You stated that you have a programmable thermostat(s). What are the heating and cooling setpoints?**

[SINGLE RESPONSE]

1. Yes. Heating Setpoint [NUMERIC RESPONSE], Cooling Setpoint [NUMERIC RESPONSE]
2. No

[*Do not read:*]

98. Don't know
99. Refused

Q57. **Are you currently using heating and cooling temperature setbacks during weekdays or on weekends? If so, please describe.**

[OPEN-ENDED RESPONSE], *INTERVIEWER, PLEASE RECORD VERBATIM RESPONSES FROM CUSTOMER IF SHE/HE DESCRIBES THERMOSTAT SETBACKS*

[MATRIX]

	OCCUPIED SETPOINT (°F)	UNOCCUPIED (SETBACK) SETPOINT (°F)	SETBACK START TIME - WEEKDAY	SETBACK END TIME - WEEKDAY	SETBACK START TIME - WEEKEND	SETBACK END TIME - WEEKEND
Heating						
Cooling						

Impact questions – SUNSCREENS [ASK IF PROGRAM = RESIDENTIAL WINDOW SUNSCREENS]

Q58. **What type of window systems does your home have?**

[MULTIPLE RESPONSE]

1. Single pane Aluminum
2. Single pane Wood
3. Double pane Aluminum
4. Double pane Wood
5. Double pane Vinyl/Fiberglass

[*Do not read:*]

96. Other, please specify: [OPEN-ENDED RESPONSE]
98. Don't know
99. Refused

Q59. **Is the window glazing tinted or does it feature low-E coating?**

[MULTIPLE RESPONSE]

1. Yes, tinted
2. Yes, low-E
3. No

[*Do not read:*]

98. Don't know
99. Refused

Q60. How many window sunscreens were installed?

[MATRIX QUESTION]

Window Type	Quantity Installed	Average Square Footage	98 DK	99 RF
1. [pipe selection 1-96 from Q58]				
2. [pipe selection 1-96 from Q58]				
3. [pipe selection 1-96 from Q58]				

Q61. What percent of your window have bug screens?

[SINGLE RESPONSE]

1. [Selection boxes, 1-100%, 10 point increments]

Q62. What proportion of the sunscreens were installed on the north, south, east, and west building elevations, respectively?

[MATRIX QUESTION]

Window Type	Elevation	Percentage (%)	98 DK	99 RF
1. [pipe selection 1-96 from Q58]	North			
2.	South			
3.	East			
4.	West			
5. [pipe selection 1-96 from Q58]	North			
6.	South			
7.	East			
8.	West			
9. [pipe selection 1-96 from Q58]	North			
10.	South			
11.	East			
12.	West			

Q63. **Did the window systems have curtains or blinds prior to the retrofit?**

[MULTIPLE RESPONSE]

1. Yes, curtains

2. Yes, blinds
3. No

[*Do not read:*]

98. Don't know
99. Refused

Q64. What was the primary method you use to cool your home?

[SINGLE RESPONSE]

1. Split System AC
2. Evaporative-cooled split-system AC
3. Ductless mini-split
4. Air Source Heat Pump
5. Window / Room A/C
6. Whole house fan
7. Space fan / Ceiling Fan
8. Geothermal

[*Do not read:*]

96. Other, please specify: [open ended response]
98. Don't know
99. Refused

Impact Questions: Pool Pumps [ASK IF PROGRAM = RESIDENTIAL VARIABLE SPEED POOL PUMPS]

Q65. What is the approximate size of your swimming pool (in gallons)?

[MULTIPLE RESPONSE]

1. [numeric response for pool volume, gallons]
2. [numeric response for pool dimensions (length x width x avg. depth), feet]

[*Do not read:*]

98. Don't know
99. Refused

Q66. What is the rated horsepower of your current pool pump?

[SINGLE RESPONSE]

1. [numeric response, hp]

[*Do not read:*]

98. Don't know
99. Refused

Q67. What was the rated horsepower of your previous pool pump?

[SINGLE RESPONSE]

1. [numeric response, hp]

[*Do not read:*]
98. Don't know
99. Refused

Q68. Was the pump that was replaced a single-speed or two-speed pump?

[MULTIPLE RESPONSE]

1. Single-speed
2. Two-speed

[*Do not read:*]
98. Don't know
99. Refused

How many days per year does your pool pump operate?

