Process Evaluation of the 2006-07 Statewide Technical Assistance and Technology Incentive Program

Final Report

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EXECUTIVE SUMMARY

PROGRAM BACKGROUND

This report presents the process evaluation results for the 2006-2007 phase of the Technical Assistance/Technology Incentive (TA/TI) Program for Southern California Edison (SCE), San Diego Gas and Electric (SDG&E), and Pacific Gas & Electric (PG&E). PG&E's Automatic Demand Response program, a component of the TI program, was also included in this evaluation. The evaluation team was led by Dr. Stephen Grover of ECONorthwest and he was assisted by Dr. Philippus Willems and Itron (fielded the phone surveys, observed the load shed tests, and conducted some of the auditor ride-alongs). The evaluation time period spanned from May 2007 to May 2008.

The TA/TI Program has two components. The Technical Assistance (TA) component provides free onsite energy audits to larger (200 kW or more) commercial and industrial customers to identify demand reduction opportunities. In some cases, a preliminary assessment is first conducted to assess the site's demand response potential before a full Technical Assessment audit is performed.

The Technology Incentive (TI) component provides financial incentives (up to $250/kW reduction) to install demand reduction measures that are identified during the TA audit. A load shed test is required to confirm the demand curtailment and to receive 50 percent of the incentive payment. The customer is paid the remaining 50 percent if he/she enrolls in a utility demand response program for at least one year.

EVALUATION OVERVIEW

For this evaluation, the following research objectives were established:

1. Document program and implementation theories, program goals, implementation strategies and procedures across utilities.
2. Provide real-time feedback to program implementers with an emphasis on improving recruitment and program delivery and identify implementation and program design problems for review and modification.
3. Assess the effectiveness of the programs using data from 2006 and 2007.
4. Evaluate areas of customer and trade ally satisfaction and dissatisfaction.
5. Identify barriers and obstacles to meeting program goals.
6. Provide recommendations for program improvements.

To meet these objectives, the following evaluation tasks were conducted:

- *Logic model and program theory.* The structure of the logic model, which links program activities and expected outcomes, is a useful instrument for identifying specific program assumptions that can be tested using a survey or other primary data collection activities.

- *Process diagrams.* The evaluation team also created a flow chart for each utility's TA/TI Program, which traces the steps required to complete each stage of the program.

- *In-depth interviews with program staff and trade allies.* In-depth interviews were conducted with program staff, 11 auditors, and six verifiers to gather additional process-related information in February 2008.

- *Participant phone surveys.* A primary data collection instrument for the TA/TI Program was a 15-minute participant phone survey, which was fielded by Itron's call center from February to March, 2008. 102 surveys were completed and respondents included SCE and SDG&E customers that just received an audit through the TA program but had not yet moved on to the TI program phase. Due to small number of customers with data available in the PG&E program, TA phone surveys were not conducted for PG&E. Instead this data was saved for the in-depth interviews.

- *In-depth interviews with participants*. To supplement the phone survey results, the evaluation team conducted 42 in-depth interviews (30 to 60 minutes) with a sampling of TA/TI participants from each of the three utilities in February and March, 2008. Four of these interviewees were with customers in the PG&E Automatic Demand Response program.

- *Load Shed Test Observations and Audit Ride-Alongs.* Other key evaluation activities included seven ride-alongs with auditors and four visits to customer sites to observe load shed testing.

- *Discrete choice analysis.* Discrete choice modeling is used to simulate the choice to participate in the TI portion of the program. This model was developed to identify key customer and program elements that have a relatively larger influence on the customer's decision to proceed from the TA to the TI program phase. Two separate discrete models were used: The Measure Model estimates the likelihood that an individual recommendation is accepted (N=3,343 measures among all three utilities), while the Participation Model estimates the likelihood that a particular customer will move from the TA phase to the TI phase of the program (N=570 participants for SCE and SDG&E programs). Because there was not enough information on PG&E customers to determine if there was a single decision maker for multiple sites, the PG&E observations were dropped from the Participation Model.

