Equipoise Consulting, Inc.

Energy Analysis

Project Management

Training

# Final Report for

# Southern California Edison Company's Evaluation, Measurement, and Verification of the 2002 Pump Test and Hydraulic Services Program

Submitted by:


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# *1 EXECUTIVE SUMMARY*

Southern California Edison's (SCE) Pump Test and Hydraulic Services (PT&HS) Program and its predecessors have delivered pump testing services and technical information since 1911. Equipoise Consulting Inc., in conjunction with Ridge & Associates, Vanward Consulting, and California AgQuest (the Team) conducted the evaluation of the Program Year (PY) 2002 SCE PT&HS Program. The evaluation had multiple objectives, which are stated below followed by the summarized results.

***Verification of Program Claimed Pump Tests and Energy Efficiency Contacts –*** The Program exceeded the stated goals for both components.

***Methodology for Estimating Potential Energy Savings from Pump Tests –*** The evaluation found that if the current method is used to calculate energy savings for the program, there is need to collect data to update the information used in this method. The Team recommends additional data gathering for algorithm variables to support potential energy savings from pump tests.

***Update Implementation Rate and Free Ridership Data –*** The evaluation found that 41 percent of the 64 participants surveyed made changes to improve their pumping system operating efficiency.

Preliminary assessment suggests that the free riders are represented by 27 percent of the participants who would have made improvements to their pumping systems in the absence of the SCE pump test information. Put another way, the net-to-gross ratio was estimated to be 0.73, with a 90 percent confidence interval of +/- 0.06. A further assessment of freeridership and net-to-gross may still be needed to further substantiate this estimate.

***Examine Program Process –*** The Team found the PT&HS Program to be a solidly-managed and well-run program. A few recommendations were made including clarifying goals and improving access to the tracking database.

The Program process analyses suggested that while most customers are satisfied with the pump test report turn around time, average customer satisfaction can still be improved by shortening the longer turn around times

***Measure the Program's Effectiveness in its Outreach Efforts –*** The SCE energy efficiency representatives operate independently of the pump test component of the Program and have differing outreach effects. For the pump test component, Program outreach seems to be reaching its customers. They are satisfied with the contact method and frequency. The outreach is accepted as understandable and seems to have influence over the likelihood of customers making an energy efficiency improvement. The information gleaned from non-pump test program customers and energy efficiency contact customers indicates that the SCE service representatives are doing a good job of getting information out to their customers as customers recall the contact, are satisfied with the frequency of contact, and are satisfied with the type of information they receive.

***Program Theory Linkage Testing –***In addition to the objectives set by SCE for this evaluation, the evaluation Team also tested various linkages from the program theory.

***Diffusion and Market Barriers –***Awareness of the Program has diffused through a large portion of the market. Nearly 91 percent of pump test customers, 58 percent of energy efficiency contact customers, and 54 percent of nonparticipants[1] were aware of the Program prior to 2002. Sixty-three percent of pump test customers have told an average 6.3 friends, neighbors or colleagues about the benefits of pump tests while 35 percent of the energy efficiency contacts have told an average of 2.5.

Customers were queried about three potential market barriers to determine if the information provided to them helped reduce the barrier. As can be seen in Exhibit 1.1, customers who participated in the Program (as either the pump test customers or EE contact customers), had a higher perceived reduction in the barriers.

**Exhibit 1.1**
**Reduction in Market Barriers**

| Reduction in Barrier | Pump Test Participants | EE Contacts | Nonparticipants |
|---|---|---|---|
| Information Search Costs | 94% | 86% | 62% |
| Asymmetric Information | 94% | 69% | 63% |
| Performance Uncertainty | 78% | 79% | 62% |

The remainder of the report provides details on the methods used and the results summarized above.

[1] Nonparticipants, for this evaluation, were designated to be customers with pumps who had not had a pump test performed by SCE within the past three years.

# 2 OVERVIEW

## 2.1 Program

Southern California Edison's (SCE) Pump Test and Hydraulic Services (PT&HS) Program has delivered pump testing services and technical information since 1911. According to SCE, each year the program has been refined to present the customer with the information they need and pump testing data to improve their pumps operating efficiency and implement energy efficiency measures for their hydraulic applications. From the program literature, this program targets downstream and upstream market participants. The primary targets are the downstream pumping system operators, who primarily are agricultural and water agency customers. Other nonresidential customers, who use significant energy for hydraulic pumping include golf courses and sewage treatment plants. The upstream focus is on distributors and contractors who can use SCE program information and pump test results to help them design and select the most efficient and cost-effective equipment for installation at the downstream customers' facilities.

SCE states that this program is promoted to all eligible customers through different channels, including their energy efficiency account representatives, events at their energy centers in Irwindale and Tulare, participation in water trade associations, and equipment distributors and installers. Customers interested in a pump test must contact SCE. Tests are scheduled on a first come, first serve basis.

Tests performed by SCE's technical specialists are stated to be in accordance with the standards that are set forth by the American Water Works Association (AWWA). These technical specialists hold a State of California Department of Health Services AWWA Grade II certification for safe evaluation of distribution water systems. SCE's PT&HS technicians are required to have a thorough knowledge of electrical theory, principles of hydraulics and a full knowledge of multiple water systems, metering, utility rate schedules, and energy efficiency opportunities.

## 2.2 Evaluation

### 2.2.1 Objectives

Equipoise Consulting Inc., in conjunction with Ridge & Associates, Vanward Consulting, and California AgQuest (the Team) conducted the evaluation of the PY2002 SCE PT&HS Program.

The objectives for the Evaluation, Measurement and Verification Study of the PY2002 SCE PT&HS Program were to:

1) verify the number of pumping systems tested and energy efficiency information contacts made;
2) evaluate the means to estimate the potential energy savings from the pump test recommendations (i.e., determine a method for measuring energy savings);
3) update relevant parameters to measure energy savings from pump tests, including implementation rate and free ridership data for potential future cost effectiveness calculations;

4) examine the program processes and provide feedback to the program manager; and

5) measure the program's effectiveness in its outreach efforts.

These five objectives were grouped into three main areas of evaluation. The first objective was concerned with measuring performance goals. Here, the Team, as an independent outside party, verified the information provided by the program. The second objectives was to find the best approach to support potential savings from pump tests. The Team analyzed current methods of calculating energy savings and identified needed additional data gathering for current algorithm variables. The third objective involved needed updates to parameters supporting potential energy savings from pump tests. The Team provided preliminary updates to two parameters and suggested the need for further assessment of these variables. The last two objectives were primarily concerned with process evaluation and customer behavioral analyses. In this area, the Team assessed the processes in place for the pump testing part of the program and evaluated the effectiveness of the outreach for the information part of the program.

In addition, the evaluation was also required to meet specific evaluation objectives that had been stipulated by the California Public Utility Commission (CPUC). These objectives and how each are addressed are discussed in the next section.

### 2.2.2 CPUC Stipulated Items

The CPUC Energy Efficiency Policy Manual[2] stipulated eight specific Evaluation, Measurement, & Verification (EM&V) objectives. There are both specific objectives and components of an EM&V plan that require discussion. The table below presents specifically how the evaluation met each of the policy manual objectives. The eight objectives are presented first followed by the EM&V components.

| **EM&V Objectives** | ***How evaluation met the objective*** |
|---|---|
| 1. Measuring level of energy and peak demand savings achieved. | *As this is an information program, no energy or demand impacts were expected and were not estimated in this evaluation. However, the Team reviewed the current method and an alternate method for measuring energy impacts for pump tests leading to pump repairs. Additionally, implementation rate and free ridership estimate were updated.* |
| 2. Measuring cost-effectiveness (except information-only) | *This is an information only program and hence, no such analysis was required.* |
| 3. Providing up-front market assessments and baseline analysis, especially for new programs | *This is not a new program and there is no expectation that energy impacts associated with this information-only program should be measured. Hence, there is no need for a baseline. However, SCE defined the baseline state as the state of a customer's pump before program participation. As a routine element in the implementation of the Program, the baseline is established and is documented by the pump* |

[2] California Public Utilities Commission. Attachment 1. Energy Efficiency Policy Manual. November 29, 2001.

| EM&V Objectives | ***How evaluation met the objective*** |
|---|---|
| | *test performed for each participant.*<br>*A market effects study was completed February 1998. This study is posted on the CALMAC website and can be found and downloaded by searching for 3507. The study name is "Southern California Edison Hydraulic Services Program Market Effects Study Final Report. Study ID 3507"* |
| 4. Providing ongoing feedback, and corrective and constructive guidance regarding the implementation of programs. | *This was provided via the recommendations section in this report since the 2002 program was already completed.* |
| 5. Measuring indicators of the effectiveness of specific programs, including testing of the assumptions that underlie the program theory and approach. | *The Team articulated the program theory, identified possible indicators of immediate, intermediate, and long-range outcomes, and assessed the desirability and feasibility of obtaining these data in light of the stated Program objectives. Specific linkages within the implementation and program theory were tested within this evaluation.* |
| 6. Assessing the overall levels of performance and success of programs. | *The Team assessed the extent to which the Program achieved its stated objectives. Data were gathered from program records, participant and nonparticipant surveys, and in-depth interviews to assess the overall level of performance and success of the program.* |
| 7. Informing decisions regarding compensation and final payments. | *This is an information-only program, hence no such analysis was required.* |
| 8. Helping to assess whether there is a continuing need for the program. | *The assessment was developed from the analysis of program success in objective 6 and the market assessment done in the study referenced above.* |

In addition to meeting the objectives above, it was stated that all evaluations should address the components listed in Exhibit 2.1. Because the PT&HS Program is an information-only program, only the non-shaded components of Exhibit 2.1were needed to be addressed in this evaluation.

**Exhibit 2.1**
**Components of an EM&V Plan**

| |
|---|
| ***Baseline Information*** *(not covered in this evaluation)* |
| • Determine whether or not baseline data exist upon which to base energy savings measurement. Existing baseline studies can be found on the California Measurement Advisory Committee website (http://www.calmac.org/) and/or the California Energy Commission website (http://www.energy.ca.gov/). Detailed sources of baseline data should be cited. |
| • If baseline data do not exist, the implementer will need to conduct a baseline study (gather baseline energy and operating data) on the operation(s) to be affected by the energy efficiency measures proposed. |
| • If the baseline data do not exist and the implementer can show that a baseline study is too difficult, expensive or otherwise impossible to carry out prior to program implementation, the contractor should then provide evidence that baseline data can be produced or acquired during the program implementation. This process should then be detailed in the EM&V plan. |
| ***Energy Efficiency Measure Information*** |
| • Full description of energy efficiency measures included in the program, including assumptions about important variables and unknowns, especially those affecting energy savings. |
| • Full description of the intended results of the measures. |
| ***Measurement and Verification Approach*** *(not covered in this evaluation)* |
| • Reference to appropriate IPMVP option. |
| • Description of any deviation from IPMVP approach. |
| • Schedule for acquiring project-specific data. |
| ***Evaluation Approach*** |
| • A list of questions to be answered through the program evaluation. |
| • A list of evaluation tasks/activities to be undertaken during the course of program implementation. |
| • A description of how evaluation will be used to meet all of the Commission objectives described above. |

The energy efficiency measure information areas were covered through a program implementation and theory assessment. The evaluation approach was detailed in the final research plan dated 2/28/03 and is presented in Section 4 of this report.

In order to better focus the efforts used to address the areas of evaluation, theories were developed of how this program was operated and was designed to achieve its stated objectives. The next section discusses the implementation theory and program theory.

### 2.2.3 Implementation and Program Theory

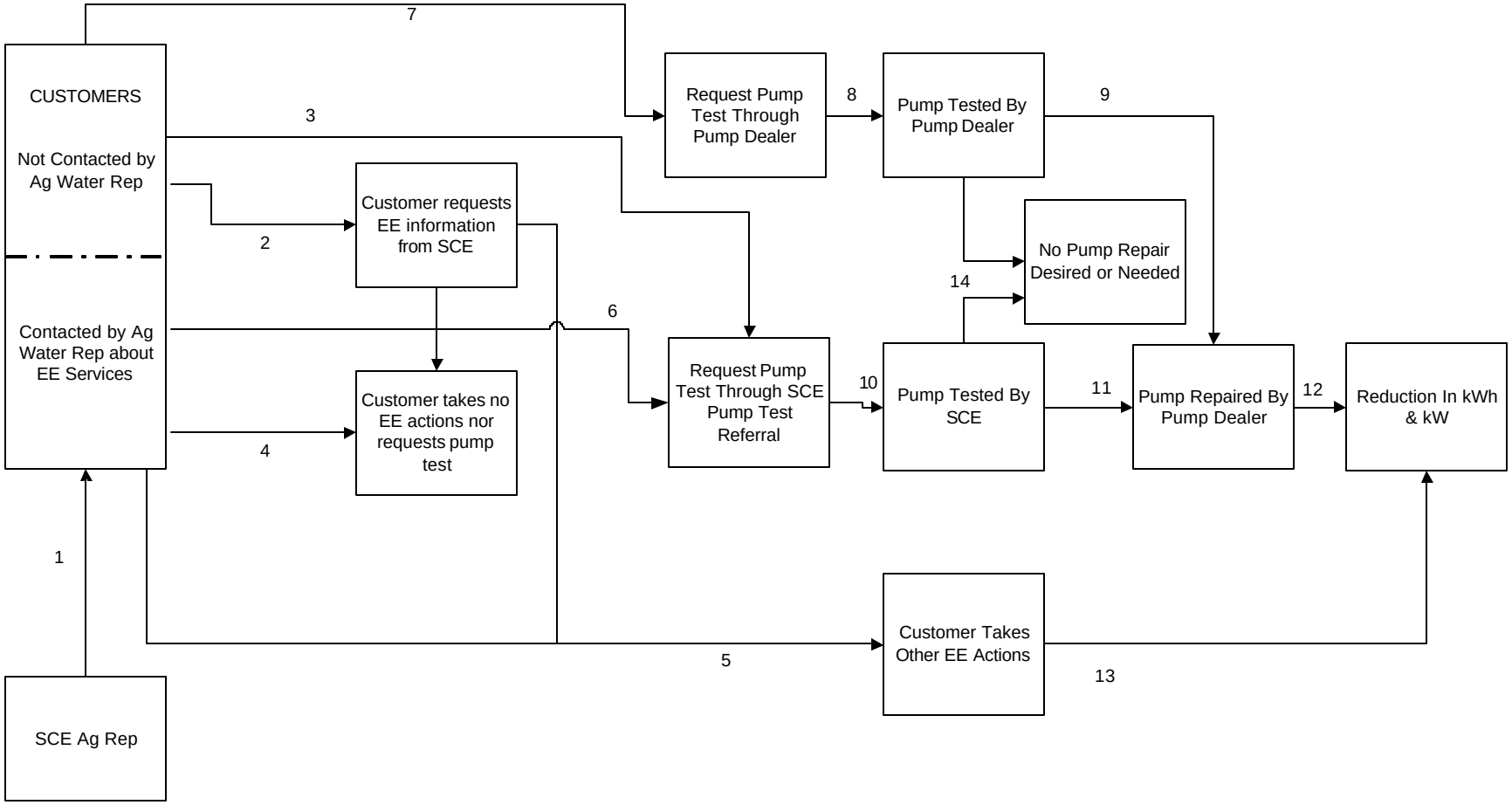
Weiss (1997) stresses that understanding the underlying theory of the program is essential to developing the most appropriate evaluation, and that a good evaluation is based on defining, testing, and analyzing the assumptions of the program theory. In general, the theory consists of activities and the hypothesized direct and indirect communication and causal linkages between these activities and the key market actors. There are many different areas in which programs can go astray, but by focusing on program theory, evaluators can keep themselves on track.

There are two types of theories used in program evaluation: 1) implementation theory, and 2) program theory. Implementation theory depicts the basic mechanics of the program consisting of a sequence of activities that begin with program outreach and end with the adoption of recommended measures and practices, and the reduction of kWh and kW. Implementation theory tells the evaluator how the program is supposed to operate in the field. In a process evaluation, the evaluator can examine the field implementation of a program to determine if there are any significant deviations from the intended program design. If there are, the evaluator can explore why these deviations occurred and what they imply regarding the achievement of any of the expected outcomes. Exhibit 2.2 presents the implementation theory with the causal linkages numbered from 1 through 14.

The program theory model seeks to illuminate *why* (i.e., the underlying mechanisms) the program activities are expected to lead to the achievement of immediate, intermediate, and long-term outcomes. For example, SCE assumes that customers lack objective and unbiased energy efficient/conservation information, particularly information about efficiency of their pumps. They further assume that if customers are presented with such objective information in an intelligible manner, they will engage in certain routine activities such as having their pumps tested. If the results of the pump tests suggest an acceptable payback, they will have their pump repaired and reduce their energy and demand use and experience lower bills.

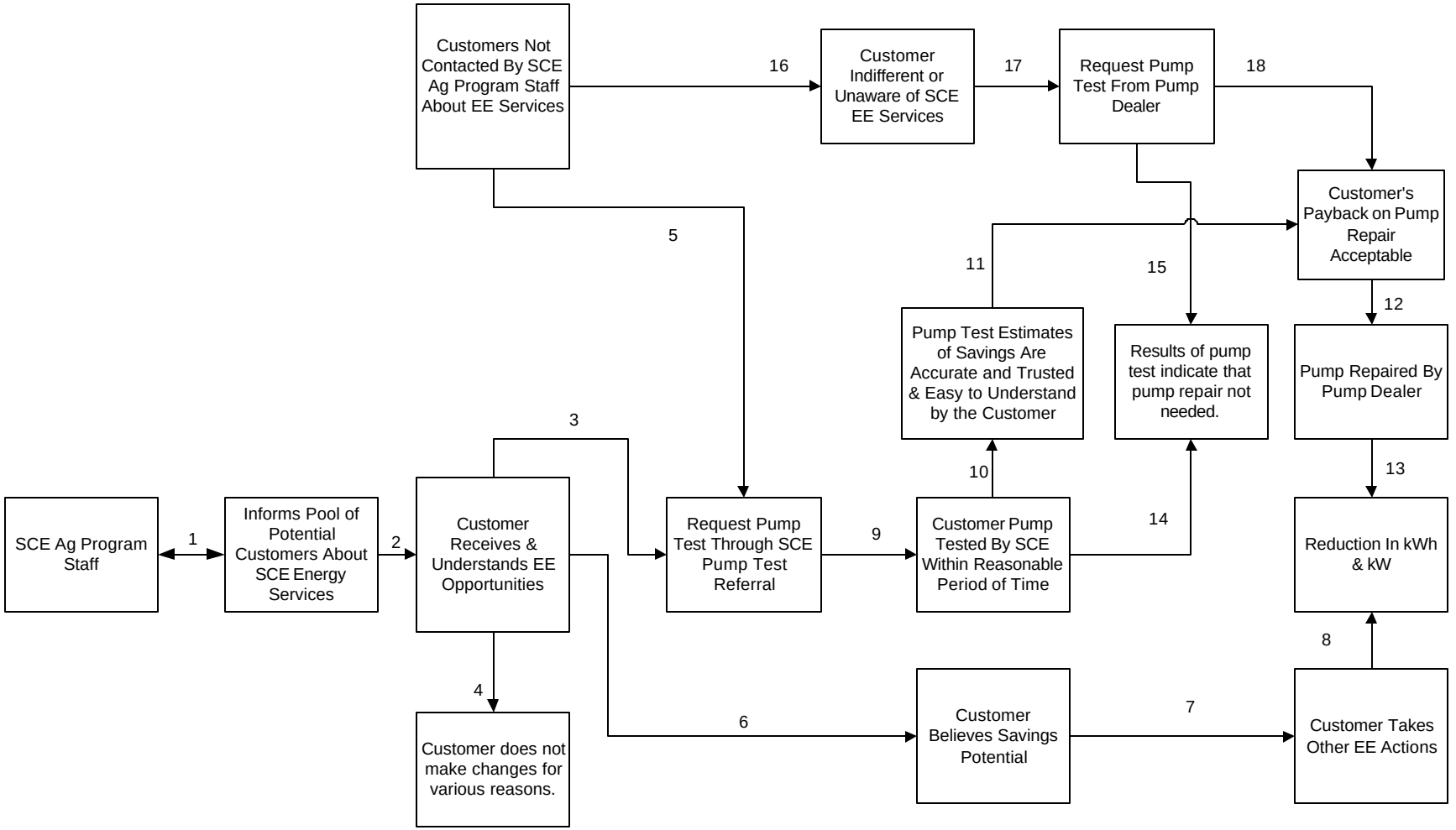
Exhibit 2.3 presents the program theory with causal linkages numbered from 1 though 18. These two theories were used to guide the data collection efforts described in the following section.

**Exhibit 2.2**
**Program Implementation Model**




**Note**: Contact is defined as any type of contact in 2002

**Exhibit 2.3**
**Program Theory**




**Note**: Contact is defined as any type of contact within last five years

# 3 DATA COLLECTION

Data collection took place during the second quarter of 2003. There were several data collection instruments created to gather the data required by the evaluation.

The evaluation team designed three telephone survey instruments. These surveys were performed via a computer aided telephone instrument (CATI) and fielded by SMS, Inc. The first survey focused on participants and was created to estimate the implementation rate and free ridership as well as asking various process questions. A second nonparticipant survey (i.e. a customer who had not had a pump test) focused on process issues such as why the customer had not participated, if they were aware of the program, etc. A third survey instrument (labeled as energy efficiency contacts within this report) was created to assess the effectiveness of the program outreach. This survey gathered information from customers exposed to SCE's marketing outreach effort.

In order to further assess process issues within the pump testing component of the program, the evaluation team also performed in-depth interviews of program staff.

The number of data points as planned and as completed are shown in Exhibit 3.1.

**Exhibit 3.1**
**Planned and Completed Data Points**

| Collection Instrument | Data Points Planned | Data Points Completed |
|---|---|---|
| Pump Test Participant CATI Survey | 200 | 64 |
| Energy Efficiency Contact Participant CATI Survey | 70 | 70 |
| Nonparticipant CATI Survey | 68 | 72 |
| In-Depth Interviews | 21 | 10 |

As noted in Exhibit 3.1, there were substantially fewer pump test participant surveys completed than planned. The original value of 200 completed surveys was based on the approximate number of pump tests performed by SCE in PY2002 (~2,200). However, these 2,200 pump tests represented only 336 unique customers and not all had valid phone numbers. Given this small unique customer-level participant population, the Team decided to conduct a census of all 336 participants in an effort to complete 200 interviews. To maximize the number of completes, up to ten calls were made to each customer. The 64 completed data points, however, more than meets a 90/10 precision. These 64 customers represent approximately 416 pump tests.

The in-depth interviews were planned for three different groups of people: seven with the SCE PT&HS program managers, seven with the SCE PT&HS pump testers, and seven with pump test participant customers. The evaluation team collected data from three program managers associated with this program and seven pump testers for the ten completed interviews. Because there was a substantial battery of process questions within the customer CATI survey, the Team concluded that there was no value in conducting any in-depth interviews with participant customers.

# *4 METHODS*

This section will focus on the main areas of the evaluation: 1) verifying program performance goals, 2) conducting process evaluation and customer behavior analyses, 3) impact assessment, and 4) updating energy savings parameters.

## 4.1 Program Verification

The verification of the program database was carried out by the Team in order to determine whether the number of pump tests were consistent with SCE claims in its fourth quarter report. According to the fourth quarter report, the PT&HS Program provided 2,262 pump tests and had 1,854 energy efficiency contacts during 2002.

The verification process used on the pump test participants in this evaluation was based on the process of the 2002 Program Year Residential and Small Business Verification Audit: Final Report (Ridge & Associates, 2003) as conducted for Southern California Edison. The verification entailed a review of a randomly drawn sample of pump tests participants from the Program database and is composed of seven steps:

1. The Team develops audit review criteria with input from the SCE Program manager,
2. The Team obtains the year-end program tracking file,
3. The Team develops and implements the audit sample,
4. SCE provided all documentation for the random sample of pump tests,
5. The Team conducts the verification audit,
6. The Team recommends any adjustments to program database (involving number of claimed pump test participants), and
7. The Team reports results.

However, the energy efficiency contact component of the program did not fit into this process as there was no other documentation on the contact outside of the program tracking database. The Team reviewed the program tracking database and, within the telephone survey, the Team asked energy efficiency contacts if they remembered receiving information from SCE. To verify the number of contacts, energy efficiency contact participants who were interviewed by telephone were asked whether they remembered being contacted by SCE during 2002 about various energy efficiency opportunities. A one-sample t-test was calculated to determine whether the percent recalling the contact was significantly different at the 95 percent level of confidence from the ex ante assumption of 100 percent. With 67 degrees of freedom, the critical t value of 1.67 is required for a one-tailed test.

Such a high level of confidence was chosen for the energy efficiency contact database verification to make it reasonably difficult to reject the null hypothesis of no difference. There were three reasons to make it difficult: 1) the person interviewed might not be the same person who was contacted, 2) the SCE contact might not have been a major event in the lives of the customers thus reducing the chances of a customer being able to recall it, and 3) the contacts for many of these customers occurred over one year ago, again reducing the chances of a customer recalling the contact.

The steps outlined next cover the verification of the pump test participants.

### 4.1.1 Team Develops Audit Review Criteria

First, the Team worked closely with the SCE PT&HS Program Manager to develop an audit checklist of requirements for the Program, based upon the program requirements as approved by the CPUC at the beginning of the program year. The checklist contained items that should be included in the file for the program. For the PT&HS Program, the following criteria were developed:

- The customer has valid account number,
- The customer is in the SCE service territory (verified by SCE account number),
- A letter was sent to customer indicating congratulations or economic analysis, and
- The pump test occurred in the 9 months of the 2002 program (April to December, 2002).

A checklist of these criteria was the primary tool used for completing the verification audit.

### 4.1.2 Team Obtains Year-End Program Databases

Next, the Program Manager provided the database containing the detailed files reflecting the PT&HS Program results for PY2002.

### 4.1.3 Team Develops and Implements Self-Audit Sample

A random sample of pump tests was developed from the year-end program database. The following paragraphs describe how the sample size and the level of precision were determined.

During the 1995 program year audit of SCE, the Office of Ratepayer Advocates and SCE agreed that a test of error proportions in audit samples would be used for programs with large numbers of applications with relatively small energy and cost impacts. The agreement specified that the audit should attempt to verify that the proportion of program participant records that contain errors is less than 5% with 95% confidence. The standard formula from Cochran (1977) used to determine sample size for estimating population proportions with a given level of confidence from a simple random sample is shown below in Equation 1.

$$n_0 = \frac{t^2 p(1-p)}{d^2} \quad (1)$$

where

$n_0$ = required sample size without the finite population correction

t = critical t value associated with the 95% level of confidence

d = desired level of accuracy

p = expected percent of valid (successful) occurrences in the population.

For a given sample size, the precision of the error rate estimate will depend on the proportion of errors found in the sample. Exhibit 4.1 shows, for a sample of 77, the effect of sample error proportion on the resulting precision of the estimate for the PT&HS population of 2,262 pump tests.

**Exhibit 4.1**
**Sample Size Calculation**

| **Population** | 2,262 | |
|---|---|---|
| **Sample** | 77 | |
| **Sample Error Proportion** | **90% Confidence Interval (+/-)** | **95% Confidence Errors Less Than** |
| 1.0% | 1.9% | 2.9% |
| 2.0% | 2.7% | 4.7% |
| 3.0% | 3.2% | 6.2% |
| 4.0% | 3.7% | 7.7% |
| 5.0% | 4.0% | 9.0% |

The estimate of errors in this population, based on a random sample of 77 participants, needed to be less than 5% with 95% confidence. The width of the confidence interval depends on the results determined during sample verification. Looking at the data above in Exhibit 4.1, if the percent of errors in the sample is 1%, then there is a 90% confidence that the "true" population error rate is some where between 0.0% and 2.9% (1.0% +/- 1.9%).

The error rate in the population needed to be verified such that it was below some upper bound. The last column of Exhibit 4.1 shows the 95% confidence interval for a "one-tailed" test. Looking again at the table, if the sample error rate turns out to be 1%, then based on the sample of 77 there is 95% confidence that the population error rate is less than 2.9%. Looking at the last row of Exhibit 4.1 shows that if the error proportion in the sample is 5.0%, the 95% confidence in the true error rate in the population is less than 9.0%.

### 4.1.4 SCE Provides Program Documentation

The SCE program manager provided the Team with all the necessary hard-copy documentation for each case in the verification audit sample.

### 4.1.5 Team Conducts Verification Audit

Next, the Team reviewed each sampled case using the established criteria. The Team recorded the results of the audit in an Excel spreadsheet for the Program.

### 4.1.6 Team Recommends Adjustments to Program Databases and Reports Results

Once the Team had completed the verification audit, the results of the audit were used to make any necessary adjustments, either up or down, to the program database in terms of the number of claimed program participants. A draft memo detailing the findings of the verification was provided to program staff and a summary of the results are provided in Section 5.1.

## 4.2 Process Evaluation and Customer Behavior Analyses

SCE's primary objective for the Process Evaluation and Customer Behavior Analyses was "to provide feedback to program implementers on the elements of the Pump Test program that can be improved to enhance the program's performance." The evaluation Team achieved this objective by performing a series of in-depth interviews with three (3) program managers and seven (7) pump testers, and by asking a series of process related question in the participant, nonparticipant and energy efficiency contact (EE Contact) telephone surveys.

The in-depth interviews with program staff provided detailed discussions with all levels of personnel responsible for implementing the program, and allowed the interviewer to maximize the value of the interview process by probing and asking follow-up questions. The in-depth interviews were conducted by Tim Caulfield and Angela Jones.

The process questions included in the pump test participant telephone survey instruments supplied the evaluation Team with the customer perspective on the SCE Pump Test Program. A similar set of questions was asked of the surveyed customers who had not participated in the pump test program in the past three years, providing the ability to compare participant and nonparticipant responses to the same questions. Nonparticipants were also queried about awareness of the program, if they have heard of the program from others, and reasons for nonparticipation.

In a third survey, the evaluation team interviewed EE Contact customers randomly selected from SCE's agricultural representative contact database that contained 1,854 Energy Efficiency Information Contacts. These customers were asked questions to measure the effectiveness of program outreach.

The issues that the evaluation Team addressed in the different interviews are summarized in Exhibit 4.2 below.

**Exhibit 4.2**
**Subjects by Interview Type**

| Subject | Program Managers | Pump Testers | Pump Test Customers | EE Information Contacted Customers | Nonparticipant Pump Customers |
|---|---|---|---|---|---|
| *Implementation/Delivery* | | | | | |
| Targeting methods | X | X | | | |
| Contact methods | X | X | X | X | X |
| Adherence to procedures | X | X | | | |
| Timeliness | X | X | X | | |
| Responsiveness | X | X | X | | |
| Clarity of program instructions | X | X | | | |
| *Program Literature/Information* | | | | | |
| Usefulness | X | X | X | X | |
| Readability | X | X | X | X | |
| Engaging? | X | X | X | X | |
| Awaremess | | | X | X | X |
| Diffusion of Information | | | X | | X |
| *Program Documentaiton* | | | | | |
| Database usefulness | X | | | | |
| Data completeness | X | | | | |
| Customer inspection documentation | X | | | | |
| Repeat participation | X | | X | | X |
| Types of customers reached | X | | | | |
| Customer response documentation | X | X | | | |
| *Customer Satisfaction* | | | | | |
| Ease of requesting pump test | | | X | | X |
| Clarity of verbal Information | | | X | X | X |
| Usefulness of Information | | | X | X | X |
| Responsiveness to queries post contact | X | | X | X | X |
| Usefulness of Pump Test Results | | | X | | X |
| Believability of Pump Test Results | | | X | | X |
| Responsiveness to queries on pump test | X | | X | | X |
| Reasons for nonparticipation | X | | | | X |
| *Effectiveness of Outreach* | X | | | X | X |

All of this information was analyzed both qualitatively and quantitatively in order to document and fully understand how the program was implemented in the field. The analysis identified minor issues in program implementations and made recommendations to resolve those issues.

In the in-depth interviews, questions were also asked about the structure and availability of the information from the program-tracking database. This information was used to make recommendations on information availability to program implementation staff.

## 4.3 Impact Evaluation

### 4.3.1 Implementation Rate

The implementation rate was calculated as the number of customers who made changes to improve the efficiency of the pumping system divided by the number of customers who received a pump test.

### 4.3.2 Net-to-Gross Analysis

In the net-to-gross analysis, the number of PT&HS Program participants who repaired their pump, was based on participant self-report telephone surveys that collected free ridership data. For each customer

who repaired a pump, a set of questions was asked in order to determine the extent to which the Program influenced the implementation of the measure (i.e., the repair of the pump). The primary objective of the net-to-gross analysis was to identify *what* the customer may have done in the absence of the program and *when* they might have done it.

The self-report method used in this evaluation is consistent with the guidelines contained in Appendix J of the "Procedures for the Verification of Costs, Benefits, and Shareholder Earnings from Demand-Side Management Programs". (Ridge, 1996) With a sample size of 64, a level of precision slightly better than 90/10 was achieved.

While reasonably consistent with Appendix J, this effort to estimate the NTGR was not the most comprehensive and rigorous. While additional questions about when the customer first heard about the pump test program, details about other competing investments, required paybacks, and other decision-related issues could have been asked in order to support a more rigorous estimate of the NTGR, budget constraints prevented the Team from doing so. The resulting NTGR represents an estimate, one that, given the increasing emphasis on resource acquisition, can be updated using a more rigorous approach in future evaluations if a NTGR is required for this program.

The specific questions that addressed the NTGR are discussed below.

#### *4.3.2.1 NTGR Inputs*

The central inputs to the calculation come from the Pump Test Participant survey presented in Appendix B, and are covered by questions 5, 6, 14, 15, and 16. The values for Questions 6 and 14 must first be transposed so that their large values have the same meaning as the large values of the other questions.

Next, the issue of deferred free-ridership was addressed. Deferred free-riders are customers who, in the absence of the program, would have eventually installed exactly the same equipment that was installed through the program. That is, the utility *accelerated* the installation of the equipment. To address this issue, two questions from the survey were used. In Question 7, respondents were asked whether, before obtaining pump test results, they were planning to make any operating efficiency improvements to their pumping system. If they indicate they were, they were then asked in Question 9 *when*, in the absence of the Program, they would have installed this equipment. Their answer to this question was associated with a NTGR using the forecast conversion information in Exhibit 4.3.

**Exhibit 4.3**
**Forecast Conversion**

| Forecasted Installation of Same Equipment | Implied NTGR |
|---|---|
| Less than 6 months | 0.0000 |
| 6 to 12 months | 0.1250 |
| 1 to 2 years | 0.2500 |
| 2 to 3 years | 0.5000 |
| 3 to 4 years | 0.7500 |
| 4 or more years | 1.0000 |
| Earlier than it was under the Program | 0.0000 |

Any implied NTGR from Question 9 was averaged along with the answers to questions 5, 6, 14, 15, and 16 to produce the NTGR.

Another issue that was assessed was the diffusion of energy efficiency/conservation information. The central concern is that if the NTGRs are low, it may be due to the fact that the PT&HS Program has made significant progress towards educating and informing the market. Beginning in 1911, SCE began offering pump efficiency test to its agricultural and water-pumping customers. Currently, there are approximately 40,000 active pumping accounts representing approximately 17,000 customers, a relatively small market. Thus, the extent to which the market may have been motivated is due to the synergy between SCE's on-going DSM efforts *and* a relatively small market in which both word-of-mouth and technology demonstrations can play a significant role.

To assess the extent to which SCE's efficiency/conservation message has diffused throughout the market, pump test participants were asked whether, prior to 2002, they were aware of SCE's pump test and hydraulic services program. They were also asked about the extent to which they had shared energy efficiency/conservation information with friends, neighbors, and colleagues.

### 4.3.3 Program Theory Linkages

The various program theory linkages were tested via the questions in the telephone surveys. The Uses and Sources chart in Appendix B gives the source of the information by survey question. Exhibit 4.4 gives an overview of which linkages were tested by each survey. As this shows, not all linkages were tested within this evaluation.

**Exhibit 4.4**
**Linkages Tested by Survey Type**

| Program Theory Linkages | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Survey** | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| Pump Test Customer | X | X | | | | | | | X | X | X | X | | X | | | X | |
| Nonparticipant | X | X | | | | | | | X | X | X | | | | | | X | |
| EE Contacts | X | X | | | | | | | X | X | | | | | | | X | |

| Program Implementation Theory Linkages | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Survey** | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| Pump Test Customer | X | | | | | | | | | X | X | | | X |
| Nonparticipant | X | | | | | X | | | | | X | | | |
| EE Contacts | X | | | | | X | | | | | | | | |

## 4.4 Energy Saving Method

The current SCE methodology for determining program energy savings was reviewed in two ways: 1) by reviewing the data that goes into the energy savings estimate and 2) by assessing the quality of that data in terms of uncertainty associated with the data. Based on the information reviewed about the current algorithm, the Team made recommendations for updating data for use in the current algorithm. The recommendation is based on the Team's experience and expertise as well as the review of relevant documents, as referenced in Appendix A, and data collected in this study.

Past evaluations were reviewed in order to assess the information available in California on the market served by the PT&HS Program. Understanding the market helps inform the process of selecting the best method for calculating energy impacts from a pump test program. Additionally, past evaluations of this market can help set expectations of potential energy savings in the future.

# *5 RESULTS*

This section addresses the results in the following order (1) verification of program implementation, (2) process results, (3) impact results, and (4) pump test impact method assessment.

## 5.1 Verification Results

For 81 percent of the cases in the audit sample, the Team was able to verify that each record met all of the established review criteria. For the remaining 19 percent, the service authorization form was unavailable. However, this was not considered a fatal error that would cause an adjustment to the total number of pump tests claimed, since for 100 percent of the cases, a pump test letter had been sent to the customer that was dated within the program year. Thus, the total number of pump tests indicated by SCE (2,262) are considered verified.

Of the 68 energy efficiency contact participants who were interviewed, 96 percent recalled the contact. The t value calculated to determine whether 96 percent is significantly different from 1.00 was 1.68. Because this t value of 1.68 is greater than the critical t value of 1.67, the null hypothesis of no difference was rejected. In other words, the difference between 0.96 and 1.00 was statistically significant. Therefore, only 96 percent of the claimed 1,854 (1,780) contacts are verified. However, the verified number of contacts exceeds SCE's goal of 1,750 contacts.

**Exhibit 5.1**
**Program Goals and Verified Results**

| Program Component | Goal | Verified Results | % of Goal |
|---|---|---|---|
| Pump Tests | 2,000 | 2,262 | 113% |
| Energy Efficiency Contacts | 1,750 | 1,780 | 102% |

## 5.2 Process Results

The process analysis results are presented in relation to their source information. The assessment of the experience of the customer with the pump test program is derived from the interviews with the pump test participants and corresponding questions asked of a group of pump test nonparticipants. In some instances, customers who were identified as Energy Efficiency Contacts (EE Contacts) were able to respond to questions regarding the pump test program and so their responses were also included.

Similarly, those in the EE Contact group provided the primary input for analysis of EE Contact program experiences. But, in some instances, the nonparticipants were able to respond to certain questions about the specific experiences, and so their responses are included to contribute weight or counter-point to the EE Contact results.

The contribution of the three groups of surveyed customers to each question is the compound result of a series of skip patterns in each survey that were designed to minimize survey length and avoid asking customers redundant or annoying questions. Thus, no attempt is made to rationalize why each group was asked questions on each particular subject.

In addition to the assessment of the customer experience, the evaluation examined the internal operation of the pump test program by interviewing the managers and staff responsible for implementing it. In all, three management level staff and seven pump testers were interviewed.