[SINGLE RESPONSE]

1. [text response] days

[*Do not read:*]
98. Don't know
99. Refused

Impact Questions – WHOLE HOUSE FAN [ASK IF PROGRAM TYPE = COOL HOME–WHOLE HOUSE FAN]

Q69. **What is the approximate square footage of your home?**

[SINGLE RESPONSE]

1. [numeric response, ft2]

[*Do not read:*]
98. Don't know
99. Refused

Q70. What months during the year does the fan system most often run?

[SINGLE RESPONSE]

1. [text response, record months per year that the system is used]

[*Do not read:*]
98. Don't know
99. Refused

Q71. Approximately how many hours per day is the fan system actively running?

[SINGLE RESPONSE]

1. [numeric response, hours]

[*Do not read:*]
98. Don't know
99. Refused

Demographics [ASK ALL]

[ASK ALL]
Q72. Including yourself, how many people currently live in your home year round?

[SINGLE RESPONSE]

1. Response Text [FORCE NUMERIC RESPONSE]

[*Do not read:*]

98. Don't know
99. Refused

[ASK ALL]

Q73. Including yourself, how many of the people currently living in your home year-round are in the following age group?

[MATRIX QUESTION]

[LOGIC] Item	NUMERIC RESPONSE	98 DK	99 RF
1. Less than 18 years old			
2. 18 to 64 years old			
3. 65 years old or older			

[ASK ALL]
Q74. Do you or members of your household own your home or do you rent it?

[SINGLE RESPONSE]

1. Own/ buying
2. Rent/ lease
3. Occupy rent-free

[*Do not read:*]

96. Other, please specify: [OPEN-ENDED RESPONSE]
98. Don't know
99. Refused

[ASK ALL]
Q75. How many square feet of living space are there in your residence, including bathrooms, foyers and hallways (exclude garages, basements and unheated porches)? Your best estimate is fine.

[SINGLE RESPONSE]

1. Response Text [FORCE NUMERIC RESPONSE]

[*Do not read:*]

98. Don't know
99. Refused

[ASK ALL]
Q76. I'm going to read a list of options. Please stop me when I reach the range that includes your annual household income from all sources in 2015 before taxes.

[SINGLE RESPONSE]

1. Under $20,000
2. $20,000 to under $30,000
3. $30,000 to under $40,000
4. $40,000 to under $50,000
5. $50,000 to under $60,000
6. $60,000 to under $75,000
7. $75,000 to under $100,000
8. $100,000 to under $150,000
9. $150,000 to under $200,000
10. Over $200,000
11. Prefer not to say

[*Do not read:*]

96. Other, please specify: [OPEN-ENDED RESPONSE]
98. Don't know
99. Refused

[ASK ALL]
Q77. About when was your home first built?

[SINGLE RESPONSE]

1. 2010 or later
2. 2000 to 2009
3. 1990 to 1999
4. 1980 to 1989
5. 1970 to 1979
6. 1960 to 1969
7. 1950 to 1959
8. 1940 to 1949
9. 1939 or earlier

[*Do not read:*]

96. Other, please specify: [OPEN-ENDED RESPONSE]
97. Not applicable
98. Don't know
99. Refused

That is all the questions I have for you. As a thank you for your time, we will mail you a $10 Visa gift card for your participation in this survey. Please provide us with the name and address for which we should mail the Visa gift card:

Name:

Address:

In the near future, we will also be conducting short in-person inspections of equipment rebated through Roseville Electric's programs. These visits last about 10-15 minutes and involve one of our technicians verifying that the equipment is present and operating as normal.

For those selected for this in-person survey, we are offering an additional $25 Visa gift card for their time, which will be given to them at the end of the visit. Would you like to be considered for a visit?

If yes, we will contact you within approximately the next 2 weeks to set up the in-person visit.

[*if needed: our technicians will be wearing Roseville Electric identification badges. The technicians will not need to open any equipment unless the nameplate information of the equipment is not visible from the outside of the unit*]

Appendix B Installer Phone Survey

Introduction

Hi, my name is ___ and I'm calling from Nexant on behalf of Roseville Electric. We are contacting you because your company installed products that qualified for customer rebates through Roseville Electric energy efficiency programs. Roseville Electric is evaluating their efficiency programs. Feedback from you is very valuable and will help us to improve these programs.

I'll need only about 20 minutes. Is now a good time to talk, or can we make an appointment for a later time?

Screening

[ASK ALL]

S3. Since July 2015 have you been involved in the sale or installation of products or services that resulted in a Roseville Electric rebate?