DATA COLLECTION AND SURVEY SAMPLE DESIGN

Table-E1 shows the final data collection samples planned verses those actually achieved for the phone survey and in-depth interviews, as well as the available participant data for each utility. A subset is PG&E's Auto DR program, which began in 2007, and the evaluation team had access to data for 19 of the total 23 customers. When the TA/TI evaluation plan was originally proposed in May 2007, it was assumed that a much larger pool of participants would be available for use in the evaluation. As the evaluation progressed, it was discovered that the original data collection plan was not appropriate given the level of participation. Table-E1 reflects the revised data

collection plan. In addition to the generally lower than expected amount of participant data, the following factors also resulted in modifying the samples used for the evaluation:

- A single contact listed for multiple participant sites (such as chain stores and franchises). This reduced the number of participants that were actually available for surveys or interviews.
- Concerns by TA/TI program staff on the amount of customer contacting proposed.
- Difficulties in coordinating load shed test observations and post result surveys.
- Concerns that a phone interview would not get into enough detail and involve too much reliance on customer recall of their audit report. As a result, some of the planned phone surveys were shifted to in-depth interviews so that the audit report recommendations could be discussed in detail with a smaller sample of customers.
- As the evaluation worked with the Demand Response Measurement and Evaluation Committee[1], it became apparent that it would be useful for the evaluation to interview those involved with recruiting customers to the program and reviewing the initial audit reports. Additional interviews were then planned for program engineers, auditors, and aggregators although no fixed target for interviews was set.

Despite the reduced sampling plan, we were not able to meet all of the quotas due to the small amount of participation data. While these samples are smaller than originally proposed, the populations from which they were drawn are also smaller and we believe that the final samples are still representative. Notably, the small amount of available PG&E customer data was saved for in-depth interviews.

[1] The Demand Response Measurement and Evaluation Committee includes a representative from each electric Investor-Owned Utility, the California Public Utilities Commission, and the California Energy Commission.

Table-E1: Final Evaluation Data Collection and Sampling Plan

Utility	TA Only Phone Surveys (Planned)	TA Only Phone Surveys (Achieved)	TA & TI In-depth Interviews (Planned)	TA & TI In-depth Interviews (Achieved)	Auditor / Aggregator / Engineer In-depth interviews (Achieved)	Available Participant Population Data		
						TA Only	TI In Progress	TI Complete
SCE	50	55	20	20	5	288	24	6
PG&E	0	0	20	8	7	32	2	76
SDG&E	50	47	20	14	5	585	37	26
Total	100	102	60	42	17	905	63	108

KEY FINDINGS

Audit recommendations for lighting controlled by an energy management system are most likely to be adopted by customers. Results of the discrete choice model showed that this measure recommendation had the strongest and most statistically significant positive effect on the customer proceeding from the TA to the TI phase of the program. Customers in the utilities industry (including water utilities) are also more likely to implement measures recommended in the audit relative to other industry groups.

Shifting operations to off-peak hours and curtailing HVAC and lighting are also popular demand response measures. In the commercial sector, the most frequent demand response opportunities tend toward increasing temperatures during demand response events to relieve HVAC systems and curtailing a building's lighting load. In the industrial sector, auditors tend to focus more on identifying loads that can be shifted as much as possible to off-peak hours.

Interviews with auditors indicate that customers are hesitant to give up control of the decision-making power in their facilities and prefer the ability to decide when and if they will participate in a demand response event. This is an important point to consider when addressing a customer's viability for automated demand response. Even with the override capability, and given the choice to opt out of a demand response activity, most manufacturers are still not open to fully automated demand response, especially if it means reducing production.

Results from phone surveys with SCE and SDG&E participants indicate that most customers were satisfied with the TA/TI process, but that there is room for improvement. Because the TA/TI program is relatively new and this is the first time it has been fully evaluated, extra attention was placed on examining the sources of dissatisfaction and uncertainty regarding the program. Specifically, 20 percent of SDG&E respondents surveyed indicated some dissatisfaction with both the usefulness of the information received from the audit report and how well the audit recommendations took into account business operations. Nine percent of SCE respondents were also dissatisfied with the usefulness of information received from the audit and 11 percent of SCE respondents were dissatisfied with the amount of time taken to complete the audit.

In-depth interviews with TA/TI participants supported these findings and indicated that the audit report would be more useful if it explained the dollar costs and savings associated with each measure and provided information on the next steps in the program (how to apply for cash incentives and enroll in demand response programs). The survey respondents who had rejected all of the audit recommendations said they never received the audit report, the measures were too expensive, or the recommendations interfered with daily business operations.

As these findings suggests, customers desire more assistance with following through with the TA recommendations. Only 30 percent of the 38 interviewed respondents in the traditional TA/TI programs said their auditors encouraged them to implement the measures. Many respondents indicated that their primary concern about moving forward with the recommendations was that they were uncertain about what to do after they received their audit reports.