The process results discussion is structured into the following sections

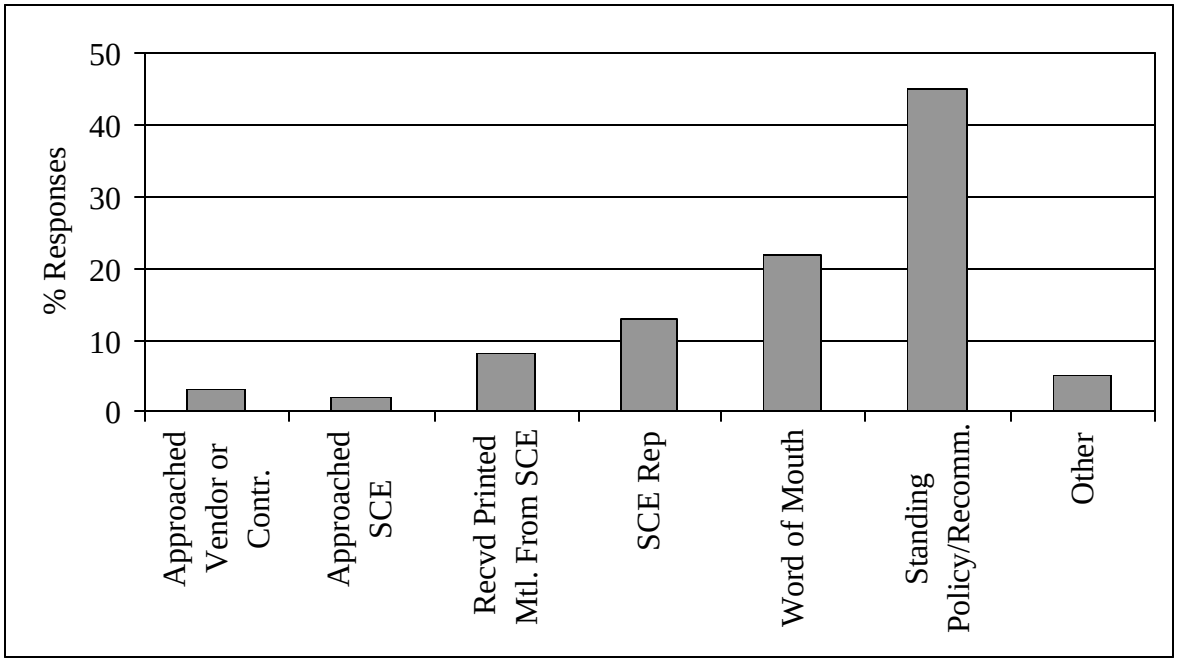
- Effectiveness of Outreach to Pump Test Customers
- The Pump Test Experience of the Customer
- Prior Pump Test Participation
- Program Internal Operation
- Searching for Energy Efficiency Information
- Energy Efficiency Information Dissemination Effectiveness

### 5.2.1 Effectiveness of Outreach to Pump Test Customers

In reviewing this section, it is important to remember that the questions addressed are directed at the experience with the pump test portion of the PT&HS Program.

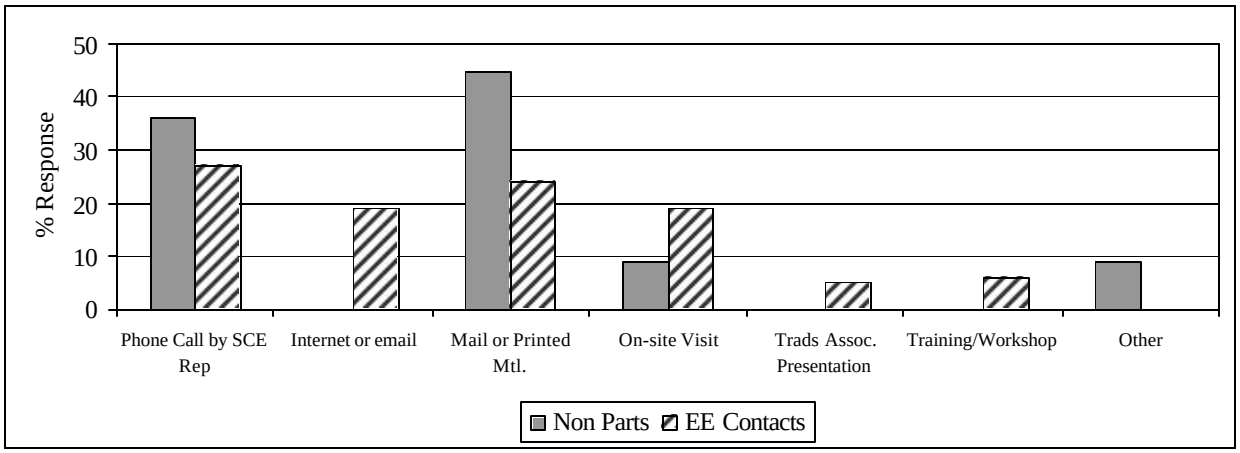
The first issue addressed was how the customer learned about the SCE Pump Test Program. This question was only asked of the pump test participant population and elicited 14 responses. The results of the query are presented in Exhibit 5.2 and shows that a standing policy or recommendation is by far the most frequent way that pump test program participants learned about the program. Combined, the responses “standing policy or recommendation”, “word of mouth”, and “SCE Representative” represent approximately 80 percent of all responses.

**Exhibit 5.2**
**How Participants Learned of Program**



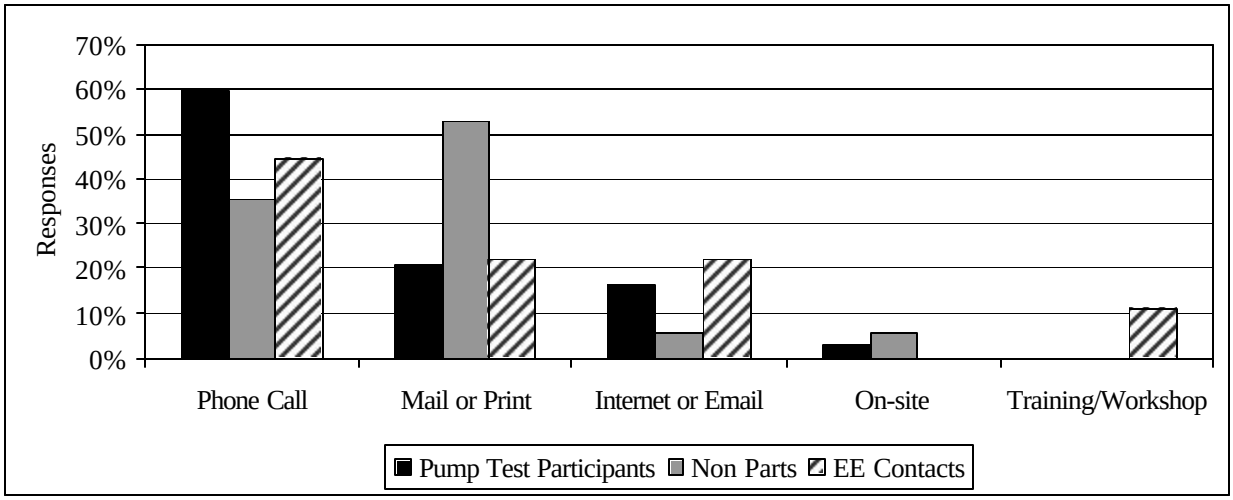

All three survey groups were then asked how they were contacted by the SCE representative. However, only three pump test participants responded to this question, so the results were not included in the analysis. Exhibit 5.3 shows that the SCE representatives use a wide variety of approaches for contacting potential pump test customers. The most commonly quoted method for both nonparticipants and EE Contacts were phone calls and printed material or mail. While the EE Contacts most often mentioned phone calls as a first response, other responses indicated that internet, email, printed material, mail and on-site visits were all significant contact channels.

**Exhibit 5.3**
**SCE Representative Method of Contact**



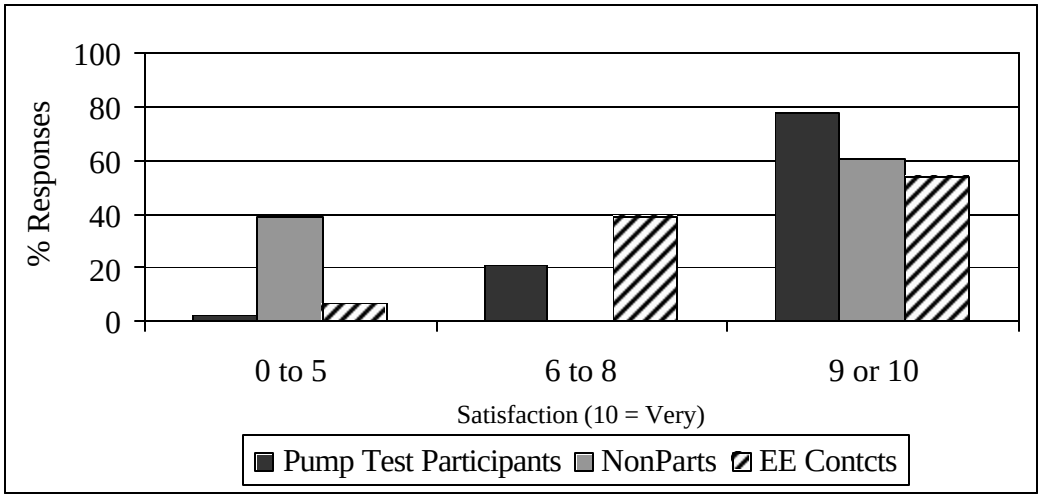
More important for understanding outreach effort effectiveness is understanding the customers preferred method of being contacted. Exhibit 5.4 demonstrates that the program staff understand their customers. The customers' top two preferences for receiving information are phone calls and mail or printed material. It is interesting to note that, for participants and EE Contacts, the internet or email runs a close third. This may be an emerging phenomenon that the program designers may want to take note of.

**Exhibit 5.4**
**Customers Preferred Method of Contact**



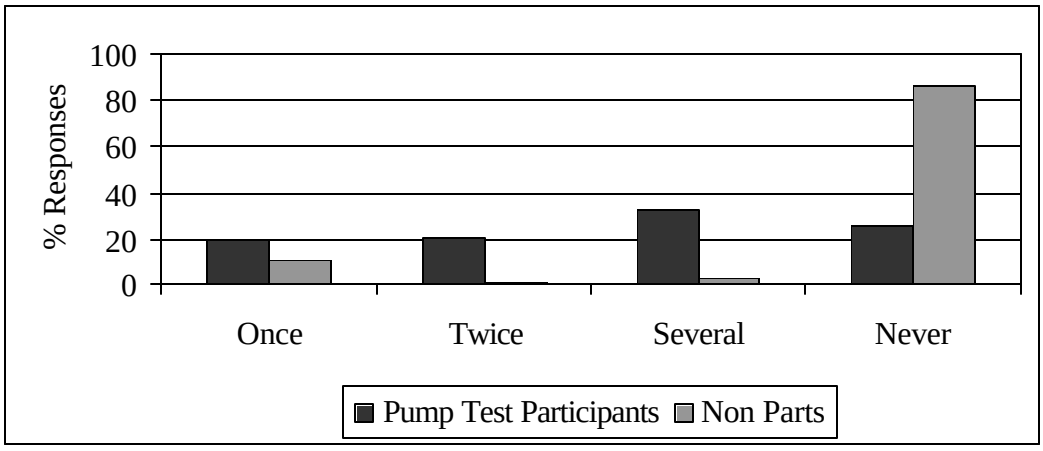

Since there is a close match between the ways that the customer is being contacted and ways that they prefer to be contacted, one would expect that customers would be generally satisfied with the ways that they are contacted. Exhibit 5.5 presents customer satisfaction with the contact method for all three types of customers. As can be seen, customers show very high levels of satisfaction, with over 40 percent of all groups giving the highest rating. The main anomaly in the data is that a significant percent of nonparticipant responses are clumped together. This is due to a very small number of respondents for this question (8) leading to grouped response percentages.

**Exhibit 5.5**
**Satisfaction with Contact Method**



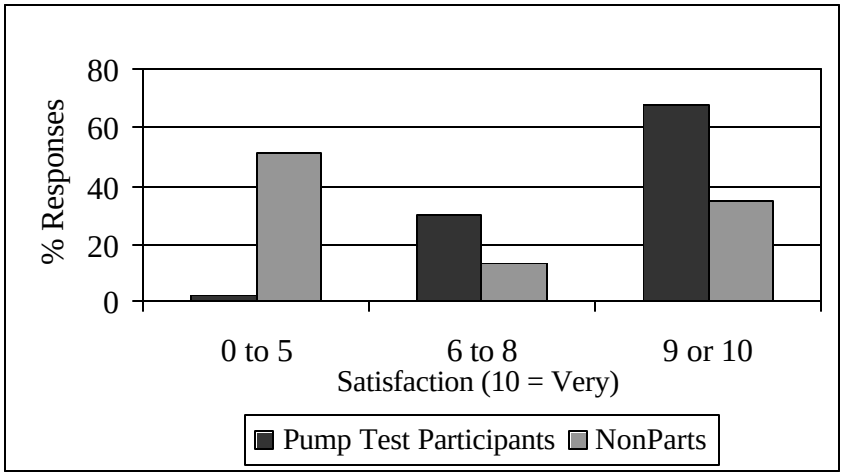

Besides the method of contact, the frequency of contact can affect the likelihood that a customer will participate in a pump test. As would be expected, 86 percent of the nonparticipants claimed that they had not been contacted within the last year, while 73 percent of the participants had been contacted at least once by SCE (Exhibit 5.6).

**Exhibit 5.6**
**Participant and Nonparticipant Contact Frequency**



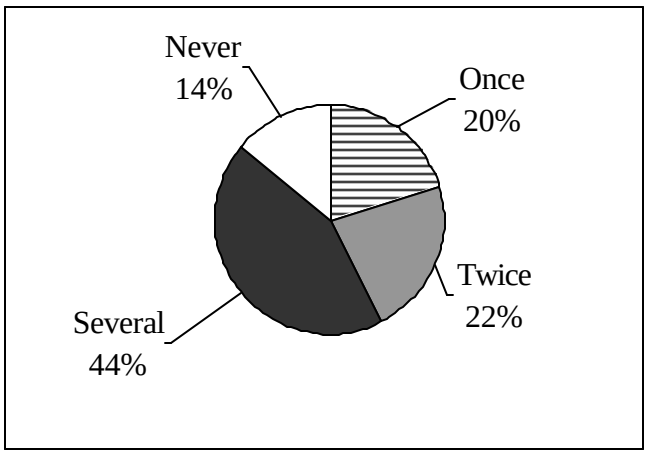

Not surprisingly, as shown in Exhibit 5.7, when these customers were asked about their satisfaction with the frequency of the contact that they are receiving from SCE, the participants all responded at mid scale or above, with 91 percent rating the amount of contact at 8 or above (very satisfied). On the other hand, nonparticipants tended to be less satisfied with the amount of contact, showing response distributions across the scale with peaks at mid range and scale maximum.

**Exhibit 5.7**
**Participant and Nonparticipant Satisfaction with Contact Frequency**



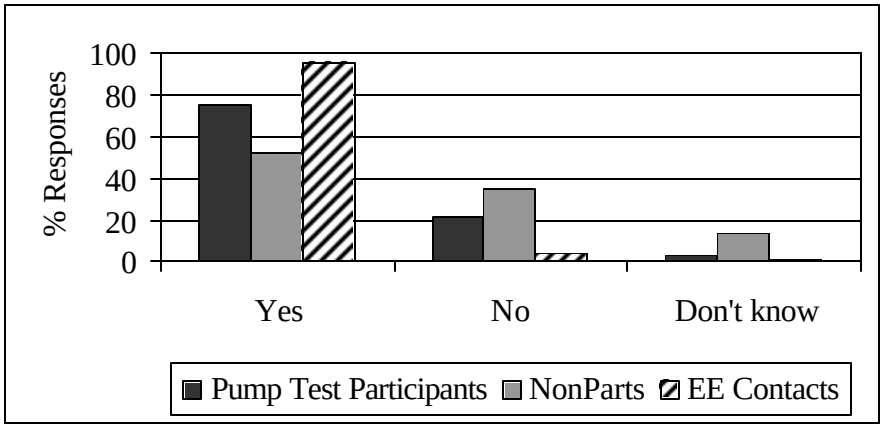

In an attempt to determine how large a role reverse contact plays, pump test participants were asked how many times *they* had contacted SCE during the past year. As Exhibit 5.8 shows, participating customers contacted SCE frequently with 86 percent reaching out to SCE at least once during the year and 44 percent contacting SCE several times. As the pump test customer must call SCE for a test, it is unclear why 14 percent stated that they have never contacted SCE in the past year. Most likely, though, it is due to customers with larger number of pumps having ongoing pump tests (and therefore not needed to contact SCE for the test to occur). Or it could have been due to another person at the company contacting SCE rather than the surveyed customer.

**Exhibit 5.8**
**Frequency Pump Test Customer contacts SCE**



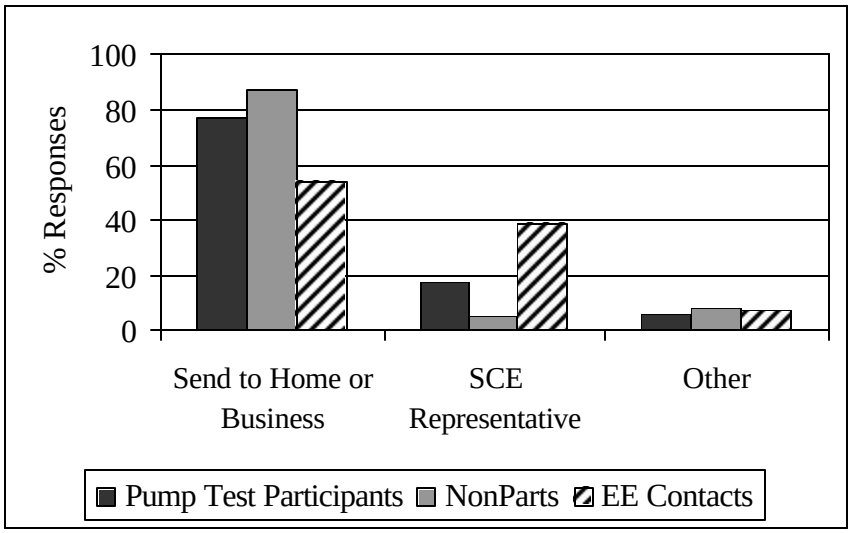

In order to assess the effectiveness of printed outreach, all surveyed customers were queried as to whether they recalled receiving printed material from SCE during the past 5 years (3 years for nonparticipants). Exhibit 5.9 shows that over 50 percent of all three groups, 75 percent of participants, and 95 percent of EE Contacts remember receiving printed material from SCE in that time period.

**Exhibit 5.9**
**Recall Printed Material Received in Past 3 to 5 Years**




To follow the trail, customers were asked where or from whom they had obtained the printed material. Exhibit 5.10 shows that over 50 percent of all queried stated that it was sent to their home or business. This is consistent with the previous statements about the most frequent way that they are contacted by SCE. Once again, for the EE contacts, the SCE representative played a significant role in delivery.

**Exhibit 5.10**
**Where Printed Material Obtained**




All three customer types were asked a series of questions about the ability of the printed material to convey its message. They were asked to agree or disagree on a four point scale from strongly disagree to strongly agree. Exhibit 5.11 presents the results of the responses to the various questions, which are presented along the left hand side of the exhibit. For ease of interpretation, the category receiving the highest percentage response has been bolded and shaded. Overall the printed material appears on target and effective, with the vast majority of interviewees agreeing somewhat or strongly that it is understandable, believable, and tends to lead them toward action on energy efficiency.

**Exhibit 5.11**
**Assessments of the Quality of Printed Material**

| Statement | | Disagree Strongly | Disagree Somewhat | Agree Somewhat | Agree Strongly | Conclusion |
|---|---|---|---|---|---|---|
| Printed in an engaging format. | Part | | | **50%** | **50%** | Format was engaging but room remains for improvement. |
| | NP | 6% | 6% | **55%** | 31% | |
| | EE | | 6% | **60%** | 32% | |
| Easy to understand | Part | | | 35% | **65%** | Information was generally easy to understand. |
| | NP | 3% | | **53%** | 44% | |
| | EE | | 7% | 38% | **57%** | |
| Useful | Part | | | 38% | **62%** | Useful, but most useful to pump test participants. |
| | NP | 6% | 12% | **52%** | 30% | |
| | EE | | 6% | **49%** | 44% | |
| Believable | Part | 2% | | 33% | **65%** | Material was highly believable by all groups. |
| | NP | 3% | 6% | 29% | **62%** | |
| | EE | | | 44% | **56%** | |
| Positively affected attitude toward EE | Part | | 5% | **53%** | 42% | The material positively affected attitudes. |
| | NP | 2% | 17% | **52%** | 26% | |
| | EE | 2% | 14% | **55%** | 30% | |
| Taught me about EE options | Part | | 7% | **58%** | 36% | Taught customers about EE options |
| | NP | 6% | 12% | **50%** | 32% | |
| | EE | | 5% | **59%** | 37% | |
| Increased likelihood of EE investment | Part | | | **54%** | 46% | Increased likelihood of EE investment |
| | NP | 3% | 21% | **39%** | 36% | |
| | EE | 2% | 8% | 42% | **49%** | |

SCE's pump test program outreach seems to be reaching its customers. They are satisfied with the contact method and frequency. The outreach is accepted as understandable and seems to have moderate influence over the likelihood of customers making an energy efficiency improvement.

### 5.2.2 The Pump Test Experience of the Customer

The assessment of the results of the surveys now turns from customer outreach to the pump test experience.

First, the surveys asked the pump test participants, who had participated in the SCE pump test program, and nonparticipants, who had had their pump tested outside the program within the past three years, about their experience with the pump test process. Each surveyed customer was asked the series of questions shown on the left in Exhibit 5.12

There are two interesting results in Exhibit 5.12. First, the highest percentage response to every question was strong agreement with the positively phrased questions. Second, for every question, the nonparticipants gave a higher response than the participants. Overall, on average, the nonparticipant ratings in the strongly agree category were 19 percent higher than the participant ratings. To assess which of the responses were real, statistical significance test were run on all responses. Only the ones

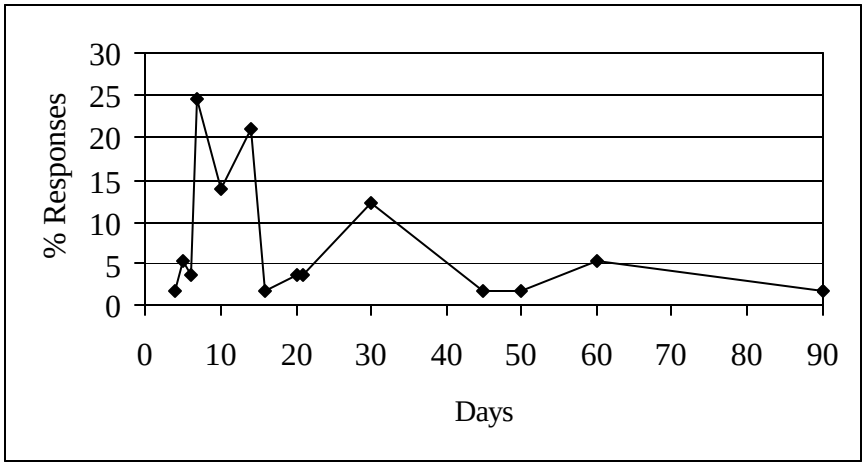
with asterisks (*) next to them were significant at the 95% confidence level. These result suggests that nonparticipants are having a more positive experience in the early part of the pump test process when they have their pump tested by outside parties. Speculating, this could be because their local pump test supplier is able to respond to their request more quickly, giving them more timely results.

**Exhibit 5.12**
**Ease and Usefulness of Pump Tests**

| Statement | | Disagree Strongly | Disagree Somewhat | Agree Somewhat | Agree Strongly | Mean | |
|---|---|---|---|---|---|---|---|
| Easy to request | Part | Invalid question on survey | | | | | |
| | NP | 0% | 5% | 5% | **90%** | | |
| Once arranged, not a long wait. | Part | 2% | 8% | 37% | **52%** | 3.41 | * |
| | NP | | 5% | 11% | **84%** | 3.79 | * |
| Information supplied at time of test useful. | Part | | 3% | 19% | **78%** | 3.75 | * |
| | NP | | | | **100%** | 4.00 | * |
| Didn't have to wait long for results. | Part | 3% | 2% | 32% | **63%** | 3.55 | * |
| | NP | | | 5% | **95%** | 3.95 | * |
| Test results were useful | Part | 3% | | 16% | **81%** | 3.75 | * |
| | NP | | | 5% | **95%** | 3.95 | * |
| Test results were easy to understand. | Part | | 3% | 25% | **72%** | 3.69 | |
| | NP | | | 15% | **85%** | 3.85 | |
| Test results were believeable | Part | 3% | | 22% | **75%** | 3.69 | * |
| | NP | | | 10% | **90%** | 3.90 | * |
| Easy to get a response to questions after test. | Part | | 3% | 21% | **76%** | 3.73 | |
| | NP | | 5% | 5% | **90%** | 3.85 | |
| Test made me more knowledgeable | Part | 2% | 2% | 35% | **61%** | 3.57 | |
| | NP | | | 32% | **68%** | 3.68 | |
| Test provided necessary info. for repairs or improvements. | Part | | 2% | 31% | **67%** | 3.66 | |
| | NP | | | 22% | **78%** | 3.78 | |
| **Averages** | Part | 1% | 3% | 26% | **69%** | | |
| | NP | 0% | 2% | 11% | **88%** | | |

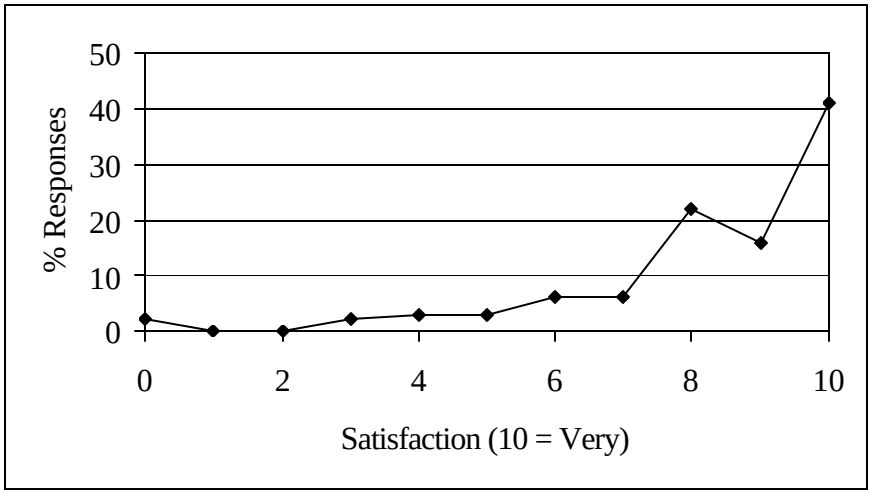
One of the areas that has a high potential to affect customer satisfaction is the time between when the test is completed and when the report is available. The next two questions looked at this issue and the effect of the elapsed time between test and report for program participants. Exhibit 5.13 presents a plot of the distribution of elapsed time between test and report. The response indicates a typical elapsed time of one to two weeks between the pump test being conducted and the test report being delivered. On average, there were 18 days between the test and the report. Over 30 percent take longer than two weeks.

**Exhibit 5.13**
**Time between Test and Report - Participants**




When the customers were asked to rate their satisfaction with the elapsed time between pump test and receipt of report, 79 percent of the respondents gave a rating of eight or above on a zero (not at all satisfied) to 10 (very satisfied) scale. The mean level of satisfaction was 8.4. This indicates a high overall level of satisfaction with pump report turn around times.

**Exhibit 5.14**
**Satisfaction with Time between Test and Report - Participants**



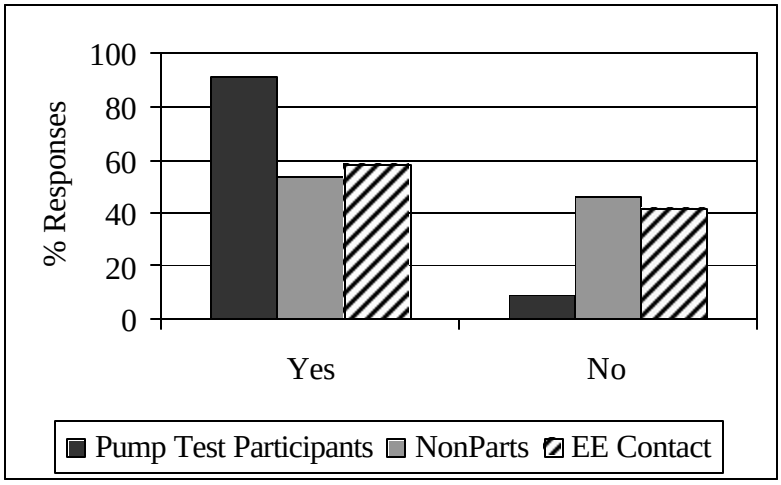

However, since the other 20 percent of the customers were less satisfied (satisfaction level of 7 or less), elapsed time for return of the pump test report was regressed against satisfaction to see if there was a correlation. The results indicate that there is correlation coefficient of –0.71 (a shared variance of 0.50) with results significant at greater than 99 percent level of confidence. This indicates that there is a strong correlation between customer dissatisfaction and the time they have to wait for the test report. The ones who have to wait longer are the more dissatisfied. Thus, while most customers are satisfied with the report turn around time, average customer satisfaction can still be improved by shortening the longer turn around times (e.g. those over two weeks).

### 5.2.3 Prior Pump Test Participation

Participants, for the purposes of this study, were defined as customers who participated in the SCE Pump Test Program during the 2002 program. Nonparticipants were defined as customers who had not had a pump test at least within the past three years. These nonparticipants could have had a pump test by SCE prior to 2000 or could have never had their pumps tested by SCE. In order to assess how many of the surveyed customers could have been affected by previous pump test programs, all surveyed customers were asked about prior awareness of the SCE the program and participation decisions.

Exhibit 5.15 presents the findings on awareness of prior SCE Pump Test Programs. As would be expected, a much larger percentage of participants were aware of SCE's Pump Test and Hydraulic Services program prior to 2002. However, slightly over 50 percent of the nonparticipating customers were also aware of the program prior to 2002. This very high market awareness is probably because the program has been in operation since the early part of the century. Additionally, of those nonparticipants who were aware, 44 percent had had a pump tested by SCE prior to 2000 (24 percent of the nonparticipants surveyed had had a pump test by SCE prior to 2000).

**Exhibit 5.15**
**Awareness of SCE Pump Test Program Prior to 2002**




Nonparticipants who were not aware of the program and had not had their pumps tested prior to 2000 (31 percent of the surveyed nonparticipants), when asked why they chose not to participate in the SCE pump test Program (Exhibit 5.16), the majority of the responses fell in the "Other" response category. In the EE Contact survey, the survey instrument did not seek any further detail on what "Other" referred to. For the nonparticipant survey, where the "Other" responses were recorded, most responses could have been categorized under either "Didn't need it" or "Didn't know about the program".

**Exhibit 5.16**
**Reasons for Not Participating in SCE Pump Test Program**

| | % EE Contacts | % NonParts |
|---|---|---|
| **Another company provides info and support** | 0 | 14 |
| **Already had a test by non SCE company** | 4 | 9 |
| **Don't have time** | 8 | 0 |
| **Have made necessary EE improvements** | 8 | 0 |
| **Our company does not have pumps** | **23** | 0 |
| **Other** | **58** | **73** |
| **Don't Know** | 0 | 5 |

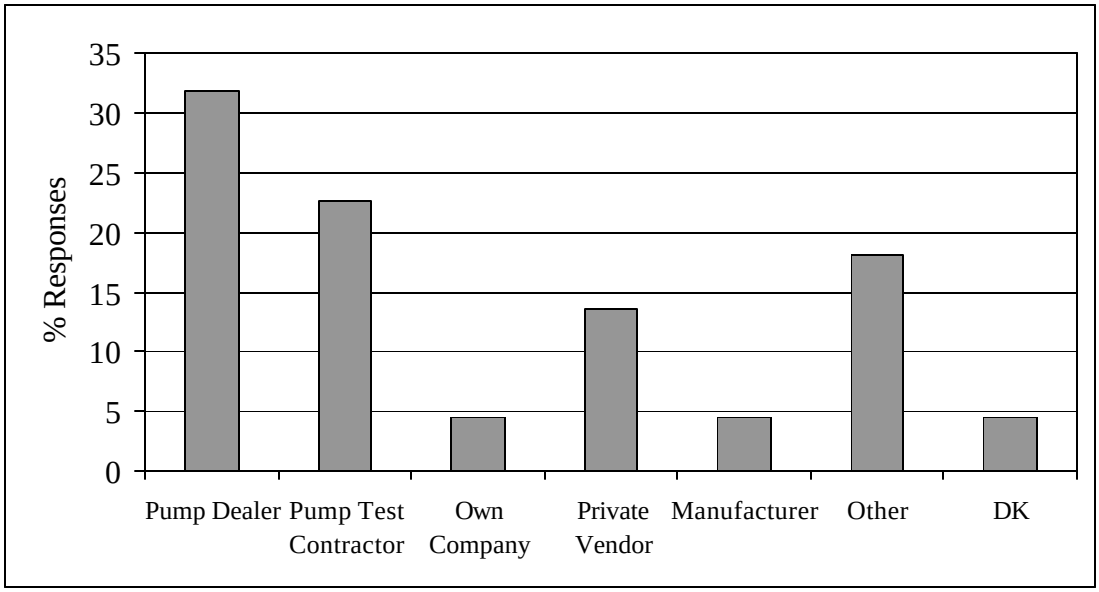
As can be seen in Exhibit 5.17, approximately 30 percent of the interviewed nonparticipants indicated that they had their pumps tested by organizations other than SCE during the past three years. This suggests that nonparticipants are not having their pumps tested very regularly.

**Exhibit 5.17**
**Nonparticipant Pumps Tested by Other Than SCE in Past Three Years**

| Response | Frequency | Percentage |
|---|---|---|
| Yes | 21 | 29.2 |
| No | 51 | 70.8 |

The 30 percent of nonparticipants who responded that they had their pumps tested during the past three years by organizations other than SCE were asked about who performed the test. Exhibit 5.18 shows that 55 percent of the non-SCE pump tests were conducted by pump dealers or pump test contractors. If the rather vague category of "Private Vendor" is included, this rises to 67 percent.

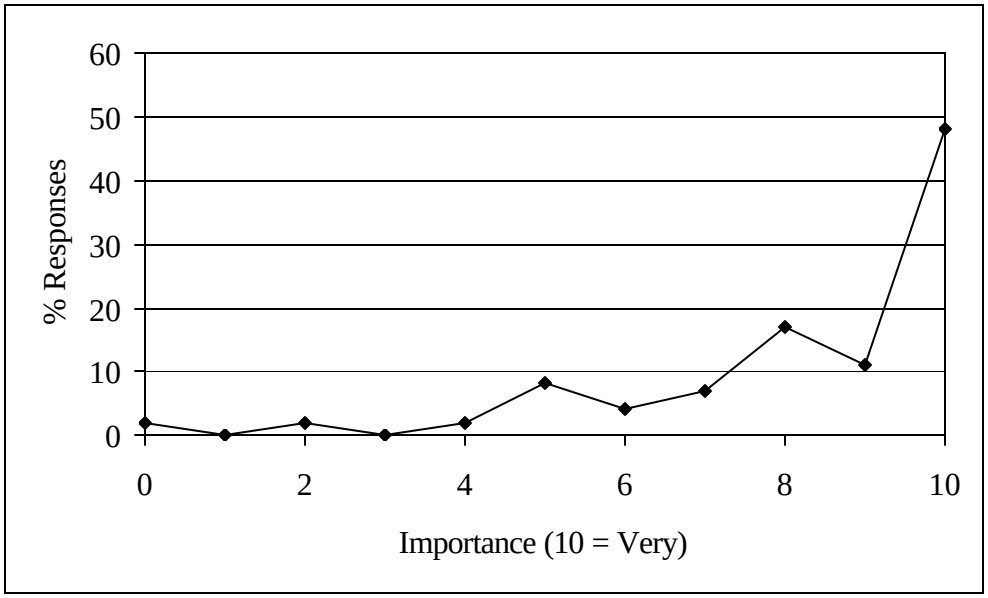
**Exhibit 5.18**
**Types of Outside Organizations Performing Pump Tests**




To attempt to uncover the reasons why the 70 percent of nonparticipant customers did not have their pumps tested in the past three years by non-SCE sources, all nonparticipants were asked about how important it is to know the energy efficiency of their pump. Exhibit 5.19 indicates that 76 percent of nonparticipants rate the importance of knowing that electricity is used efficiently as 8 or above when 10 equals very important. The mean was 8.4[3]. Since this is inconsistent with their stated behavior, this may indicate that they are providing the socially desirable response, where few customers are willing to say that it isn't important. Or, this could be considered an indication of bounded rationality on the part of customers, where customer's behavior is rational in intention but limited in execution.

[3] Nonparticipants indicating a Yes response in Exhibit 5.17 had had a mean of 8.55 and those indicating No had a mean of 8.35. There was no significant difference between the two groups. (t test = 0.35).

**Exhibit 5.19**
**Importance of Knowing Energy Efficiency of Pump (Nonparticipant Response)**




The next section addresses the operation of the Program from the perspective of the internal staff.

### 5.2.4 Program Internal Operation

This section of the process assessment looks at the program operations within SCE. To achieve this, in-depth interviews were performed with three program staff (two managers and one program support staff), and seven pump test technicians. These interviews were designed to probe the uniformity of program staff understandings of program operation, goals, objectives, delivery and needs. The interview guide used for all interviews is attached in Appendix B.

Overall, the management and pump test staff demonstrated a clear understanding of the program and its implementation. There is obvious mutual respect between pump test staff and management that is reflected in the manner that both describe their work. Both management and pump test staff mutually agree on job responsibilities and demonstrate a confidence that the other has the ability to do their job well. They illustrate a commendable esprit de corps in supporting other staff when they need help.

The following sections cover the various areas that were discussed as part of the interview instrument. Each section was targeted to assess the program operation and see if there were areas where changes might result in improved program delivery.

#### *Program Training and Staffing*

While there have been recent hires to replace staff who had left, there seemed to be a general consensus among the program staff that the current program needed one, or possibly two, additional pump testers. This appeared to be based on historical staffing levels rather than on perceived backlog of tests, since both managers and testers unanimously stated that they meet their pump testing goal. Managers

indicated that they are currently trying to hire new staff and redistribute staff geographically to minimize drive time[4] between tests.

One difference of opinion that surfaced several times among the staff concerned the need to hire a data entry clerk to enter pump test results, allowing pump testers to spend more time performing pump tests. Several pump testers discussed the issue, but most acknowledged that the data input process also acted as a quality control step that helped them to produce consistent pump tests. Similarly, several pointed out that part of their job included rate analysis and that it might make sense to pass off the rate analysis responsibilities to a rate analysis specialist to free up additional time. At the same time, most recognized that the rate analysis was an integral part of their overarching responsibility to help customers minimize their electrical costs. Thus, most were reluctant to pass off that responsibility.

When the issue of training was discussed, the staff virtually unanimously agreed that the current method of on-the-job training for approximately one year was the best, or maybe only, method for training pump testers. Staff at all levels concurred that pump testing could not be learned from a book because of the diversity of the situations encountered in the field. They stated that in order to be able to understand and handle the various situations, it was necessary to encounter a wide variety of situations before the pump tester was asked to handle them on their own.

While program staff at all levels stated that pump testing could not be learned from a book, they acknowledged the need for improving current written material. The program supervisor has assigned three senior pump testers to update and improve the currently out-of-date training manual in order to at least supply some current reference manual.

Two recommendations came from the pump testing staff for improving the current training regime:

1. Ensure that the pump testers who are training new staff are effective teachers as well as experienced pump testers.
2. Have the apprentice pump testers train under more than one journeyman pump tester in order to expose the apprentice to a greater variety of approaches and techniques.

Both of these suggestions make good sense to the evaluation team.

When asked whether certifications were required in order to be a pump tester, all agreed that there is no particular "pump tester" certification. There was general agreement that pump testers must have a sound understanding of electricity and all are required to carry an American Water Works Association (AWWA) Grade 2 license to illustrate to their customers that they understand water systems.