[SINGLE RESPONSE]

1. Yes
2. No
98. Don't know
99. Refused

[IF S3 = 2, ASK S4, THEN SKIP TO END OF SURVEY]

S4. What are the reasons you haven't been involved with any sales that qualify for Roseville Electric's efficiency programs?

[MULTIPLE RESPONSE]

1. Product lines we carry (or services we offer) don't qualify for rebates
2. Didn't know about rebates or incentives
3. Our customers aren't interested in energy efficiency
4. Dealing with the program (application, etc.) is too much trouble
96. Other, please specify: [OPEN-ENDED RESPONSE]
98. Don't know
99. Refused

[ASK ALL]

S5. Which of the following categories **best** describes the services your firm provides?

[SINGLE RESPONSE] [*Read*]

1. Lighting
2. HVAC
3. Hot water heating

4. Windows
5. Insulation
6. Refrigeration
7. Motor rewind services
8. Electrical

[*Do not read:*]

96. *Other, please specify: [OPEN-ENDED RESPONSE]*
98. Don't know
99. Refused

[ASK ALL]

S6. And what other services does your firm provide?

[MULTIPLE RESPONSE]

1. Lighting
2. HVAC
3. Hot water heating
4. Windows
5. Insulation
6. Refrigeration
7. Motor rewind services
8. Electrical
96. Other, please specify: [OPEN-ENDED RESPONSE]
97. None of the above
98. Don't know
99. Refused

Respondent Background [ASK ALL]

First, I just want to know a little about your company and your role at your company.

[ASK ALL]

Q1. What is your role at your company? *[Probe to code]*

[MULTIPLE RESPONSE]

1. Owner
2. Executive (VP, CFO, COO)
3. Engineer
4. Architect
5. Contractor
6. Technician
7. Electrician
8. Sales Manager/Business Development
9. Installer

10. Pricing Specialist
96. Other, please specify: [OPEN-ENDED RESPONSE]
98. Don't know
99. Refused

[ASK ALL]
Q2. How many residential jobs have you completed over the last year? Your best guess is fine.

[SINGLE RESPONSE]

1. Response Text
98. Don't know
99. Refused

[IF Q2 = 1, ELSE SKIP]
Q3. And approximately what proportion of those jobs received Roseville Electric incentives?

[SINGLE RESPONSE]

1. Response Text [0-100 percent]

96. Other, please specify: [OPEN-ENDED RESPONSE]
98. Don't know
99. Refused

[ASK ALL]
Q4. How long have you been doing Roseville Electric rebated jobs?

[SINGLE RESPONSE]

1. About one year
2. 2-3 years
3. 4-5 years
4. More than 5 years
97. Not applicable
98. Don't know
99. Refused

[ASK ALL]
Q5. What proportion does your business do work within….? [*Read*]

1. California [PERCENT]
2. Other [OPEN-ENDED RESPONSE]: [PERCENT]
98. Don't know
99. Refused

[ASK IF Q5_1 > 0%]

Q6. Thinking about the work you do in California, is the majority in the Roseville/Sacramento area or outside the area?

[SINGLE RESPONSE]

1. Roseville/Sacramento area
2. Outside the Roseville/Sacramento area
3. Both
96. Other, please specify: [OPEN-ENDED RESPONSE]
98. Don't know
99. Refused

Awareness and Satisfaction

We'd like to ask some questions to learn more about your *residential* jobs and customers. So even if you are involved in jobs with commercial or industrial customers, when answering the following questions, please think only about your residential jobs and customers.

[ASK ALL]

Q7. Using a scale of 1 to 5 where 1 equals "not at all satisfied" and 5 equals "very satisfied", please rate the following elements of Roseville Electric residential programs. If you are not aware of a specific element please tell me. To start with, how satisfied are you with …. [*Interviewer: prompt with responses for each, do not read 97-99]*.

ITEM	1	2	3	4	5	97 NA	98 DK	99 RF
1….the range of qualifying products								
2….the amount of the rebates								
3….the length of time required to complete program paperwork								
4….the amount of marketing Roseville Electric does for the program								
5….the quality of Roseville Electric's marketing								
6….the ability of staff to explain how the program works								
7….the ability of staff to communicate the status of applications								
8….the ability of staff to resolve problems								
9….the Roseville Electric program website								

[IF Q7_1-9 = 1-3, REPEAT FOR EACH OCCURENCE]

Q8. And why were you not completely satisfied with **[piped item from Q7]**?