From the various data collection activities, several overarching needs for the TA/TI program are apparent:

- Audit reports that take better account of each customer's business operation
- More assistance for customers trying to navigate through the program
- Shorter time periods between the various stages of the program, including delivery of the audit report to the customer
- More information on the likely costs of the recommended measures

One way to address all these issues is to move toward a turn-key model for the TA/TI program, similar to the option currently available for PG&E. With the turn-key model, the auditing firm would provide more continuous support to the customer, which will help navigate the process needed to go from TA to TI. The auditing firm will also be able to provide information on measure costs at the beginning of the process, as well as assist with identifying incentives available from other programs. The turn-key approach also appears to be more in-tune with customer business operations, as the customer are basically agreeing at the beginning to do the audit and accept at least a portion of the recommended measures. The turn-key design approach should also shorten the time between audit and measure installation as the same firm will handle both components. Finally, a turn-key approach would also allow for more guidance to be provided to the customer on how to interpret the audit report.

RECOMMENDATIONS

Based on the conclusions above and the evaluations findings presented earlier in this report, we offer the following recommendations for the TA/TI Program:

- **Move toward a more turn-key program design, where more and continuous assistance is available to customers at each stage of the program.** A turn-key approach would help minimize or eliminate completely several of the issues discussed by participants. Specifically, the turn-key approach would address customer desire for more assistance with the program process, provide an audit report that is tailored more to customer concerns regarding business operations, provide more information on measure

costs, and result in a faster progression from the audit stage to the measure implementation stage.

The following recommendations relate to adjusting the current program design:

- **Develop a business information form for participants to fill out prior to the initial TA audit.** This form would collect information on business operations and equipment holdings to assist the auditor in where to look for potential demand savings. Part of this form should be a set list of questions that will identify areas where customers will not consider any form of demand response. Completing a short questionnaire will help address the issue of auditors not understanding business operations and avoid making recommendations that customers do not view as viable options given their type of business.

- **Develop a standard audit process with a checklist of areas that must be assessed during the audit.** Given the audit payment structure based on $/kW of DR potential identified (for SCE and SDG&E), some auditors indicated that they were reluctant to spend extra time searching for additional demand response opportunities if it seemed unlikely that this would be productive. That is, the auditors are reluctant to spend additional time in audits searching for incremental demand response potential if the extra time spent may not result in additional kW (and consequently a higher payment for the auditor). This increases the likelihood that some viable demand response opportunities will be missed as the auditor focuses more on the easily identified opportunities.

  The business questionnaire from the previous recommendation could also be used to structure the audit. Based on the business and building characteristics, a required review list for the audit covering end uses and equipment can be developed for each customer that the auditor must follow during the audit. This will help ensure that all of the reasonable potential demand response opportunities are investigated.

- **Develop a standard and consistent process for following up with customers after they have completed the TA audit.** A common complaint among TA participants was that there was no follow up or assistance in moving on to the next phase of the program. This tended to stall the participation process as customers did not know how to apply for TI incentives. Each program should assign a specific person to follow up with the customer after the audit to assist them with getting the recommended measures installed and enrolling in the TI program component.

- **Create a consistent tracking database for both TA and TI program participants.** A better database is needed for tracking participation, documenting recommended measures in detail, and tracking participation status. For this evaluation, much of the data needed had to be entered by hand from the original TA audit reports as detail on the audit recommendations was not consistently tracked electronically by the utilities. For the TA program phase, this database should also include a field to record when the audit report was sent to the customer.

- **Provide more information on the expected measure costs and savings as part of the TA audit.** Customers indicated that they would like to have a better understanding of the equipment costs and expected energy savings benefits associated with the audit recommendations. Additionally, respondents in the TA phone survey indicated that saving energy and money were the two primary reasons that the implemented the recommended measures from the audit. Providing additional information in this regard should help increase the numbers of participants moving from TA to the TI phase. For those measures that will vary substantially across applications, a range of cost and savings values adjusted by building type and size could be provided.

- **Deliver the audit reports more quickly to the customers.** Several respondents discussed their dissatisfaction with the audit reports: either they never received them, received them very late or the audit report content was not what they expected or desired. The program should work to improve how quickly the reports are provided to the customer in order to capitalize on any momentum that is built during the audit. The utility company and the contractors should clearly describe to participants how the audit reports are compiled and when the participant should expect to receive it. This issue has stalled measure adoption and is a major obstacle to moving between the TA and TI phases of the program.

In addition to program recommendations, we also offer the following recommendations for future TA/TI Program evaluations:

- **Conduct more customer interviews and surveys and include adequate up-front customer notification to facilitate this process.** The most valuable information from this evaluation was obtained from the TA participant phone survey and the TA/TI in-depth interviews where each element of the audit report and auditing process was discussed. These should be continued in future evaluations.

  To prevent customer complaints, a letter should be sent alerting participants prior to fielding the survey or recruiting for in-depth interviews. This will also help increase the participation in the survey as well as help identify early those customers that do not wish to respond. Having a larger participant population from which to draw sample will also decrease the likelihood of customer complaints.