### *Program Goals and Strategies*

While there is agreement among all staff on the goal for the number of tests to be achieved annually, there seems to be significant confusion as to other goals. Most staff disagreed as to whether there were any "hard-to-reach" (HTR) goals for the Program. Among the managers, one mentioned the existence of HTR goals in response to several questions while another clearly stated that pump test number and

[4] As traffic congestion has increased, pump testers are spending higher proportions of their time driving between sites, rather than pump testing.

quality goals were the only Program goals. This lack of clarity at the management level is reflected in the responses of the pump testers to the same question. When asked to describe the Program goals, some pump testers stated that there are now HTR goals (one even defined it as customers who had not had a pump test in the past three years) while others made no mention of HTR goals.

Leaving aside the lack of clarity on HTR goals, all program staff agree that the goals are clearly and consistently communicated to the staff. The responses indicated that the process and timing for communicating goals is clear and is carried out on schedule.

All interviewees agree that the program and that most if not all individuals are meeting or exceeding their pump test goals and that progress toward these goals is clearly communicated. Consistent with the discussion above, not one interviewee commented on progress toward achieving the HTR goal.

Recommendations:

1. Clearly define in writing all goals for the PT&HS Program and pass those written goals on to all staff.
2. Keep staff apprised of progress toward all goals, including secondary goals such as HTR.

***Program Promotion and Marketing***

When queried about program promotion the staff pointed out that the program was not target marketed. While it is promoted at industry trade shows, with each pump tester required to attend four such events per year, knowledge of the program is mostly passed on by word of mouth from one customer to another. (It should be noted here that this is consistent with information from the customer surveys.) In addition, account representatives tell their customers about energy efficiency in general. After that, it is left up to the customer to initiate that pump test or request other services.

There is a new promotional plan to reach "new" customers who have not participated before, but this is on a limited basis. Until program year 2003, this has not been done before. Managers were primarily the ones who discussed this new plan.

Several of the comments by the interviewees indicate that the program is operating "at capacity" without any marketing or promotion. Several staff commented on the backlog of tests and the relatively long elapsed time between request for pump test and completion of the pump test. One of the managers stated that additional promotion would require additional pump testers to meet the demand.

The interviewees suggested that the Program could increase its effectiveness if it coordinated a larger effort using such low-cost marketing strategies such as collecting cards at trade shows and handing out low cost items that promote the program.

The Team feels that, if the Program employs this strategy, it should also make sure that there is an adequate supply of pump testers to meet the expected increase in demand for pump tests. This is critical since the survey data indicate that a customer's level of satisfaction decreases as the time between pump test and results increases.

***Program Implementation***

The Program staff has a shared understanding of the Program design and its implementation. This is probably because it is a long-standing program. The program consists of a standard pump test offered

to all customers, along with a pumping efficiency brochure upon request. The only additional comment from management was that if multi-year funding could be obtained, it would make operation of the Program more consistently available to the customer.

### *Customer Tracking/Program Database*

While the customer-tracking database was not analyzed in depth, some useful information was obtained from the interviews with program staff.

The customer-tracking database appears to be comprehensive and well designed. It supplies the pump testers with the information they need to track customer requests. However, the information in the database on customer tracking does not seem to be readily available to all of the Program Managers. One manager stated that he could not tell how many people are in the queue for pump tests. He went on to suggest that the responsibility for the database should be transferred to the Energy Efficiency Administration Department. Similarly, when another manager was asked about the elapsed time between the request for a pump test and the completion of the pump test he gave a generalized response, perhaps suggesting a lack of specific current information.

As has been shown in previous discussions in this report, customer satisfaction is directly correlated to the length of the turn around time.

Recommendation:

1. Changes should be made to the tracking database management so that summary information such as number of tests scheduled and elapsed time between request and test is more readily available to all program managers.

### *Pump Tests*

Managers and staff were queried about their understanding of the process of implementing the pump tests. The following bulleted points illustrate a uniform understanding of and agreement on the pump test process.

- Very good agreement among all staff on the approximate time required to perform a pump test and on the primary goal of supplying a quality pump test result.
- Clear understanding among the staff on individual responsibility for monitoring test results and quality.
- Clear understanding among the staff on test result report review and the quality control process.
- Clear understanding among the staff of the reward/penalty process for achieving/not achieving test goals.
- Consensus on the fact that the pump tester arrives at the site and assess the situation to determine how and if a test can be performed. Agreement that if a pump test is not performed, the main reason is safety.

There were two areas in which there was a uniform lack of clarity among the staff. These areas were the HTR goal and what role it plays in the reward/penalty process.

### *Test Result Quality Control*

Program staff were asked several questions about the quality control process for test reports. There was complete agreement on how many of the tests went through a quality control process (all) and about who was responsible for performing the quality control task. All felt that the quality control process did not interfere with or compromise the performance of the pump test or delivery of the report. There is clear, even if general, agreement at all levels on what is reviewed during quality control and that the primary goal is the delivery of a high quality test result.

The staff who perform the pump test quality control estimate that one to three percent of the tests are sent back to the pump tester with quality control questions. However, no one seemed to have actual data on the specific number sent back. Similarly, there was a lack of clarity from the responses on how quality control records are kept. The responses suggested that there is either no system, or inconsistent systems from office to office, for tracking quality control frequencies and reasons.

The Team recommends the creation of a central tracking system to monitor the quality control return rate and the reason(s) for each return in order to quickly identify implementation issues and minimize the return rate. This does not need to be an expensive or complicated system.

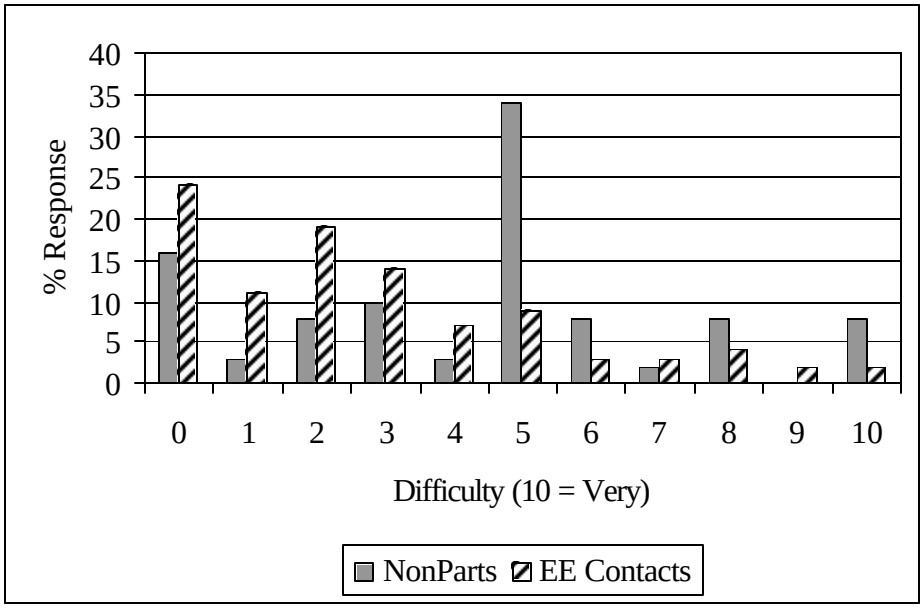
Another quality-control issue was addressed by asking all staff about how customer complaints were handled. While all agreed that customer complaints were infrequent, there was a definite lack of agreement on *how* complaints were handled. Some said that they were given to the original pump tester to resolve with the customer, while others said that the supervisor handled them. While this lack of clarity about the process may be due to the low number of complaints, the Team nevertheless recommends that clear procedures be established to handle customer complaints.

### 5.2.5 Searching for Energy Efficiency Information

This section turns away from the pump test portion of the program and provides information on obtaining information on other energy efficiency areas.

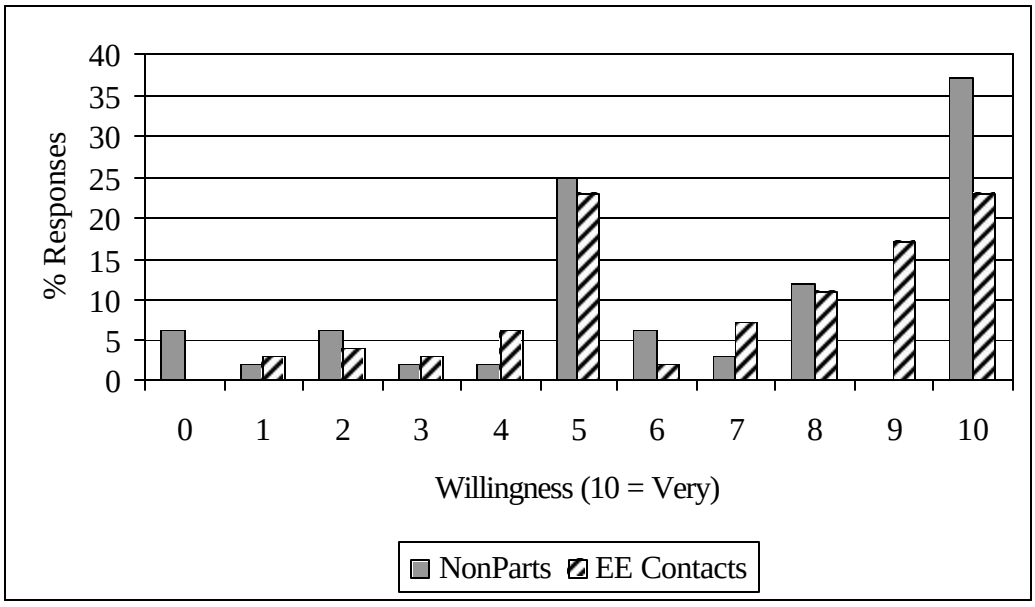
EE contact customers and nonparticipants were asked to rate the difficulty of finding alternate ways of reducing energy use. Exhibit 5.20 shows that for EE Contacts 68 percent of the respondents rated the difficulty of getting information on alternate ways of reducing energy use as a 3 or lower (i.e., not very difficult) and very few felt it was difficult (9 or 10). However, nonparticipants seemed to feel that it was somewhat more difficult to get information since close to 35 percent gave a response half way between not very difficult and very difficult.

**Exhibit 5.20**
**Difficulty of Finding Energy Efficiency Information**




While the two groups gave slightly different readings of the difficulty of finding energy efficiency information, both EE Contacts and nonparticipants show a moderate willingness to look for information on ways to reduce energy. (Exhibit 5.21).

**Exhibit 5.21**
**Willingness to Spend Time Searching for EE Information**




Consistent with the moderate interest in spending time looking into energy efficiency options, Exhibit 5.22 illustrates that customers rely on SCE as their primary sources for new energy efficiency

information. As can be seen from the cells shown in gray, customers tend to learn about energy efficiency options through passive means[5], primarily receiving information from SCE representatives or through printed material.

**Exhibit 5.22**
**Sources of Energy Efficiency Options**

| | % EE Contact | % Non Parts |
|---|---|---|
| **You approach vendor or contractor** | 6 | 8 |
| **Approached by SCE** | 7 | 3 |
| **Printed material from SCE** | 20 | 25 |
| **TV, radio, or newpaper** | 2 | 13 |
| **SCE Rep contact you** | 32 | 6 |
| **Contractor/Vendor contacts you** | 7 | 3 |
| **Word of mouth** | 3 | 14 |
| **Industry trade shows** | 3 | 3 |
| **Family tradition/ Business policy/ Recommendation** | 14 | 8 |
| **Other** | 6 | 16 |

### 5.2.6 Energy Efficiency Information Dissemination Effectiveness

This section of the report focuses on the effectiveness of the SCE Energy Efficiency representatives, or service representatives, in supplying general energy efficiency information, including printed material, to the customers. As discussed in the methodology section, SCE Energy Efficiency representatives operate independently from the pump test component part of the Program and supply customers with general information on energy efficiency options.

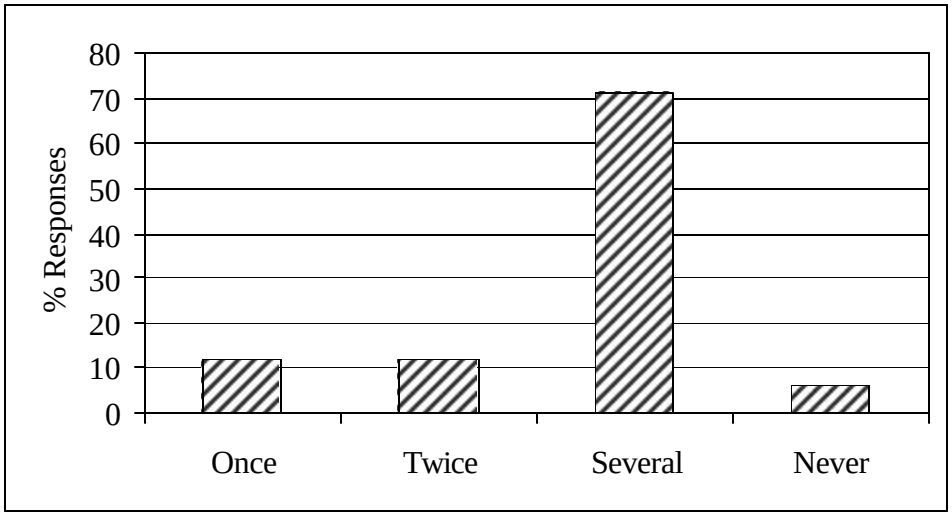
The effectiveness with which information is disseminated can be measured using a number of indicators. The ones selected for this Program include:

- Ability to recall being contacted by SCE (this suggests that the event was meaningful in some respect and therefore memorable)
- Satisfaction with the frequency of contact
- Satisfaction with the type of information provided

SCE Energy Efficiency representatives focused much of their efforts on contacting a target group of customers about energy efficiency. How effective were they in reaching these customers? First, 94 percent of the surveyed EE Contact customers remember having at least one contact with SCE within the past year. As can be seen in Exhibit 5.23, 71 percent of them recall being contacted several times.

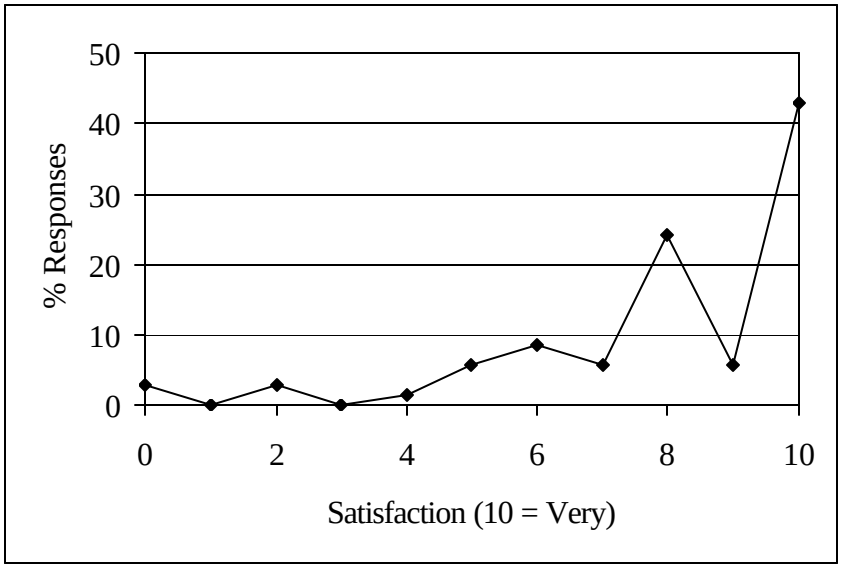
[5] Passive means defined as the customer is not actively seeking information or taking initiative, but are approached by SCE.

**Exhibit 5.23**
**Frequency of Receipt of Information from SCE in Last Year – EE Contacts**




EE Contact customers seem reasonably satisfied with the amount of contact they receive from SCE. The mean rating was 8.1 with 73 percent giving a satisfaction rating of 8 or above (Exhibit 5.24).

**Exhibit 5.24**
**Satisfaction with Frequency of EE Representative Contact**



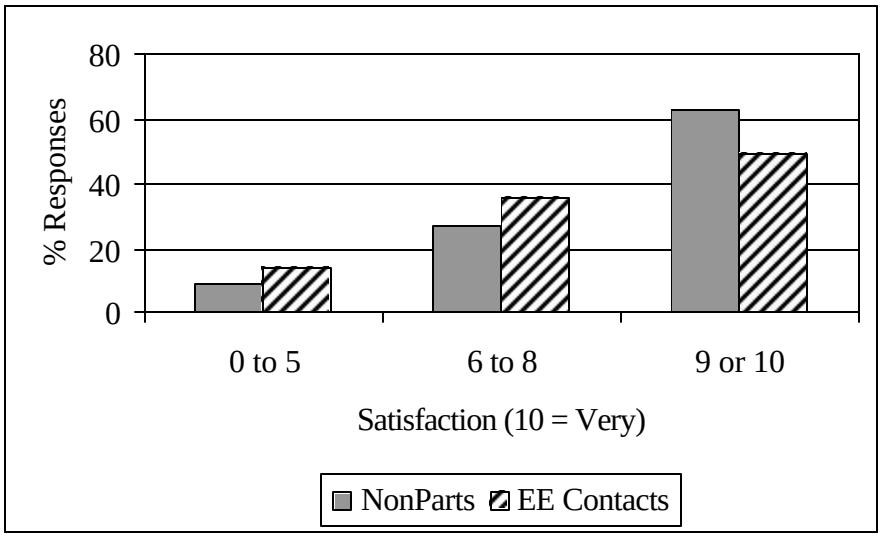

As shown in Exhibit 5.25, energy efficiency program information was the type of information most frequently obtained by EE Contact and nonparticipant customers.

**Exhibit 5.25**
**Type of EE Information Received from SCE Representative**

| | % EE Contact | % Non Parts |
|---|---|---|
| **Rebate Information** | 30 | 11 |
| **EE Program Information** | 38 | 47 |
| **Pump test information** | 12 | 16 |
| **Info. On improving pump productivity** | 15 | 21 |
| **Other** | 5 | 5 |

When queried about their satisfaction with the type of information received from the SCE service representative, 72 percent of EE Contacts and 81 percent of nonparticipants responding had satisfaction ratings of 8 or above. Less than 10 percent of both cohorts responded with a satisfaction rating of less than 5 (Exhibit 5.26).

**Exhibit 5.26**
**Satisfaction with the Type of Information from SCE Representative**




Overall, the information gleaned from nonparticipants and EE contact program customers indicates that the SCE service representatives are doing a good job of getting information out to their customers as customers recall the contact, are satisfied with the frequency of contact, and are satisfied with the type of information they receive.

## 5.3 Impact Results

### 5.3.1 Pump Test Participants

Impact results from the pump test participants are presented first, followed by the nonparticipants and the energy efficiency contacts.

#### *5.3.1.1 Implementation rate*

Of the 64 participants who completed the telephone interview, 26, or 40.6 percent, made changes to improve their pumping system operating efficiency approximately over a years time frame. This is somewhat higher than the 33 percent found in the past SDG&E study (Johnson, 1996). Analysis was done to see if the implementation rate varied by customer size or organizational type. Exhibit 5.27 and Exhibit 5.28 provide these rates.

**Exhibit 5.27**
**Implementation Rate, by Organization Type**

| Organization Type | Implementation Rate | N |
|---|---|---|
| Water Districts | 33% | 33 |
| Non-Water Districts | 50% | 30 |

**Exhibit 5.28**
**Implementation Rate by Size of Firm**

| Size of Firm | Implementation Rate | N |
|---|---|---|
| Small | 38.5% | 26 |
| Medium | 47.8% | 23 |
| Large | 35.7% | 14 |

T-tests were calculated for the possible pair-wise comparisons within these two exhibits and none were statistically significant. The largest difference seen was between the water and non-water districts. It is hypothesized that a significant difference could show up if the mix of pump test participants varied much from the PY2002 participants or the sample sizes were larger.

#### *5.3.1.2 Net-To-Gross Ratio*

Using the methods described in Section 4.3.2 for the customers who indicated that they had made changes to improve their pumping system operating efficiency, the un-weighted NTGR was estimated to be 0.73, with a 90 percent confidence interval of +/- 0.06. This means that 73 percent of the savings associated with these improvements in pumping system efficiency would not have occurred in the absence of the information provided by the PT&HS Program (i.e., the pump test). Conversely, it could be stated that 27 percent of the savings associated with the installation of these measures would have occurred anyway, if the PT&HS Program had not existed. Exhibit 5.29 presents the distribution of the NTGR for these 26 participants.

**Exhibit 5.29**
**NTGR Distribution**

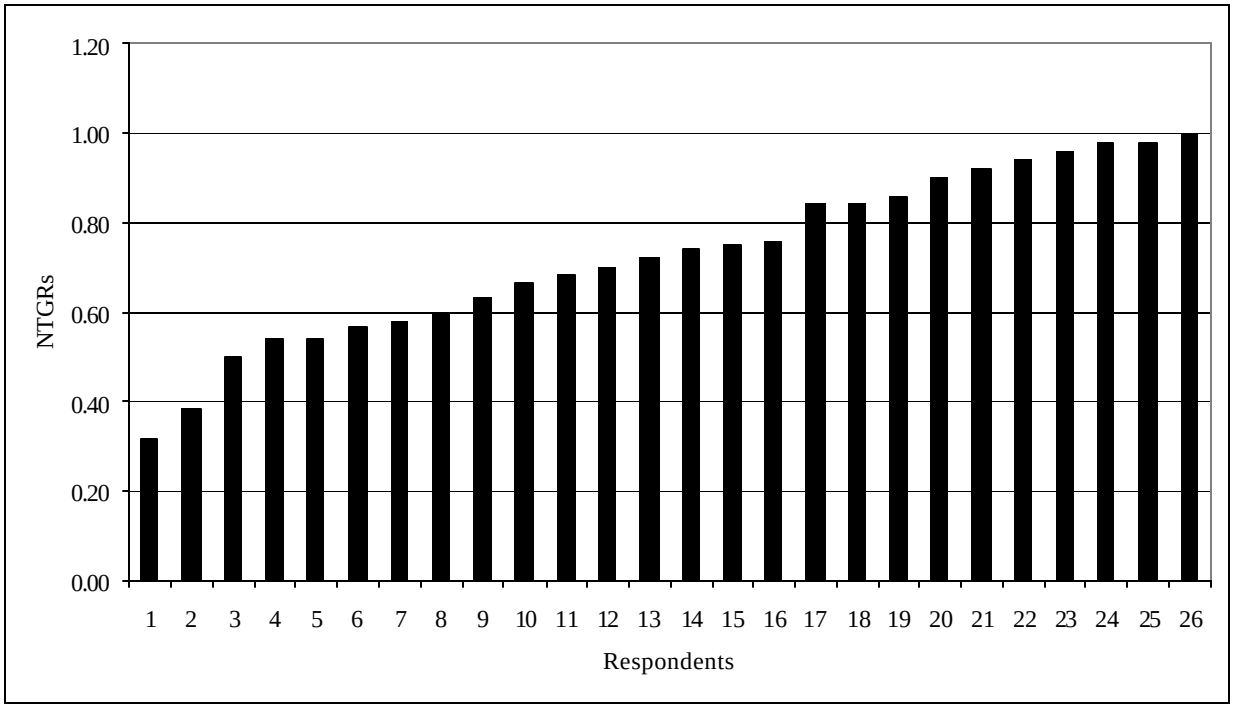



Exhibit 5.30 through Exhibit 5.32 show how the NTGR varies by size of firm, type of organization, and the combination of these two variables.

**Exhibit 5.30**
**NTGR, by Size of Firm**

| Size of Firm | NTGR |
|---|---|
| Small | 0.78 |
| Medium | 0.72 |
| Large | 0.62 |

The relationship, shown in Exhibit 5.30 between size of firm and the NTGR seems plausible. Small firms are less likely to have staff who are knowledgeable about pumping efficiency and are therefore less likely to have repaired their pump without the information provided by the SCE pump test. On the other hand, large firms are more likely to have knowledgeable staff are therefore more likely to have repaired their pumps without the information provided by the SCE pump test. However, when t-tests were calculated for the three possible pair-wise comparisons, none were statistically significant. Certainly, the difference between the small and large of 0.16 is of *practical* significance and of importance for program design.

From Exhibit 5.31 one can see that water districts have a somewhat lower NTGR than non-water districts. The fact that the NTGR for water districts is lower than that of non-water districts is intuitively

appealing. Firmographic data presented later in this section, indicate that water districts have, on average a larger number of pumps and pumps that are somewhat older They are, therefore, perhaps somewhat more likely to have knowledge about pump efficiency improvements and to have made the repairs to their pumping system without the information provided by the SCE pump test. The results of the t-test revealed that the difference between these two NTGRs is not statistically significant.

**Exhibit 5.31**
**NTGR, by Organization Type**

| Organization Type | NTGR |
|---|---|
| Water Districts | 0.71 |
| Non-Water Districts | 0.75 |

The pattern of decreasing NTGRs as the size of the firm increases is also seen both within water districts and non-water districts. Exhibit 5.32 illustrates this pattern. Due to small sample sizes, no ability to determine statistical difference was possible.

**Exhibit 5.32**
**NTGR by Size of Firm, by Organization Type**

| Organization Type | NTGR Small Firm | NTGR Medium Firm | NTGR Large Firm |
|---|---|---|---|
| Water Districts | 0.82 | 0.75 | 0.68 |
| Non-Water Districts | 0.76 | 0.71 | 0.38 |

In addition, SCE had a greater impact on the specification of the pumping improvements than other sources of this information. Exhibit 5.33 shows that nearly 54 percent of the participants who made pumping improvement indicated that the pump test results or the SCE representative had the greatest impact.

**Exhibit 5.33**
**Had the Greatest Impact on Specification of Pumping System Improvements**

| Sources | Frequency | Percent |
|---|---|---|
| Pump test results from SCE pump program | 12 | 46.2 |
| Equipment distributor or pump dealer | 4 | 15.4 |
| Installer | 4 | 15.4 |
| Internal staff | 3 | 11.5 |
| SCE representative | 2 | 7.7 |
| Don't Know | 1 | 3.9 |

#### *5.3.1.3 Diffusion of Information*

Awareness of the Program had diffused throughout a very large portion of the market, with nearly 91 percent of the pump test participants stating that they were aware of the SCE Pump Test Program prior to 2002. Much of this diffusion is likely due to word-of-mouth, which in smaller markets can be an effective way of spreading information about a new technology or service (Rogers, 1995). To underscore this point the surveyed customers stated that, since the installation, nearly 63 percent of the participants have told an average of 6.3 friends, neighbors and colleagues about the benefits of the pump test.

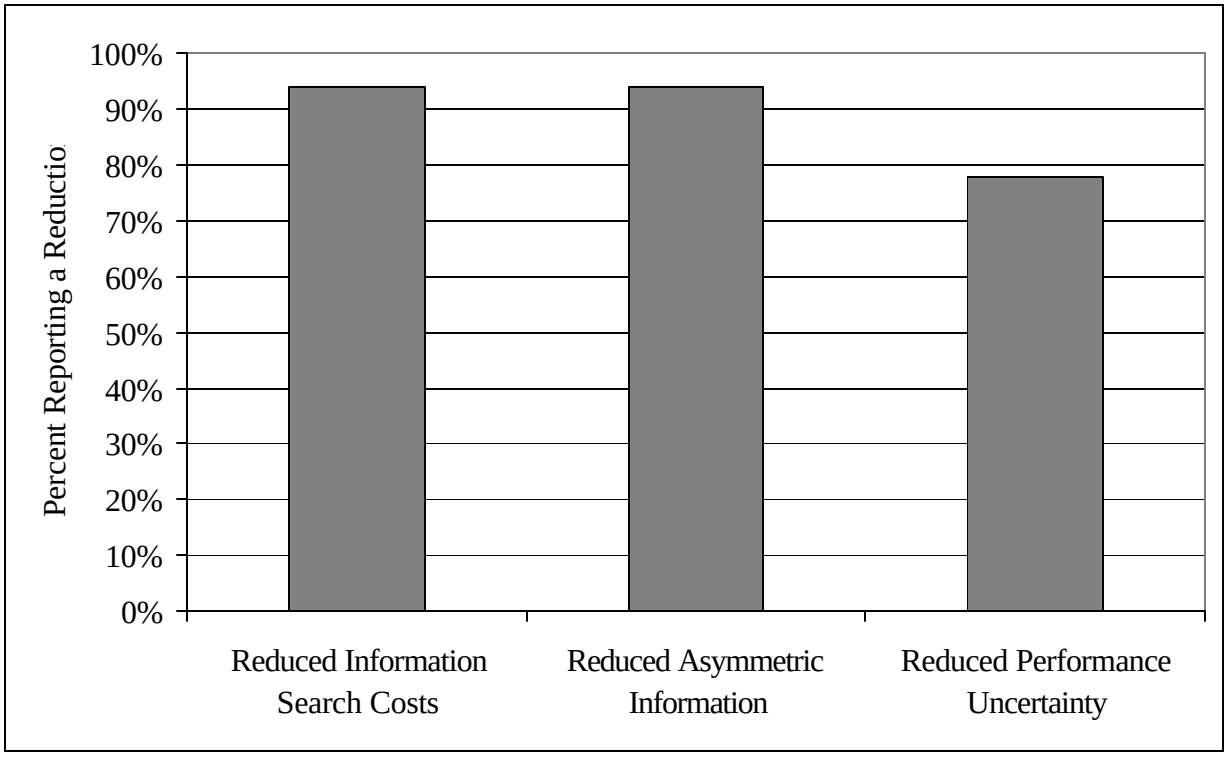
#### *5.3.1.4 Market Barriers*

Participants were also asked whether they recalled receiving, within the last three years, any printed material from SCE on energy efficiency. Seventy-five percent recall receiving such information. Those who recalled were then asked about the an effect of these materials on several market barriers:

1. **Information search costs** (reduced the time or cost of collecting information that you would otherwise need to get on your own)
2. **Asymmetric information** (reduced the information disadvantage you may have with some dealers and suppliers)
3. **Performance uncertainty** (reduced doubt and uncertainty about your pumping system efficiency).

Exhibit 5.34 suggests that the impact on these three market barriers was significant with 90 percent stating that the materials reduced the information-search costs and asymmetric information and nearly eighty percent stating that the materials reduced their performance uncertainty.

**Exhibit 5.34**
**Reduction of Market Barriers Due to the Program – Pump Test Participants**




The reduction of these market barriers is in large part due to the confidence that participants have in the information provided by SCE. Participants were asked how confident they are in the information provided by SCE's pump test results and how confident they would be if the pump test results were provided by a non-SCE firm. The means, the t value, and the associated probability are presented in Exhibit 5.35.

**Exhibit 5.35**
**t Test Results for Confidence in Pump Test Results, by Source**

| Source of Pump Test Information | Mean Level of Confidence | t | Probability |
|---|---|---|---|
| SCE | 9.2 | 5.36 | < .0001 |
| Non-SCE | 5.4 | | |

Clearly, participants are more confident in the test results they are provided by SCE than they would be from a non-SCE source. The t value of 5.36 is statistically significant at far less than the 0.01 level (Probability < .0001). The explanation for this large difference in confidence scores given to SCE and non-SCE firms is discussed next.

Each respondent was questioned about the confidence they had in the pump-test information provided by SCE and non-SCE firms and followed by questions about what their *confidence* or *lack of*

*confidence* was based upon. Those who answered with a "6" or above on the 10-point scale were considered to be confident while those who answered with a "5" or below were considered to be not confident. Participants confident in the information provided SCE's pump test results were asked what their confidence was based upon. Exhibit 5.36 presents their responses.

**Exhibit 5.36**
**Reasons for Being Confident in Information Provided by SCE's Pump Tests**

| Reasons For Confidence | Frequency | Percent |
|---|---|---|
| Your previous experience with SCE | 39 | 62.9 |
| The experience of other colleagues/growers | 4 | 6.5 |
| The person you talk to is knowledgeable | 12 | 19.4 |
| The fact that you feel they are unbiased | 4 | 6.5 |
| Other | 2 | 3.2 |
| Don't Know | 1 | 1.6 |

Nearly 63 percent indicated that their confidence is based on their previous experience with SCE while slightly more than 19 percent indicated that the SCE representative with whom they spoke is knowledgeable. Of the two respondents who were not confident, one indicated that his lack of confidence was based on his previous experience with SCE.

Participants were also asked how confident they would be if the pump tests were provided by a non-SCE firm. Those who were confident were then asked what their confidence was based upon. Exhibit 5.37 presents their responses.

**Exhibit 5.37**
**Reasons for Being Confident in Pump Test Information Provided by a Non-SCE Firm**

| Reasons for Confidence | Frequency | Percent |
|---|---|---|
| Your previous experience with them and long-term relationship | 12 | 32.4 |
| The experience of other colleagues/growers | 2 | 5.4 |
| The person you talk to is knowledgeable | 2 | 5.4 |
| The fact that you feel they are unbiased | 3 | 8.1 |
| Other | 5 | 13.5 |
| Don't Know | 13 | 35.1 |

Thirty-three percent indicated that their confidence is based on their previous experience with non-SCE firms and long-term relationship while 8 percent felt that the information provided was unbiased.

Those who were not confident were asked what their lack of confidence was based upon. Exhibit 5.38 presents these results.

**Exhibit 5.38**
**Reasons for Lack of Confidence in Pump Test Information Provided by a Non-SCE Firm**

| Reasons for Lack of Confidence | Frequency | Percent |
|---|---|---|
| Your previous experience with them | 6 | 14.0 |
| The person you talk to is not knowledgeable | 3 | 7.0 |
| The fact that you feel they are biased | 9 | 20.9 |
| Other | 12 | 27.9 |
| Don't Know | 13 | 30.2 |

Nearly 21 percent felt that the information provided was biased and nearly 14 percent indicated their previous experience with them.

Clearly, previous experience with SCE and the fact that the SCE representative are considered to be knowledgeable combined with the perception that non-SCE firms do not provide unbiased information explain most of the difference between the confidence scores given to SCE and non-SCE firms shown in Exhibit 5.35.

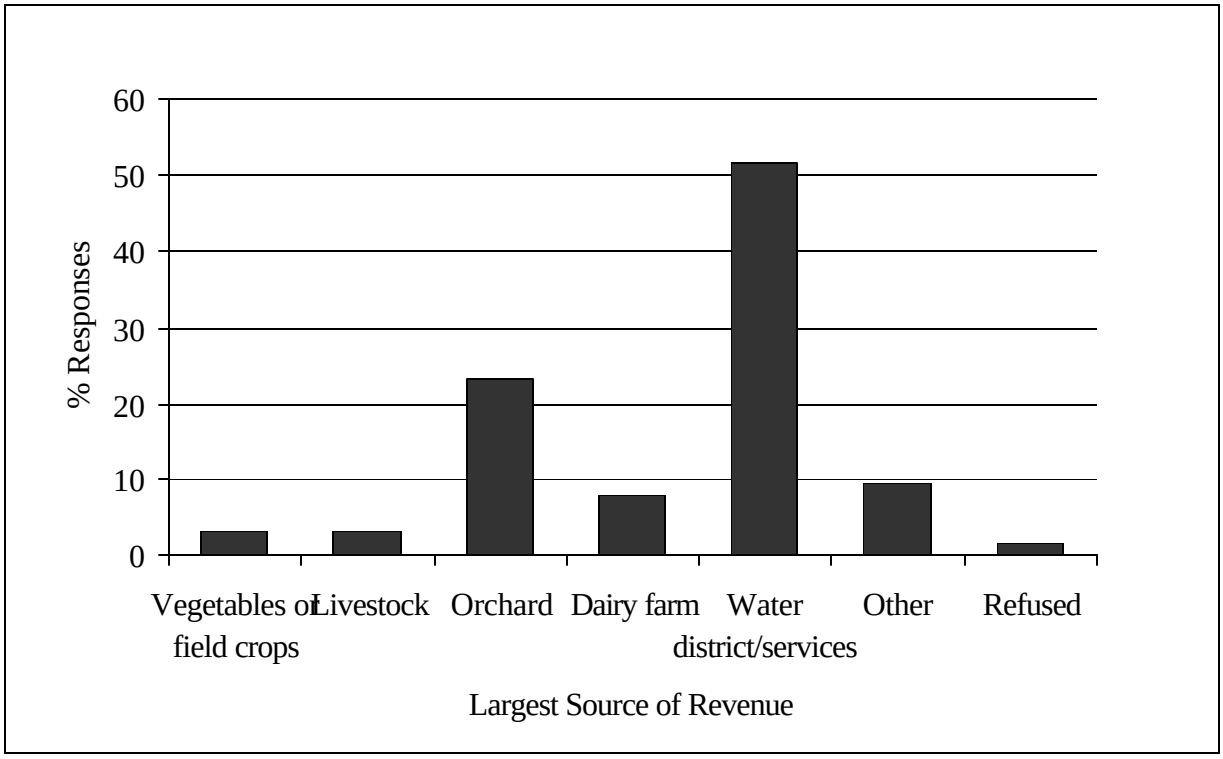
#### *5.3.1.5 Firmographics*

In this section, the self-reported basic information regarding participant characteristics is presented, including:

- Largest source of revenue
- Type of organization
- Size of organization
- Time at current location
- Number of pumps,
- Age of pumps, and
- Months in which pumps are used.

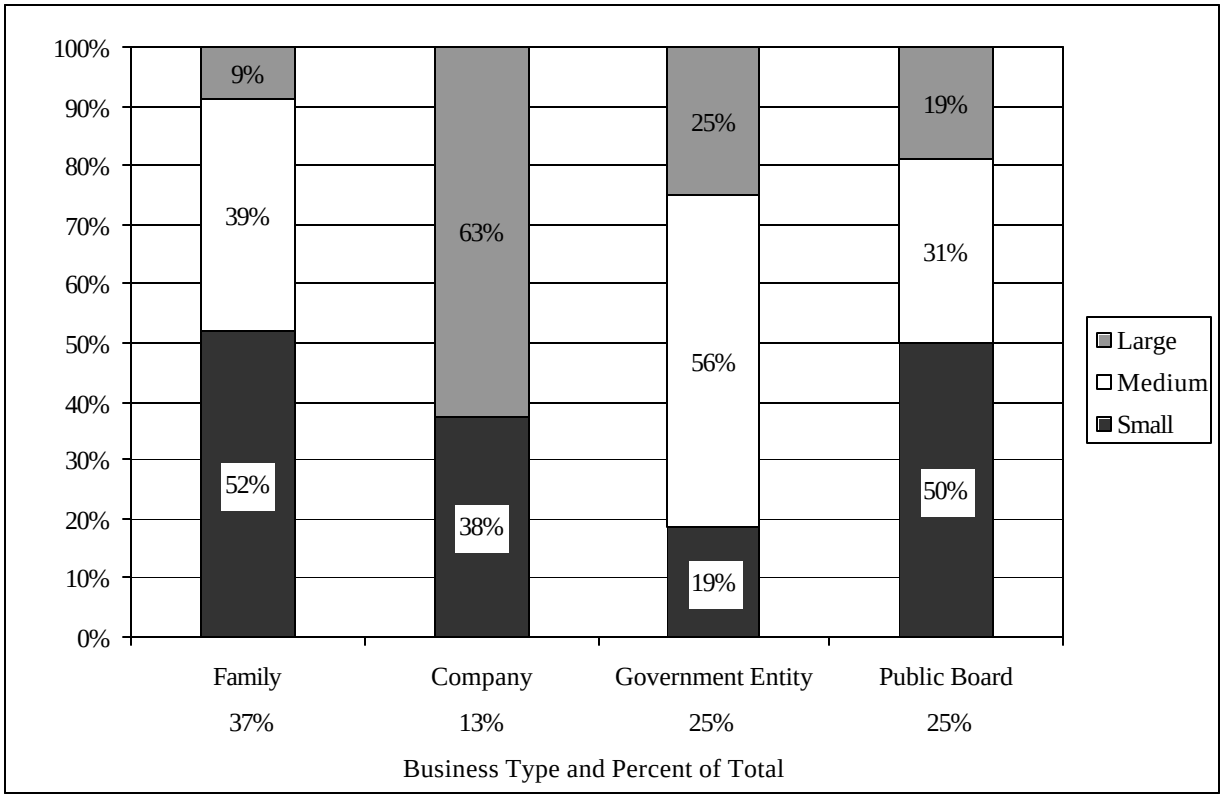
We asked respondents what was their largest source of revenue. Exhibit 5.39 presents these results. Water districts comprise nearly 52 percent of the participants with orchards representing the next largest group at 23 percent. Over 90 percent of the non-water-agency customers own the property their businesses occupy.