1. [OPEN-ENDED RESPONSE]
98. Don't know
99. Refused

[ASK ALL]
Q9. When you're talking with potential residential customers, who typically brings up the topic of utility rebates?

[SINGLE RESPONSE] *[Try to fit response into options below, probe for 'other' response if options don't apply]*

1. Almost always initiated by contractor
2. Almost always customer initiated
3. Mostly contractor initiated
4. Mostly customer initiated
5. About half contractor and half customer
96. Other, please specify: [OPEN-ENDED RESPONSE]
98. Don't know
99. Refused

Motivations to Participation

[ASK ALL]
Q10. On a scale of 1 to 5 where one means "not at all agree" and 5 means "strongly agree", how much do you agree with each of the following statements about your residential jobs. *Interviewer: prompt with responses for each, do not read 97-99*

ITEM	1	2	3	4	5	97 NA	98 DK	99 RF
I always tell Roseville Electric customers about Roseville Electric incentives								
Roseville Electric incentives help me sell jobs								
The Roseville Electric incentives help keep me knowledgeable about new technologies								
The Roseville Electric incentives push customers to install more efficient equipment								

Sales Practices

[ASK ALL]
Q11. What percentage of the residential equipment you sold in the past two years would you categorize as "high-efficiency" or "ENERGY STAR qualified" equipment? *[Interviewer note: try to get a single number, record a range only if they just can't come up with a single figure]*

[SINGLE RESPONSE]

1. Response Text [RANGE = 0-100]
98. Don't know
99. Refused

[ASK ALL]

Q12. When bidding a job for a residential customer, how many equipment or service options do you typically provide? *[If needed, probe with: "Do you give a good, better, and best type of options and if so, how many options do you give?"]*

[SINGLE RESPONSE]

1. 1
2. 2
3. 3
4. 4
5. 5 or more
97. Not applicable
98. Don't know
99. Refused

[ASK IF Q12 = 2-5, ELSE SKIP]

Q13. What typically distinguishes the options you provide? *[If needed, examples could be: price, efficiency rating, brand name…]*

1. [OPEN-ENDED RESPONSE]
98. Don't know
99. Refused

[ASK ALL]

Q14. In the past two years, do you recall ever discouraging a residential customer from ordering the high-efficiency equipment option?

[SINGLE RESPONSE]

1. Yes
2. No
98. Don't know
99. Refused

[ASK IF Q14 =1]

Q15. Why is that? *[Record verbatim response but later code within options below]*

1. [OPEN-ENDED RESPONSE]
98. Don't know
99. Refused

[CODE LATER IF POSSIBLE]

1. Long wait: too long for delivery
2. Too complex: installations are too difficult
3. Not reliable: Less reliable than most standard efficiency equipment
4. Not reliable: Customers complain about equipment
5. Lack of knowledge: don't have enough information for customer
6. Lack of knowledge: don't know enough about codes
7. Cost: too expensive for customer even with rebate

96. Other, please specify: [OPEN-ENDED RESPONSE]

[ASK ALL]

Q16. When you sell products/services that qualify for a Roseville Electric rebate to a residential customer, who typically prepares the rebate application? Is it you, your customer, or does the application process typically involve both of you?

[SINGLE RESPONSE]

1. Typically respondent (Contractor) prepares all or most of the application
2. Typically the customer prepares all or most of the application
3. Typically both respondent (Contractor) and customer – pretty half and half effort
4. Depends on the rebate
96. Other, please specify: [OPEN-ENDED RESPONSE]
98. Don't know
99. Refused

[ASK IF Q16 = 4]

Q17. How does it depend on the rebate?

1. [OPEN-ENDED RESPONSE]
98. Don't know
99. Refused

[ASK ALL]

Q18. When discussing high-efficiency equipment with residential customers, what benefits do you typically mention? *[Read all, probe with "anything else" after each response]*

[MULTIPLE RESPONSE]

1. Lower operation costs over time
2. Lower maintenance costs
3. Roseville Electric's rebate
4. High-quality of equipment
5. Improved comfort
96. Other, please specify: [OPEN-ENDED RESPONSE]
98. Don't know
99. Refused

Net-to-Gross

I'd like to get your thoughts on the influence that Roseville Electric energy efficiency programs have on your residential customers' decisions to do energy efficiency upgrades for **[piped response from S5]** equipment. In answering the next few questions, please think about the most recent residential efficiency **[piped response from S5]** upgrade job you worked on that qualified for the rebate.