- **Eliminate load shed test observations from the process evaluation.** The four that were observed in this evaluation were varied to allow for drawing general conclusions. While the load test observations (or at least a review of the load shed test report) is of use for an impact evaluation, it seems to have limited value for a process evaluation.

- **Attempt audit ride-alongs for visits that involve the initial contact between the auditor and the customer.** This will allow the evaluation to observe first-hand how the program is being promoted and customer concerns and initial reactions. Ride-alongs that are done later in the audit process after the customers have agreed to the program and are comfortable with the auditor are of less value to the evaluation.

1. INTRODUCTION

This report presents the process evaluation results for the 2006-2007 phase of the Technical Assistance/Technology Incentive (TA/TI) Program for Southern California Edison (SCE), San Diego Gas and Electric (SDG&E), and Pacific Gas & Electric (PG&E). PG&E's Auto DR program was also included in this evaluation.

The TA/TI Program has two components. The Technical Assistance (TA) component provides free onsite energy audits to larger (200 kW or more) commercial and industrial customers to identify demand reduction opportunities. In some cases, a preliminary assessment is first conducted to assess the site's demand response potential before a full Technical Assessment audit is performed.

The Technology Incentive (TI) component provides financial incentives (up to $250/kW reduction) to install demand reduction measures that are identified during the TA audit. A load shed test is required to confirm the demand curtailment and to receive 50 percent of the incentive payment. The customer is paid the remaining 50 percent if he/she enrolls in a utility demand response program for at least one year. In 2007, an Auto Demand Response (Auto DR) component was added to the TI Program that provides incentives for installing equipment that allows for automatic load curtailment during a load control event.[2]

In addition, most TA/TI participants work with multiple engineering firms and contractors to complete all the phases of the project. However, one variant is a turn-key audit, in which a single engineering firm performs all the necessary audits and load shed tests, oversees the installation of the demand response measures, and sometimes assists the business site during the demand response events.

1.1 EVALUATION OVERVIEW

This report presents the process evaluation results for the SCE, SDG&E, and PG&E TA/TI Program during the 2006-2008 program cycle. For this evaluation, the following research objectives were established:

1. Document program and implementation theories, program goals, implementation strategies and procedures across utilities.
2. Provide real-time feedback to program implementers with an emphasis on improving recruitment and program delivery and identify implementation and program design problems for review and modification.
3. Assess the effectiveness of the programs using data from 2006 and 2007.
4. Evaluate areas of customer and trade ally satisfaction and dissatisfaction.
5. Identify barriers and obstacles to meeting program goals.
6. Provide recommendations for program improvements.

[2] The Auto DR program was only offered through PG&E in this evaluation period.

To meet these objectives, the following evaluation tasks were conducted:

- *Logic model and program theory.* A logic model established a starting point for all evaluation activities. The structure of the logic model, which links program activities and expected outcomes, is a useful instrument for identifying specific program assumptions that can be tested using a survey or other primary data collection activities.

- *Process diagrams.* The evaluation team also created a flow chart for each utility's TA/TI Program, which traces the steps required to complete each stage of the program.

- *In-depth interviews with program staff and trade allies.* In-depth interviews were conducted with program staff, auditors, and verifiers to gather additional process-related information in February 2008. Program staff members helped to gauge program progress, provided valuable insight into daily operations, and proposed research topics to be addressed by the evaluation. Moreover, interviews with trade allies who were installing the various demand reduction measures helped to determine how well the program is working and collected suggestions for program improvement.

- *Participant phone surveys.* A primary data collection instrument for the TA/TI Program was a 15-minute participant phone survey, which was fielded by Itron's call center from February to March, 2008. Respondents included customers that just received an audit through the TA program component but had not moved on the TI program phase. The surveys explored the participant experience with program services and addressed the research issues identified by the logic model and in-depth interviews. Key topics include drivers and barriers to demand response, customer satisfaction, and suggestions for program improvements.

- *In-depth interviews with participants*. To supplement the phone survey results, the evaluation team conducted in-depth interviews (30 to 60 minutes) with a sampling of both TA and TI participants from each utility in February and March, 2008. These interviews targeted large facilities, typically with more complicated audit measures. Key research issues explored why various measures are being implemented or rejected, areas for program improvement, and satisfaction levels with the TA/TI process.

- *Load Shed Test Observations and Audit Ride-Alongs.* Other key evaluation activities included ride-alongs with auditors and visits to customer sites to observe load shed testing. These were done to gain additional perspective on these areas where the TA/TI Program interacts directly with the customer.

- *Discrete choice analysis.* A discrete choice model is used to simulate the choice to participate in the TA portion of the program. This model was developed to identify key customer and program elements that have a relatively larger influence on the customer's decision to proceed from the TA to the TI program phase.