**Exhibit 5.39**
**Largest Source of Revenue – Pump Test Participants**




With respect to the type of operating structure, approximately 37 percent are family operated, while 25 percent are government operated, and another 25 percent are operated by a board.. Participants were also asked to report whether they are a small, medium, or large business. Exhibit 5.40 presents results that indicate the percent of the self-reported size by operating structure.

**Exhibit 5.40**
**Type of Operating Structure and Size – Pump Test Participants**




The PY 2002 Program was comprised of long-time, stable customers. Nearly 94 percent of participants have been at their current location for more than 10 years. Exhibit 5.41 presents these results.

**Exhibit 5.41**
**Time at Current Location – Pump Test Participants**

| Time at Current Location | Frequency | Percent |
|---|---|---|
| 4 to 10 years | 3 | 4.7 |
| More than 10 years | 60 | 93.8 |
| Refused | 1 | 1.6 |

Participants were also asked about the number and age of their electric water pumps. Exhibit 5.42 presents the mean and standard error of number of pumps and the age of these pumps.

**Exhibit 5.42**
**Mean Number of Electric Water Pumps and Mean Age of Pumps (Yrs) – Pump Test Participants**

| Number and Age of Pumps | Mean | Standard Error |
|---|---|---|
| Number of Electric Water Pumps | 20.3 | 3.3 |
| Age of Pumps (yrs) | 15.3 | 1.4 |

It is instructive to examine the breakdown of these two variables by the size of the organization and whether the organization is a water district. Exhibit 5.43 and Exhibit 5.44 present these results.

**Exhibit 5.43**
**Number and Age of Pumps, by Size of Organization – Pump Test Participants**

| | Small | | Medium | | Large | |
|---|---|---|---|---|---|---|
| Number and Age of Pumps | Mean | Standard Error | Mean | Standard Error | Mean | Standard Error |
| Number of Electric Water Pumps | 7.1 | 1.9 | 29.6 | 7.0 | 30.9 | 7.2 |
| Age of Pumps (yrs) | 14.6 | 2.5 | 13.9 | 1.6 | 18.8 | 3.9 |

Not surprisingly, the number of pumps increases with the size of the organization, although the number of pumps for large organizations is only slightly larger than the number of pumps for medium organizations. The mean age of the pumps of small and medium size organizations are nearly the same, 14.6 years and 13.9 years, respectively. However, the mean age of the pumps of large organizations is 35 percent greater than the mean age of medium size customers.

In Exhibit 5.45, the mean age of pumps for water districts is nearly 19 percent greater than that of non-water districts while the mean number of pumps of water districts is 149 percent greater than non-water districts. Having a greater number of pumps that are also older makes water districts a reasonably large source of future savings potential.

**Exhibit 5.44**
**Number and Age of Pumps, by Water District, by Other – Pump Test Participants**

| | Water Districts | | Other | |
|---|---|---|---|---|
| Number and Age of Pumps | Mean | Standard Error | Mean | Standard Error |
| Number of Electric Water Pumps | 28.4 | 5.1 | 11.4 | 3.7 |
| Age of Pumps | 16.5 | 2.2 | 13.9 | 1.9 |

Participants were asked how many months, on average, their pumps are used. As Exhibit 5.45 shows, over 54 percent indicated that they use their pumps through the year.

**Exhibit 5.45**
**Number of Months Pumps in Use – Pump Test Participants**

| Number of Months Pumps Used | Frequency | Percent |
|---|---|---|
| Less than 3 months | 2 | 3.1 |
| 3 to 6 months | 13 | 20.3 |
| 7 to 9 months | 14 | 21.9 |
| Year round | 35 | 54.7 |

Whether the number of months in which a participant uses their pumps varies as a function of the size of an organization and type of organization was examined. There was no relationship found between the size of an organization and the number of months in which the pumps are used (Chi Square=0.86, Probability=0.65).

However, there was a statistically significant and strong relationship between the type of organization and the number of months in which the pumps are used (Chi Square=19.35, Probability=0.0001). That is, water districts tend to use their pumps a larger portion of the year than do non-water districts. Exhibit 5.46 presents the cross-tabulation of these two variables.

**Exhibit 5.46**
**Cross-tabulation of Number of Months Pumps in Use by Type of Organization – Pump Test Participants**

| Number of Months Pumps Used | Water Districts | | Non-Water Districts | |
|---|---|---|---|---|
| | Frequency | Percent | Frequency | Percent |
| 0 to 6 Months | 3 | 9 | 12 | 40 |
| 7 - 12 Months | 30 | 91 | 18 | 60 |

### 5.3.2 Nonparticipants

#### *5.3.2.1 Diffusion of Information*

Awareness of the Program had diffused throughout the market, with over 54 percent of the nonparticipants stating that they were aware of the SCE Pump Test Program prior to the interview (See Exhibit 5.15). This is not surprising since more than 44 percent had their pumps tested prior to 2000. However, this level of awareness is 37 percentage points lower than that observed among participants.

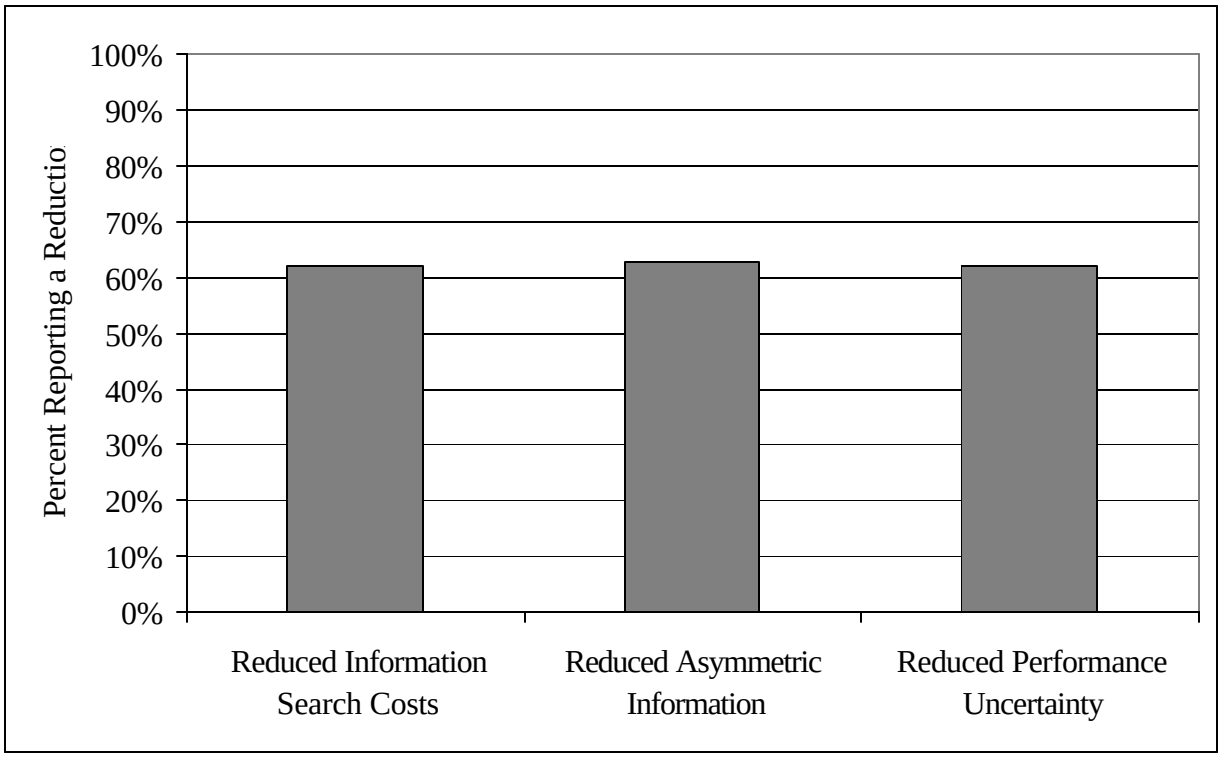
#### *5.3.2.2 Market Barriers*

Nonparticipants were also asked whether, in the last five years, they had received any printed material from SCE about pumping productivity that explained the benefits of making pump repairs or operating efficiency improvements to their pumping system and options for making repairs and improvement to save energy. Over 60 percent of the respondents recalled receiving such information. Those who recalled receiving this information were then asked to report the impact of this information on several market barriers:

1. **Information search costs** (reduced the time or cost of collecting information that you would otherwise need to get on your own)
2. **Asymmetric information** (reduced the information disadvantage you may have with some dealers and suppliers)
3. **Performance uncertainty** (reduced doubt and uncertainty about your pumping system efficiency).

Exhibit 5.47 suggests that the impact on these three market barriers was significant, with over 60 percent stating that the materials reduced all three market barriers.

**Exhibit 5.47**
**Reduction of Market Barriers Due to the Program - Nonparticipants**




The reduction of these market barriers is in large part due to the confidence that nonparticipants have in the information provided by SCE. Nonparticipants were asked how confident they would be in the information provided by SCE's pump test results and how confident they would be if the pump tests

were provided by a non-SCE firm. The means, the t value, and the associated probability are presented in Exhibit 5.48.

**Exhibit 5.48**
**t Test Results for Confidence in Pump Test Results, by Source**

| Source of Pump Test Information | Mean Level of Confidence | t | Probability |
|---|---|---|---|
| SCE | 7.9 | 2.72 | < .009 |
| Non-SCE | 6.6 | | |

Nonparticipants are more confident in the test results if they are provided by SCE. The t value of 2.72 is statistically significant at less than the 0.01 level (Probability < .009). The explanation for this difference in confidence scores given to SCE and non-SCE firms is discussed in the following section.

Each respondent was questioned about the confidence they had in the pump-test information provided by SCE and non-SCE firms was followed by questions about what their *confidence* or *lack of confidence* was based upon. Those who answered with a "6" or above on the 10-point scale were considered to be confident while those who answered with a "5" or below were considered to be not confident. Nonparticipants who are confident in the information provided SCE's pump test results were asked what their confidence was based upon. Exhibit 5.49 presents their responses.

**Exhibit 5.49**
**Reasons for Being Confident in Information Provided by SCE's Pump Tests**

| Reasons for Confidence | Frequency | Percent |
|---|---|---|
| Your previous experience with SCE | 23 | 45.1 |
| The experience of other businesses like yours | 3 | 5.9 |
| The person you talk to is knowledgeable | 10 | 19.6 |
| The fact that you feel they are unbiased | 8 | 15.7 |
| Other | 7 | 13.7 |

Forty-five percent indicated that their confidence is based on their previous experience with SCE while 20 percent indicated that the SCE representative with whom they spoke is knowledgeable. Sixteen percent felt that the information was unbiased. Of the 12 respondents who were not confident, 33 percent (4) indicated that their lack of confidence was based on that previous experience with SCE.

Nonparticipants were also asked how confident they would be if the pump tests were provided by a non-SCE firm. Those who were confident were then asked what their confidence was based upon. Exhibit 5.50 presents their responses.

**Exhibit 5.50**
**Reasons for Being Confident in Pump Test Information Provided by a Non-SCE Firm**

| Reasons for Confidence | Frequency | Percent |
|---|---|---|
| Your previous experience with them and long-term relationship | 17 | 54.8 |
| The experience of other businesses like yours | 3 | 9.7 |
| The person you talk to is knowledgeable | 4 | 12.9 |
| The fact that you feel they are unbiased | 5 | 16.1 |
| Other | 2 | 6.5 |

Fifty-five percent indicated that their confidence is based on their previous experience and long-term relationships while 16 percent felt that the information provided was unbiased. Of the 9 who were not confident, 37 percent felt that the information provided was biased.

Clearly, previous experience with SCE firms and the fact that the SCE representative are considered to be more knowledgeable explain much of the difference between the confidence scores given to SCE and non-SCE pump testers.

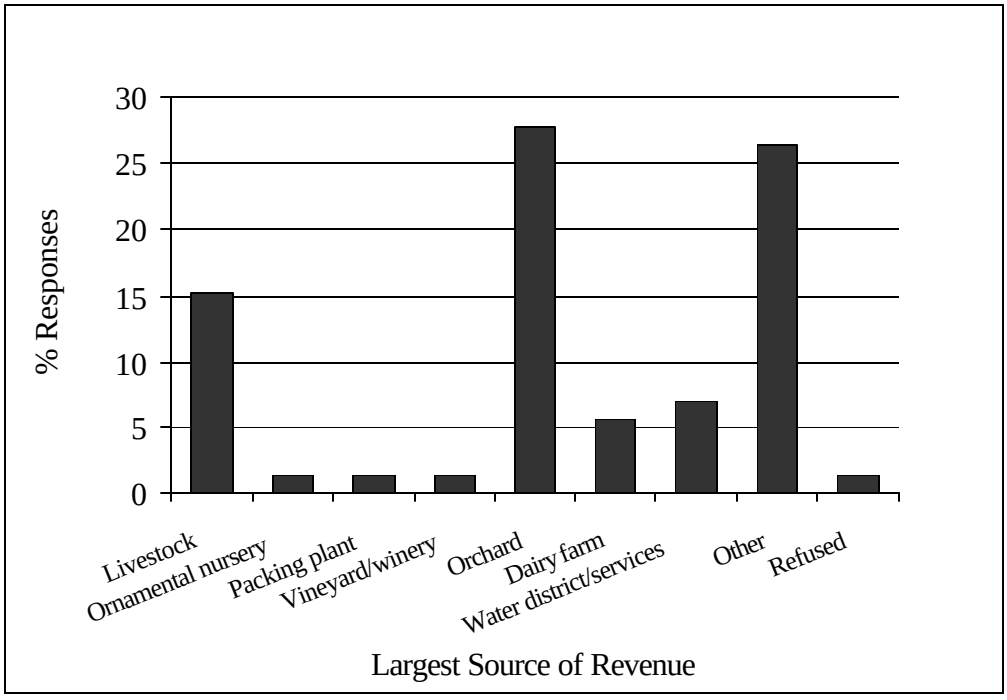
#### *5.3.2.3 Firmographics*

This section provides the self-reported basic information regarding nonparticipant characteristics, including:

- Largest source of revenue
- Type of organization
- Size of organization
- Time at current location
- Number of pumps,
- Age of pumps, and
- Months in which pumps are used.

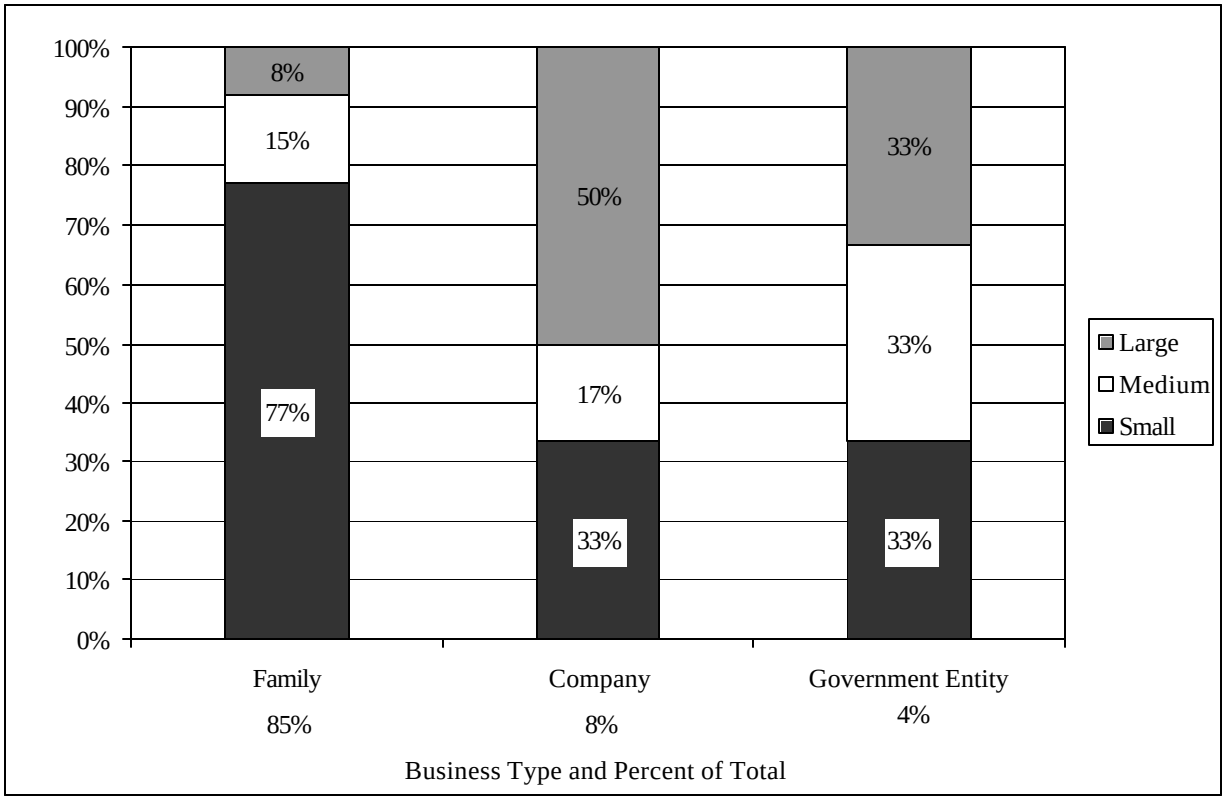
Respondents were asked what was their largest source of revenue. Exhibit 5.51 presents these results. It is noteworthy that only slightly less than 7 percent of the nonparticipants are water districts. The largest group of nonparticipants are orchards. Over 89 percent of the nonparticipants own the property their businesses occupy.

**Exhibit 5.51**
**Largest Source of Revenue for Nonparticipants**




With respect to the type of operating structure, nearly 85 percent are family operated, while 8 percent are company operated, and another 4 percent are operated by a board (2 percent were non applicable responses). Participants were also asked to report whether they are a small, medium, or large business. Slightly over 70 percent consider their organization to be small, nearly 16 percent consider their organization to be medium, and only about 13 percent consider their organization to be small. Exhibit 5.52 presents a cross tabulation of the results of both operating structure and business size.

**Exhibit 5.52**
**Type of Operating Structure by Size of Company - Nonparticipants**




The nonparticipants were also long-time, stable customers. Nearly 81 percent of participants have been at their current location for more than 10 years. However, this is 13 percentage points lower than that observed among participants. Exhibit 5.53 present these results.

**Exhibit 5.53**
**Time at Current Location - Nonparticipants**

| Time at Current Location | Frequency | Percent |
|---|---|---|
| 1 to 3 years | 4 | 5.6 |
| 4 to 10 years | 10 | 13.9 |
| More than 10 years | 58 | 80.6 |

Nonparticipants were also asked about the number and age of their electric water pumps. Exhibit 5.54 presents the mean and standard error of number of pumps and the age of these pumps.

**Exhibit 5.54**
**Mean Number of Electric Water Pumps and Mean Age of Pumps - Nonparticipants**

| Number and Age of Pumps | Mean | Standard Error |
|---|---|---|
| Number of Electric Water Pumps* | 4.8 | 1.0 |
| Age of Pumps | 14.3 | 1.4 |

* Note that one outlier with a value of 225 pumps was not used in any calculations.

It is revealing to examine the breakdown of these two variables by the size of the organization and whether the organization is a water district. Exhibit 5.55 and Exhibit 5.56 present these results.

**Exhibit 5.55**
**Number and Age of Pumps, by Size of Organization - Nonparticipants**

| | Small | | Medium | | Large | |
|---|---|---|---|---|---|---|
| Number and Age of Pumps | Mean | Standard Error | Mean | Standard Error | Mean | Standard Error |
| Number of Electric Water Pumps | 2.5 | 0.4 | 7.7 | 2.6 | 16.0 | 5.8 |
| Age of Pumps | 13.8 | 1.5 | 17.7 | 3.6 | 14.0 | 6.2 |

Not surprisingly, the number of pumps increases with the size of the organization. However, the mean age of the pumps is fairly similar regardless of organization size.

The mean age of pumps for water districts is 42 percent shorter than that of non-water districts while the mean number of pumps of water districts is close to five times greater than non-water districts. This contrasts to the participating water districts who had older pumps.

**Exhibit 5.56**
**Number and Age of Pumps, by Water District, by Other - Nonparticipants**

| | Water Districts | | Other | |
|---|---|---|---|---|
| Number and Age of Pumps | Mean | Standard Error | Mean | Standard Error |
| Number of Electric Water Pumps* | 18.0 | 9.4 | 3.8 | 0.6 |
| Age of Pumps | 6.4 | 1.8 | 15.8 | 1.5 |

* Note that one outlier with a value of 225 pumps was not used in any calculations.

Participants were also asked how many months, on average, the pumps are used. Exhibit 5.57 present the results. As one can see, about 53 percent indicated that they use their pumps through the year.

**Exhibit 5.57**
**Number of Months Pumps in Use - Nonparticipants**

| Number of Months Pumps Used | Frequency | Percent |
|---|---|---|
| Less than 3 months | 4 | 5.7 |
| 3 to 6 months | 17 | 24.3 |
| 7 to 9 months | 12 | 17.1 |
| Year round | 37 | 52.9 |

Whether the number of months in which a participant uses their pumps varies as a function of the size of an organization and type of organization was also assessed. There was no relationship between the size of an organization and the number of months in which the pumps are used (Chi Square=2.26, Probability=0.12).

Because there were only five water districts in the nonparticipant sample, a statistical analysis of the relationship between the number of months that the pumps are used and whether one is a water district was not possible. However, all five water districts pump throughout the year.

#### *5.3.2.4 Motivation to Know More About Pumping Efficiency*

The nonparticipants were queried as to how important is was for them to be sure that their pumping system makes efficient use of electricity. They were ask to respond using a 10-point scale with a "0" indicating "not at all important" and a "10" indicating "very important." Respondents indicated a strong interest in this issue with a mean of 8.4.

### 5.3.3 Participants Versus Nonparticipants

In this section, direct comparisons are made between participants and nonparticipants with respect to eight attributes:

- Type of organization
- Ownership of the property
- Type of operation
- Size of organization
- Length of time at current location
- Number of months pumps used during year
- Age of pumps, and
- Number of pumps

Both chi-square and t-test were used to examine any differences. Exhibit 5.58 presents a summary of the findings.

**Exhibit 5.58**
**Summary of Differences Between Pump Test Participants and Nonparticipants**

| Attribute | Results of Comparison | Statistical Test Results |
|---|---|---|
| Type of organization | Visual inspection reveals that more water districts among participants | Statistical test (Chi-Square[6]) could not be calculated due to sparsely populated cells) |
| Ownership of the property | No statistically significant difference | Chi-Square=0.006, $p = 0.94$ |
| Type of operation | Statistically significance difference: More family-run businesses among nonparticipants; more government entities and more public boards among participants. | Chi-Square=36.8, $p < .0001$ |
| Size of organization | Statistically significant difference: More medium and large businesses among the participants. | Chi-Square=12.6, $p <.002$ |
| Length of time at current location | Visual inspection reveals that participants have been longer at current location. | Statistical test (Chi-Square) could not be calculated due to sparsely populated cells) |
| Number of months pumps used during year | No statistically significant difference | Chi-Square=0.73, $p = .39$ |
| Age of pumps | No statistically significant difference | t-test=0.50, $p = 0.62$ |
| Number of pumps | Statistically significant difference: participants have an average of 20 pumps and nonparticipants have an average of 8 pumps. | t-test=2.6, $p = 0.009$ |

Pump test participants in the PY2002 program can be generally characterized as:

- Customers with a large number of pumps
- Government entities and customers with public boards

[6] The chi-square test is one way to examine the association between a single categorical independent variable and a nominal or ordinal dependent variable. A t-test is used to determine whether the difference between the means of two groups is statistically significant. A *p* value that is equal to or less than 0.05 indicates statistical significance.

- Customers who have been at their location for more than 10 years
- Medium and large size organizations
- A large proportion of water districts

Put another way, small family-run businesses with a small number of pumps appear to be under-represented.

### 5.3.4 Energy Efficiency Contact Customers

#### *5.3.4.1 Diffusion of Information*

Awareness of the Program among EE Contact customers was moderate, with 58 percent of respondents stating that they were aware of the SCE Pump Test Program prior to 2002. Of the 58 percent who were aware of the program prior to 2002, 79 percent had participated in the program at some point. Of those who were not aware of the Program prior to 2002, only 14 percent subsequently participated in the program after learning about the program. While a large proportion of the respondents indicated that they received information relating to pump tests and improving pumping productivity, there was little diffusion of information about the benefits of pump testing, or making pump repairs or efficiency improvements on pumping systems by word-of-mouth. Sixty-five percent of the surveyed EE contact customers indicate that they did not tell any business colleagues or other farmers about the benefits of pump testing, or making pump repairs or efficiency improvements on pumping systems. On average, those who did share such information by word-of-mouth told an average of 2.5 colleagues or other farmers.

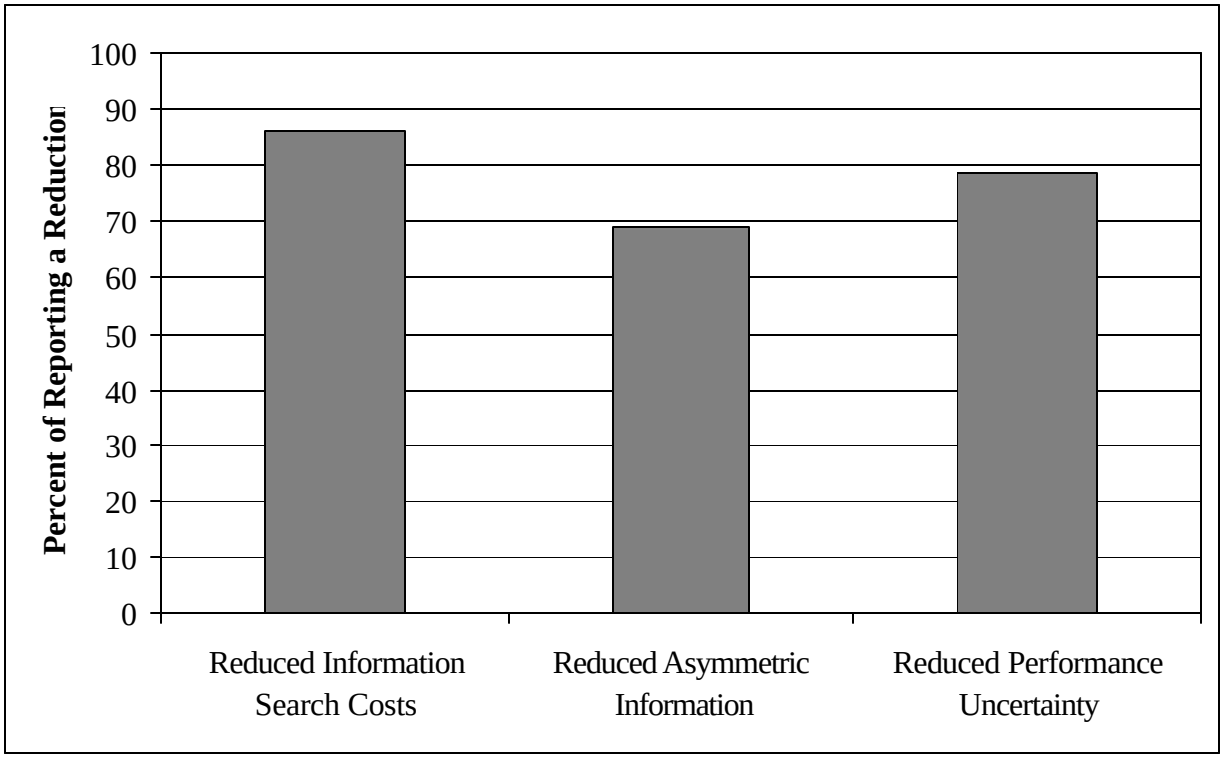
#### *5.3.4.2 Market Barriers*

EE Contact customers were asked whether they recalled receiving, within the last five years, any printed material from SCE on energy efficiency. Ninety-six percent recall receiving such information. Those who recalled were then asked about the effect of these materials on several market barriers:

1. **Information search costs** (reduced the time or cost of collecting information that you would otherwise need to get on your own)
2. **Asymmetric information** (reduced the information disadvantage you may have with some dealers and suppliers)
3. **Performance uncertainty** (reduced doubt and uncertainty about energy efficiency).

Exhibit 5.59 suggests that the impact on these three market barriers was large with 85 percent of those that responded stating that the materials reduced the information-search cost. However slightly fewer, 66 and 77 percent respectively, state that the materials reduced the asymmetric information and their performance uncertainty.

**Exhibit 5.59**
**Reduction of Market Barriers Due to the Program – EE Contacts**




EE contact customers were not asked additional follow-up questions that could be used to explain the reduction of these market barriers.

### *5.3.4.3 Firmographics*

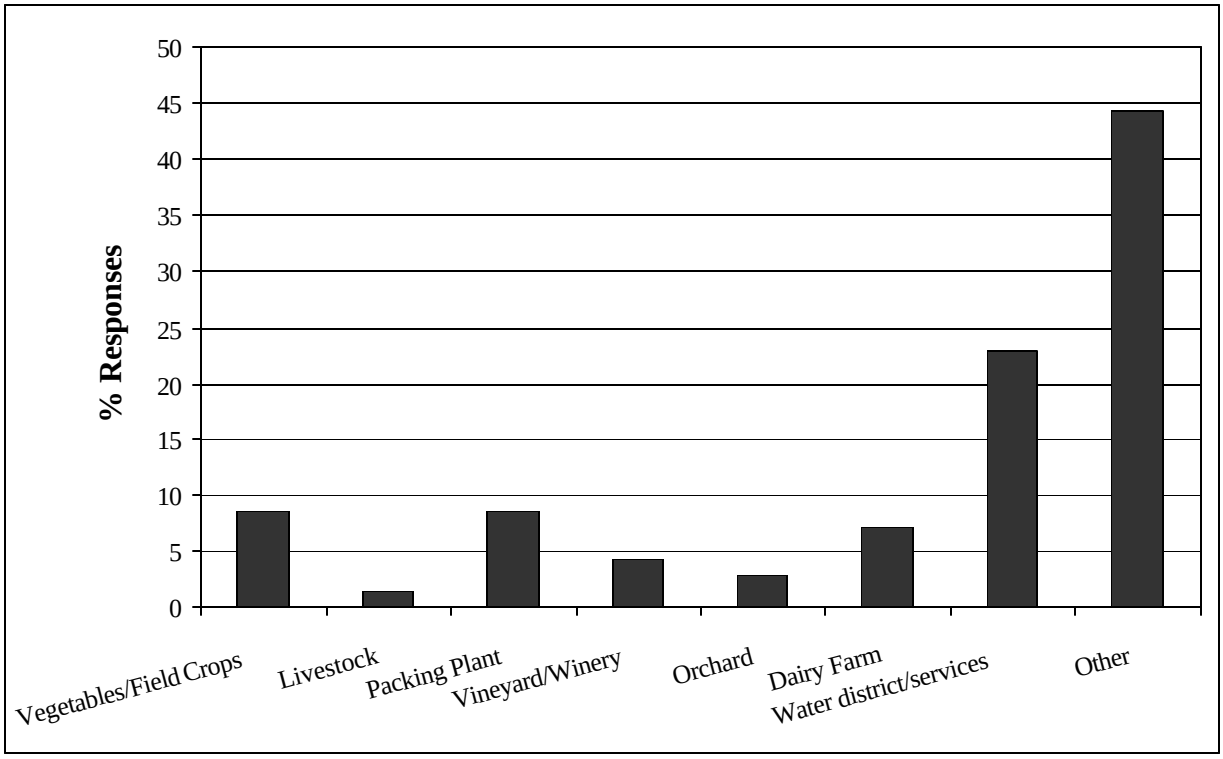
In this section, the self-reported basic information regarding EE contact customer characteristics is presented, including:

- Largest source of revenue
- Type of organization
- Size of organization
- Time at current location
- Number of pumps,
- Age of pumps, and
- Months in which pumps are used.

Respondents were asked about their largest source of revenue. Exhibit 5.60 presents these results. Most responses (44.3 percent) fell into the "Other" category with the sources of revenue stemming from a mix of activities including, cities, government, school districts, manufacturing, tax revenue, oil refining, and coops. Water districts represented the next largest group at 23 percent with vegetables/field crops and packing plants comprising 9 percent each. Eighty-seven percent of the customers in the "Other" category, who own the property their businesses occupy. One hundred percent of the remaining non-

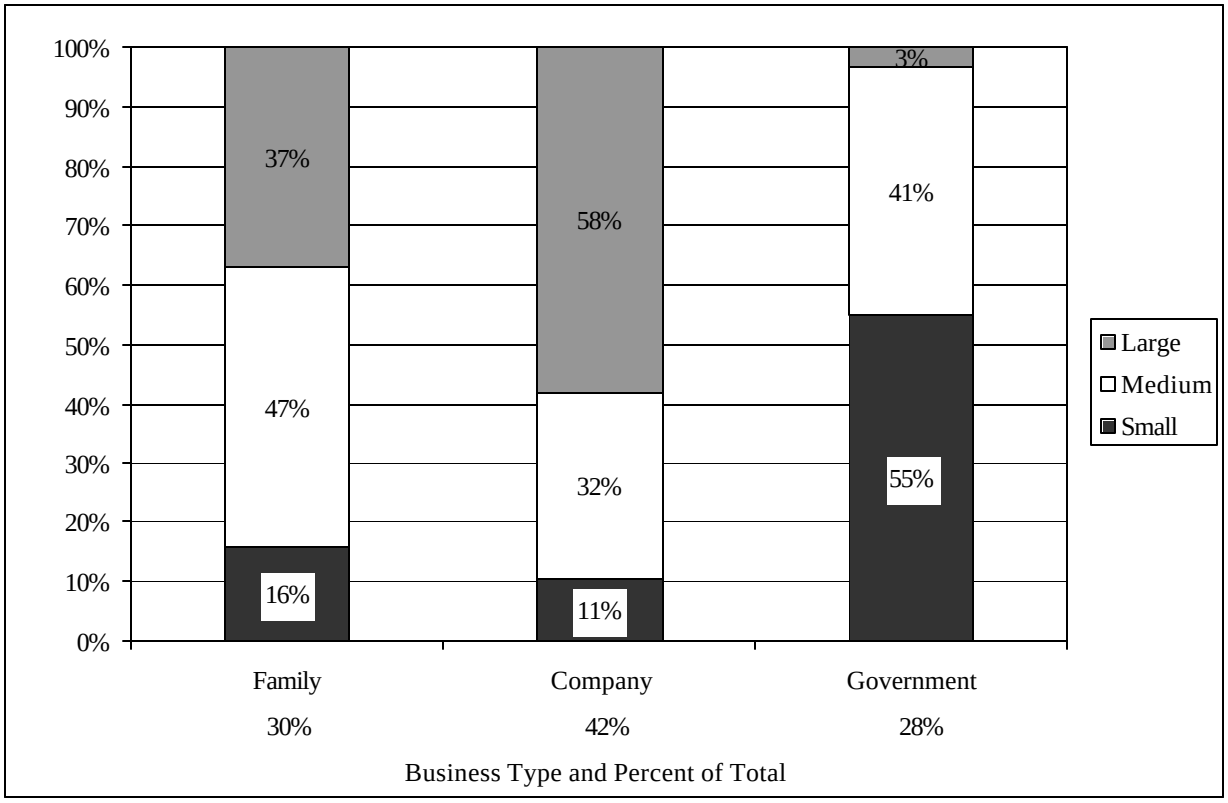
water-agency customers own the property their businesses occupy and 94 percent of the water district/services own the property their businesses occupy.

**Exhibit 5.60**
**Largest Source of Revenue – EE Contacts**




With respect to the type of operating structure, approximately 28 percent are family operated, and another 28 percent are company operated, while 42 percent are operated by a government entity. EE contact customers were also asked to report whether they are a small, medium, or large business. Exhibit 5.61 presents results that indicate the percent of the self-reported size by operating structure.

**Exhibit 5.61**
**Type of Operating Structure, by Size – EE Contacts**




The PY 2002 Program was comprised of long-time, stable customers. Seventy-seven percent of EE contact customers have been at their current location for more than 10 years. Exhibit 5.62 presents these results.

**Exhibit 5.62**
**Time at Current Location – EE Contacts**

| YEARS | Frequency | Percent |
|---|---|---|
| 1-3 years | 5 | 7.1 |
| 4-10 years | 11 | 15.7 |
| More than 10 years | 54 | 77.1 |

EE contact customers were also asked about the number and age of their electric water pumps. Exhibit 5.63 presents the mean and standard error of number of pumps and the age of these pumps.

**Exhibit 5.63**
**Mean Number of Electric Water Pumps and Mean Age of Pumps (Yrs) – EE Contacts**

| Number and Age of Pumps | Mean | Standard Error |
|---|---|---|
| Number of Electric Water Pumps | 13.9 | 2.4 |
| Age of Pumps (yrs) | 13.5 | 1.7 |

The breakdown of these two variables is also given by the size of the organization. Exhibit 5.64 presents these results.

**Exhibit 5.64**
**Number and Age of Pumps, by Size of Organization – EE Contacts**

| | Small | | Medium | | Large | |
|---|---|---|---|---|---|---|
| Number and Age of Pumps | Mean | Standard Error | Mean | Standard Error | Mean | Standard Error |
| Number of Electric Water Pumps | 14.7 | 2.9 | 12.0 | 2.8 | 16.6 | 7.4 |
| Age of Pumps (yrs) | 12.0 | 3.4 | 13.4 | 2.6 | 15.3 | 3.4 |

The number of pumps varies with the size of the organization, although there is not a wide variation in the mean number of pumps by size for these customers. This may be due to the fact that there is significant variation in the type of customer (by source of revenue) included in the population of EE contacts. Similarly, the mean age of the pumps do not very much by size of the organization, although the mean age of the pumps of larger customers is somewhat higher than that of small and medium size customers.

EE contact customers were asked how many months, on average, their pumps are used during a year. As Exhibit 5.65 shows, customers with pumps who responded to this question, over 69 percent indicated that they use their pumps year round.

**Exhibit 5.65**
**Number of Months Pumps in Use – EE Contacts**

| Number of Months Pumps Used | Frequency | Percent |
|---|---|---|
| Less than 3 months | 1 | 1.7 |
| 3 to 6 months | 6 | 10.3 |
| 7 to 9 months | 11 | 19.0 |
| Year round | 40 | 69.0 |

## 5.4 Method to Estimate Energy Savings

Two components of energy savings impact, gross savings and net savings, were reviewed to evaluate the means to estimate the potential energy savings from the pump test recommendations. The following discussion provides the results of this review and recommendation for calculating energy impacts from the PT&HS program.

### 5.4.1 SCE PT&HS Market

The population serviced by the PT&HS Program is relevant to an impact calculation as there may be large differences in potential energy savings based on the customer type (e.g., water agencies use pumps year round while agricultural customers use pumps periodically during the year and, depending on the available surface water, there may be years with little pump use).

A market effects study was performed on the SCE PT&HS Program in 1998 (RLW, 1998) that characterized the current pumping market for SCE. Among the findings of that report were:

- The program tested pumps for 19 percent of agricultural and water customer premises that represented 52 percent of energy usage of the total agricultural and water customer premises (pump test customers averaged 202 MWh per premise while nonparticipants averaged 45 MWh per premise).
- 43 percent of past pump tests were performed for water customers, 40 percent were for agricultural customers, and 17 percent were for other types of customers.[7]
- The program provides testing on various pump types. Horizontal centrifugal booster pumps were 11 percent of past pump tests, deep well turbines were 53 percent of past tests, turbine boosters were 22 percent of past tests, submersible wells were 12 percent of past tests, and submersible boosters were 2 percent of past tests.
- 74 percent of pumps tested were found to be below an efficiency level deemed appropriate by industry standards and received a cost analysis letter recommending efficiency improvements.
- Naturally occurring levels of pump testing may be as low as 17 percent or as high as 58 percent of all premises.