[ASK ALL]

Q19. First…How much, if at all, did the utility's efficiency messages and programs influence your promotion of higher energy-efficient products over standard or less-efficient products to that customer? Please rate the influence on a scale of one to five where one equals not at all influential and five equals extremely influential.

1. [RECORD RESPONSE]

[*Do not read:*]

97. Not applicable
98. Don't know
99. Refused

[ASK ALL]

Q20. On 1 to 5 scale, with "1" indicating not at all influential and "5" indicating extremely influential, how influential were you on the client's decision to install energy efficient [**Pipe in S5 response**] products?

1. [RECORD RESPONSE]

[*Do not read:*]

97. Not applicable
98. Don't know
99. Refused

[ASK ALL]

Q21. Based on the discussions you had with the client in planning that job, what do you think the client most likely would have done if the Roseville Electric rebate did not exist?

[SINGLE RESPONSE] [*READ OPTIONS 1-4*]

1. Done the exact same upgrade
2. Installed a less energy efficient product or reduced the scope of the job
3. Done an upgrade with standard-efficiency product(s)
4. Canceled or postponed the upgrade

[Do not read:]

96. Other, please specify: [OPEN-ENDED RESPONSE]
98. Don't know
99. Refused

[ASK ALL]

Q22. In the past two years have you installed high-efficiency products that qualifies for a rebate from Roseville Electric, yet the rebate was not applied for?

[SINGLE RESPONSE]

1. Yes
2. No
98. Don't know
99. Refused

[ASK IF Q22 = 1]
Q23. Under what circumstances might this happen? *[Record verbatim response but later code within options below]*

1. [OPEN-ENDED RESPONSE]
98. Don't know
99. Refused

[CODE LATER IF POSSIBLE]

1. Not aware of the rebate at the time: Contractor didn't know about the rebate or program
2. Customer isn't eligible: Very large customers, wrong fuel type
3. Applying takes too long: Application process too time consuming
4. Too difficult: Application process too difficult
5. Rebate is small: Not worth the bother – too little money
6. Long wait: Long wait for rebate
96. Other, see verbatim

Wrap Up

Thank you for the time you have taken. I have just a few more questions.

[ASK ALL]
Q24. What, if any, high efficiency equipment or measures would you like to see added to Roseville Electric's list of rebated equipment?

1. [OPEN-ENDED RESPONSE]
98. Don't know
99. Refused

[IF Q24 = 1, ELSE SKIP]
Q25. Why is that? *[Probes: are rebates needed to move these items into the market?]*

1. [OPEN-ENDED RESPONSE]
98. Don't know
99. Refused

[ASK ALL]
Q26. What, if any, equipment or measures would you like to see removed from the current list?

1. [OPEN-ENDED RESPONSE]
98. Don't know

99. Refused

[IF Q26 = 1, ELSE SKIP]
Q27. Why is that? *[Probes: rebates are no longer needed to move these items into the market?]*

1. [OPEN-ENDED RESPONSE]
98. Don't know
99. Refused

[ASK ALL]
Q28. Which of the following are good ways for you to get energy efficiency information from Roseville Electric?

[MULTIPLE RESPONSE] [Don't read, probe if needed. Ask: any other ways after first two responses]
[Interviewer: We are trying to gather a list of all the possible ways respondents would like information. We are trying to go beyond first mention to get a list of all the ways that would be good for them to receive information.]

1. Roseville Electric website
2. By phone
3. By US mail via bill insert
4. By US mail separate from bill insert
5. By e-mail
6. At a community event
7. At a workshop, seminar, or classroom event
8. At a webinar
96. Other, please specify: [OPEN-ENDED RESPONSE]
98. Don't know
99. Refused

[ASK ALL]
Q29. Including yourself, how many employees work at your company?

[SINGLE RESPONSE]

1. 1
2. 2-4
3. 5-9
4. 10-19
5. 20-99
6. 100-499
7. 500+
98. Don't know
99. Refused

[ASK ALL]

Q30. That is all of the questions I have. Before we sign off, is there anything else that you would like Roseville Electric to know about its programs?

1. [OPEN-ENDED RESPONSE]
98. Don't know
99. Refused

Thank you for your time. Your feedback has been very helpful.

Appendix C Survey Demographics

C.1 Participant Survey

The majority of surveyed participants (81 of 84) own their home, with one respondent being the landlord and another being the person that pays the bills and occupies a home that is owned by a family member. Additional demographic information collected during the customer survey is summarized in the tables below.