2. LOGIC MODEL AND PROGRAM THEORY

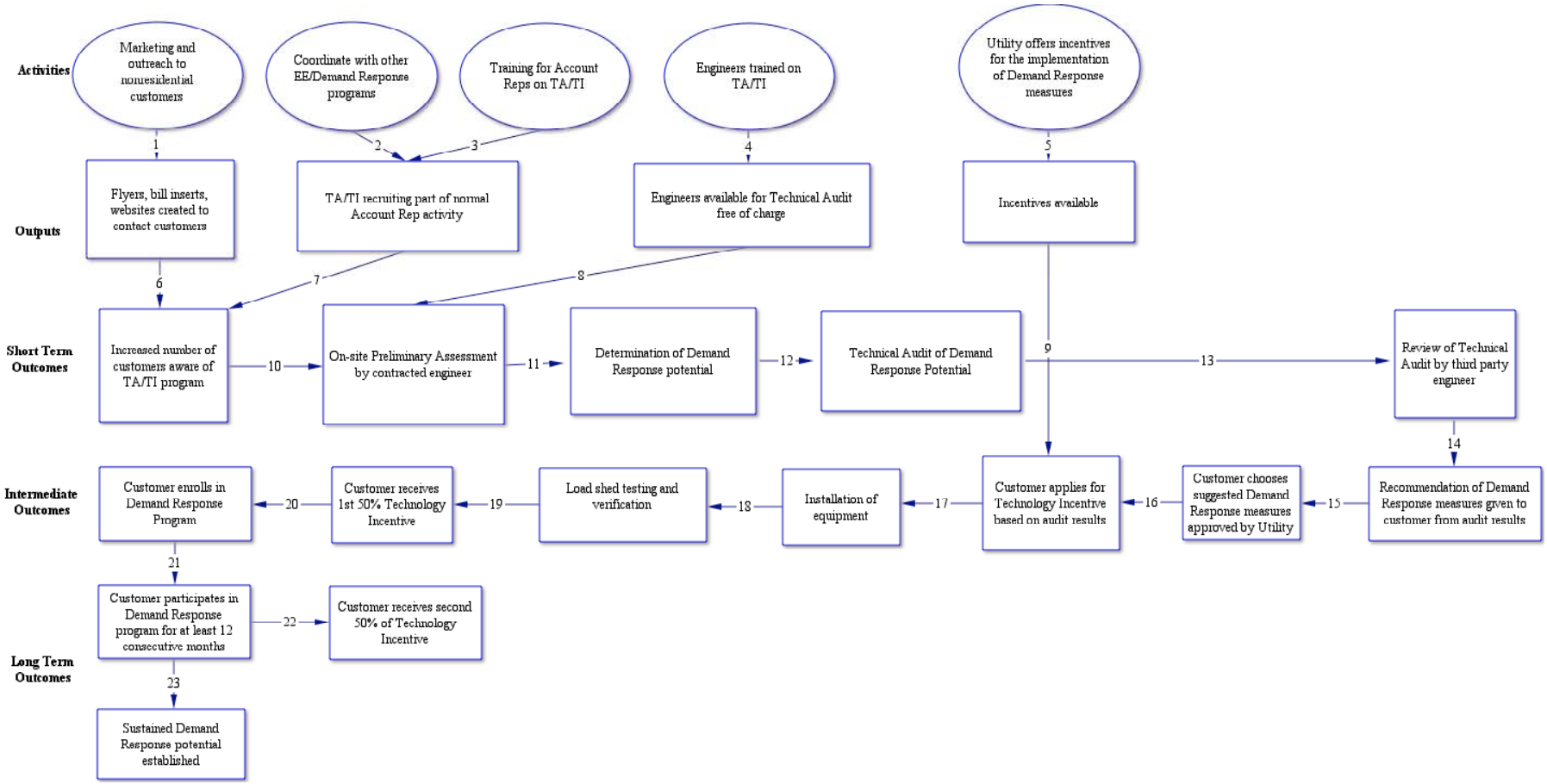
One of the first tasks for the evaluation was to develop a program logic model and document the program theory for the TA/TI Program. The structure of the logic model that links activities and outcomes is a useful instrument for identifying specific program assumptions that can be tested using survey or other primary data collection activities. Crucial program evaluation issues often question whether program services are adequately designed and equipped to generate their desired outcomes.

Additionally, the construction of a program theory and logic model provides a common knowledge and language between program implementers, evaluators, and stakeholders. It allows for a more precise conversation about what is occurring within a program and why the program actions should produce the expected outcomes.

2.1 TA/TI PROGRAM LOGIC MODEL

Figure 1 presents the logic model for the 2006-08 TA/TI Program.