Therefore, past analyses indicate that much of the energy use for the water and agricultural pumping customers is from a relatively small number of customers. These high-use customers tended to take advantage of the program and request pump tests through the SCE PT&HS Program.

There are a large number of pumps tested that appear to need repairs. The implementation rate (see Section 5.3.1.1) for those with SCE pump tests is 41%. The analysis found no statistical difference between the implementation rates of water districts and non-water districts, nor did it find any statistical difference in implementation rate by size of firm (water and non-water districts combined for the analysis

[7] This data based on pump tests performed from 1990-1997, the period covered within the market effects study.

of implementation rate by size). However, it is hypothesized that a significant difference could show up if the mix of pump test participants varied much from the PY2002 participants.

Pump types have various levels of efficiency potential (i.e., smaller horsepower turbine pumps may average 64 percent efficiency while larger turbine booster pumps may average 69 percent efficiency). Agricultural growers use the different pumps for different reasons and the decision point on when to repair the pump may vary. Therefore, the expectation of efficiency and impact potential will vary by pump type.

These differences can affect both gross and net savings calculations of the program. Each of these savings calculation methods are discussed next and recommendations made on the use of these methods.

### 5.4.2 Gross kWh Impact Calculation

Assuming that the goal of the PT&HS Program is to provide reliable energy savings, then the more detailed and precisely measured the variables in an algorithm for calculating energy impacts are, the greater the certainty of the savings numbers. The study describes two similar methods to calculate the gross savings.

**Exhibit 5.66**
**Method One for Calculating Gross Impacts**

Program Level Gross kWh Impact =

$$\sum_{j=1}^{n} \left(\text{Annual kWh Usage}_{pre,j} * \text{Avg.OPE Ratio}_{j}\right) * \text{Implementation Rate} \quad (3)$$

Where:

Annual kWh Usage, $_{pre,j}$ = total kWh usage prior to an efficiency improvement for all pumps of type j

OPE = Overall Pumping Plant Efficiency from a pump test

OPE Ratio $= \left(1 - \frac{OPE_{pre}}{OPE_{post}}\right)$

Avg OPE Ratio,$_j$ = Average of OPE ratios with both pre- and post-repair pump test results for pump type j

j = type of pump

Implementation Rate = rate at which the population implements a recommended efficiency improvement

*OPE Ratio* - This algorithm requires an average OPE ratio for each different pump type in order to calculate the gross kWh impact for the program. The algorithm indicates the importance of difference of OPE before and after the pump retrofits, and hence energy savings. For example, if the OPE ratio is changed by 10%, the per-unit kWh impact is also changed by 10%.

As implied in Method One, a pump's OPE varies by the pump type and the application. The following discussion supplies some typical trends in post retrofit OPE, by pump type:

*Deep Well Turbine Pumps* - The OPE of a turbine pump is partly a function of dynamic head (pumping depth, column & shaft losses) but varies mostly by the horsepower ranges of the motor. For example, if a retrofit includes a new motor, then the OPE after a retrofit is affected by the efficiency of the new motors, which in the 5 to 20 HP range is typically around 85% and increases to near 92% for a 125 HP motor. When this motor efficiency is combined with the pump efficiency of about 75%, the post-retrofit pump OPE ranges between 64% and 69%, resulting in a post-retrofit OPE range of about 5%, depending on pump horsepower.

*Submersible Pumps* – Most of the submersible pumps in agricultural applications are 20 HP or less (discounting the agricultural domestic pumps at 1 to 3 HP). These pumps are usually "off the shelf" units and the pumps are not matched to operating conditions (i.e. impellers are not trimmed to meet specific operating conditions). In addition, the motors used in submersibles are generally not as efficient as those for turbine pumps (possibly due to their slender shapes) and there are sometimes significant electrical losses due to the long wire runs. Therefore, this type of pump has a lower OPE than turbine pumps, typically between 58% and 60%.

*Centrifugal Booster Pumps* – For centrifugal pumps both motor and pump efficiencies are typically a little higher than those for turbine pumps at the same horsepower. This is likely due to the fact that the operating conditions are usually more stable plus the short coupling of the motor to the pump. The dynamic head for a booster used to lift water from a surface supply usually remains fairly stable. The typical post-repair OPE can range from 73% to 75%.

For this method to be applied, then, one must know the average OPE ratios across the different pump types. This would typically be achieved by performing pre- and post-retrofit pump tests on a properly designed sample of pumps.

*Annual kWh Usage* - For the annual kWh usage, uncertainty is virtually nonexistent as this is based on actual pre-retrofit billed usage data. Uncertainty for future savings may arise due to variability in usage of a pump in a given year or time period. For example, agricultural customers pump usage can vary significantly from year to year. Because of this, there may be more uncertainty due to this variable use for agricultural pumps compared to those for water supply companies. To help ameliorate this variability in, an annual kWh usage averaged over more than one year can be used in this algorithm.

**Exhibit 5.67**
**Method Two for Calculating Impacts**

Program Gross kWh Impact = kWh Expected Impact * Implementation Rate * % of Expected Savings (4)

Where:

kWh Expected Impact = sum of expected savings based on a pre-repair pump tests

Implementation Rate = rate at which the population implements a recommended efficiency improvement

% Expected Savings = percent of forecast savings found in the field from post repair tests

This algorithm is similar to the base equation (3) of method one, except that it uses predicted realized savings based on historical data to de-rate the predicted /expected kWh impact.

In a study for San Diego Gas & Electric Company (SDG&E) agricultural program (Johnson, 1996), SDG&E surveyed their customers to determine how often energy savings changes were made to pumps after the pump test and how many of those changes were due to their program. This information was based on responses from 66 customers (80 percent of the total program participants to whom recommendations were made) covering 166 pumps (43 percent of the pumps tested). The study used Method Two (shown in Exhibit 5.67) to determine gross energy kWh savings. The algorithm used in this study starts with the energy that the pump test predicted would be saved if recommended changes to the pump were implemented (kWh expected impact). This value is based on the previous annual usage of the pump, the current operating efficiency of the pump as measured by the pump test, and the predicted post-repair pump operating efficiency.

The SDG&E study analysis found that 33 percent of the customers implemented recommended energy efficiency improvements (the implementation rate). The study does not specify the exact number, but some of those participants who stated they implemented a change at the pump had a post-repair pump test that allowed a comparison of the results of the predicted expected savings to the realized savings after the improvement. The results found that 87 percent of the savings predicted from the original pump test result were realized after the implementation of the repair. SCE currently uses this approach to calculate gross energy impact. The SCE calculation uses the SDG&E value for the implementation rate (33%) and the SDG&E percent of realized savings (87%).

*Implementation Rate* – From the SCE Market Effects Study (RLW, 1998), larger customers perceived that the PT&HS Program provided them with more benefits than did the smaller customers, although there was no determination of whether this benefit may lead the customer to implement an energy efficient change. The SCE PT&HS Program provides services to water service agencies as well as agricultural customers. It is widely believed that the business model followed by water service agencies is different from agricultural customers, at least as far as the pumping systems. Water service agencies regularly test and service their pumps while agricultural customers generally have other higher priorities and the pumps are serviced only as needed to assure adequate water for crops. In a PG&E Study (Equipoise, 1999), 45 percent of the agricultural customers felt that access to financing for pump repairs was an issue, with a larger percent of that group made up of small and medium sized agricultural customers. In another study, the PG&E Market Needs Study (Equipoise, 2000) indicates that small agricultural customers are less willing to pay for assistance than medium sized agricultural customers. An extrapolation of this could indicate that agricultural customers may also have differing implementation rates based on their size.

These three reports suggest that there is a strong likelihood of variation in implementation rate based on customer type and size. Use of an average implementation rate that is overly weighted towards one group or another may lead to higher or lower energy impacts as the program is implemented in future years. However, analysis within the PY2002 program did not indicate any difference in implementation rates by customer type or size. Because this may change with the program mix of participants, it is suggested that an implementation rate for water service agencies and agricultural customers be

determined from survey data and compared to see if there are statistically different in future programs. If resources allow, breaking down the agricultural sector into small, medium, and large customers and assessing the difference in implementation rate among this group would be useful. This evaluation assessed water service and agricultural groups, but was not be able to adequately assess further stratification within the agricultural group due to sample size.

### 5.4.3 Net kWh Impact Calculation

The net kWh impact indicates how much of the gross impact was due to the program. To get the net impact calculation, a net-to-gross ratio (NTGR) variable is added to the gross impact from either equation 3 and equation 4 as shown in Exhibit 5.68:

**Exhibit 5.68**
**Net Impact Algorithms**

Net kWh Impact = Gross Impact* NTGR (5)

Where:

NTGR = Net-to-Gross ratio, which is one minus the percentage of customers that would have taken the same action in the absence of the program.

This NTGR variable is closely linked to the implementation rate discussion. Water service agencies may have a regular cycle of servicing their pumps and may (1) rely less on a pump test results to determine whether to repair the pump or not, and (2) have been willing to pay for the pump test had the program not existed. This would result in a low NTGR.

Agricultural customers may be very different in this regard, resulting in a NTGR that is substantially different than the water service agencies. For example, a grower's decision to repair a pump that is deteriorating in operating efficiency depends on the type of pump and its application. For example:

*Deep Well Turbine Pumps* - The decision to repair a turbine pump is very much a function of the type of application in the field. A grower with a deep well turbine employed for surface irrigation and non-permanent crops will typically compensate for deterioration in the pump flow rate by adjusting the amount of land he is irrigating per set. For example, a grower with 100 acres may irrigate 10 acres at a time (e.g., per set) when the flow rate is high and decrease that to 8 or 9 acres per set to compensate for a lower flow. In this case, it takes longer to irrigate the entire 100 acre field and uses more energy. When the flow rate has declined to a point where it is not tolerable, then he will consider a repair. A grower could allow the OPE to decline into the 35% to 40% range in this situation before deciding to repair.

A grower with a deep well supplying a pressurized irrigation system will typically make a repair when the system pressures drop below acceptable levels. A decision point may be when there is not enough pressure to back flush sand media filters or when the system pressure leaving the pumping station (after the filters) is unacceptably low. In either case, a turbine pump is likely to be repaired when the OPE reaches the 40% to 45% range.

*Submersible Pumps* – The decision to repair a submersible is similar than that for a turbine pump, that is, it is a function of the type of application in the field. However compared to turbine pumps, they may be repaired a little earlier depending on the pressure loss in the irrigation system.

*Centrifugal Booster Pumps* – Repair decisions for boosters again depend on the application. If supplying a pressurized irrigation system, the repair decision will be based on a decline in the system pressure. For canal lifts to supply surface irrigation systems, the repair decision may not occur until the flow rate declines to a point where he can not make adjustments in the field.

In addition, growers naturally tend to be less knowledgeable about pumps than water service agencies, who deal with pumps as their primary business. Growers have many other issues to deal with and only worry about pumping efficiencies when the pumps no longer supply their needs.

Because of variations between agricultural and water users, it may be more precise to allow the NTGR to vary by type of customer.

It should be noted that past evaluations indicate that the results of a pump test play a small part in the decision to repair a pump for the agricultural sector. Other factors such as cash flow and crop cycles, and pump failure have more affect on whether a pump gets repaired. In the PG&E EMS Market Effects Study (Equipoise, 1998), while 68 percent of the customers stated that a pump test was very important in their decision to repair a pump, about the same percentage of customers stated that they repaired the pump because it was broken or low-performing. Only about 30 percent stated that their decision to repair their pump was due to the results of the pump test. If this turns out to be the case with future surveys, the NTGR may be very low. When looking at the NTGR as only a function of freeridership (i.e., NTGR=1-freeridership), past NTGRs for pump repairs within rebate programs have been 0.33 (Quantum, 1996 for PG&E PY1994), 0.33 (Quantum, 1997 for PG&E, PY1995), 0.39 (Equipoise, 1998 for PG&E PY1996), and 0.53 (Athens Research for SCE PY1994). While these past reports found low NTGR, this current evaluation determined a NTGR of 0.73.

However, at least in the short-term, the questions regarding the actual magnitude of the NTGR may be moot. In the fall of 2000, the California Measurement Advisory Counsel (CALMAC) obtained public input to net-to-gross ratios based on many previous years of evaluation. These NTGR were subsequently incorporated into the California Public Utility Commission (CPUC) Energy Efficiency Policy Manual (CPUC, 2001). The NTGR for agricultural incentive programs within this document is 0.75 while the NTGR for agricultural information programs is 0.83. These default values may be able to be used if the CPUC determines that the NTGRs within energy efficiency policy manual values are sufficient for future programs. At this point, if SCE uses the pump test program for resource acquisition and the default values are to be used, it is unclear which of the default NTGRs (0.75 or 0.83) would be most appropriate.

### 5.4.4 Conclusion Regarding Uncertainty Surrounding kWh Impact

As discussed above, the uncertainty surrounding the kWh impact (gross and net) is the result of the uncertainty surrounding each of the terms in Equations 3 through 5. The errors associated with the terms propagate and produce an error bound around the kWh impact that is much greater than the simple

error around the estimated kWh impact. Exhibit 5.69, however, can be used to estimate the confidence interval around the kWh impact in a manner that recognizes the propagation of errors.

**Exhibit 5.69**
**Algorithm for Determining Error**

*kWh Impact +/- tdq* (6)

where

$dq$ = The standard error around the kWh impact that is calculated as $\sqrt{(dw)^2 + (dx)^2 + (dy)^2 + (dz)^2}$ , the quadratic sum of the uncertainties $dw, dx, dy, and\ dz$.

$dw$ = The standard error of w, the average kWh usage OR kWh Expected Impact

$dx$ = The standard error of x, the OPE ratio OR % of Expected Savings

$dy$ = The standard error of y, the implementation rate

$dz$ = The standard error of z, the NTGR

t= The normal deviate corresponding to the confidence probability

The calculation of the confidence interval assumes that the uncertainties associated with each of the four terms are independent and random.

# *6 CONCLUSIONS AND RECOMMENDATIONS*

## 6.1 Conclusions

The evaluation objectives are stated below followed by the summarized results.

***Verification of Program Claimed Pump Tests and Energy Efficiency Contacts –*** The Team verified all pump tests and energy efficiency contacts claimed by the Program. The pump test component required no adjustments while energy efficiency contacts were reduced by 4 percent. Exhibit 6.1 indicates that the Program exceeded the stated goals for both components.

**Exhibit 6.1**
**Program Goals and Verified Results**

| Program Component | Goal | Verified Results | % of Goal |
|---|---|---|---|
| Pump Tests | 2,000 | 2,262 | 113% |
| Energy Efficiency Contacts | 1,750 | 1,780 | 102% |

***Method for Estimating Potential Energy Savings from Pump Tests –***. If Method Two is chosen to calculate kWh impact, the Team recommends that in SCE program- specific information be gathered to inform the variables within the algorithm if the decision is made to use this program for resource acquisition. Specifically, the method needs to use updated information on implementation rate, % expected savings, and NTGR. Note that some of this information has been collected in this study as a step towards this update.

***Update Implementation Rate and Free Ridership Data –*** The evaluation found that 41 percent of the 64 participants who completed the telephone survey made changes to improve their pumping system operating efficiency. The majority of improvements (69 percent) were to the shaft, impeller, or pump bowls. Motor improvements represent 17 percent of the total. The evaluation found that the implementation rate varied by organization type and size. However, due to small sample sizes, none of the differences were statistically significance.

The free riders are represented by the 27 percent of the customers who said they would have made an improvement to their pumping system in the absence of the SCE pump test information. Put another way, the net-to-gross ratio (NTGR) was estimated to be 0.73, with a 90 percent confidence interval of +/- 0.06. The evaluation found that the NTGR varied by organization type and size. Again, while there were observed differences, none were statistically significant.

While reasonably consistent with Appendix J (Quality Assurance Guidelines For Statistical, Engineering, and Self-Report Methods for Estimating DSM Program Impacts) contained in the *Protocols and Procedures for the Verification of Costs, Benefits, and Shareholder Earning from Demand-Side Management Programs* (CADMAC, 1998), this effort to estimate the NTGR was not the most comprehensive and rigorous. While additional questions about when the customer first heard about the pump test program, details about other competing investments, required paybacks, and other decision-related issues could have been asked in order to support a more rigorous estimate of the NTGR, budget

constraints prevented the Team from doing so. The resulting NTGR represents a rough estimate, one that, given the increasing emphasis on resource acquisition, should be undated using a more rigorous approach in future evaluations if a NTGR is required for this program.

***Examine Program Process –*** The Team found the PT&HS Program to be a solidly-managed and well-run program. A few recommendations were made regarding changes that could be made in the future. Among them was the preparation of a document that contains clearly defined goals and clearly communicating these goals to program staff. Additionally, changes in the tracking database should be made so that managers can better access critical summary information such as number of tests scheduled and elapsed time between request and tests.

The Program processes were also analyzed using information from pump test customers. Of note was the strong correlation found between customer dissatisfaction and the time they have to wait for the test report. While most customers are satisfied with the report turn-around time, average customer satisfaction can still be improved by setting, as a target, turn-around times no longer than two weeks. This corresponds to the Program staff who indicate that there is a need for more pump testers.

***Measure the Program's Effectiveness in its Outreach Efforts –*** The evaluation found that the Program used a wide variety of approaches for contacting potential pump test customers from mail or printed material to phone calls and the Internet. Customers interested in a pump test must contact SCE. Tests are scheduled on a first-come, first-serve basis.

The effectiveness with which information is disseminated can be measured using a number of indicators. The ones selected for this Program include:

- Ability to recall being contacted by SCE (this suggests that the event was meaningful in some respect and therefore memorable)
- Satisfaction with the frequency of contact
- Satisfaction with the type of information provided

The SCE energy efficiency representatives operate independently of the pump test component of the Program and have differing outreach effects. For the pump test component, Program outreach seems to be reaching its customers. They are satisfied with the contact method and frequency. The outreach is accepted as understandable and seems to have moderate influence over the likelihood of customers making an energy efficiency improvement. The information gleaned from non-pump test program customers and energy efficiency contact customers indicates that the SCE service representatives are doing a good job of getting information out to their customers as customers recall the contact, are satisfied with the frequency of contact, and are satisfied with the type of information they receive.

***Program Theory Linkage Testing –***In addition to the objectives set by SCE for this evaluation, the evaluation Team also tested various linkages from the program theory. The data were analyzed to determine if the claims of the linkages were supported or not supported. The results are summarized below in Exhibit 6.2. . Note that the hypothesis for each linkage is often tested using more than a single question across more than one of the three groups surveyed. The linkages in the both the program implementation model (Exhibit 2.2) and program theory (Exhibit 2.3) and the questions from each of the

three surveys that were used to test the hypothesis associated with each linkage are provided in Appendix B. The description of each linkage is general enough to capture the full meaning of the linkage.

**Exhibit 6.2**
**Program Theory Linkages Supported or Not**

| *Linkage* | *Description* | No Support | Weak Support | Moderate Support | Strong Support |
|---|---|---|---|---|---|
| ***Implementation Theory*** | | | | | |
| 1 | Customer satisfied with the method and frequency of SCE contact | | | X | |
| 6 | Customer obtained information on pump test referral process | | X | | |
| 10 | Customer satisfied with timing of pump test results | | | X | |
| 11 | Customer made changes to pump after pump test | | X | | |
| ***Program Theory*** | | | | | |
| 1 | Customer outreach is successful | | | X | |
| 2 | Customer understands outreach information and finds it useful. It positively affected attitude towards energy efficiency. | | | X | |
| 2 | Customer understands pump test data and feels is more knowledgeable about operating efficiency improvements for pumping operations | | | X | |
| 3 | Customer requests pump test | | | | |
| 9 | Pump testsed within a reasonable time period after pump test request | | | X | |
| 10 | Customer is confident in pump test results | | | | X |
| 11 | Market Barriers reduced: | | | | X |
| 11 | Customer was provided necessary information to make required repairs or operating efficiency improvemenst to pumping system | | | X | |
| 12 | Pump Repaired by Pump Dealer | | | X | |
| 16 | Customers are unaware of SCE PT&HS Program | | X | | |
| 17 | Customers use non-SCE sources to obtain pump tests | | X | | |

***Diffusion and Market Barriers –*** The potential diffusion of information from customers and possible market barriers were also analyzed. Awareness of the Program has diffused through a large portion of the market. Nearly 91 percent of pump test customers, 58 percent of energy efficiency contact customers, and 54 percent of nonparticipants were aware of the Program prior to 2002. Sixty-three percent of pump test customers have told an average 6.3 friends, neighbors or colleagues about the benefits of pump tests while 35 percent of the energy efficiency contacts have told an average of 2.5.

Customers were queried about three potential market barriers to determine if the information provided to them helped reduce the barrier. For those customers surveyed who remembered receiving information from SCE, the following definitions were used to determine any reduction in the barrier: 1) Information search costs - reduced the time or cost of collecting information that you would otherwise need to get on your own 2) Asymmetric information - reduced the information disadvantage you may have with some dealers and suppliers, and 3) Performance uncertainty - reduced doubt and uncertainty about your pumping system efficiency. As can be seen in Exhibit 6.3, customers who participated in the Program (as either the pump test customers or EE contact customers), had a higher perceived reduction in the barriers.

**Exhibit 6.3**
**Reduction in Market Barriers**

| Reduction in Barrier | Pump Test Participants | EE Contacts | Nonparticipants |
|---|---|---|---|
| Information Search Costs | 94% | 86% | 62% |
| Asymmetric Information | 94% | 69% | 63% |
| Performance Uncertainty | 78% | 79% | 62% |

## 6.2 Recommendations

Based on the findings of the Team, the following recommendations are made by area assessed.

**Process Assessment Recommendations**

While it is apparent that the PT&HS Program is a solidly managed and well run program, the evaluation team believes that the following specific recommendations will improve overall program operations:

1. Prepare a document that clearly defines all goals of the PT&HS Program and provide this document to all staff.
2. Keep staff apprised of progress toward all goals, including secondary goals such as HTR.
3. Changes should be made to the tracking database management so that summary information such as number of tests scheduled and elapsed time between request and test is more readily available to all program management staff.
4. Create a central tracking system for quality control return rate and the reason that the report was sent back to the pump tester in order to identify issues and decrease the return rate. This does not need to be an expensive or complicated system.
5. Establish a standard process or series of processes for handling customer complaints, so that all staff are clear on how they are handled. Follow those procedures when complaints occur.

**Energy Savings Method Recommendations**

Should SCE choose to use the PT&HS program as a resource acquisition program in the future, Equipoise recommends the following:

6. Use either Equation 3 (Exhibit 5.66) or Equation 4 (Exhibit 5.67) as the algorithm to estimate gross kWh impacts. Each equation will provide reliable estimates of impact as long as the variables within them are rigorously determined.
7. Determine what is a practical number of years of billing history to use for the annual usage and document that decision.
8. If Method One is chosen to calculate energy savings impact of the program, then SCE should undertake an effort to create a matrix of OPE ratios by pump type. This means that SCE should perform pump tests on pumps that have implemented the suggested efficiency pump changes. Those post-repair tests should be done shortly after the efficiency improvements have been implemented. A sample of post pump tests can be performed to determine the OPE Ratio. Through proper sample design, 90/10 precision can be obtained with 67 post-repair pump tests across the pump types. It should be adequate to perform this analysis once every five years or so. There may be sufficient evidence to allow updating of this variable less frequently.
9. If Method Two is used to calculate energy saving impact of the program, SCE should undertake an effort to update the % Expected Savings variable (currently estimated to be 87%). This means that SCE should perform pump tests on pumps that have implemented the suggested efficiency pump changes. Those post-repair tests should be done shortly after the efficiency improvements have been implemented. A sample of post pump tests can be performed to determine % Expected Savings. It is recommend that at least 67 post-repair pump tests be performed on customers to provide 90/10 precision. It should be adequate to perform this analysis once every five years or so. There may be sufficient evidence to allow updating of this variable less frequently. If the % of expected savings value is assessed, it is recommended that a new value be adopted based on the new assessment only if it is different than the original value at the 80% confidence +/-20% precision level from the current value of 0.87.[8]
10. Use the implementation rate that was determined in this evaluation of the PY2002 program for program planning (40.6%). If the mandate for the program creates a change in the size of the customer served by the PT&HS program, consider determining the relationship between implementation rate and customer size as well in future evaluations.
11. At this point, there is no regulatory authority for SCE to use anything other than the default NTGR of either 0.75 or 0.83. However, within this evaluation effort, the net-to-gross ratio was estimated to be 0.73, with a 90 percent confidence interval of +/- 0.06. A further assessment of freeridership and net-to-gross may still be needed to further substantiate this estimate.
12. Regardless of the method chosen, use Equation 6 to calculate the confidence interval around the kWh impact.

[8] This level of difference was chosen to mimic the Protocol standards for updating Effective Useful Life (EUL) values.

# Appendix A
# References

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# Appendix B
# Survey Questions Used to Test Hypotheses Associated with the Linkages in the Program Implementation and Program Theory Models (Uses and Sources Chart)

| Program Implementation Links | Program Theory Links | Final PT Customer | Final EE Contact Customer | Nonparticipant V11 | Screener | Participant Descriptors | Program Impacts | Process | Customer Satisfaction | Market Barrier Perceptions | Program Awareness | EE Knowledge | Diffusion |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10 | 9 | 1 | | | X | X | | | | | | | |
| | 10 | 2 | | | X | X | | | | | | | |
| 11, 14 | 12, 14 | 3 | | | | X | | | | | | | |
| 11 | | 4 | | | | X | | | | | | | |
| | 11 | 5 | | | | | X | | | | | | |
| | 11 | 6 | | | | | X | | | | | | |
| | 11 | 7 | | | | | X | | | | | | |
| | | 8 | | | | | X | | | | | | |
| | 11 | 9 | | | | | X | | | | | | |
| | 11 | 10 | | | | | X | | | | | | |
| | 11 | 11 | | | | | X | | | | | | |
| | 11 | 12 | | | | | X | | | X | | | |
| | 11 | 13 | | | | | X | | | X | | | |
| | 11 | 14 | | | | | X | | | | | | |
| | 11 | 15 | | | | | X | | | | | | |
| | 11 | 16 | | | | | X | | | | | | |
| | | 17 | | | | | X | | | | | | |
| | | 18 | | | | | X | | | | | | |
| | 10, 16 | 19 | 26 | 4 | | | | | | | X | | |
| | | 20 | | | | | | X | | | | | |
| 1 | 1 | 21 | 7 | 16 | | | | X | | | | | |
| 1 | | 22 | 9 | 18 | | | | X | | | | | |
| 1 | 1 | 23 | 8 | 17 | | | | X | X | | | | |
| 1 | | 24 | | 14 | | | | X | | | | | |
| 1 | | 25 | | 15 | | | | X | X | | | | |
| | | 26 | | | | | | X | | | | | |
| 1 | | 27 | | | | | | X | | | X | | |
| 1 | 1 | 28 | 13 | 22 | | | | X | | | | | |
| | 2 | 29 | 14 | 23 | | | | X | | | | | |

| Program Implementation Links | Program Theory Links | Final PT Customer | Final EE Contact Customer | Nonparticipant V11 | Screener | Participant Descriptors | Program Impacts | Process | Customer Satisfaction | Market Barrier Perceptions | Program Awareness | EE Knowledge | Diffusion |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11 | 2, 9, 10, 11 | 30 | | 9 | | | | X | | | | | |
| 10 | 9 | 31 | | | | | | X | | | | | |
| 10 | 9 | 32 | | | | | | X | X | | | | |
| | | 33 | 15 | 24 | | | | | | X | | | |
| | 10, 11, 17 | 34 | | 25 | | | | | | X | | | |
| | 10, 11, 17 | 35 | | 26 | | | | | | X | | | |
| | 10, 11, 17 | 36 | | 27 | | | | | | X | | | |
| | 10, 11, 17 | 37 | | 28 | | | | | | X | | | |
| | 10, 11, 17 | 38 | | 29 | | | | | | X | | | |
| | 10, 11, 17 | 39 | | 30 | | | | | | X | | | |
| | | 40 | 16 | 31 | | X | X | X | | | | | |
| | | 41 | 17 | 32 | | X | X | X | | | | | |
| | | 42 | 18 | 33 | | X | X | X | | | | | |
| | 17 | 43 | 19 | 34 | | X | X | X | | | | | |
| | 9 | 44 | 20 | 35 | | X | X | X | | | | | |
| | | 45 | 21 | 2 | | X | X | X | | | | | |
| | | 46 | 22 | 36 | | X | X | X | | | | | |
| | | 47 | 23 | 37 | | X | X | X | | | | | |
| | | 48 | 24 | 38 | | X | X | X | | | | | |
| | | 49 | 29 | | | | | | | | | | X |
| 1 | 1 | | 1 | | X | | | | | | | | |
| | | | 2 | 10 | | | | X | | X | | | |
| | | | 3 | 11 | | | | X | | X | | | |
| | | | 4 | 12 | | | | X | | X | | X | |
| 1 | 2 | | 5 | | | | | X | | | | | |
| 1 | 2 | | 6 | | | | | X | X | | | | |
| 1, 6 | 2 | | 10 | 19 | | | | X | | | | | |
| 1 | 2 | | 11 | 20 | | | | X | X | | | | |
| 1 | 2 | | 12 | 21 | | | | X | | | X | | |
| | | | 25 | | | | | | | | X | | |

| Program Implementation Links | Program Theory Links | Final PT Customer | Final EE Contact Customer | Nonparticipant V11 | Screener | Participant Descriptors | Program Impacts | Process | Customer Satisfaction | Market Barrier Perceptions | Program Awareness | EE Knowledge | Diffusion |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 17 | | 27 | 5 | | X | | X | | | | | |
| | 17 | | 28 | 6 | | X | | X | | | | | |
| | | | | 1 | x | | | | | | | | |
| | | | | 3 | x | | | | | | | | |
| | 17 | | | 7 | | | | x | | | | | |
| | 17 | | | 8 | | | | x | | | | | |
| | | | | 13 | x | | | | | | x | | |
| | | | | 39 | | | | x | | | | x | |

# Appendix C
# Survey Instruments

There were three telephone instruments in this evaluation. In order they are:

1. Pump Test Participants Survey
2. Nonparticipant Survey
3. Energy Efficiency Contact Survey

There also was an in-depth interview for the program managers and pump test participants. That instrument is last in this appendix.

**2002 Edison PT&HS Program Telephone Survey**

**-- Final Pump Test Customer Questionnaire --**

**Introduction**

Hello, my name is (Surveyor Name) and I'm calling on behalf of the Southern California Edison Company (SCE). May I please speak with (Contact Name)?

**SCHEDULE 4 CALL-BACKS, IF NECESSARY.**

Hello, my name is (Surveyor Name) and I'm calling on behalf of the Southern California Edison Company (SCE). We are seeking your cooperation in a study, which will help Edison to better understand the needs of its agricultural and pumping customers. Edison is required by the California Public Utilities Commission to complete this study. Your responses are completely confidential and no organization will ever be able to identify you or your responses from the survey information that is collected. (**ADD, IF NECESSARY**: If there are any questions at any point about the purposes of this study, we would ask you to contact Shahana Samiullah at the Southern California Edison Company at 626-302-8293). (**ADD, IF NECESSARY**: This survey will take approximately 15 minutes.)

Our records indicate that your company participated in Edison's recent Pump Test Program. Are you the person in your company most knowledgeable about your company's pumping plant and this Edison Pump Test Program?

***IF NO***: Who in your company would be the most knowledgeable about your company's pumping plant and participation in the Edison Pump Test Program? _____

May I please speak with _____?

**(LAST RESORT – CONDUCT INTERVIEW WITH PERSON ALREADY ON THE PHONE)**

**PUMP TEST AND IMPLEMENTATION RATE QUESTIONS**

SCE records indicate that, in this past year, your company received a pump test for one or more pumps and received a report on the potential financial and energy savings from efficiency improvements to your pumping system:

1 Do you remember receiving a pump test through SCE's Pump Test Program in 2002?

Yes.....1
No.....2
Don't know.....DK (88)
Refused .....REF (99)

2 Do you remember receiving a follow-up letter regarding the potential financial and energy savings from making operating efficiency improvements to your pumping system that was based on the results of the pump test?

Yes.....1
No.....2
Don't know.....DK (88)
Refused .....REF (99)

[THANK AND TERMINATE IF (Q1=2 AND Q2=2) OR (Q1=88 OR 99 AND Q2=88 OR 99)]

3 Did you make changes to improve the operating efficiency of your pump that received a pump test last year?

Yes.....1
No.....2 (GO TO Q19)
Don't know.....DK (8) (GO TO Q19)
Refused .....REF (9) (GO TO Q19)

4 In what general area did you make the changes in the pump or pumping system? (READ)

Well casing .....1
Pump (shaft/bowls/impeller).....2
Motor.....3
Upstream of the pump (e.g., irrigation system).....4
Don't Know .....DK (88)
Refused .....REF (99)

*4a. **If Q4=1 , 2, 3, or 4, ask**: Specifically, what did you do to improve your pumping system?*

---

---

**NET TO GROSS QUESTIONS [ASK ONLY IF IMPLEMENTED SOMETHING IN Q3, OTHERWISE SKIP TO Q19]**

There is more than one way that the pump test results you received might have influenced your decision to make efficiency improvements to your pumping system. They might have influenced *what* you installed (the type of equipment or its efficiency) or the influence might have been just on *when* you installed it. Now, when answering the next two questions, please consider only the possible influence of the pump test results on *what* you installed, *not* the possible influence of on *when* you installed it. After that, I will ask you about possible influence on the *timing* of the efficiency improvements.

5 How much influence did the pump test results have on your decision to make the efficiency improvements to your pumping system? Please use a scale from 0 to 10, with 0 being no influence at all and 10 being a lot of influence.

___ Response (**0-10**) **88** Don't Know **99** Refused to Answer

6 If the pump test results received through SCE's Pump Test Program had not been available, how likely is it you would have made the efficiency improvements exactly the same way anyway? Please use a scale from 0 to 10, with 0 being not at all likely and 10 being very likely.

___ Response (**0-10**) **88** Don't Know **99** Refused to Answer

**Special Instruction for Contradictory Responses**: If [**Q5 is 0,1,2** *and* **Q6 is 0,1,2**] *or* [**Q5 is 8,9,10** *and* **Q6 is 8,9,10**]. **Probe for the reason. However, it is important not to communicate a challenging attitude when posing the question. For example, say,**

When you answered "8" for the question about the influence of the pump test results, I would interpret that to mean that the information provided was quite important to your decision to make efficiency improvements to your pumping system; then, when you answered "8" for how likely you would be to implement the same recommendation *without* the pump test results, it sounds like the information provided was *not* very important in your installation decision. I want to check to see if I am misunderstanding your answers or if the questions may have been unclear.

**If they volunteer a helpful answer at this point, respond by changing the appropriate answer. If not, follow up with something like:**

Will you explain in your own words, the role the pump test results played in your decision to implement this efficiency improvement recommendation?

**If possible, translate the answer into a question 5 or 6 response that makes them consistent with each other, and check the response with the respondent for accuracy. If the answer doesn't allow you to decide what answer should be changed, write the answer down and continue the interview.**

Answer: _____

_____

**Say**: Now I would like to ask you three questions about what pumping system projects you might have been planning to do before you decided to participate in SCE's Pump Test Program.

7 Before you obtained the pump test results, were you planning to make any operating efficiency improvements in your pumping system?

**1** Yes
**2** No **(Go to Q11)**
**88** Don't Know (**Go to Q11**)
**99** Refused to Answer (**Go To Q11)**

8 Approximately how long were you considering making these changes?

_____(Time period) **98** Don't Know **99** Refused to Answer

9 *In this plan, when* would you have made the operating efficiency improvements without the pump test results provided by SCE's Pump Test Program? (**Don't read response categories**)

**1** _____ ...within 6 months of when it actually was installed?
**2** _____ ...6 months to one year later?
**3** _____ ...one to two years later?
**4** _____ ...two to three years later?
**5** _____ ...three to four years later?
**6** _____ ...four or more years later?
**88** _____ ...Don't Know **(Go to Q11)**
**99** _____ ...Refused to Answer **(Go to Q11)**

10 Why do you think you would have made these operating efficiency improvements in _____months/yrs_____

11 Where did the **idea** come from for the operating efficiency improvements that you made? **If necessary read examples:** Consultant, Previous experience with energy efficiency projects, SCE, Equipment supplier or installer, Internal staff, Other (Please Specify).

_____

_____

**If answer is *INTERNAL STAFF* probe here to find out:**

**1. How the internal staff knew about the operating efficiency improvements, and**

**2. If and how they knew that assistance might be available through SCE's Pump Test Program**

12 What would you say was the impact of the pump test results in motivating the efficiency improvements that were made?

_____

_____

_____

13 Which of the following had the greatest impact on the design or specification of the pumping system improvements made**? (Read the list)**

**1** The pump test results provided through SCE's Pump Test Program
**2** Agricultural Engineer
**3** Equipment Distributor or Pump Dealer
**4** Installer
**5** Internal Staff
**6** SCE Representative
**88** Don't Know
**99** Refused to Answer

**READ:** Here are some statements that may be more or less true for your company about the energy efficiency improvements made. Please assign a number between 0 and 10 to register how true it is. Please use a 10 to indicate that it is completely true, and a 0 to indicate that it is completely untrue.

14 The pump test results provided through SCE's Pump Test Program were nice, but they were *unnecessary* to cause me to make operating efficiency improvements of this pumping system equipment.

_____ Response (0-10) **88** Don't Know **99** Refused to Answer

15 The pump test results provided through SCE's Pump Test Program was a *critical factor* in doing the type of improvement that we did.

_____ Response (0-10) **88** Don't Know **99** Refused to Answer

16 We would not have made the operating energy efficiency improvement that we did without the pump test results provided through SCE's Pump Test Program.