Table C.1-2: Number of people living in home year round (n=84)

Number or residents in home	Count of respondents	Percent of respondents
1	10	12%
2	33	39%
3	16	19%
4	17	20%
5	4	5%
6	4	5%
TOTAL	84	100%

Table C.1-3 Count of respondents with the following home size (n=84)

Square Footage of Home	Count of respondents	Percent of respondents
Less than 1,500	9	11%
1,500 – 3,000	54	65%
3,000 – 4,500	15	18%
Don't know	6	7%

Table C.1-4 Respondent's household income bracket (n=84)

Income bracket	Count of respondents	Percent of respondents
Under $20,000	1	1%
$30,000 to under $40, 000	4	5%
$40,000 to under $50,000	1	1%
$50,000 to under $60,000	7	8%
$60,000 to under $75,000	6	7%
$75,000 to under $100,000	4	5%
$100,000 to under $150,000	28	33%
$150,000 to under $200,000	11	13%
Over $200,000	10	12%
Don't know	2	2%
Prefer not to say	5	6%
Refused	5	6%
TOTAL	**84**	**100%**

Table C.1-5 Respondents Age of Home Category (n=84)

Year Home Built	Count of respondents	Percent of respondents
1950 to 1959	2	2%
1960 to 1969	2	2%
1970 to 1979	7	8%
1980 to 1989	11	13%
1990 to 1999	22	26%
2000 to 2009	27	32%
2010 or later	13	15%
TOTAL	84	100%

C.2 Installer Survey

Installers reported where they conduct their work: 22 of 23 work within California. Sixteen report the majority of their work is in the Roseville/Sacramento area versus elsewhere. Additional collected installer demographic information is contained in the tables below.

Table C.2-6 Role of interviewee, installer survey (n=23)

Role	Count of Surveyed Installers
Owner	11
Office/Staff Manager	4
Administrative Assistant / customer service	3
Pricing Specialist / Estimator	2
Sales Manager / Business Development	2
Scheduling /Installation coordinator	2
Executive (VP, CFO,COO)	1

Table C.2-7 Number of residential jobs completed over the last year (n=23)

Number of Residential Jobs	Count of Surveyed Contractors
Less than 75	8
75-149	5
150-249	3
250-600	3
More than 600	4

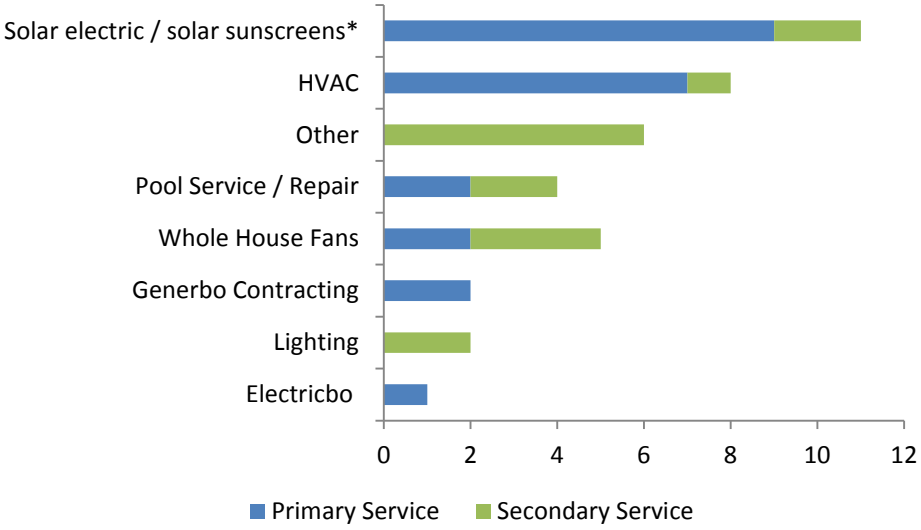
Table C.2-8 Time installers have been doing Roseville Electric rebated jobs (n=23)

Time	Count of Surveyed Installer
About a year	3
2-3 years	7
4-5 years	3
More than 5 years	11

Table C.2-9 Number of employees that work at responding installer firms (n=23)

Number of employees	Count of Surveyed Installers
1	6
2-4	5
5-9	5
10-19	5
Over 20	2

Figure C.2-1: Services offered by surveyed installers (n=23)



Nexant, Inc.

Headquarters

101 2nd Street, Suite 1000

San Francisco CA 94105-3651

Tel: (415) 369-1000

Fax: (415) 369-9700

www.nexant.com