Figure 1. 2006-2008 TA/TI Program Logic Model



2.2 TA/TI PROGRAM THEORY

The following discussion of the TA/TI Program theory builds on the program logic model and provides additional detail on program activities, outputs, and outcomes.

The overall theory behind the TA/TI Program is that many customers face significant barriers to participation in demand response programs, including lack of knowledge; concern about impacts on business operations and customer/employee comfort; and an aversion to the risks associated with spending money on control technologies with no assurance that they will actually work to reduce peak demand. By covering the full cost of audits and a significant proportion of the cost of equipment, the TA/TI Program reduces risk, increases customer awareness of DR opportunities, and helps to mitigate impact on operations.

Activities

Marketing and outreach to nonresidential customers

The TA/TI Program is targeted to nonresidential customers. This segment of customers will be contacted through flyers, bill inserts, and websites as well as through direct contact by Account Reps. Marketing presentations and materials are created that have a clear and compelling message. They are easy to understand with specifics regarding energy efficiency benefits and available program services.

Coordinate with other DR programs

Customers already enrolled in DR programs who have not responded to DR events (such as many of those enrolled in the Demand Bidding Program) can serve as an excellent source for potential TA/TI participants. If a customer is already enrolled in a DR program, they are automatically eligible for a 100% Technology Incentive.

Training for Account Reps on TA/TI

Account reps that are trained on the TA/TI Program have the knowledge necessary to attract additional customers to the program. When AR's are trained on TA/TI, they will make program recruitment a permanent part of their effort to encourage DR program participation activity.

Engineers Trained on TA/TI

Technical audits are a required step in the TA/TI process. These audits will require the trained personnel necessary to complete this step.

UTILITY offers incentives for the implementation of Demand Response measures

Since the incentives offered for DR program participation have not been sufficient to help the utilities attain their DR goals, financial incentives are offered for the installation of DR technologies to promote both an increase in customer enrollment and load reduction.

Outputs (Direct Results of Program Activities)

Flyers, bill inserts, websites created to contact customers

Various outlets are created to reach potential TA/TI customers.

TA/TI recruiting part of normal Account Rep activity

To increase participation of TA/TI customers, Account Reps will make recruiting clients already enrolled in various DR and EE programs a regular occurrence.

Engineers available for Technical Audit free of charge

The cost of the technical audit is incurred by the utility. If the customer wants to provide his or her own engineer, the reimbursement is $100 for every kW of potential DR curtailment.

Incentives available

Incentives to enroll in the TA/TI program drive participation. If the customer completes all phases of TA/TI, they will have undergone a free audit, had a portion of their DR equipment paid for, and increased their potential to save on their energy bill.

Short Term Outcomes

Increased number of customers aware of TA/TI program

The advertising campaign and collaboration with other demand response programs will inform customers of the TA/TI Program and the incentives it offers.

On-site Preliminary Assessment by UTILITY-contracted engineer

With encouragement from their account rep, customers will undergo a preliminary assessment to determine if there is potential for load reduction.

Determination of Demand Response Potential

If the contracting engineer finds potential for demand response, a more thorough audit, or technical audit (TA) will be scheduled.

Technical Audit of Demand Response Potential

The technical audit portion of TA/TI is an in-depth audit to determine which technology is best suited for that particular customer's practices and operational constraints, including the need to maintain occupant comfort or critical industrial processes.

Customer applies to reserve funding for Technology Incentive based on audit results

Customers may start the application process for receiving their Technology Incentive payment before the installation of the DR measures.

Mid Term Outcomes

Recommendation of Demand Response Measures given to the customer from audit results

As a result of the technical audit, the customer is presented with a portfolio of choices for demand response technologies if the audit results in a determination of significant DR potential.

Customer chooses suggested Demand Response measures approved by UTILITY

Once the list of DR measures is identified by the audit and approved by UTILITY, the customer may choose all, some, or none of the DR measures.

Installation of Equipment

Following measure approval and selection, the customer and PM coordinate for the installation of the DR measure(s).

Load Shed Testing

Upon installation of equipment, load shed testing is performed to determine if the actual load being shed matches the planned load shed potential. The Technology Incentive is determined by the actual load shed test and not the planned DR potential.

Customer receives first 50% Technology Incentive (TI)

Once the DR measure(s) are installed and tested, the first incentive check is released to the customer.

Customer enrolls in one or more of 13 Demand Response Programs

Now that the customer is equipped with DR measure(s), enrolling in one or more of thirteen DR programs or tariffs may be of significant economic value to them. Intervention on the part of the account rep at this stage can cement the customer's enrollment.