_____ Response (0-10) **88** Don't Know **99** Refused to Answer

17 Did you receive any financial assistance to help defray the cost of any improvements made?

Yes.....1
No.....2 (GO TO 19)
Don't know.....DK (88) (GO TO 19)
Refused .....REF (99) (GO TO 19)

18 From whom did you receive the financial assistance? (Please specify)

_____

**PROCESS AND CUSTOMER SATISFACTION QUESTIONS**

19 Prior to 2002, were you aware of SCE's Pump Test and Hydraulic Services program?

Yes.....1
No.....2
Don't know.....DK (88)
Refused .....REF (99)

20 How did you learn about the SCE Pump Test Program?

You approached a vendor or contractor .....1 (GO TO 22)
You approached SCE .....2 (GO TO 22)
Through printed material sent by SCE.....3 (GO TO 22)
When a SCE representative contacted you .....4
When a contractor or vendor contacted you .....5 (GO TO 22)
By word of mouth.....6 (GO TO 22)
At industry trade shows.....7 (GO TO 22)
Or is it family tradition/business policy/recommendation.....8 (GO TO 22)
Anything else? (**SPECIFY**) _____.....9 (GO TO 22)
Don't know (**DO NOT READ**).....DK (88)
Refused (**DO NOT READ**) .....REF (99)

21 How did the SCE representative contact you?

Phone Call .....1
Internet or email .....2
Mail Printed Material.....3
Training Workshop .....4
Trade Association Meeting / Presentation .....5
On-site visit.....6
Other: Specify_____.....7
Don't Don't know (**DO NOT READ**).....DK (88)
Refused (**DO NOT READ**) .....REF (99)

22 What is your preferred way to be contacted by SCE?

Phone Call .....1
Internet or email .....2
Mail Printed Material.....3
Training Workshop .....4
Trade Association Meeting / Presentation .....5
On-site visit.....6
Other: Specify_____.....7
Don't Don't know (**DO NOT READ**).....DK (88)
Refused (**DO NOT READ**) .....REF (99)

23 How satisfied are you with the ways in which you were contacted by the SCE Pump Test Program? Please use a scale from 1 to 10, with 1 being not at all satisfied and 10 being very satisfied. [CUSTOMER SATISFACTION WITH PROGRAM OUTREACH]

___ Response (**number)** **88** Don't Know **99** Refused to Answer

24 How many times has **SCE** contacted **you** in the past year regarding your pumps? (**READ LIST**) [FREQUENCY OF DELIVERY DURING PROGRAM]

Once .....1
Twice .....2
Several times, or .....3
Never .....4
Don't know (**DO NOT READ**).....DK (88)
Refused (**DO NOT READ**) ..... REF (99)

25 How satisfied are you with that amount of contact? Please use a scale from 0 to 10, with 0 being not at all satisfied and 10 being very satisfied. [CUSTOMER SATISFACTION WITH PROGRAM OUTREACH]

___ Response (**0-10**) **88** Don't Know **99** Refused to Answer

26 How many times have **you** contacted **SCE** about your pumps in the past year? (**READ LIST**) [FREQUENCY OF DELIVERY DURING PROGRAM]

Once .....1
Twice .....2
Several times, or .....3
Never .....4
Don't know (**DO NOT READ**).....DK (88)
Refused (**DO NOT READ**) ..... REF (99)

27 In the past five years, do you recall receiving any printed material from SCE on pumping productivity that explained the benefits of making pump repairs or operating efficiency improvements to your pumping system and options for making repairs and improvements to save energy? [PROGRAM OUTREACH - PRINTED MATERIAL EFFECTIVENESS]

**1** Yes
**2** No (skip to Q30)
**88** Don't Know (skip to Q30)
**99** Refused to Answer (skip to Q30)

28 Where or from whom did you get this printed material? [PROGRAM DELIVERY - PRINTED MATERIAL EFFECTIVENESS]

Sent to the business/home.....1
Given to me by SCE representative .....2
Picked up at booth at conference / event.....3
SCE Website.....4
Other (Please Specify) _____ ....5
Don't know (**DO NOT READ**).....DK (88)
Refused (**DO NOT READ**) .....REF (99)

29 I'm now going to read a series of statements regarding this printed material. For each statement, tell me whether you disagree strongly, disagree somewhat, agree somewhat, or agree strongly.

| | Disagree Strongly | Disagree Somewhat | Agree Somewhat | Agree Strongly |
|---|---|---|---|---|
| **29A.** The information in the printed material was presented in an engaging format. | | | | |
| **29B**. The information in the printed material was easy to understand. | | | | |
| **29C.** The information in the printed material was useful. | | | | |
| **29D**. The information in the printed material was believable. | | | | |
| **29E**. The information in the printed material positively affected my attitude toward energy efficiency. | | | | |
| **29F.** I learned a considerable amount about available energy efficiency options from reading the printed material | | | | |
| **29G.** The information on the printed material increased the likelihood that I will investigate energy efficiency options | | | | |

30 I'm now going to read a series of statements regarding the pump test and the pump test report. For each statement, tell me whether you disagree strongly, disagree somewhat, neither disagree or agree, agree somewhat, or agree strongly.

| | **Disagree Strongly** | **Disagree Somewhat** | **Agree Somewhat** | **Agree Strongly** |
|---|---|---|---|---|
| **30A**. It was easy to request a pump test | | | | |
| **30B**. Once I requested a pump test, I didn't have to wait very long to have the test performed. | | | | |
| **30C.** It was easy to get responses to pump test related questions after I scheduled the test, but before the test was conducted. | | | | |
| **30D**. The information provided by the SCE pump tester ***at the time of the test*** was useful. | | | | |
| **30E.** I didn't have to wait very long for to receive the results of the pump test. | | | | |
| **30F**. The pump test results were useful. | | | | |
| **30G**. The pump test results were easy to understand. | | | | |
| **30H**. The pump test results were believable. | | | | |
| **30I.** It was easy to get responses to pump test related questions after the test was conducted. | | | | |
| **30J**. As a result of having my pump tested, I am now much more knowledgeable about needed operating efficiency improvements for my pumping operations. | | | | |
| **30K** . The pump test report provided the necessary information for me to make required repairs or operating efficiency improvements on my pumping system. | | | | |

31 How many days passed between the pump test being conducted and the delivery of the pump test results report? [TIMELINESS OF PROGRAM DELIVERY]

___ Response (**number)** **88** Don't Know **99** Refused to Answer

32 How satisfied were you with the amount of time that elapsed between the date the test was completed and when you received the results? Please use a scale from 0 to 10, with 0 being not at all satisfied and 10 being very satisfied. [CUSTOMER SATISFACTION WITH PROGRAM TIMELINESS]

___ Response (**number)** **88** Don't Know **99** Refused to Answer

**MARKET BARRIER QUESTION**

33 Has Edison's pump testing program helped you to (READ . . . . ):

| | Yes (1) | No (2) | Don't Know (88) | Refused to Answer (99) |
|---|---|---|---|---|
| 33A. Reduce the time or cost of collecting information you would otherwise need to get on your own? | | | | |
| 33B. Reduce your doubt and uncertainty about your pumping system efficiency. | | | | |
| 33C. Reduce the information disadvantage you may have with some dealers and suppliers. (NOTE: If customer is unclear about this question, clarify by saying: "Did the pump test results help you to feel you knew about what your pump may need.") | | | | |

34 How confident are you in the advantages and operating efficiency improvement information received from the SCE pump test results? Please use a scale from 1 to 10, with 1 being not at all confident and 10 being very confident. [IF RESONSE=1-5 THEN GO TO Q35; IF RESPONSE=6-10 THEN GO TO Q36; IF 88 OR 99 THEN GO TO Q37]

___ Response (**1-10**) **88** Don't Know **99** Refused to Answer

35 Is your confidence based on: (**READ LIST; RECORD ONLY ONE**)?

Your previous experience with SCE.....1
The experience of other growers.....2
The person you talked to is knowledgeable.....3
The fact that you feel they are unbiased.....4
Something else? (**SPECIFY**) _____.....5
Don't know (**DO NOT READ**).....DK (88)
Refused (**DO NOT READ**).....REF (99)

[GO TO Q37]

36 Are you <u>not</u> confident because of: (**READ LIST**)

Your previous experience with SCE .....1
The experience of other growers .....2
The person you talked to is not knowledgeable .....3
The fact that you feel they are biased .....4
Something else? (**SPECIFY**) _____.....5
Don't know (**DO NOT READ**).....DK (88)
Refused (**DO NOT READ**) .....REF (99)

37 How confident would you be in the advantages and operating efficiency improvement information from pump test results if they were provided by a company other than SCE? Please use a scale from 1 to 10, with 1 being not at all confident and 10 being very confident. [IF RESONSE=1-5 THEN GO TO Q38; IF RESPONSE=6-10 THEN GO TO Q39; IF 88 OR 99 THEN GO TO Q40]

___ Response (**1-10**) **88** Don't Know **99** Refused to Answer

38 Is your confidence based on: (**READ LIST; RECORD ONLY ONE**)?

Your previous experience with them/long-term relationship with them.....1
The experience of other growers .....2
The person you talked to is knowledgeable .....3
The fact that you feel they are unbiased.....4
Something else? (**SPECIFY**) _____...5
Don't know (**DO NOT READ**).....DK (88)
Refused (**DO NOT READ**) .....REF (99)

[GO TO Q40]

39 Are you <u>not</u> confident because of: (**READ LIST**)?

Your previous experience with them .....1
The experience of other growers .....2
The person you talked to is not knowledgeable .....3
The fact that you feel they are biased .....4
Something else? (**SPECIFY**) _____...5
Don't know (**DO NOT READ**).....DK (88)
Refused (**DO NOT READ**) .....REF (99)

## FIRMOGRAPHIC INFORMATION

**READ:** Next, I would like to ask you some general questions about your business or organization.

40 Which of the following is your largest source of revenue? (read entire list; code only one that best fits)?

Vegetables or field crops.....1
Livestock.....2
Ornamental nursery.....3
Indoor crops (greenhouse).....4
Packing plant.....5
Vineyard/winery.....6
Orchard.....7
Dairy farm.....8
Water district/services.....9
Other? (**SPECIFY**) _____..0
Don't know (**DO NOT READ**).....DK (88)
Refused (**DO NOT READ**).....REF (99)

41 Does your business own this property?

Yes.....1
No.....2
Don't know.....DK (88)
Refused.....REF (99)

42 Would you consider your business or organization operated by a family or operated by a company or government entity?

Family.....1
Company.....2
Not applicable.....3
Government Entity.....4
Don't know.....DK (88)
Refused.....REF (99)

43 Compared to other businesses or organizations similar to yours, would you categorize this business or organization as small, medium or large?

Small.....1
Medium.....2
Large.....3
Don't know (**DO NOT READ**).....DK (88)

Refused (**DO NOT READ**) .....REF (99)

44 How long has your company or organization been operating at its current location? (read list)

1 to 3 years.....1

4 to 10 years.....2

More than 10 years.....3

Don't know (**DO NOT READ**).....DK (88)

Refused (**DO NOT READ**) .....REF (99)

45 How many electric water pumps are used in your operation? (number of pumps)

Number of Pumps....._____
Don't know.....DK (88)
Refused .....REF (99)

46 What is your estimate of the average age of the pump(s)?

Average # of years (**OR RECORD RANGE)**: _____ years old
Don't know (**DO NOT READ**).....DK (88)
Refused (**DO NOT READ**).....REF (99)

47 On average, how many months are the pumps used during the year? (read list)

Less than 3 months.....1
3-6 months .....2
7-9 months .....3
Year round .....4
Don't know (**DO NOT READ**).....DK (88)
Refused (**DO NOT READ**).....REF (99)

48 Approximately, what percentage of your total annual operating costs is spent in electricity bills?

Approximate % (**OR RECORD RANGE)**:..... _____%
Don't know (**DO NOT READ**).....DK (88)
Refused (**DO NOT READ**) .....REF (99)

49 Approximately how many business colleagues/other farmers have you told about the benefits of pump testing or making pump repairs or efficiency improvements on pumping systems?

____ Number

**88** Don't Know

**99** Refused

Those are all my questions. On behalf of SCE, I thank you very much for your time.

**NOTE: IF RESPONDENT REQUESTED CONTACT INFORMATION FOR SCE, CHECK BOX AT BOTTOM OF CONTACT RECORD SHEET.**

**NOTE: IF RESPONDENT WANTED COMMENTS FORWARDED TO SCE, ENTER THEM HERE:**

_____

_____

_____

**RESPONDENT NAME: _____**

**SAMPLE ID NUMBER: _____**

**DATE: _____**

**2002 Edison Pump Test Program Telephone Survey**

**-- Non-Participant Questionnaire - Final**

**Introduction**

Hello, my name is (Surveyor Name) and I'm calling on behalf of the Southern California Edison Company (SCE). We are seeking your cooperation in a study, which will help Edison to better understand the needs of its agricultural and pumping customers. Edison is required by the California Public Utilities Commission to complete this study. Your responses are completely confidential and no organization will ever be able to identify you or your responses from the survey information that is collected. (**ADD, IF NECESSARY**: If there are any questions at any point about the purposes of this study, we would ask you to contact Shahana Samiullah at the Southern California Edison Company at 626-302-8293). (**ADD, IF NECESSARY**: This survey will take approximately 15 minutes.)

Are you the person in your business that is most knowledgeable or responsible for making decisions about the pumping system at your company.

**If yes:** (Go to **B**)

**If no:** Could you give me the name of the person that is responsible for making decisions about your company's pumping system and would be most familiar with SCE's Pump Test program?

**Contact Name:** _____

**Contact Number:** _____

**If customer is concerned that this is a sales call:** This is not a marketing or sales call., I just want to ask you a few questions about your reasons for not participating in this program. This should take only 10 to 15 minutes. If you would like to verify this research, I can give you the name and number of an SCE representative:

Shahana Samiullah 626-302-8293

**B:** **Say**: I want to assure you that your answers will be kept strictly confidential and will not be directly attributable to you.

1 Is water pumping at least one of the ways in which your company/organization uses electricity at any of your facilities?

Yes.....1
No.....2 [THANK AND TERMINATE]
Don't know.....DK (88)
Refused .....REF (99)

2 How many electric water pumps are used in your operation?

Number of Pumps....._____
Don't know.....DK (88)

Refused .....REF (99)

I would like to discuss with you SCE's program that is available to customers in the agriculture and water supply sectors.

First, at the customer's request, an Edison pump tester visits a pumping facility and conducts tests to determine whether the pump or pump system is working efficiently. Follow-up letters are sent to the customer indicating either that the equipment is operating efficiently, or that some energy savings are possible by increasing efficiency to match industry standards.

**GENERAL OUTREACH/PROGRAM AWARENESS/ PUMP SYSTEM IMPROVEMENT AWARENESS QUESTIONS**

3 Our records indicate that none of your pumps were tested by SCE's Pump Test program within the past three years. To the best of your memory, is this correct?

Yes.....1
No.....2 [THANK AND TERMINATE]
Don't know.....DK (88)
Refused .....REF (99)

4 Prior to this call, were you aware of SCE's Pump Test program?

Yes.....1
No.....2 (skip to Q7)
Don't know.....DK (88)) (skip to Q7)
Refused ..... REF (99) (skip to Q7**Error! Reference source not found.**)

5 Prior to year 2000, have you ever had any of your pumps tested by SCE's Pump Test Program?

Yes.....1 (skip to Q7)
No.....2
Don't know (**DO NOT READ**).....DK (88)
Refused (**DO NOT READ**) .....REF (99)

6 Why did you choose not to have your pumps tested by SCE's Pump Test Program? (**DO NOT READ CHOICES**)

**1** Did not believe the pump test results
**2** Did not have time
**3** Another company/contractor provides energy efficiency information/support relating to your pumping systems
**4** Already had pump tested by a company or individual other than SCE
**5** Have made necessary operating efficiency improvements to my pumping system to save energy.

**6** Other (Please specify) _____
**88** Don't Know
**99** Refused

7 Within the past three years have you ever had your pumping system(s) tested by other non- Edison sources?

Yes.....1
No.....2 (SKIP TO Q10)
Don't know.....DK (88) (SKIP TO Q10)
Refused.....REF (99) (SKIP TO Q10)

8 What type of non-Edison sources did your organization used for on-site testing of the operating efficiency of your pump? (DO NOT READ CHOICES)

Pump Dealer.....1
Pump Test Contractor.....2
Company itself.....3
Private vendor.....4
Manufacturer.....5
Federal or State government service.....8
Other: Specify _____.....9
Don't know.....DK (88)
Refused.....REF (99)

9 I'm now going to read a series of statements regarding the pump test and the pump test results. For each statement, tell me whether you disagree strongly, disagree somewhat, agree somewhat, or agree strongly.

| | **Disagree Strongly** | **Disagree Somewhat** | **Agree Somewhat** | **Agree Strongly** |
|---|---|---|---|---|
| **9A**. It was easy to request a pump test | | | | |
| **9B**. Once I requested a pump test, I didn't have to wait very long to have the test performed. | | | | |
| **9C**. The information provided by the pump tester ***at the time of the test*** was useful. | | | | |
| **9D.** I didn't have to wait very long to receive the results of the pump test. | | | | |
| **9E**. The pump test results were useful. | | | | |
| **9F**. The pump test results were easy to understand. | | | | |
| **9G**. The pump test results were believable. | | | | |
| **9H.** It was easy to get responses to pump test related questions after the test was conducted. | | | | |
| **9I**. As a result of having my pump tested, I am now much more knowledgeable about needed operating efficiency improvements for my pumping operations. | | | | |
| **9J**. The pump test results provided the necessary information for me to make required repairs or operating efficiency improvements on my pumping system. | | | | |

**BASIC KNOWLEDGE ABOUT EFFICIENCY OPTIONS**

Now thinking of your general operation:

10 How difficult is it to get information about alternative ways of reducing energy use? Please use a scale from 0 to 10, with 0 being not very difficult and 10 being very difficult. [INFORMATION SEARCH COSTS]

___ Response (**0-10**) **88** Don't Know **99** Refused to Answer

11 How willing are you to spend time looking for information on ways to reduce energy use? Please use a scale from 0 to 10, with 0 being not at all willing and 10 being very willing. [INFORMATION SEARCH COSTS]

___ Response (**0-10**) **88** Don't Know **99** Refused to Answer

12 How do you usually first learn about new energy-efficiency options? Do you first learn: (**READ LIST**)?

When you approach a vendor or contractor.....1
When you approach SCE .....2
Through printed material sent by SCE or a bill insert.....3
Through television/radio/newspaper ads.....4
When a SCE representative contacts you.....5
When a contractor or vendor contacts you.....6
By word of mouth.....7
At industry trade shows.....8
Or is it family tradition/business policy/recommendation.....9
Anything else? (**SPECIFY**) _____.....9
Don't know (**DO NOT READ**).....DK (88)
Refused (**DO NOT READ**) .....REF (99)

**PROCESS QUESTIONS**

13 In the last three years, do you recall receiving any contact and/or information from SCE on energy efficiency?

Yes.....1
No.....2
Don't know (**DO NOT READ**).....DK (88)
Refused (**DO NOT READ**) .....REF (99)

14 How many times has **SCE** contacted **you** in the past year regarding your pumps? (**READ LIST**) [FREQUENCY OF DELIVERY DURING PROGRAM]

Once .....1
Twice .....2
Several times, or .....3
Never .....4
Don't know (**DO NOT READ**).....DK (88)
Refused (**DO NOT READ**) ..... REF (99)

15 How satisfied are you with that amount of contact? Please use a scale from 0 to 10, with 0 being not at all satisfied and 10 being very satisfied. [CUSTOMER SATISFACTION WITH PROGRAM OUTREACH]

___ Response (**0-10**) **88** Don't Know **99** Refused to Answer

[IF NEVER IN Q14, THEN SKIP TO Q21]

16 How did SCE contact you? (Indicate all that apply) (DO NOT READ)

Phone Call by an SCE representative.....1
Internet or email.....2
Mail Printed Material.....3
Training Workshop.....4
Trade Association Meeting / Presentation.....5
On-site visit by an SCE representative.....6
Other: Specify_____.....7
Don't know (**DO NOT READ**).....DK (88)
Refused (**DO NOT READ**).....REF (99)

17 How satisfied are you with the ways, in which, you were contacted by SCE? Please use a scale from 0 to 10, with 0 being not at all satisfied and 10 being very satisfied. [CUSTOMER SATISFACTION WITH PROGRAM OUTREACH]

___ Response (**number)** **88** Don't Know **99** Refused to Answer

(If Response >5, then Go To Q19, else Go To Q19)

18 What is your preferred way to be contacted by SCE? (Indicate all that apply)

Phone Call.....1
Internet or email.....2
Mail Printed Material.....3
Training Workshop.....4
Trade Association Meeting / Presentation.....5
On-site visit.....6
Other: Specify_____.....7
Don't Don't know (**DO NOT READ**).....DK (88)
Refused (**DO NOT READ**).....REF (99)

19 What type of energy efficiency information did you receive from SCE? (Indicate all that apply)

Rebate Information.....1
Energy Efficiency Program Information.....2
Pump Test Referral.....3
Information on improving pumping productivity.....4
Other (Please Specify) _____ ....5
Don't know (**DO NOT READ**).....DK (88)
Refused (**DO NOT READ**).....REF (99)

20 How satisfied are you with the type of information provided by SCE? Please use a scale from 0 to 10, with 0 being not at all satisfied and 10 being very satisfied. [CUSTOMER SATISFACTION WITH PROGRAM OUTREACH]

___ Response (**number)** **88** Don't Know **99** Refused to Answer

21 Including any information we have already discussed, in the last three years, do you recall receiving any printed material from SCE on energy efficiency? [PROGRAM DELIVERY - PRINTED MATERIAL EFFECTIVENESS]

**1** Yes
**2** No (skip to Q25)
**88** Don't Know (skip to Q25)
**99** Refused to Answer (skip to Q25)

22 Where or from whom did you get this printed material? [PROGRAM DELIVERY - PRINTED MATERIAL EFFECTIVENESS]

Sent to the business/home.....1
Given to me by SCE representative .....2
Picked up at booth at conference / event.....3
SCE Website.....4
Other (Please Specify) _____ ....5
Don't know (**DO NOT READ**).....DK (88)
Refused (**DO NOT READ**) .....REF (99)

23 I'm now going to read a series of statements regarding this printed material. For each statement, tell me whether you disagree strongly, disagree somewhat, agree somewhat, or agree strongly.

| | Disagree Strongly | Disagree Somewhat | Agree Somewhat | Agree Strongly |
|---|---|---|---|---|
| **23A.** The information in the printed material was presented in an engaging format. | | | | |
| **23B**. The information in the printed material was easy to understand. | | | | |
| **23C.** The information in the printed material was useful. | | | | |
| **23D**. The information in the printed material was believable. | | | | |
| **23E**. The information in the printed material positively affected my attitude toward energy efficiency. | | | | |
| **23F.** I learned a considerable amount about available energy efficiency options from reading the printed material. | | | | |
| **23G.** The information on the printed material increased the likelihood that I will investigate energy | | | | |

| | | | | |
|---|---|---|---|---|
| efficiency options. | | | | |

**MARKET BARRIER QUESTIONS**

24 Has the energy efficiency information provided by SCE that we have been discussing helped to (READ . . . . ):

| | Yes (1) | No (2) | Don't Know (88) | Refused to Answer (99) |
|---|---|---|---|---|
| 24A. Reduce the time or cost of collecting information you would otherwise need to get on your own? | | | | |
| 24B. Reduce your doubt and uncertainty about energy efficiency. | | | | |
| 24C. Reduce the information disadvantage you may have with some dealers and suppliers. | | | | |

25 If you were to get your pump tested by SCE, how confident would you be in the advantages and operating efficiency improvement information provided by the test? Please use a scale from 1 to 10, with 1 being not at all confident and 10 being very confident. [IF RESONSE=1-5 THEN GO TO Q27 IF RESPONSE=6-10 THEN GO TO Q26; IF 88 OR 99 THEN GO TO Q28]

___ Response (**1-10**) **88** Don't Know **99** Refused to Answer

26 Is your confidence based on: (**READ LIST; RECORD ONLY ONE**)?

Your previous experience with SCE.....1
The experience of other businesses like yours .....2
The person you talked to at SCE (?) is knowledgeable.....3
The fact that you feel they are unbiased.....4
Something else? (**SPECIFY**) _____.....5
Don't know (**DO NOT READ**).....DK (88)
Refused (**DO NOT READ**).....REF (99)

[GO TO Q37]

27 Are you <u>not</u> confident because of: (**READ LIST**)

Your previous experience with SCE .....1
The experience of other businesses like yours .....2
The person you talked to is not knowledgeable .....3
The fact that you feel they are biased .....4
Something else? (**SPECIFY**) _____.....5
Don't know (**DO NOT READ**).....DK (88)
Refused (**DO NOT READ**) .....REF (99)

28 How confident would you be in the advantages and operating efficiency improvement information from pump test results if they were provided by a company <u>other</u> than SCE? Please use a scale from 1 to 10, with 1 being not at all confident and 10 being very confident. [IF RESONSE=1-5 THEN GO TO Q30; IF RESPONSE=6-10 THEN GO TO Q29; IF 88 OR 99 THEN GO TO Q31]

___ Response (**1-10**) **88** Don't Know **99** Refused to Answer

29 Is your confidence based on: (**READ LIST; RECORD ONLY ONE**)?

Your previous experience with them/long-term relationship with them.....1
The experience of other businesses like yours .....2
The person you talked to is knowledgeable .....3
The fact that you feel they are unbiased.....4
Something else? (**SPECIFY**) _____...5
Don't know (**DO NOT READ**).....DK (88)
Refused (**DO NOT READ**) .....REF (99)

[GO TO Q40]

30 Are you <u>not</u> confident because of: (**READ LIST**)?

Your previous experience with SCE .....1
The experience of other businesses like yours .....2
The person you talked to is not knowledgeable .....3
The fact that you feel they are biased .....4
Something else? (**SPECIFY**) _____...5
Don't know (**DO NOT READ**).....DK (88)
Refused (**DO NOT READ**) .....REF (99)

## FIRMOGRAPHIC INFORMATION

Next, I would like to ask you some general questions about your business or organization.

31 Which of the following is your largest source of revenue? (**READ ENTIRE LIST; CODE ONLY ONE THAT BEST FITS**)?

Vegetables or field crops.....1
Livestock.....2
Ornamental nursery.....3
Indoor crops (greenhouse) .....4
Packing plant .....5
Vineyard/winery.....6
Orchard.....7
Dairy farm.....8
Water district/services .....9
Other? (**SPECIFY**) _____..0
Don't know (**DO NOT READ**).....DK (88)
Refused (**DO NOT READ**).....REF (99)

32 Does your business own this property?

Yes.....1
No.....2
Don't know.....DK (88)
Refused .....REF (99)

33 Would you consider your business or organization operated by a family or operated by a company or government entity?

Family.....1
Company.....2
Government Entity.....3
Not applicable .....4
Don't know.....DK (88)
Refused .....REF (99)

34 Compared to other businesses or organizations similar to yours, would you categorize this business or organization as small, medium or large?

Small .....1
Medium.....2
Large .....3
Don't know (**DO NOT READ**).....DK (88)
Refused (**DO NOT READ**) .....REF (99)

35 How long has your company or organization been operating at its current location? (**READ LIST**)

1 to 3 years.....1

4 to 10 years.....2

More than 10 years.....3

Don't know (**DO NOT READ**).....DK (88)

Refused (**DO NOT READ**) .....REF (99)

36 What is your estimate of the average age of the pump(s)?

Average # of years (**OR RECORD RANGE**): ..... _____ years old
Don't know (**DO NOT READ**).....DK (88)
Refused (**DO NOT READ**).....REF (99)

37 On average, how many months are the pumps used during the year? (**READ LIST**)

Less than 3 months.....1
3-6 months .....2
7-9 months .....3
Year round .....4
Don't know (**DO NOT READ**).....DK (88)
Refused (**DO NOT READ**).....REF (99)

38 Approximately, what percentage of your total annual operating costs is spent in <u>electricity</u> bills?

Approximate % (**OR RECORD RANGE**): ..... _____%
Don't know (**DO NOT READ**).....DK (88)
Refused (**DO NOT READ**) .....REF (99)

39 How important is it for you to be sure that your pumping system makes efficient use of electricity? Please use a scale from 0 to 10, with 0 being not at all important and 10 being very important.

___ Response (**0-10**) **88** Don't Know **99** Refused to Answer

Those are all my questions. On behalf of SCE, I thank you very much for your time.

**NOTE: IF RESPONDENT REQUESTED CONTACT INFORMATION FOR SCE, CHECK BOX AT BOTTOM OF CONTACT RECORD SHEET.**

**NOTE: IF RESPONDENT WANTED COMMENTS FORWARDED TO SCE, ENTER THEM HERE:**

**RESPONDENT NAME: _____**

**SAMPLE ID NUMBER: _____**

**DATE: _____**

**2002 Edison PT&HS Program Telephone Survey**

**-- Final EE Contacts Questionnaire --**

**Introduction**

Hello, my name is (Surveyor Name) and I'm calling on behalf of the Southern California Edison Company (SCE). May I please speak with (Contact Name)?

**SCHEDULE 4 CALL-BACKS, IF NECESSARY.**

Hello, my name is (Surveyor Name) and I'm calling on behalf of the Southern California Edison Company (SCE). We are seeking your cooperation in a study, which will help Edison to better understand the needs of its agricultural and pumping customers. Edison is required by the California Public Utilities Commission to complete this study. Your responses are completely confidential and no organization will ever be able to identify you or your responses from the survey information that is collected. (**ADD, IF NECESSARY**: If there are any questions at any point about the purposes of this study, we would ask you to contact Shahana Samiullah at the Southern California Edison Company at 626-302-8293). (**ADD, IF NECESSARY**: This survey will take approximately 15 minutes.)

**If customer is concerned that this is a sales call:** This is not a marketing or sales call. Today, I just want to ask you a few questions about your reasons about your experience with obtaining general energy efficiency information from SCE. This should take only 10 to 15 minutes. If you would like to verify this research, I can give you the name and number of an SCE contact:

Shahana Samiullah 626-302-8293

**Say**: I want to assure you that your answers will be kept strictly confidential and will not be directly attributable to you.

**SCREENER QUESTION**

1 Our records indicate that you received energy efficiency information from an SCE service representative in 2002 that provided general information about energy efficiency services offered by SCE. Is this correct?

Yes.....1
No.....2 (Thank and Terminate)
Don't know..... DK (88) (Thank and Terminate)
Refused .....REF (99) (Thank and Terminate)

**BASIC KNOWLEDGE ABOUT EFFICIENCY OPTIONS**

I am going to ask you a few questions about energy efficiency in general.

2 How <u>difficult is it to get information</u> about alternative ways of reducing energy use? Please use a scale from 0 to 10, with 0 being not very difficult and 10 being very difficult. [INFORMATION SEARCH COSTS]

___ Response (**0-10**) **88** Don't Know **99** Refused to Answer

3 How willing are you to spend time looking for information on ways to reduce energy use? Please use a scale from 0 to 10, with 0 being not at all willing and 10 being very willing. [INFORMATION SEARCH COSTS]

___ Response (**0-10**) **88** Don't Know **99** Refused to Answer

4 How do you usually first learn about energy-efficiency options? Do you first learn: (**READ LIST**)?

When you approach a vendor or contractor.....1
When you approach SCE .....2
Through printed material sent by SCE or a bill insert.....3
Through television/radio/newspaper ads.....4
When a SCE representative contacts you.....5
When a contractor or vendor contacts you.....6
By word of mouth.....7
At industry trade shows.....8
Or is it family tradition/business policy/recommendation.....9
Anything else? (**SPECIFY**) _____.....9
Don't know (**DO NOT READ**).....DK (88)
Refused (**DO NOT READ**) .....REF (99)

**PROCESS AND CUSTOMER SATISFACTION QUESTIONS**

5 How many times have you received energy efficiency information from the SCE service representative in the past year? (**READ LIST**) [FREQUENCY OF DELIVERY DURING PROGRAM]

Once .....1
Twice .....2
Several times, or .....3
Never .....4
Don't know (**DO NOT READ**).....DK (88)
Refused (**do not read**)..... REF (99)

6 How satisfied are you with the amount of contact that you received from the SCE? Please use a scale from 0 to 10, with 0 being not at all satisfied and 10 being very satisfied. [CUSTOMER SATISFACTION WITH PROGRAM OUTREACH]

___ Response (**number)** **88** Don't Know **99** Refused to Answer

[IF NEVER IN Q0, THEN SKIP TO Q21]

7 How did the SCE representative contact you? (Indicate all that apply)

Phone Call.....1
Internet or email.....2
Mail Printed Material.....3
Training Workshop.....4
Trade Association Meeting / Presentation.....5
On-site visit.....6
Other: Specify_____.....7
Don't Don't know (**DO NOT READ**).....DK (88)
Refused (**DO NOT READ**).....REF (99)

8 How satisfied are you with the ways, in which, you were contacted by the SCE service representative? Please use a scale from 0 to 10, with 0 being not at all satisfied and 10 being very satisfied. [CUSTOMER SATISFACTION WITH PROGRAM OUTREACH]

___ Response (**number)** **88** Don't Know **99** Refused to Answer

If Response >5, then Go To 0)

9 What is your preferred way to be contacted by SCE? (Indicate all that apply)

Phone Call.....1
Internet or email.....2
Mail Printed Material.....3
Training Workshop.....4
Trade Association Meeting / Presentation.....5
On-site visit.....6
Other: Specify_____.....7
Don't Don't know (**DO NOT READ**).....DK (88)
Refused (**DO NOT READ**).....REF (99)

10 What type of energy efficiency information did you receive from the SCE service representative? (Indicate all that apply)

Rebate Information.....1
Energy Efficiency Program Information.....2
Pump Test Referral.....3
Information on improving pumping productivity.....4
Other (Please Specify) _____ ....5
Don't know (**DO NOT READ**).....DK (88)
Refused (**DO NOT READ**).....REF (99)

11 How satisfied are you with the type of information provided by the SCE service representative? Please use a scale from 0 to 10, with 0 being not at all satisfied and 10 being very satisfied. [CUSTOMER SATISFACTION WITH PROGRAM OUTREACH]

___ Response (**number)** **88** Don't Know **99** Refused to Answer

12 Including any information we have already discussed, in the last 5 years, do you recall receiving any printed material from SCE on energy efficiency? [PROGRAM DELIVERY - PRINTED MATERIAL EFFECTIVENESS]

**1** Yes
**2** No (skip to Q24)
**88** Don't Know (skip to Q24)
**99** Refused to Answer (skip to Q24)

13 Where or from whom did you get this printed material? [PROGRAM DELIVERY - PRINTED MATERIAL EFFECTIVENESS]

Sent to the business/home.....1
Given to me by SCE representative .....2
Picked up at booth at conference / event.....3
SCE Website.....4
Other (Please Specify) _____ ....5
Don't know (**DO NOT READ**).....DK (88)
Refused (**DO NOT READ**) .....REF (99)

14 I'm now going to read a series of statements regarding this printed material. For each statement, tell me whether you disagree strongly, disagree somewhat, agree somewhat, or agree strongly.

| | Disagree Strongly | Disagree Somewhat | Agree Somewhat | Agree Strongly |
|---|---|---|---|---|
| **14A.** The information in the printed material was presented in an engaging format. | | | | |
| **14B**. The information in the printed material was easy to understand. | | | | |
| **14C.** The information in the printed material was useful. | | | | |
| **14D**. The information in the printed material was believable. | | | | |
| **14E**. The information in the printed material positively affected my attitude toward energy efficiency. | | | | |
| **14F.** I learned a considerable amount about available energy efficiency options from reading the printed material. | | | | |
| **14G.** The information on the printed material increased the likelihood that I will investigate energy | | | | |

| | | | | |
|---|---|---|---|---|
| efficiency options. | | | | |

## MARKET BARRIER QUESTIONS

If you were to consider options to save energy, you may want to learn about the advantages and predicted energy savings of the options. As you may know, you may get that information from SCE, from pump dealers, from consultants, or from irrigation system designers.

15 Has the energy efficiency information provided by SCE that we have been discussing helped you to (READ . . . . ):

| | Yes (1) | No (2) | Don't Know (88) | Refused to Answer (99) |
|---|---|---|---|---|
| 15A. Reduce the time or cost of collecting information you would otherwise need to get on your own? | | | | |
| 15B. Reduce your doubt and uncertainty about energy efficiency. | | | | |
| 15C. Reduce the information disadvantage you may have with some dealers and suppliers. | | | | |

## FIRMOGRAPHIC INFORMATION

Next, I would like to ask you some general questions about your business or organization.

16 Which of the following is your largest source of revenue? (**READ ENTIRE LIST; CODE ONLY ONE THAT BEST FITS**)?

Vegetables or field crops.....1
Livestock.....2
Ornamental nursery.....3
Indoor crops (greenhouse) .....4
Packing plant .....5
Vineyard/winery.....6
Orchard.....7
Dairy farm.....8
Water district/services .....9

Other? (**SPECIFY**) _____..0
Don't know (**DO NOT READ**).....DK (88)
Refused (**DO NOT READ**).....REF (99)

17 Does your business own this property?

Yes.....1
No.....2
Don't know.....DK (88)
Refused .....REF (99)

18 Would you consider your business or organization operated by a family or operated by a company or government entity?

Family.....1
Company.....2
Government Entity.....3
Not applicable .....4
Don't know.....DK (88)
Refused .....REF (99)

19 Compared to other businesses or organizations similar to yours, would you categorize this business or organization as small, medium or large?

Small .....1

Medium.....2

Large .....3

Don't know (**DO NOT READ**).....DK (88)

Refused (**DO NOT READ**) .....REF (99)

20 How long has your company or organization been operating at its current location? (**READ LIST**)

1 to 3 years.....1

4 to 10 years.....2

More than 10 years.....3

Don't know (**DO NOT READ**).....DK (88)

Refused (**DO NOT READ**) .....REF (99)

21 How many electric water pumps are used in your operation? (**NUMBER OF PUMPS**)

Number of Pumps....._____ (IF =0, GO TO Q5.2.3)
Don't know.....DK (88)

Refused .....REF (99)

22 What is your estimate of the average age of the pump(s)?

Average # of years (**OR RECORD RANGE**): ..... _____ years old
Don't know (**DO NOT READ**).....DK (88)
Refused (**DO NOT READ**).....REF (99)

23 On average, how many months are the pumps used during the year? (**READ LIST**)

Less than 3 months.....1
3-6 months .....2
7-9 months .....3
Year round .....4
Don't know (**DO NOT READ**).....DK (88)
Refused (**DO NOT READ**).....REF (99)

24 Approximately, what percentage of your total annual operating costs is spent in electricity bills?

Approximate % (**OR RECORD RANGE**): ..... _____%
Don't know (**DO NOT READ**).....DK (88)
Refused (**DO NOT READ**) .....REF (99)

25 How important is it for you to be sure that your pumping system makes efficient use of electricity? Please use a scale from 0 to 10, with 0 being not at all important and 10 being very important.

___ Response (**0-10**) **88** Don't Know **99** Refused to Answer

**PARTICIPATION QUESTIONS**

26 Prior to 2002, were you aware of SCE's Pump Test and Hydraulic Services program?

Yes.....1
No.....2
Don't know.....DK (88)
Refused .....REF (99)

27 Have you ever participated in SCE's Pump Test Program?

Once .....1 (skip to Q0)
Twice .....2 (skip to Q0)
Several times, or .....3 (skip to Q0)
Never .....4
Don't know (**DO NOT READ**).....DK (88) (skip to Q0)
Refused (**DO NOT READ**) .....REF (99) (skip to Q0)

28 Why did/would you choose not to participate in SCE's Pump Test Program?

**1** Do not believe the pump test results
**2** Do not have time
**3** Another company/contractor provides operating efficiency information/support relating to your pumping systems
**4** Already had pump tested by a company or individual other than SCE
**5** Have made necessary operating efficiency improvements to my pumping system to save energy.
**6** Our company does not have pumps. (GO TO END)
**7** Other (Please specify) _____
**88** Don't Know
**99** Refused

**DIFFUSION QUESTION**

29 Approximately how many business colleagues/other farmers have you ***told*** about the benefits of pump testing or making pump repairs or efficiency improvements on pumping systems?

____ Number

**88** Don't Know

**99** Refused

Those are all my questions. On behalf of SCE, I thank you very much for your time.

**NOTE: IF RESPONDENT REQUESTED CONTACT INFORMATION FOR SCE, CHECK BOX AT BOTTOM OF CONTACT RECORD SHEET.**

**NOTE: IF RESPONDENT WANTED COMMENTS FORWARDED TO SCE, ENTER THEM HERE:**

_____

_____

_____

**RESPONDENT NAME: _____**

**SAMPLE ID NUMBER: _____**

**DATE: _____**

# *Southern California Edison*

# *Agricultural Pump Test and Hydraulic Services Staff Interview Guide - Final*

The following questions will be asked of interviewees, depending on the appropriateness of the question to the person being interviewed. However, the intent is to ask as many questions as possible with each level of interviewee in order to compose a complete picture of the level of knowledge, communication, and buy in to the program objectives and goals.

The guide is only an outline, allowing the interviewee and interviewer to deviate into areas that contribute to an overall understanding of program operation.

There are ten areas that will to be covered during the 14 planned in-depth interviews (7 planned interviews with SCE Program Staff that are not pump testers and 7 with SCE Pump Testers).

## General Information

1. What are your responsibilities in the program?
2. What percentage of your time do you spend on the program? How long have you been involved in the program?
3. How many staff are currently involved in the operation of the program (promotion, administration, monitoring)?
4. Please describe the organizational structure with regard to the implantation of the program.
5. How often and in what formats do you communicate with the program staff? What kinds of issues do you communicate about? Does this relationship work well? What are its strengths and weaknesses?
6. What is your opinion of the distribution of program implementation staff? Would more or less be better? More or less where?
7. What is your opinion of the distribution of program implementation responsibilities?
8. What is your opinion of the communication among people/groups responsible for different aspects of the program?
9. What staffing/organizational improvements would you suggest?

## Program Training / Staffing

10. How are clerical staff, technical staff and the pump test staff provided training on the program? Are there training manuals, are there materials used, or is the training informal? (Request copies of material if available.)
11. What training improvements would you suggest?
12. What is the current turnover rate amongst staff responsible for the program? Does the turnover rate affect the effectiveness of program implementation?

13. Informally, how would you rate the program performance of the following staff? Clerical staff? Technical staff? Pump testers?
14. Describe the main tasks of the pump testers.
15. What special qualifications are required of pump testers? Must they have any certifications?

## Program Goals/Strategies

16. What are the goals of the program? Have the goals changed since the start of the program? The program year? Are the goals appropriate? Are there other goals that should be included? (What are they?)
17. How are the program goals set? Who sets them?
18. How are program goals communicated to you? Are they communicated clearly? How do you communicate them to your staff?
19. What goals have been achieved in the program to date?
20. Where has the program fallen short of its goals? Where has it exceeded goals?
21. What actions do you think would increase the success of the program in reaching its goals? If they exceeded the goals why do you think that occurred?

## Program Target Population

22. Who do you see as the primary market for the program? Secondary Market?
23. Is the program reaching that/those market(s)? Describe the makeup of program participants to date. What are the response rates?
24. Has the program targeted any specific segments of the agricultural market such as small or medium size customers?
25. Are there changes you might suggest in program design or implementation to better reach a wider or different set of customers?

## Program Promotion and Marketing

26. How do prospective participants learn about the program? Which marketing strategies are primary? Secondary?
27. What are the specific staff responsibilities in program promotion?
28. What feature(s) of the program do you think are the most influential in inducing customers to participate?
29. What features tend to stop customers from participating?
30. What are the advantages and disadvantages of the current marketing arrangements? What would you change?
31. Was market research done and was available for the design of this program? Please describe.

## Program Delivery

32. Who decides what information is offered to each customer?
33. Who supervises this?
34. When does this happen?
35. Does this system work well? What changes would you make?

## Customer Tracking and Program Database

36. How are customers tracked from initial contact?
37. What is the typical length of time from customer expression of interest in the program until the customer is sent information? Until the customer schedules a pump test? Until the customer gets a pump test?
38. How many times do you believe the average customer has to be contacted before they decide to do a pump test?
39. What percent of customers schedule a pump test then cancel before it is performed? Why do they cancel?
40. What actions have been taken to decrease cancellations?
41. Can you summarize for me the types of information are included in the program database?

## Pump Tests

42. How long does the typical pump test take?
43. Are there time goals or test quality goals?
44. Who checks that goals are met?
45. Are there incentives for meeting any such goals?
46. Are there penalties for taking too long or poor test results?
47. Who sets the goals?
48. What are the criteria for whether a pump test should be done?
49. What conditions would cause a pump tester to not perform a scheduled test after arriving at the site?

## Test Results/Quality Control

50. What percentage of the completed tests are checked for quality control?
51. Who performs the quality control? How long between the time the pump test is performed and the completion of quality control? Is that amount of time acceptable? Why?
52. Does the person who performs the quality control have other responsibilities? What are they and do they delay or interfere with the quality control task?

53. What are the criteria for acceptability?
54. What percentage of the pump tests fail quality control? What happens when there is a failure?
55. How are records of quality control maintained?
56. How are customer complaints handled?

## General Suggestions and Other Comments

# Appendix D
# Pump Test Participant Survey Frequencies

Because these were CATI surveys, the numbering of the questions in the CATI did not match the numbers on the Word document and Uses and Sources Chart (Appendix B). The first number for the question in [brackets] is the corresponding number in Appendix C while the other question number corresponds to the CATI numbering system.

## SCE Pump Test & Hydraulic Services Evaluation

## Pump Test Participant Survey Frequencies

Recall receiving pump test

| [Q1] q_10 | Frequency | Percent |
|---|---|---|
| Yes | 63 | 98.44 |
| Don't Know | 1 | 1.56 |

Make changes to improve pump ee?

| [Q3] q_13 | Frequency | Percent |
|---|---|---|
| Yes | 26 | 40.63 |
| No | 35 | 54.69 |
| Don't Know | 3 | 4.69 |

| [Q4] q_14A | Frequency | Percent |
|---|---|---|
| Well casing | 1 | 4.55 |
| Pump(Shaft/Bowls/Impeller) | 16 | 72.73 |
| Motor | 3 | 13.64 |
| Upstream from pump | 1 | 4.55 |
| Don't Know | 1 | 4.55 |

Frequency Missing = 42

| [Q4] q_14b | Frequency | Percent |
|---|---|---|
| Well casing | 2 | 50.00 |
| Pump(Shaft/Bowls/Impeller) | 2 | 50.00 |

Frequency Missing = 60

| [Q4] q_14c | Frequency | Percent |
|---|---|---|
| Pump(Shaft/Bowls/Impeller) | 2 | 50.00 |
| Motor | 2 | 50.00 |

Frequency Missing = 60

Influence on pump test on decision

| [Q5] | q_17 | Frequency | Percent |
|---|---|---|---|
| | 0 | 1 | 3.85 |
| | 2 | 1 | 3.85 |
| | 5 | 3 | 11.54 |
| | 7 | 1 | 3.85 |
| | 8 | 4 | 15.38 |
| | 9 | 5 | 19.23 |
| | 10 | 10 | 38.46 |
| Don't Know | | 1 | 3.85 |

Frequency Missing = 38

If no test rlts how likely make improve?

| [Q6] | q_18 | Frequency | Percent |
|---|---|---|---|
| | 0 | 4 | 15.38 |
| | 1 | 1 | 3.85 |
| | 2 | 2 | 7.69 |
| | 3 | 3 | 11.54 |
| | 5 | 4 | 15.38 |
| | 7 | 6 | 23.08 |
| | 8 | 1 | 3.85 |
| | 10 | 3 | 11.54 |
| Don't Know | | 2 | 7.69 |

Frequency Missing = 38

Before test rslts plan to improve ee?

| [Q7] | q_21 | Frequency | Percent |
|---|---|---|---|
| Yes | | 10 | 38.46 |
| No | | 13 | 50.00 |
| Don't Know | | 3 | 11.54 |

Frequency Missing = 38

How long considering these improvements?

| [Q8] q_22 | Frequency | Percent |
|---|---|---|
| 1 YEAR | 1 | 10.00 |
| 1 YR | 2 | 20.00 |
| 30 DAYS | 1 | 10.00 |
| 5 YRS | 1 | 10.00 |
| 6 MONTHS | 4 | 40.00 |
| SOON | 1 | 10.00 |

Frequency Missing = 54

Without test rslts when make ee improve?

| [Q9] q_23 | Frequency | Percent |
|---|---|---|
| Within 6 Months | 5 | 50.00 |
| 1 to 2 Years Later | 1 | 10.00 |
| 4 or More Years Later | 1 | 10.00 |
| Don't Know | 3 | 30.00 |

Frequency Missing = 54

Which had greatest impacts on ee sepcs?

| [Q13] q_28 | Frequency | Percent |
|---|---|---|
| Pump test results from SCE pump program | 12 | 46.15 |
| Equipment distributor or pump dealer | 4 | 15.38 |
| Installer | 4 | 15.38 |
| Internal staff | 3 | 11.54 |
| SCE representative | 2 | 7.69 |
| Don't Know | 1 | 3.85 |

Frequency Missing = 38

Test rslts nice but unnecessary

| [Q14] q_30 | Frequency | Percent |
|---|---|---|
| 0 | 12 | 46.15 |
| 1 | 5 | 19.23 |
| 3 | 2 | 7.69 |

| | | |
|---|---|---|
| 4 | 1 | 3.85 |
| 5 | 2 | 7.69 |
| 7 | 1 | 3.85 |
| 8 | 1 | 3.85 |
| 9 | 1 | 3.85 |
| 10 | 1 | 3.85 |

Frequency Missing = 38

Test results were critical

| [Q15] q_31 | Frequency | Percent |
|---|---|---|
| 5 | 2 | 7.69 |
| 6 | 2 | 7.69 |
| 7 | 1 | 3.85 |
| 8 | 3 | 11.54 |
| 9 | 3 | 11.54 |
| 10 | 15 | 57.69 |

Frequency Missing = 38

Without rslts not have made changes

| [Q16] q_32 | Frequency | Percent |
|---|---|---|
| 0 | 1 | 3.85 |
| 1 | 1 | 3.85 |
| 3 | 1 | 3.85 |
| 5 | 4 | 15.38 |
| 7 | 1 | 3.85 |
| 8 | 3 | 11.54 |
| 9 | 2 | 7.69 |
| 10 | 12 | 46.15 |
| Don't Know | 1 | 3.85 |

Frequency Missing = 38

Receive any financial assistance?

| [Q17] q_33 | Frequency | Percent |
|---|---|---|
| Yes | 2 | 7.69 |
| No | 24 | 92.31 |

Frequency Missing = 38

From whom did you receive assistance?

| [Q18] q_34 | Frequency | Percent |
|---|---|---|
| FROM EDISON REBATE | 1 | 50.00 |
| STATE OF CALIFORNIA | 1 | 50.00 |

Frequency Missing = 62

Prior to 2002 aware of SCE pump test?

| [Q19] q_35 | Frequency | Percent |
|---|---|---|
| Yes | 58 | 90.63 |
| No | 6 | 9.38 |

How learn about SCE pump test program?

| [Q20] q_36 | Frequency | Percent |
|---|---|---|
| Approached a vendor or contractor | 2 | 3.13 |
| Approached SCE | 1 | 1.56 |
| Through printed material from SCE | 5 | 7.81 |
| Contacted by SCE representative | 8 | 12.50 |
| By word of mouth | 14 | 21.88 |
| Family tradition/business policy/recommendation | 29 | 45.31 |
| Other | 3 | 4.69 |
| Don't Know | 2 | 3.13 |

How did SCE rep contact you?

| [Q21] q_37 | Frequency | Percent |
|---|---|---|
| HE CONTACTED SEISON | 1 | 33.33 |
| IT WAS ALREADY ESTABLISHED | 1 | 33.33 |
| WAS IN PLACE WHEN I STARTED WORKING HERE | 1 | 33.33 |

Frequency Missing = 61

What is best way to be contacted by SCE?

| [Q22] q_40a | Frequency | Percent |
|---|---|---|
| Phone call | 39 | 60.94 |
| Internet or e mail | 6 | 9.38 |
| Mail or printed material | 13 | 20.31 |
| On site visit | 2 | 3.13 |
| Other | 2 | 3.13 |
| Don't Know | 2 | 3.13 |

What is best way to be contacted by SCE?

| [Q22] q_40b | Frequency | Percent |
|---|---|---|
| Phone call | 1 | 14.29 |
| Internet or e mail | 5 | 71.43 |
| Mail or printed material | 1 | 14.29 |

Frequency Missing = 57

What is best way to be contacted by SCE?

| [Q22] q_40c | Frequency | Percent |
|---|---|---|
| Internet or e mail | 1 | 50.00 |
| Mail or printed material | 1 | 50.00 |

Frequency Missing = 62

How satisfied with ways contacted

| [Q23] q_41 | Frequency | Percent |
|---|---|---|
| 5 | 1 | 1.56 |
| 6 | 1 | 1.56 |
| 7 | 4 | 6.25 |
| 8 | 8 | 12.50 |
| 9 | 13 | 20.31 |
| 10 | 37 | 57.81 |

Times SCE contact in past yr pump

| [Q24] q_42 | Frequency | Percent |
|---|---|---|

| | | |
|---|---|---|
| Once | 12 | 18.75 |
| Twice | 13 | 20.31 |
| Several times | 21 | 32.81 |
| Never | 16 | 25.00 |
| Don't Know | 2 | 3.13 |

How satisfied with amount of contact?

| [Q25] q_43 | Frequency | Percent |
|---|---|---|
| 2 | 1 | 1.56 |
| 5 | 3 | 4.69 |
| 7 | 1 | 1.56 |
| 8 | 14 | 21.88 |
| 9 | 7 | 10.94 |
| 10 | 35 | 54.69 |
| Don't Know | 3 | 4.69 |

How many times you contact SCE re pump?

| [Q26] q_44 | Frequency | Percent |
|---|---|---|
| Once | 13 | 20.31 |
| Twice | 14 | 21.88 |
| Several times | 28 | 43.75 |
| Never | 9 | 14.06 |

In 5 yrs recall get printed material?

| [Q27] q_45 | Frequency | Percent |
|---|---|---|
| Yes | 48 | 75.00 |
| No | 14 | 21.88 |
| Don't Know | 2 | 3.13 |

Where did you get the printed material?

| [Q28] q_46 | Frequency | Percent |
|---|---|---|
| Sent to your business/home | 36 | 76.60 |
| Given to you by SCE representative | 8 | 17.02 |

| | | | | |
|---|---|---|---|---|
| Picked up at booth at conference/event | | | 2 | 4.26 |
| Other | 1 | 2.13 | | |

Frequency Missing = 17

Information in interesting format

| [Q29a] | q_49 | Frequency | Percent |
|---|---|---|---|
| Somewhat agree | | 24 | 50.00 |
| Strongly agree | | 24 | 50.00 |

Frequency Missing = 16

Material easy to understand

| [Q29b] | q_50 | Frequency | Percent |
|---|---|---|---|
| Somewhat agree | | 17 | 35.42 |
| Strongly agree | | 31 | 64.58 |

Frequency Missing = 16

Information was useful

| [Q29c] | q_51 | Frequency | Percent |
|---|---|---|---|
| Somewhat agree | | 18 | 37.50 |
| Strongly agree | | 30 | 62.50 |

Frequency Missing = 16

Information was believable

| [Q29d] | q_52 | Frequency | Percent |
|---|---|---|---|
| Strongly disagree | | 1 | 2.08 |
| Somewhat agree | | 16 | 33.33 |
| Strongly agree | | 30 | 62.50 |
| Don't Know | | 1 | 2.08 |

Frequency Missing = 16

Positively affect my attitude toward ee

| [Q29e] q_53 | Frequency | Percent |
|---|---|---|
| Somewhat disagree | 2 | 4.26 |
| Somewhat agree | 23 | 48.94 |
| Strongly agree | 18 | 38.30 |
| Don't Know | 4 | 8.51 |

Frequency Missing = 17

Learned a lot about ee options

| [Q29f] q_54 | Frequency | Percent |
|---|---|---|
| Somewhat disagree | 3 | 6.25 |
| Somewhat agree | 26 | 54.17 |
| Strongly agree | 16 | 33.33 |
| Don't Know | 3 | 6.25 |

Frequency Missing = 16

Increased chances of looking EE options

| [Q29g] q_55 | Frequency | Percent |
|---|---|---|
| Somewhat agree | 25 | 52.08 |
| Strongly agree | 21 | 43.75 |
| Don't Know | 2 | 4.17 |

Frequency Missing = 16

Arranged not have to wait long for test

| [Q30b] q_57 | Frequency | Percent |
|---|---|---|
| Strongly disagree | 1 | 1.56 |
| Somewhat disagree | 5 | 7.81 |
| Somewhat agree | 21 | 32.81 |
| Strongly agree | 37 | 57.81 |

Requested not have to wait long for test

| [Q30c] q_58 | Frequency | Percent |
|---|---|---|
| Strongly disagree | 1 | 1.56 |
| Somewhat disagree | 5 | 7.81 |
| Somewhat agree | 24 | 37.50 |
| Strongly agree | 33 | 51.56 |
| Don't Know | 1 | 1.56 |

Information at test time was useful

| [Q30d] q_59 | Frequency | Percent |
|---|---|---|
| Somewhat disagree | 2 | 3.13 |
| Somewhat agree | 12 | 18.75 |
| Strongly agree | 50 | 78.13 |

Not wait long for test results

| [Q30e] q_60 | Frequency | Percent |
|---|---|---|
| Strongly disagree | 2 | 3.13 |
| Somewhat disagree | 1 | 1.56 |
| Somewhat agree | 21 | 32.81 |
| Strongly agree | 40 | 62.50 |

Test results were useful

| [Q30f] q_61 | Frequency | Percent |
|---|---|---|
| Strongly disagree | 2 | 3.13 |
| Somewhat agree | 10 | 15.63 |
| Strongly agree | 52 | 81.25 |

Test results easy to understand

| [Q30g] q_62 | Frequency | Percent |
|---|---|---|
| Somewhat disagree | 2 | 3.13 |
| Somewhat agree | 16 | 25.00 |
| Strongly agree | 46 | 71.88 |

Test results were believable

| [Q30h] | q_63 | Frequency | Percent |
|---|---|---|---|
| Strongly disagree | | 2 | 3.13 |
| Somewhat agree | | 14 | 21.88 |
| Strongly agree | | 48 | 75.00 |

After test easy to get answers

| [Q30i] | q_64 | Frequency | Percent |
|---|---|---|---|
| Somewhat disagree | | 2 | 3.13 |
| Somewhat agree | | 13 | 20.31 |
| Strongly agree | | 47 | 73.44 |
| Refused | | 2 | 3.13 |

After test know more about ee improve

| [Q30j] | q_65 | Frequency | Percent |
|---|---|---|---|
| Strongly disagree | | 1 | 1.56 |
| Somewhat disagree | | 1 | 1.56 |
| Somewhat agree | | 22 | 34.38 |
| Strongly agree | | 39 | 60.94 |
| Don't Know | | 1 | 1.56 |

Test provided necessary information

| [Q30k] | q_66 | Frequency | Percent |
|---|---|---|---|
| Somewhat disagree | | 1 | 1.56 |
| Somewhat agree | | 20 | 31.25 |
| Strongly agree | | 43 | 67.19 |

Number of days between test and rslts

| [Q31] | q_67 | Frequency | Percent |
|---|---|---|---|

| | | |
|---|---|---|
| 4 | 1 | 1.56 |
| 5 | 3 | 4.69 |
| 6 | 2 | 3.13 |
| 7 | 14 | 21.88 |
| 10 | 8 | 12.50 |
| 14 | 12 | 18.75 |
| 16 | 1 | 1.56 |
| 20 | 2 | 3.13 |
| 21 | 2 | 3.13 |
| 30 | 7 | 10.94 |
| 45 | 1 | 1.56 |
| 50 | 1 | 1.56 |
| 60 | 3 | 4.69 |
| Don't Know | 6 | 9.38 |
| 90 | 1 | 1.56 |

How satisfied with number of days

| [Q32] | q_68 | Frequency | Percent |
|---|---|---|---|
| 0 | 1 | 1.56 |
| 3 | 1 | 1.56 |
| 4 | 2 | 3.13 |
| 5 | 2 | 3.13 |
| 6 | 4 | 6.25 |
| 7 | 4 | 6.25 |
| 8 | 14 | 21.88 |
| 9 | 10 | 15.63 |
| 10 | 26 | 40.63 |

Did test reduce timecost of get info

| [Q33a] | q_69 | Frequency | Percent |
|---|---|---|---|
| Yes | 60 | 93.75 |
| No | 2 | 3.13 |
| Don't Know | 2 | 3.13 |

Did test reduce doubt about system eff

| [Q33b] | q_70 | Frequency | Percent |
|---|---|---|---|

| | | |
|---|---|---|
| Yes | 60 | 93.75 |
| No | 3 | 4.69 |
| Don't Know | 1 | 1.56 |

Did test prog reduce dealer disadvant

| [Q33c] | q_71 | Frequency | Percent |
|---|---|---|---|
| Yes | | 50 | 78.13 |
| No | | 10 | 15.63 |
| Don't Know | | 4 | 6.25 |

Confident in info from test results

| [Q34] | q_72 | Frequency | Percent |
|---|---|---|---|
| 3 | | 1 | 1.56 |
| 5 | | 1 | 1.56 |
| 6 | | 1 | 1.56 |
| 7 | | 2 | 3.13 |
| 8 | | 19 | 29.69 |
| 9 | | 7 | 10.94 |
| 10 | | 33 | 51.56 |

What is confidence based on

| [Q35] | q_73 | Frequency | Percent |
|---|---|---|---|
| Your previous experience with SCE | | 39 | 62.90 |
| The experience of other colleagues/growers | | 4 | 6.45 |
| The person you talk to is knowledgeable | | 12 | 19.35 |
| The fact that you feel they are unbiased | | 4 | 6.45 |
| Other | | 2 | 3.23 |
| Don't Know | | 1 | 1.61 |

Frequency Missing = 2

Why not confident

| [Q36] | q_75 | Frequency | Percent |
|---|---|---|---|
| Your previous experience with SCE | | 1 | 50.00 |

| | | |
|---|---|---|
| Other | 1 | 50.00 |

Frequency Missing = 62

How confident in info if not from SCE

| [Q37] q_77 | Frequency | Percent |
|---|---|---|
| 0 | 3 | 4.69 |
| 1 | 2 | 3.13 |
| 2 | 3 | 4.69 |
| 3 | 2 | 3.13 |
| 5 | 20 | 31.25 |
| 6 | 5 | 7.81 |
| 7 | 5 | 7.81 |
| 8 | 8 | 12.50 |
| 10 | 3 | 4.69 |
| Don't Know | 13 | 20.31 |

What is confidence based on

| [Q38] q_78 | Frequency | Percent |
|---|---|---|
| Your previous experience with them and long-term relationship | 12 | 32.43 |
| The experience of other colleagues/growers | 2 | 5.41 |
| The person you talk to is knowledgeable | 2 | 5.41 |
| The fact that you feel they are unbiased | 3 | 8.11 |
| Other | 5 | 13.51 |
| Don't Know | 13 | 35.14 |

Frequency Missing = 27

Why not confident

| [Q39] q_79 | Frequency | Percent |
|---|---|---|
| Your previous experience with them | 6 | 13.95 |
| The person you talk to is not knowledgeable | 3 | 6.98 |
| The fact that you feel they are biased | 9 | 20.93 |
| Other | 12 | 27.91 |
| Don't Know | 13 | 30.23 |

Frequency Missing = 21

Largest source of revenue

| [Q40] q_80 | Frequency | Percent |
|---|---|---|
| Vegetables or field crops | 2 | 3.13 |
| Livestock | 2 | 3.13 |
| Orchard | 15 | 23.44 |
| Dairy farm | 5 | 7.81 |
| Water district/services | 33 | 51.56 |
| Other | 6 | 9.38 |
| Refused | 1 | 1.56 |

Does business own this property

| [Q41] q_82 | Frequency | Percent |
|---|---|---|
| Yes | 29 | 90.63 |
| No | 3 | 9.38 |

Frequency Missing = 32

Who operates your business or org

| [Q42] q_83 | Frequency | Percent |
|---|---|---|
| Family | 23 | 35.94 |
| Company | 8 | 12.50 |
| Government entity | 16 | 25.00 |
| Public Board | 16 | 25.00 |
| Refused | 1 | 1.56 |

Is your business large med small

| [Q43] q_84 | Frequency | Percent |
|---|---|---|
| Small | 26 | 40.63 |
| Medium | 23 | 35.94 |
| Large | 14 | 21.88 |
| Refused | 1 | 1.56 |

How long at current location

| [Q44] q_85 | Frequency | Percent |
|---|---|---|

| | | |
|---|---|---|
| 4 to 10 years | 3 | 4.69 |
| More than 10 years | 60 | 93.75 |
| Refused | 1 | 1.56 |

How many elect water pumps are used

| [Q45] | q_86 | Frequency | Percent |
|---|---|---|---|
| | 1 | 4 | 6.25 |
| | 2 | 6 | 9.38 |
| | 3 | 9 | 14.06 |
| | 4 | 3 | 4.69 |
| | 5 | 1 | 1.56 |
| | 6 | 1 | 1.56 |
| | 7 | 3 | 4.69 |
| | 8 | 1 | 1.56 |
| | 10 | 2 | 3.13 |
| | 11 | 1 | 1.56 |
| | 12 | 4 | 6.25 |
| | 14 | 2 | 3.13 |
| | 15 | 3 | 4.69 |
| | 19 | 1 | 1.56 |
| | 20 | 4 | 6.25 |
| | 21 | 1 | 1.56 |
| | 22 | 1 | 1.56 |
| | 25 | 1 | 1.56 |
| | 30 | 1 | 1.56 |
| | 31 | 1 | 1.56 |
| | 32 | 1 | 1.56 |
| | 40 | 3 | 4.69 |
| | 50 | 3 | 4.69 |
| | 53 | 1 | 1.56 |
| | 55 | 1 | 1.56 |
| | 64 | 1 | 1.56 |
| | Don't Know | 1 | 1.56 |
| | 90 | 1 | 1.56 |
| | 100 | 1 | 1.56 |
| | 140 | 1 | 1.56 |

Average age of pumps

| [Q46] | q_87 | Frequency | Percent |
|---|---|---|---|

| | | |
|---|---|---|
| 1 | 2 | 3.13 |
| 2 | 2 | 3.13 |
| 3 | 1 | 1.56 |
| 5 | 5 | 7.81 |
| 6 | 1 | 1.56 |
| 7 | 1 | 1.56 |
| 8 | 1 | 1.56 |
| 9 | 1 | 1.56 |
| 10 | 18 | 28.13 |
| 13 | 1 | 1.56 |
| 15 | 6 | 9.38 |
| 16 | 3 | 4.69 |
| 18 | 1 | 1.56 |
| 20 | 7 | 10.94 |
| 25 | 4 | 6.25 |
| 30 | 1 | 1.56 |
| 35 | 2 | 3.13 |
| 40 | 2 | 3.13 |
| 50 | 2 | 3.13 |
| Don't Know | 3 | 4.69 |

How many months are pumps used during yr

| [Q48] | q_88 | Frequency | Percent |
|---|---|---|---|
| Less than 3 months | | 2 | 3.13 |
| 3 to 6 months | | 13 | 20.31 |
| 7 to 9 months | | 14 | 21.88 |
| Year round | | 35 | 54.69 |

How many told about benefit of pump test

| [Q49] | q_89 | Frequency | Percent |
|---|---|---|---|
| 0 | | 21 | 32.81 |
| 1 | | 1 | 1.56 |
| 2 | | 3 | 4.69 |
| 3 | | 3 | 4.69 |
| 4 | | 7 | 10.94 |
| 5 | | 6 | 9.38 |
| 6 | | 4 | 6.25 |
| 7 | | 1 | 1.56 |

| | | |
|---|---|---|
| 10 | 7 | 10.94 |
| 12 | 2 | 3.13 |
| 15 | 1 | 1.56 |
| 20 | 2 | 3.13 |
| 30 | 1 | 1.56 |
| 50 | 2 | 3.13 |
| Don't Know | 3 | 4.69 |

# Appendix E
# Pump Test Nonparticipant Survey Frequencies

Because these were CATI surveys, the numbering of the questions in the CATI did not match the numbers on the Word document and Uses and Sources Chart (Appendix B). The first number for the question in [brackets] is the corresponding number in Appendix C while the other question number corresponds to the CATI numbering system.

## SCE Pump Test & Hydraulic Services Evaluation

## Pump Test Nonparticipant Survey Frequencies

Water pump using electricity?

| [Q1] Q6 | Frequency | Percent |
|---|---|---|
| Yes | 72 | 100.00 |

Number of electric pumps at location?

| [Q2] Q7 | Frequency | Percent |
|---|---|---|
| 1 | 32 | 44.44 |
| 2 | 10 | 13.89 |
| 3 | 7 | 9.72 |
| 4 | 1 | 1.39 |
| 5 | 1 | 1.39 |
| 6 | 7 | 9.72 |
| 10 | 2 | 2.78 |
| 12 | 2 | 2.78 |
| 13 | 1 | 1.39 |
| 15 | 1 | 1.39 |
| 20 | 3 | 4.17 |
| 25 | 1 | 1.39 |
| 53 | 1 | 1.39 |
| Don't Know | 2 | 2.78 |
| 225 | 1 | 1.39 |

No test by SCE done in last 3 yrs?

| [Q3] Q9 | Frequency | Percent |
|---|---|---|
| Yes | 72 | 100.00 |

Prior to call aware of SCE program?

| [Q4] Q10 | Frequency | Percent |
|---|---|---|

| | | |
|---|---|---|
| Yes | 39 | 54.17 |
| No | 33 | 45.83 |

Prior to 2000 any pumps tested by SCE?

| [Q5] Q11 | Frequency | Percent |
|---|---|---|
| Yes | 17 | 43.59 |
| No | 19 | 48.72 |
| Don't Know | 3 | 7.69 |

Frequency Missing = 33

Why not have pump tested by SCE?

| [Q6] Q12 | Frequency | Percent |
|---|---|---|
| Another company provides infor & support | 3 | 13.64 |
| Already had a rest by non SCE company | 2 | 9.09 |
| Other | 16 | 72.73 |
| Don't Know | 1 | 4.55 |

| Other Response | Interpretation for analysis |
|---|---|
| 1. Didn’t know who contacted | --- |
| 2. Not sure if SCE did it or someone else | Didn’t know about program |
| 3. Not informed | Didn’t know about program |
| 4. Not necessary | Didn’t need it |
| 5. Hadn’t had the chance | --- |
| 6. Didn’t bother | Didn’t need it |
| 7. Switched to diesel | Didn’t need it |
| 8. Down for a couple of years | Didn’t need it |
| 9. No time | --- |
| 10. Only worked there for 5 years | --- |
| 11. Didn’t know there was an option | Didn’t know about program |
| 12. Pump only 5 horsepower | Didn’t need it |
| 13. Don’t use them all that much | Didn’t need it |
| 14. Just never did | Didn’t need it |
| 15.No one offered it to us | Didn’t know about program |
| 16.Pumps were efficient | Didn’t need it |

Frequency Missing = 50

Within last 3 yrs pump tested by non SCE

| [Q7] Q14 | Frequency | Percent |
|---|---|---|

| | | |
|---|---|---|
| Yes | 21 | 29.17 |
| No | 51 | 70.83 |

Type of non SCE sources used for testing

| [Q8] Q15 | Frequency | Percent |
|---|---|---|
| Pump dealer | 7 | 31.82 |
| Pump test contractor | 5 | 22.73 |
| Company itself | 1 | 4.55 |
| Private vendor | 3 | 13.64 |
| Manufacturer | 1 | 4.55 |
| Other | 4 | 18.18 |
| Don't Know | 1 | 4.55 |

Frequency Missing = 50

Easy to request a pump test

| [Q9a] Q18 | Frequency | Percent |
|---|---|---|
| Somewhat disagree | 1 | 4.76 |
| Somewhat agree | 1 | 4.76 |
| Strongly agree | 18 | 85.71 |
| Don't Know | 1 | 4.76 |

Frequency Missing = 51

Requested not have to wait long for test

| [Q9b] Q19 | Frequency | Percent |
|---|---|---|
| Somewhat disagree | 1 | 4.76 |
| Somewhat agree | 2 | 9.52 |
| Strongly agree | 16 | 76.19 |
| Don't Know | 2 | 9.52 |

Frequency Missing = 51

Information at test time was useful

| [Q9c] Q20 | Frequency | Percent |
|---|---|---|

| | | |
|---|---|---|
| Strongly agree | 20 | 95.24 |
| Don't Know | 1 | 4.76 |

Frequency Missing = 51

Not wait long for test results

| [Q9d] Q21 | Frequency | Percent |
|---|---|---|
| Somewhat agree | 1 | 4.76 |
| Strongly agree | 19 | 90.48 |
| Don't Know | 1 | 4.76 |

Frequency Missing = 51

Test results were useful

| [Q9e] Q22 | Frequency | Percent |
|---|---|---|
| Somewhat agree | 1 | 4.76 |
| Strongly agree | 19 | 90.48 |
| Don't Know | 1 | 4.76 |

Frequency Missing = 51

Test results easy to understand

| [Q9f] Q23 | Frequency | Percent |
|---|---|---|
| Somewhat agree | 3 | 14.29 |
| Strongly agree | 17 | 80.95 |
| Don't Know | 1 | 4.76 |

Frequency Missing = 51

Test results were believable

| [Q9g] Q24 | Frequency | Percent |
|---|---|---|
| Somewhat agree | 2 | 9.52 |
| Strongly agree | 18 | 85.71 |
| Don't Know | 1 | 4.76 |

Frequency Missing = 51

After test easy to get answers

| [Q9h] | Q25 | Frequency | Percent |
|---|---|---|---|
| Somewhat disagree | | 1 | 4.76 |
| Somewhat agree | | 1 | 4.76 |
| Strongly agree | | 18 | 85.71 |
| Don't Know | | 1 | 4.76 |

Frequency Missing = 51

After test know more about ee improve

| [Q9i] | Q26 | Frequency | Percent |
|---|---|---|---|
| Somewhat agree | | 6 | 28.57 |
| Strongly agree | | 13 | 61.90 |
| Don't Know | | 1 | 4.76 |
| Refused | | 1 | 4.76 |

Frequency Missing = 51

Test provided necessary information

| [Q9j] | Q27 | Frequency | Percent |
|---|---|---|---|
| Somewhat agree | | 4 | 19.05 |
| Strongly agree | | 14 | 66.67 |
| Don't Know | | 2 | 9.52 |
| Refused | | 1 | 4.76 |

Frequency Missing = 51

How difficult to get ee information?

| [Q10] | Q28 | Frequency | Percent |
|---|---|---|---|
| 0 | | 10 | 13.89 |
| 1 | | 2 | 2.78 |
| 2 | | 5 | 6.94 |
| 3 | | 6 | 8.33 |
| 4 | | 2 | 2.78 |
| 5 | | 21 | 29.17 |
| 6 | | 5 | 6.94 |
| 7 | | 1 | 1.39 |

| | | |
|---|---|---|
| 8 | 5 | 6.94 |
| 10 | 5 | 6.94 |
| Don't Know | 10 | 13.89 |

Willing to spend time look for info?

| [Q11] | Q29 | Frequency | Percent |
|---|---|---|---|
| 0 | 4 | 5.56 | |
| 1 | 1 | 1.39 | |
| 2 | 4 | 5.56 | |
| 3 | 1 | 1.39 | |
| 4 | 1 | 1.39 | |
| 5 | 16 | 22.22 | |
| 6 | 4 | 5.56 | |
| 7 | 2 | 2.78 | |
| 8 | 8 | 11.11 | |
| 10 | 24 | 33.33 | |
| Don't Know | 6 | 8.33 | |
| Refused | 1 | 1.39 | |

How first learn about ee options?

| [Q12] | Q30 | Frequency | Percent |
|---|---|---|---|
| When you approach a vendor or contractor | | 5 | 6.94 |
| When you approach SCE | | 2 | 2.78 |
| Through printed material sent by SCE or bill insert | | 17 | 23.61 |
| Througy TV radio newspaper ads | | 8 | 11.11 |
| When a SCE rep contacts you | | 4 | 5.56 |
| When a contractor or vendor contacts you | | 2 | 2.78 |
| By word of mouth | | 9 | 12.50 |
| At industry trade shows | | 2 | 2.78 |
| Family tradition business policy recommendation | | 5 | 6.94 |
| Other | | 10 | 13.89 |
| Don't Know | | 7 | 9.72 |
| Refused | | 1 | 1.39 |

Last 3 yrs recall contact/info from SCE?

| [Q13] | Q32 | Frequency | Percent |
|---|---|---|---|

| | | |
|---|---|---|
| Yes | 35 | 48.61 |
| No | 33 | 45.83 |
| Don't Know | 3 | 4.17 |
| Refused | 1 | 1.39 |

In last yr times contact by SCE re pump?

| [Q14] Q33 | Frequency | Percent |
|---|---|---|
| Once | 7 | 9.72 |
| Twice | 1 | 1.39 |
| Several times | 2 | 2.78 |
| Never | 57 | 79.17 |
| Don't Know | 4 | 5.56 |
| Refused | 1 | 1.39 |

How satisfied with that amount contact?

| [Q15] Q34 | Frequency | Percent |
|---|---|---|
| 0 | 5 | 6.94 |
| 1 | 4 | 5.56 |
| 2 | 1 | 1.39 |
| 3 | 3 | 4.17 |
| 4 | 3 | 4.17 |
| 5 | 16 | 22.22 |
| 6 | 3 | 4.17 |
| 8 | 5 | 6.94 |
| 9 | 3 | 4.17 |
| 10 | 19 | 26.39 |
| Don't Know | 9 | 12.50 |
| Refused | 1 | 1.39 |

How did SCE contact you?

| [Q16] Q35a | Frequency | Percent |
|---|---|---|
| Phone call by SCE representative | 4 | 25.00 |
| Mail or printed material | 5 | 31.25 |
| On site visit by SCE rep | 1 | 6.25 |
| Other | 1 | 6.25 |
| Don't Know | 4 | 25.00 |

| | | |
|---|---|---|
| Refused | 1 | 6.25 |

Frequency Missing = 56

How did SCE contact you?

| [Q16] Q35b | Frequency | Percent |
|---|---|---|
| Training workshop 1 | 100.00 | |

Frequency Missing = 71

How satisfied with ways SCE contacted?

| [Q17] Q37 | Frequency | Percent |
|---|---|---|
| 0 | 1 | 6.25 |
| 2 | 1 | 6.25 |
| 5 | 3 | 18.75 |
| 10 | 8 | 50.00 |
| Don't Know | 2 | 12.50 |
| Refused | 1 | 6.25 |

Frequency Missing = 56

What is the preferred way be contacted?

| [Q18] Q38a | Frequency | Percent |
|---|---|---|
| Phone call | 6 | 37.50 |
| Internet or email | 1 | 6.25 |
| Mail or printed material | 7 | 43.75 |
| On site visit by SCE rep | 1 | 6.25 |
| Refused | 1 | 6.25 |

Frequency Missing = 56

What is the preferred way be contacted?

| [Q18] Q38b | Frequency | Percent |
|---|---|---|
| Mail or printed material | 2 | 100.00 |

Frequency Missing = 70

What type of ee info receive from SCE?

| [Q19] Q40a | Frequency | Percent |
|---|---|---|
| Rebate information | 2 | 13.33 |
| Energy efficiency program information | 7 | 46.67 |
| Information on improving pumping productivity | 2 | 13.33 |
| Other | 1 | 6.67 |
| Don't Know | 2 | 13.33 |
| Refused | 1 | 6.67 |

Frequency Missing = 57

What type of ee info receive from SCE?

| [Q19] Q40b | Frequency | Percent |
|---|---|---|
| Energy efficiency program information | 2 | 50.00 |
| Pump test referral | 1 | 25.00 |
| Information on improving pumping productivity | 1 | 25.00 |

Frequency Missing = 68

What type of ee info receive from SCE?

| [Q19] Q40c | Frequency | Percent |
|---|---|---|
| Pump test referral | 2 | 100.00 |

Frequency Missing = 70

What type of ee info receive from SCE?

| [Q19] Q40d | Frequency | Percent |
|---|---|---|
| Information on improving pumping productivity | 1 | 100.00 |

Frequency Missing = 71

How satisfied with type of SCE info?

| [Q20] Q42 | Frequency | Percent |
|---|---|---|

| | | |
|---|---|---|
| 0 | 1 | 6.67 |
| 6 | 1 | 6.67 |
| 8 | 2 | 13.33 |
| 10 | 7 | 46.67 |
| Don't Know | 3 | 20.00 |
| Refused | 1 | 6.67 |

Frequency Missing = 57

Last 3 yrs recall SCE printed material?

| [Q21] | Q43 | Frequency | Percent |
|---|---|---|---|
| Yes | 38 | | 52.78 |
| No | 25 | | 34.72 |
| Don't Know | 8 | | 11.11 |
| Refused | 1 | | 1.39 |

Where did you get the printed material?

| [Q22] | Q44 | Frequency | Percent |
|---|---|---|---|
| Sent to your business/home | | 33 | 86.84 |
| Given to you by SCE representative | | 2 | 5.26 |
| SCE website | | 1 | 2.63 |
| Other | | 2 | 5.26 |