Long Term Outcomes

Customer participates in Demand Response program for at least 12 consecutive months

Upon signing up for a DR program and completion of one year in the program, the customer is eligible for a second 50% Technology Incentive.

Customer Receives second 50% Technology Incentive

The second 50% payment for DR measure(s) serves as an incentive for the customer to sign up for any of the thirteen DR programs. Encouraging customers to sign up for these DR programs is a long-term goal of the TA/TI Program.

Sustained Demand Response Potential

Successful DR program participation encourages customers to pursue additional local control strategies, resulting in sustained, long-term demand response

2.3 TA/TI Program Process Diagrams

The following process diagrams outline the steps required to complete each utility TA/TI Program, from start to finish. These diagrams serve as tools to familiarize readers with the features of each program contained in this evaluation. Diamond-shaped boxes represent decision points, where either the customer, auditor, or program administrator must make a decision to continue with the demand reduction project. If "no" is chosen at any of these points, the customer drops out of the program.

Process diagrams are different from logic models because process diagrams represent programs as narrow, linear strings of events. While they are useful for conveying the basic program mechanics, the diagrams do not incorporate the effects of multiple or indirect influences and outcomes. Alternatively, logic models encapsulate a broad range of program influences at a high level and trace how program activities produce multiple short-term, mid-term, and long-term outcomes.

This section presents the TA/TI process diagrams for each utility's standard program. Two diagrams represent each TA/TI program: one for TA and a second one for TI. The process diagrams as presented as follows: SCE TA/TI Program Process Diagram, Figure 3 (TA) and Figure 4 (TI); SDG&E TA/TI Program Process Diagram, Figure 5 (TA) and Figure 6 (TI); and PG&E TA/TI Program Process Diagram, Figure 7 (TA), Figure 8 (TI).

Similarities/Differences Among SCE SDG&E, and PG&E TA/TI

The TA/TI process for the SCE, SDG&E, PG&E standard TA/TI programs have the same basic structure, but differ on some details such as a pre-audit assessment and payment structures for auditors. Key similarities and differences are outlined in Figure 2 below.

PG&E also offers two unique alternatives to their standard TA/TI program, a turnkey audit and a specialized type of turnkey audit through the Auto Demand Response (Auto DR) program. PG&E customers may choose any of the three options. According to the PG&E program manager, 20 customers were enrolled in the standard TA/TI program during 2006-2007, of which half did a turnkey audit. The 2007 Auto DR program had a total of 23 participants.

For turnkey programs, turnkey auditors not only perform the audit portion of the TA program phase, but also interface with the utility customer from the start of the program at the preliminary audit, and through installation and load shed verification. This is distinct from all the standard utility TA/TI offerings in which the technical auditor completes his/her job once the audit results have been presented to the client.

In addition, PG&E formally initiated its Automatic Demand Response (Auto DR) in 2007, which is a specialized type of the turnkey program[3]. There are two types of Auto DR customers, hardware clients and software clients (and the majority are hardware clients). For hardware clients, a CLIR (Client & Logic with Integrated Relay) box is installed at the facility site that

[3] It was a pilot program in 2005 and 2006.

automatically triggers a load curtailment during a demand response event. Alternatively, for software clients, a XML signal is sent directly to the site's Energy Monitoring and Control System. The Auto DR program is explained in greater detail in section 3.8 of this report.

Figure 2. Key Similarities and Differences Among Standard TA/TI Programs

Step	Similarities	Differences
1	Account Executive Recruitment TA/TI clients are recruited by utility Account Executives and then referred to an auditor.	Preliminary Assessment: For SCE and PG&E customers, the next step is a preliminary assessment (utility pays auditor a set fee) to determine if there is sufficient demand response potential at each facility site. However, SDG&E has abandoned this practice because it decided that the preliminary audit is of minimal value.
2	Technical Audit If sufficient demand response potential is determined, the client may progress to a Technical Audit, which is also free to the client and funded by each utility. The auditors discuss the business's operational requirements with the client before the audit is conducted in order to ensure that recommended measures will fit the business model.	Payment Mechanism for Auditors: Auditors for SCE and SDG&E are paid for their time and materials not to exceed $100 per identified kW. Alternatively, PG&E sets a standard rate for their auditors dependent upon the size and type of the facility being audited. Integrated Energy Audit PG&E offers an Integrated Energy Audit option, which identifies energy efficiency improvements (kWh savings) in addition to demand reduction (kW). Turn-key Audit PG&E also offers a turn-key option, where the auditing firm also provides continuous assistance during the measure installation and load shed testing stages.
3	Review of Technical Audit Completed Technical Audits are submitted to Program Verification Engineers for review before they are presented to the client.	Program Verification Engineers: For SCE and SDG&E, these verifiers are third party consultants hired by the utility, while PG&E uses its internal engineering staff.
4	Load Shed Test Customers who decide to move ahead with the Technology Incentive phase can reserve their technology incentives and receive the cash incentive for their new equipment installs only after a load shed test. Clients receive up to $250/kW identified in the load shed test.	
5	Enrollment in Demand Response Programs All three utilities require that their customers be enrolled in a demand response program for 12 months to receive the other half of their incentive payments. However, each customer has the option to not participate on the day of a demand response event. Enrollment in the program does not guarantee participation in demand response events.	