Frequency Missing = 34

Information in interesting format

| [Q23a] | Q47 | Frequency | Percent |
|---|---|---|---|
| Strongly disagree | 2 | | 5.26 |
| Somewhat disagree | 2 | | 5.26 |
| Somewhat agree | 19 | | 50.00 |
| Strongly agree | 11 | | 28.95 |
| Don't Know | 4 | | 10.53 |

Frequency Missing = 34

Material easy to understand

| [Q23b] Q48 | Frequency | Percent |
|---|---|---|
| Strongly disagree | 1 | 2.63 |
| Somewhat agree | 18 | 47.37 |
| Strongly agree | 15 | 39.47 |
| Don't Know | 4 | 10.53 |

Frequency Missing = 34

Information was useful

| [Q23c] Q49 | Frequency | Percent |
|---|---|---|
| Strongly disagree | 2 | 5.26 |
| Somewhat disagree | 4 | 10.53 |
| Somewhat agree | 17 | 44.74 |
| Strongly agree | 10 | 26.32 |
| Don't Know | 5 | 13.16 |

Frequency Missing = 34

Information was believable

| [Q23d] Q50 | Frequency | Percent |
|---|---|---|
| Strongly disagree | 1 | 2.63 |
| Somewhat disagree | 2 | 5.26 |
| Somewhat agree | 10 | 26.32 |
| Strongly agree | 21 | 55.26 |
| Don't Know | 4 | 10.53 |

Frequency Missing = 34

Positively affect my attitude toward ee

| [Q23e] Q51 | Frequency | Percent |
|---|---|---|
| Strongly disagree | 1 | 2.63 |
| Somewhat disagree | 6 | 15.79 |
| Somewhat agree | 18 | 47.37 |
| Strongly agree | 9 | 23.68 |
| Don't Know | 4 | 10.53 |

Frequency Missing = 34

Learned a lot about ee options

| [Q23f] Q52 | Frequency | Percent |
|---|---|---|
| Strongly disagree | 2 | 5.26 |
| Somewhat disagree | 4 | 10.53 |
| Somewhat agree | 17 | 44.74 |
| Strongly agree | 11 | 28.95 |
| Don't Know | 4 | 10.53 |

Frequency Missing = 34

Increased chances of looking EE options

| [Q23g] Q53 | Frequency | Percent |
|---|---|---|
| Strongly disagree | 1 | 2.63 |
| Somewhat disagree | 7 | 18.42 |
| Somewhat agree | 13 | 34.21 |
| Strongly agree | 12 | 31.58 |
| Don't Know | 5 | 13.16 |

Frequency Missing = 34

EE info reduced time tp collect info?

| [Q24a] Q55 | Frequency | Percent |
|---|---|---|
| Yes | 21 | 55.26 |
| No | 13 | 34.21 |
| Don't Know | 4 | 10.53 |

Frequency Missing = 34

Reduced uncertainty about ee?

| [Q24b] Q56 | Frequency | Percent |
|---|---|---|
| Yes | 21 | 55.26 |
| No | 13 | 34.21 |
| Don't Know | 4 | 10.53 |

Frequency Missing = 34

Reduced info advantage that dealer have?

| [Q24c] Q57 | Frequency | Percent |
|---|---|---|
| Yes | 19 | 50.00 |
| No | 11 | 28.95 |
| Don't Know | 7 | 18.42 |
| Refused | 1 | 2.63 |

Frequency Missing = 34

Confident in info from SCE pump test?

| [Q25] Q58 | Frequency | Percent |
|---|---|---|
| 1 | 3 | 4.17 |
| 3 | 1 | 1.39 |
| 4 | 1 | 1.39 |
| 5 | 8 | 11.11 |
| 6 | 3 | 4.17 |
| 7 | 6 | 8.33 |
| 8 | 11 | 15.28 |
| 9 | 6 | 8.33 |
| 10 | 27 | 37.50 |
| Don't Know | 4 | 5.56 |
| Refused | 2 | 2.78 |

What is confidence based on?

| [Q26] Q59 | Frequency | Percent |
|---|---|---|
| Your previous experience with SCE | 23 | 43.40 |
| The experience of other businesses like yours | 3 | 5.66 |
| The person you talk to is knowledgeable | 10 | 18.87 |
| The fact that you feel they are unbiased | 8 | 15.09 |
| Other | 7 | 13.21 |
| Don't Know | 2 | 3.77 |

Frequency Missing = 19

What is non confidence based on?

| [Q27] Q61 | Frequency | Percent |
|---|---|---|

| | | |
|---|---|---|
| Your previous experience with SCE | 4 | 30.77 |
| The person you talk to is not knowledgeable | 1 | 7.69 |
| Other | 7 | 53.85 |
| Don't Know | 1 | 7.69 |

Frequency Missing = 59

Confident in info from nonSCE pump test?

| [Q28] Q63 | Frequency | Percent |
|---|---|---|
| 1 | 5 | 6.94 |
| 2 | 3 | 4.17 |
| 3 | 1 | 1.39 |
| 4 | 1 | 1.39 |
| 5 | 13 | 18.06 |
| 6 | 4 | 5.56 |
| 7 | 6 | 8.33 |
| 8 | 10 | 13.89 |
| 9 | 2 | 2.78 |
| 10 | 14 | 19.44 |
| Don't Know | 11 | 15.28 |
| Refused | 2 | 2.78 |

What is confidence based on?

| [Q29] Q64 | Frequency | Percent |
|---|---|---|
| Your previous experience with them and long-term relationship | 17 | 47.22 |
| The experience of other businesses like yours | 3 | 8.33 |
| The person you talk to is knowledgeable | 4 | 11.11 |
| The fact that you feel they are unbiased | 5 | 13.89 |
| Other | 2 | 5.56 |
| Don't Know | 5 | 13.89 |

Frequency Missing = 36

What is non confidence based on?

| [Q30] Q66 | Frequency | Percent |
|---|---|---|
| Your previous experience with SCE | 3 | 13.04 |
| The fact that you feel they are biased | 7 | 30.43 |

| | | |
|---|---|---|
| Other | 9 | 39.13 |
| Don't Know | 4 | 17.39 |

Frequency Missing = 49

Largest source of revenue

| [Q31] Q68 | Frequency | Percent |
|---|---|---|
| Vegetables or field crops | 9 | 12.50 |
| Livestock | 11 | 15.28 |
| Ornamental nursery | 1 | 1.39 |
| Packing plant | 1 | 1.39 |
| Vineyard/winery | 1 | 1.39 |
| Orchard | 20 | 27.78 |
| Dairy farm | 4 | 5.56 |
| Water district/services | 5 | 6.94 |
| Other | 19 | 26.39 |
| Refused | 1 | 1.39 |

Does business own this property

| [Q32] Q70 | Frequency | Percent |
|---|---|---|
| Yes | 64 | 88.89 |
| No | 7 | 9.72 |
| Refused | 1 | 1.39 |

Who operates your business or org

| [Q33] Q71 | Frequency | Percent |
|---|---|---|
| Family | 61 | 84.72 |
| Company | 6 | 8.33 |
| Government entity | 3 | 4.17 |
| Not applicable | 2 | 2.78 |

Is your business large med small

| [Q34] Q72 | Frequency | Percent |
|---|---|---|
| Small | 50 | 69.44 |

| | | |
|---|---|---|
| Medium | 11 | 15.28 |
| Large | 9 | 12.50 |
| Don't Know | 1 | 1.39 |
| Refused | 1 | 1.39 |

How long at current location

| [Q35] Q73 | Frequency | Percent |
|---|---|---|
| 1 to 3 years | 4 | 5.56 |
| 4 to 10 years | 10 | 13.89 |
| More than 10 years | 58 | 80.56 |

Average age of pumps

| [Q36] Q74 | Frequency | Percent |
|---|---|---|
| 1 | 3 | 4.17 |
| 2 | 4 | 5.56 |
| 3 | 4 | 5.56 |
| 4 | 3 | 4.17 |
| 5 | 5 | 6.94 |
| 7 | 1 | 1.39 |
| 8 | 3 | 4.17 |
| 10 | 5 | 6.94 |
| 12 | 1 | 1.39 |
| 15 | 9 | 12.50 |
| 16 | 1 | 1.39 |
| 19 | 1 | 1.39 |
| 20 | 8 | 11.11 |
| 22 | 1 | 1.39 |
| 23 | 1 | 1.39 |
| 25 | 4 | 5.56 |
| 27 | 1 | 1.39 |
| 30 | 3 | 4.17 |
| 38 | 1 | 1.39 |
| 40 | 1 | 1.39 |
| 50 | 1 | 1.39 |
| Don't Know | 11 | 15.28 |

How many months are pumps used during yr

| [Q37] Q75 | Frequency | Percent |
|---|---|---|
| Less than 3 months | 4 | 5.56 |
| 3 to 6 months | 17 | 23.61 |
| 7 to 9 months | 12 | 16.67 |
| Year round | 37 | 51.39 |
| Don't Know | 2 | 2.78 |

Percent of operating cost for energy?

| [Q38] Q76 | Frequency | Percent |
|---|---|---|
| 1 | 3 | 4.17 |
| 3 | 2 | 2.78 |
| 4 | 2 | 2.78 |
| 5 | 7 | 9.72 |
| 7 | 2 | 2.78 |
| 10 | 4 | 5.56 |
| 12 | 2 | 2.78 |
| 15 | 3 | 4.17 |
| 20 | 10 | 13.89 |
| 25 | 4 | 5.56 |
| 28 | 1 | 1.39 |
| 30 | 1 | 1.39 |
| 33 | 2 | 2.78 |
| 40 | 4 | 5.56 |
| 45 | 1 | 1.39 |
| 50 | 1 | 1.39 |
| 80 | 1 | 1.39 |
| 85 | 1 | 1.39 |
| Don't Know | 20 | 27.78 |
| Refused | 1 | 1.39 |

Importance of pumping system efficiency

| [Q39] Q77 | Frequency | Percent |
|---|---|---|
| 0 | 1 | 1.41 |
| 2 | 1 | 1.41 |
| 4 | 1 | 1.41 |
| 5 | 6 | 8.45 |
| 6 | 3 | 4.23 |
| 7 | 5 | 7.04 |

| | | |
|---|---|---|
| 8 | 12 | 16.90 |
| 9 | 8 | 11.27 |
| 10 | 34 | 47.89 |

Frequency Missing = 1

# Appendix F
# Energy Efficiency Contact Survey Frequencies

Because these were CATI surveys, the numbering of the questions in the CATI did not match the numbers on the Word document and Uses and Sources Chart (Appendix B). The number for the question in [brackets] is the corresponding number in Appendix C.

# Frequencies: Survey Responses – EE Contact Database

## RESPONSE QUESTION NUMBERS ARE TO THE RIGHT OF THE TABLE OR DIRECTLY BELOW IT ON THE LEFT

## Frequency Tables

**Availability for interview**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Available | 63 | 90.0 | 100.0 | 100.0 |
| Missing | System | 7 | 10.0 | | |
| Total | | 70 | 100.0 | | |

**Willing to do survey**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Yes | 70 | 100.0 | 100.0 | 100.0 |

**Received EE info from an SCE rep in 2002**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Yes | 70 | 100.0 | 100.0 | 100.0 |

**[Q1]**

**Rate difficulty to get info on reducing energy use**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 0 | 17 | 24.3 | 25.0 | 25.0 |
| | 1 | 8 | 11.4 | 11.8 | 36.8 |
| | 2 | 13 | 18.6 | 19.1 | 55.9 |
| | 3 | 10 | 14.3 | 14.7 | 70.6 |
| | 4 | 5 | 7.1 | 7.4 | 77.9 |
| | 5 | 6 | 8.6 | 8.8 | 86.8 |
| | 6 | 2 | 2.9 | 2.9 | 89.7 |
| | 7 | 2 | 2.9 | 2.9 | 92.6 |
| | 8 | 3 | 4.3 | 4.4 | 97.1 |
| | 9 | 1 | 1.4 | 1.5 | 98.5 |
| | 10 | 1 | 1.4 | 1.5 | 100.0 |
| | Total | 68 | 97.1 | 100.0 | |
| Missing | 88 | 2 | 2.9 | | |
| Total | | 70 | 100.0 | | |

**[Q2]**

**Rate willingness to spend time looking for info**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 1 | 2 | 2.9 | 2.9 | 2.9 |
| | 2 | 3 | 4.3 | 4.3 | 7.2 |
| | 3 | 2 | 2.9 | 2.9 | 10.1 |
| | 4 | 4 | 5.7 | 5.8 | 15.9 |
| | 5 | 16 | 22.9 | 23.2 | 39.1 |
| | 6 | 1 | 1.4 | 1.4 | 40.6 |
| | 7 | 5 | 7.1 | 7.2 | 47.8 |
| | 8 | 8 | 11.4 | 11.6 | 59.4 |
| | 9 | 12 | 17.1 | 17.4 | 76.8 |
| | 10 | 16 | 22.9 | 23.2 | 100.0 |
| | Total | 69 | 98.6 | 100.0 | |
| Missing | 87 | 1 | 1.4 | | |
| Total | | 70 | 100.0 | | |

**[Q3]**

**How first learn about EE options**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Approach vendor/contractor | 4 | 5.7 | 5.8 | 5.8 |
| | Approach SCE | 5 | 7.1 | 7.2 | 13.0 |
| | Printed Material SCE | 14 | 20.0 | 20.3 | 33.3 |
| | TV/Radio/Newspaper | 1 | 1.4 | 1.4 | 34.8 |
| | SCE rep contacts you | 22 | 31.4 | 31.9 | 66.7 |
| | Contractor/Vendor contacts you | 5 | 7.1 | 7.2 | 73.9 |
| | Word of mouth | 2 | 2.9 | 2.9 | 76.8 |
| | Industry Trade Shows | 2 | 2.9 | 2.9 | 79.7 |
| | Family trad/bus policy/recomm | 10 | 14.3 | 14.5 | 94.2 |
| | Other | 4 | 5.7 | 5.8 | 100.0 |
| | Total | 69 | 98.6 | 100.0 | |
| Missing | 88 | 1 | 1.4 | | |
| Total | | 70 | 100.0 | | |

**[Q4]**

**How many times received EE info from SCE rep in past yr**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Once | 8 | 11.4 | 11.6 | 11.6 |
| | Twice | 8 | 11.4 | 11.6 | 23.2 |
| | Several Times | 49 | 70.0 | 71.0 | 94.2 |
| | Never | 4 | 5.7 | 5.8 | 100.0 |
| | Total | 69 | 98.6 | 100.0 | |
| Missing | 8 | 1 | 1.4 | | |
| Total | | 70 | 100.0 | | |

**[Q5]**

**Rate how satisfied you were with amount of contact**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 0 | 2 | 2.9 | 2.9 | 2.9 |
| | 2 | 2 | 2.9 | 2.9 | 5.7 |
| | 4 | 1 | 1.4 | 1.4 | 7.1 |
| | 5 | 4 | 5.7 | 5.7 | 12.9 |
| | 6 | 6 | 8.6 | 8.6 | 21.4 |
| | 7 | 4 | 5.7 | 5.7 | 27.1 |
| | 8 | 17 | 24.3 | 24.3 | 51.4 |
| | 9 | 4 | 5.7 | 5.7 | 57.1 |
| | 10 | 30 | 42.9 | 42.9 | 100.0 |
| | Total | 70 | 100.0 | 100.0 | |

**[Q6]**

**How did the SCE rep contact you response #1**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Phone Call | 32 | 45.7 | 49.2 | 49.2 |
| | Internet or email | 9 | 12.9 | 13.8 | 63.1 |
| | Mail printed material | 13 | 18.6 | 20.0 | 83.1 |
| | On-site Visit | 10 | 14.3 | 15.4 | 98.5 |
| | Other | 1 | 1.4 | 1.5 | 100.0 |
| | Total | 65 | 92.9 | 100.0 | |
| Missing | 8 | 1 | 1.4 | | |
| | System | 4 | 5.7 | | |
| | Total | 5 | 7.1 | | |
| Total | | 70 | 100.0 | | |

**[Q7]**

**How did the SCE rep contact you response #2**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Phone Call | 7 | 10.0 | 14.0 | 14.0 |
| | Internet or email | 18 | 25.7 | 36.0 | 50.0 |
| | Mail printed material | 14 | 20.0 | 28.0 | 78.0 |
| | Training workshop | 1 | 1.4 | 2.0 | 80.0 |
| | Trade assoc meeting/presentation | 2 | 2.9 | 4.0 | 84.0 |
| | On-site Visit | 8 | 11.4 | 16.0 | 100.0 |
| | Total | 50 | 71.4 | 100.0 | |
| Missing | System | 20 | 28.6 | | |
| Total | | 70 | 100.0 | | |

**[Q7]**

**How did the SCE rep contact you response #3**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Phone Call | 5 | 7.1 | 19.2 | 19.2 |
| | Internet or email | 2 | 2.9 | 7.7 | 26.9 |
| | Mail printed material | 12 | 17.1 | 46.2 | 73.1 |
| | Training workshop | 1 | 1.4 | 3.8 | 76.9 |
| | Trade assoc meeting/presentation | 1 | 1.4 | 3.8 | 80.8 |
| | On-site Visit | 5 | 7.1 | 19.2 | 100.0 |
| | Total | 26 | 37.1 | 100.0 | |
| Missing | System | 44 | 62.9 | | |
| Total | | 70 | 100.0 | | |

**[Q7]**

**How did the SCE rep contact you response #4**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Internet or email | 1 | 1.4 | 9.1 | 9.1 |
| | Training workshop | 8 | 11.4 | 72.7 | 81.8 |
| | On-site Visit | 2 | 2.9 | 18.2 | 100.0 |
| | Total | 11 | 15.7 | 100.0 | |
| Missing | System | 59 | 84.3 | | |
| Total | | 70 | 100.0 | | |

**[Q7]**

**How did the SCE rep contact you response #5**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Phone Call | 1 | 1.4 | 12.5 | 12.5 |
| | Trade assoc meeting/presentation | 6 | 8.6 | 75.0 | 87.5 |
| | On-site Visit | 1 | 1.4 | 12.5 | 100.0 |
| | Total | 8 | 11.4 | 100.0 | |
| Missing | System | 62 | 88.6 | | |
| Total | | 70 | 100.0 | | |

**[Q7]**

**How did the SCE rep contact you response #6**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | On-site Visit | 5 | 7.1 | 100.0 | 100.0 |
| Missing | System | 65 | 92.9 | | |
| Total | | 70 | 100.0 | | |

**[Q7]**

**Rate how satisfied you were with the ways contacted**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 1 | 1 | 1.4 | 1.6 | 1.6 |
| | 5 | 3 | 4.3 | 4.7 | 6.3 |
| | 6 | 4 | 5.7 | 6.3 | 12.5 |
| | 7 | 5 | 7.1 | 7.8 | 20.3 |
| | 8 | 16 | 22.9 | 25.0 | 45.3 |
| | 9 | 6 | 8.6 | 9.4 | 54.7 |
| | 10 | 29 | 41.4 | 45.3 | 100.0 |
| | Total | 64 | 91.4 | 100.0 | |
| Missing | 88 | 2 | 2.9 | | |
| | System | 4 | 5.7 | | |
| | Total | 6 | 8.6 | | |
| Total | | 70 | 100.0 | | |

**[Q8]**

**What is your preferred way to be contacted response #1**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Phone Call | 4 | 5.7 | 66.7 | 66.7 |
| | Internet or Email | 2 | 2.9 | 33.3 | 100.0 |
| | Total | 6 | 8.6 | 100.0 | |
| Missing | System | 64 | 91.4 | | |
| Total | | 70 | 100.0 | | |

**[Q9]**

**What is your preferred way to be contacted response #2**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Mail Printed Material | 2 | 2.9 | 66.7 | 66.7 |
| | Training Workshop | 1 | 1.4 | 33.3 | 100.0 |
| | Total | 3 | 4.3 | 100.0 | |
| Missing | System | 67 | 95.7 | | |
| Total | | 70 | 100.0 | | |

**[Q9]**

**What type of EE info did you receive response #1**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Rebate Info | 39 | 55.7 | 60.0 | 60.0 |
| | EE Program Info | 17 | 24.3 | 26.2 | 86.2 |
| | Pump Test Referral | 1 | 1.4 | 1.5 | 87.7 |
| | Info to improve pumping prodtvty | 6 | 8.6 | 9.2 | 96.9 |
| | Other | 2 | 2.9 | 3.1 | 100.0 |
| | Total | 65 | 92.9 | 100.0 | |
| Missing | 8 | 1 | 1.4 | | |
| | System | 4 | 5.7 | | |
| | Total | 5 | 7.1 | | |
| Total | | 70 | 100.0 | | |

**[Q10]**

**What type of EE info did you receive response #2**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Rebate Info | 1 | 1.4 | 2.3 | 2.3 |
| | EE Program Info | 34 | 48.6 | 77.3 | 79.5 |
| | Pump Test Referral | 3 | 4.3 | 6.8 | 86.4 |
| | Info to improve pumping prodtvty | 2 | 2.9 | 4.5 | 90.9 |
| | Other | 4 | 5.7 | 9.1 | 100.0 |
| | Total | 44 | 62.9 | 100.0 | |
| Missing | System | 26 | 37.1 | | |
| Total | | 70 | 100.0 | | |

**[Q10]**

**What type of EE info did you receive response #3**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | EE Program Info | 1 | 1.4 | 5.6 | 5.6 |
| | Pump Test Referral | 13 | 18.6 | 72.2 | 77.8 |
| | Info to improve pumping prodtvty | 3 | 4.3 | 16.7 | 94.4 |
| | Other | 1 | 1.4 | 5.6 | 100.0 |
| | Total | 18 | 25.7 | 100.0 | |
| Missing | System | 52 | 74.3 | | |
| Total | | 70 | 100.0 | | |

**[Q10]**

**What type of EE info did you receive response #4**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Rebate Info | 1 | 1.4 | 9.1 | 9.1 |
| | Info to improve pumping prodtvty | 10 | 14.3 | 90.9 | 100.0 |
| | Total | 11 | 15.7 | 100.0 | |
| Missing | System | 59 | 84.3 | | |
| Total | | 70 | 100.0 | | |

**[Q10]**

**Rate how satisfied you were with the type of info provided**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 2 | 1 | 1.4 | 1.6 | 1.6 |
| | 3 | 2 | 2.9 | 3.1 | 4.7 |
| | 4 | 2 | 2.9 | 3.1 | 7.8 |
| | 5 | 4 | 5.7 | 6.3 | 14.1 |
| | 6 | 1 | 1.4 | 1.6 | 15.6 |
| | 7 | 7 | 10.0 | 10.9 | 26.6 |
| | 8 | 15 | 21.4 | 23.4 | 50.0 |
| | 9 | 13 | 18.6 | 20.3 | 70.3 |
| | 10 | 19 | 27.1 | 29.7 | 100.0 |
| | Total | 64 | 91.4 | 100.0 | |
| Missing | 88 | 1 | 1.4 | | |
| | System | 5 | 7.1 | | |
| | Total | 6 | 8.6 | | |
| Total | | 70 | 100.0 | | |

**[Q11]**

**Recall receiving printed materials last 5 years**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Yes | 67 | 95.7 | 95.7 | 95.7 |
| | No | 3 | 4.3 | 4.3 | 100.0 |
| | Total | 70 | 100.0 | 100.0 | |

**[Q12]**

**Where or from whom did you get this printed material**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Sent to bus/home | 36 | 51.4 | 53.7 | 53.7 |
| | Given by SCE rep | 26 | 37.1 | 38.8 | 92.5 |
| | Picked up at booth at conf/event | 1 | 1.4 | 1.5 | 94.0 |
| | SCE Website | 4 | 5.7 | 6.0 | 100.0 |
| | Total | 67 | 95.7 | 100.0 | |
| Missing | 8 | 1 | 1.4 | | |
| | System | 2 | 2.9 | | |
| | Total | 3 | 4.3 | | |
| Total | | 70 | 100.0 | | |

**[Q13]**

**Info was printed in an engaging format**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Somewhat Disagree | 4 | 5.7 | 6.2 | 6.2 |
| | Somewhat Agree | 40 | 57.1 | 61.5 | 67.7 |
| | Strongly Agree | 21 | 30.0 | 32.3 | 100.0 |
| | Total | 65 | 92.9 | 100.0 | |
| Missing | 8 | 3 | 4.3 | | |
| | System | 2 | 2.9 | | |
| | Total | 5 | 7.1 | | |
| Total | | 70 | 100.0 | | |

**[Q14A]**

**The info in the printed material was easy to understand**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Somewhat Disagree | 5 | 7.1 | 7.7 | 7.7 |
| | Somewhat Agree | 25 | 35.7 | 38.5 | 46.2 |
| | Strongly Agree | 35 | 50.0 | 53.8 | 100.0 |
| | Total | 65 | 92.9 | 100.0 | |
| Missing | 8 | 2 | 2.9 | | |
| | System | 3 | 4.3 | | |
| | Total | 5 | 7.1 | | |
| Total | | 70 | 100.0 | | |

**[Q14B]**

**The info in the printed material was useful**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Somewhat Disagree | 4 | 5.7 | 6.2 | 6.2 |
| | Somewhat Agree | 32 | 45.7 | 49.2 | 55.4 |
| | Strongly Agree | 29 | 41.4 | 44.6 | 100.0 |
| | Total | 65 | 92.9 | 100.0 | |
| Missing | 8 | 2 | 2.9 | | |
| | System | 3 | 4.3 | | |
| | Total | 5 | 7.1 | | |
| Total | | 70 | 100.0 | | |

**[Q14C]**

**The info in the printed material was believable**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Somewhat Agree | 28 | 40.0 | 44.4 | 44.4 |
| | Strongly Agree | 35 | 50.0 | 55.6 | 100.0 |
| | Total | 63 | 90.0 | 100.0 | |
| Missing | 8 | 3 | 4.3 | | |
| | 9 | 1 | 1.4 | | |
| | System | 3 | 4.3 | | |
| | Total | 7 | 10.0 | | |
| Total | | 70 | 100.0 | | |

## [Q14D]

**The info in the printed material positively affected my attitude toward EE**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Strongly Disagree | 1 | 1.4 | 1.6 | 1.6 |
| | Somewhat Disagree | 9 | 12.9 | 14.1 | 15.6 |
| | Somewhat Agree | 35 | 50.0 | 54.7 | 70.3 |
| | Strongly Agree | 19 | 27.1 | 29.7 | 100.0 |
| | Total | 64 | 91.4 | 100.0 | |
| Missing | 8 | 3 | 4.3 | | |
| | System | 3 | 4.3 | | |
| | Total | 6 | 8.6 | | |
| Total | | 70 | 100.0 | | |

## [Q14E]

**I learned a considerable amount about EE options from the printed material**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Somewhat Disagree | 3 | 4.3 | 4.6 | 4.6 |
| | Somewhat Agree | 38 | 54.3 | 58.5 | 63.1 |
| | Strongly Agree | 24 | 34.3 | 36.9 | 100.0 |
| | Total | 65 | 92.9 | 100.0 | |
| Missing | 8 | 2 | 2.9 | | |
| | System | 3 | 4.3 | | |
| | Total | 5 | 7.1 | | |
| Total | | 70 | 100.0 | | |

## [Q14F]

**The info in the printed material increased my likelihood of investigating EE options**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Strongly Disagree | 1 | 1.4 | 1.5 | 1.5 |
| | Somewhat Disagree | 5 | 7.1 | 7.7 | 9.2 |
| | Somewhat Agree | 27 | 38.6 | 41.5 | 50.8 |
| | Strongly Agree | 32 | 45.7 | 49.2 | 100.0 |
| | Total | 65 | 92.9 | 100.0 | |
| Missing | 8 | 2 | 2.9 | | |
| | System | 3 | 4.3 | | |
| | Total | 5 | 7.1 | | |
| Total | | 70 | 100.0 | | |

**[Q14G]**

**Has the EE info from SCE helped you to: reduce the time or cost of collecting info**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Yes | 57 | 81.4 | 85.1 | 85.1 |
| | No | 10 | 14.3 | 14.9 | 100.0 |
| | Total | 67 | 95.7 | 100.0 | |
| Missing | 8 | 2 | 2.9 | | |
| | System | 1 | 1.4 | | |
| | Total | 3 | 4.3 | | |
| Total | | 70 | 100.0 | | |

**[Q15A]**

**Helped you to reduce your doubt and uncertainty about EE**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Yes | 52 | 74.3 | 76.5 | 76.5 |
| | No | 16 | 22.9 | 23.5 | 100.0 |
| | Total | 68 | 97.1 | 100.0 | |
| Missing | 8 | 1 | 1.4 | | |
| | System | 1 | 1.4 | | |
| | Total | 2 | 2.9 | | |
| Total | | 70 | 100.0 | | |

**[Q15B]**

**Helped reduce the info disadvantage you may have with dealers and suppliers**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Yes | 42 | 60.0 | 65.6 | 65.6 |
| | No | 22 | 31.4 | 34.4 | 100.0 |
| | Total | 64 | 91.4 | 100.0 | |
| Missing | 8 | 5 | 7.1 | | |
| | System | 1 | 1.4 | | |
| | Total | 6 | 8.6 | | |
| Total | | 70 | 100.0 | | |

**[Q15C]**

**Which is your largest source of revenue**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Vegetables/Field Crops | 6 | 8.6 | 8.6 | 8.6 |
| | Livestock | 1 | 1.4 | 1.4 | 10.0 |
| | Packing Plant | 6 | 8.6 | 8.6 | 18.6 |
| | Vineyard/Winery | 3 | 4.3 | 4.3 | 22.9 |
| | Orchard | 2 | 2.9 | 2.9 | 25.7 |
| | Dairy Farm | 5 | 7.1 | 7.1 | 32.9 |
| | Water district/services | 16 | 22.9 | 22.9 | 55.7 |
| | Other | 31 | 44.3 | 44.3 | 100.0 |
| | Total | 70 | 100.0 | 100.0 | |

**[Q16]**

**Does business own property**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Yes | 65 | 92.9 | 92.9 | 92.9 |
| | No | 5 | 7.1 | 7.1 | 100.0 |
| | Total | 70 | 100.0 | 100.0 | |

**[Q17]**

**Operated by family or company or government entity**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Family | 19 | 27.1 | 27.5 | 27.5 |
| | Company | 19 | 27.1 | 27.5 | 55.1 |
| | Government Entity | 29 | 41.4 | 42.0 | 97.1 |
| | Not Applicable | 2 | 2.9 | 2.9 | 100.0 |
| | Total | 69 | 98.6 | 100.0 | |
| Missing | 8 | 1 | 1.4 | | |
| Total | | 70 | 100.0 | | |

**[Q18]**

**Small, Med, Large business**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Small | 21 | 30.0 | 30.0 | 30.0 |
| | Medium | 30 | 42.9 | 42.9 | 72.9 |
| | Large | 19 | 27.1 | 27.1 | 100.0 |
| | Total | 70 | 100.0 | 100.0 | |

**[Q19]**

**How long operating at current location**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 1-3 years | 5 | 7.1 | 7.1 | 7.1 |
| | 4-10 years | 11 | 15.7 | 15.7 | 22.9 |
| | More than 10 years | 54 | 77.1 | 77.1 | 100.0 |
| | Total | 70 | 100.0 | 100.0 | |

**[Q20]**

**Number of pumps**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 0 | 6 | 8.6 | 10.3 | 10.3 |
| | 1 | 6 | 8.6 | 10.3 | 20.7 |
| | 3 | 5 | 7.1 | 8.6 | 29.3 |
| | 4 | 5 | 7.1 | 8.6 | 37.9 |
| | 5 | 4 | 5.7 | 6.9 | 44.8 |
| | 6 | 1 | 1.4 | 1.7 | 46.6 |
| | 8 | 6 | 8.6 | 10.3 | 56.9 |
| | 9 | 1 | 1.4 | 1.7 | 58.6 |
| | 10 | 1 | 1.4 | 1.7 | 60.3 |
| | 12 | 3 | 4.3 | 5.2 | 65.5 |
| | 14 | 1 | 1.4 | 1.7 | 67.2 |
| | 15 | 3 | 4.3 | 5.2 | 72.4 |
| | 16 | 1 | 1.4 | 1.7 | 74.1 |
| | 18 | 1 | 1.4 | 1.7 | 75.9 |
| | 20 | 1 | 1.4 | 1.7 | 77.6 |
| | 22 | 1 | 1.4 | 1.7 | 79.3 |
| | 24 | 1 | 1.4 | 1.7 | 81.0 |
| | 25 | 2 | 2.9 | 3.4 | 84.5 |
| | 30 | 5 | 7.1 | 8.6 | 93.1 |
| | 45 | 1 | 1.4 | 1.7 | 94.8 |
| | 60 | 1 | 1.4 | 1.7 | 96.6 |
| | 80 | 1 | 1.4 | 1.7 | 98.3 |
| | 90 | 1 | 1.4 | 1.7 | 100.0 |
| | Total | 58 | 82.9 | 100.0 | |
| Missing | 88 | 9 | 12.9 | | |
| | 99 | 3 | 4.3 | | |
| | Total | 12 | 17.1 | | |
| Total | | 70 | 100.0 | | |

**[Q21]**

**Average age of pumps**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 1 | 1 | 1.4 | 2.0 | 2.0 |
| | 2 | 1 | 1.4 | 2.0 | 4.0 |
| | 3 | 4 | 5.7 | 8.0 | 12.0 |
| | 4 | 3 | 4.3 | 6.0 | 18.0 |
| | 5 | 7 | 10.0 | 14.0 | 32.0 |
| | 6 | 2 | 2.9 | 4.0 | 36.0 |
| | 7 | 1 | 1.4 | 2.0 | 38.0 |
| | 8 | 1 | 1.4 | 2.0 | 40.0 |
| | 9 | 2 | 2.9 | 4.0 | 44.0 |
| | 10 | 10 | 14.3 | 20.0 | 64.0 |
| | 12 | 2 | 2.9 | 4.0 | 68.0 |
| | 15 | 4 | 5.7 | 8.0 | 76.0 |
| | 20 | 3 | 4.3 | 6.0 | 82.0 |
| | 25 | 1 | 1.4 | 2.0 | 84.0 |
| | 30 | 4 | 5.7 | 8.0 | 92.0 |
| | 35 | 1 | 1.4 | 2.0 | 94.0 |
| | 43 | 1 | 1.4 | 2.0 | 96.0 |
| | 50 | 1 | 1.4 | 2.0 | 98.0 |
| | 51 | 1 | 1.4 | 2.0 | 100.0 |
| | Total | 50 | 71.4 | 100.0 | |
| Missing | 88 | 15 | 21.4 | | |
| | System | 5 | 7.1 | | |
| | Total | 20 | 28.6 | | |
| Total | | 70 | 100.0 | | |

**[Q22]**

**How many months pumps used during year**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Less than 3 months | 1 | 1.4 | 1.7 | 1.7 |
| | 3-6 months | 6 | 8.6 | 10.3 | 12.1 |
| | 7-9 months | 11 | 15.7 | 19.0 | 31.0 |
| | Year Round | 40 | 57.1 | 69.0 | 100.0 |
| | Total | 58 | 82.9 | 100.0 | |
| Missing | 8 | 7 | 10.0 | | |
| | System | 5 | 7.1 | | |
| | Total | 12 | 17.1 | | |
| Total | | 70 | 100.0 | | |

**[Q23]**

**What percent of annual costs is spent on electricity**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 1 | 1 | 1.4 | 2.3 | 2.3 |
| | 2 | 1 | 1.4 | 2.3 | 4.7 |
| | 3 | 3 | 4.3 | 7.0 | 11.6 |
| | 4 | 1 | 1.4 | 2.3 | 14.0 |
| | 5 | 3 | 4.3 | 7.0 | 20.9 |
| | 6 | 2 | 2.9 | 4.7 | 25.6 |
| | 8 | 1 | 1.4 | 2.3 | 27.9 |
| | 10 | 6 | 8.6 | 14.0 | 41.9 |
| | 15 | 3 | 4.3 | 7.0 | 48.8 |
| | 20 | 4 | 5.7 | 9.3 | 58.1 |
| | 25 | 7 | 10.0 | 16.3 | 74.4 |
| | 30 | 6 | 8.6 | 14.0 | 88.4 |
| | 33 | 2 | 2.9 | 4.7 | 93.0 |
| | 37 | 1 | 1.4 | 2.3 | 95.3 |
| | 40 | 1 | 1.4 | 2.3 | 97.7 |
| | 75 | 1 | 1.4 | 2.3 | 100.0 |
| | Total | 43 | 61.4 | 100.0 | |
| Missing | 88 | 22 | 31.4 | | |
| | System | 5 | 7.1 | | |
| | Total | 27 | 38.6 | | |
| Total | | 70 | 100.0 | | |

**[Q24]**

**Rate how important it is that pumping system makes use of electricity efficiently**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 0 | 1 | 1.4 | 1.6 | 1.6 |
| | 2 | 1 | 1.4 | 1.6 | 3.2 |
| | 5 | 3 | 4.3 | 4.8 | 8.1 |
| | 6 | 1 | 1.4 | 1.6 | 9.7 |
| | 7 | 4 | 5.7 | 6.5 | 16.1 |
| | 8 | 4 | 5.7 | 6.5 | 22.6 |
| | 9 | 14 | 20.0 | 22.6 | 45.2 |
| | 10 | 34 | 48.6 | 54.8 | 100.0 |
| | Total | 62 | 88.6 | 100.0 | |
| Missing | 88 | 3 | 4.3 | | |
| | System | 5 | 7.1 | | |
| | Total | 8 | 11.4 | | |
| Total | | 70 | 100.0 | | |

**[Q25]**

**Prior to 2002 were you aware of SCE's PT program**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Yes | 40 | 57.1 | 58.0 | 58.0 |
| | No | 29 | 41.4 | 42.0 | 100.0 |
| | Total | 69 | 98.6 | 100.0 | |
| Missing | 8 | 1 | 1.4 | | |
| Total | | 70 | 100.0 | | |

**[Q26]**

**Ever participated in SCE's PT program**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Once | 11 | 15.7 | 16.7 | 16.7 |
| | Twice | 5 | 7.1 | 7.6 | 24.2 |
| | Several Times | 18 | 25.7 | 27.3 | 51.5 |
| | Never | 32 | 45.7 | 48.5 | 100.0 |
| | Total | 66 | 94.3 | 100.0 | |
| Missing | 8 | 4 | 5.7 | | |
| Total | | 70 | 100.0 | | |

**[Q27]**

**Why didn't/not participate in SCE's PT program**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Don't have time | 2 | 2.9 | 7.7 | 7.7 |
| | Aready had pumpt tested by other than SCE | 1 | 1.4 | 3.8 | 11.5 |
| | Have made nec effic improvements | 2 | 2.9 | 7.7 | 19.2 |
| | Our co does not have pumps | 6 | 8.6 | 23.1 | 42.3 |
| | Other | 15 | 21.4 | 57.7 | 100.0 |
| | Total | 26 | 37.1 | 100.0 | |
| Missing | 8 | 6 | 8.6 | | |
| | System | 38 | 54.3 | | |
| | Total | 44 | 62.9 | | |
| Total | | 70 | 100.0 | | |

**[Q28]**

**How many business colleagues/other farmers told you about benefits of PT/repair**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 0 | 39 | 55.7 | 65.0 | 65.0 |
| | 1 | 1 | 1.4 | 1.7 | 66.7 |
| | 2 | 7 | 10.0 | 11.7 | 78.3 |
| | 3 | 3 | 4.3 | 5.0 | 83.3 |
| | 4 | 2 | 2.9 | 3.3 | 86.7 |
| | 5 | 2 | 2.9 | 3.3 | 90.0 |
| | 6 | 2 | 2.9 | 3.3 | 93.3 |
| | 10 | 2 | 2.9 | 3.3 | 96.7 |
| | 20 | 1 | 1.4 | 1.7 | 98.3 |
| | 55 | 1 | 1.4 | 1.7 | 100.0 |
| | Total | 60 | 85.7 | 100.0 | |
| Missing | 88 | 8 | 11.4 | | |
| | 99 | 2 | 2.9 | | |
| | Total | 10 | 14.3 | | |
| Total | | 70 | 100.0 | | |

**[Q29]**