The process diagrams for the SCE, SDG&E, and PG&E standard programs are presented next.

Figure 3: SCE Technical Assistance (TA) Program Process Diagram

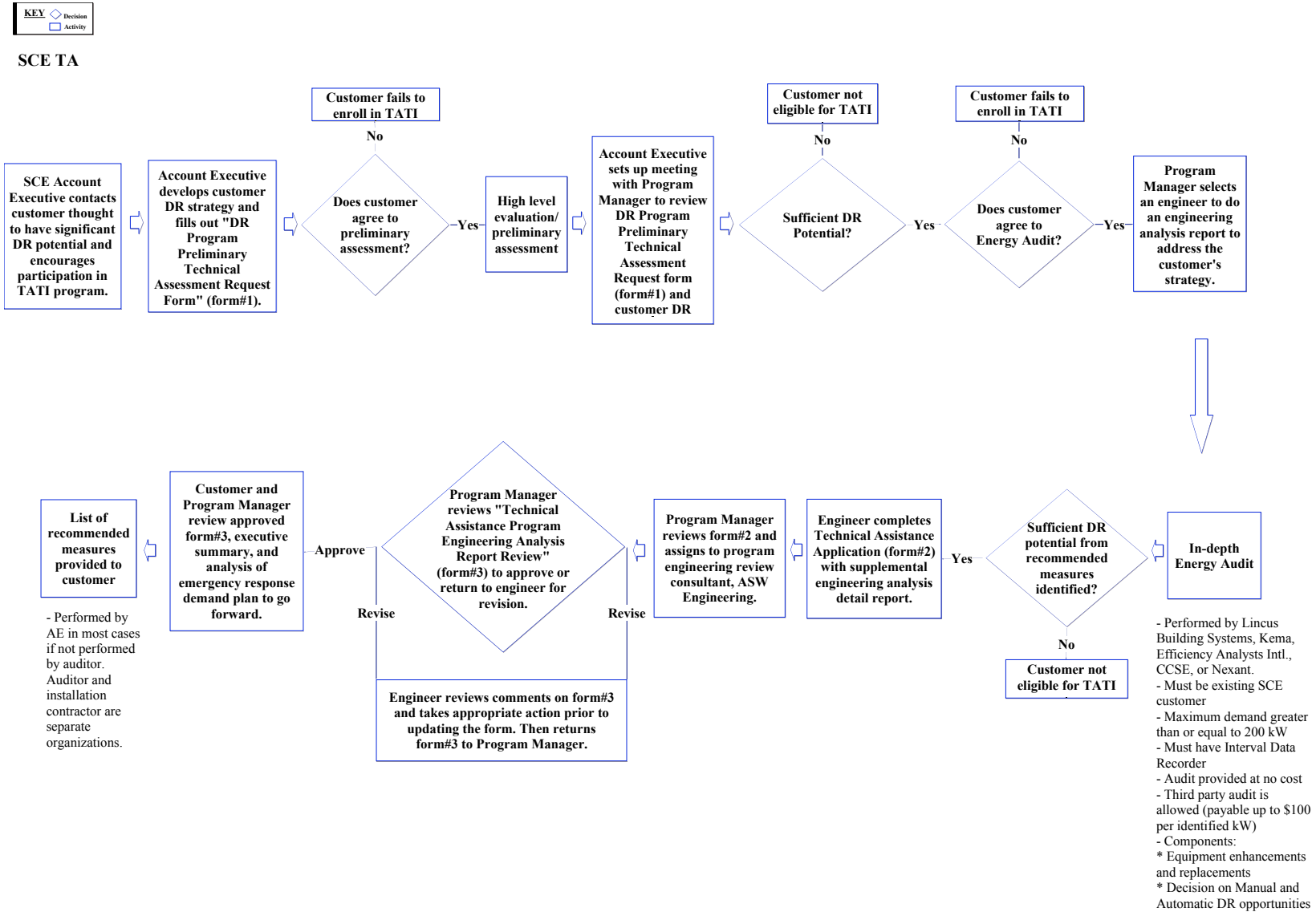


Figure 4. SCE Technology Incentives (TI) Program Process Diagram

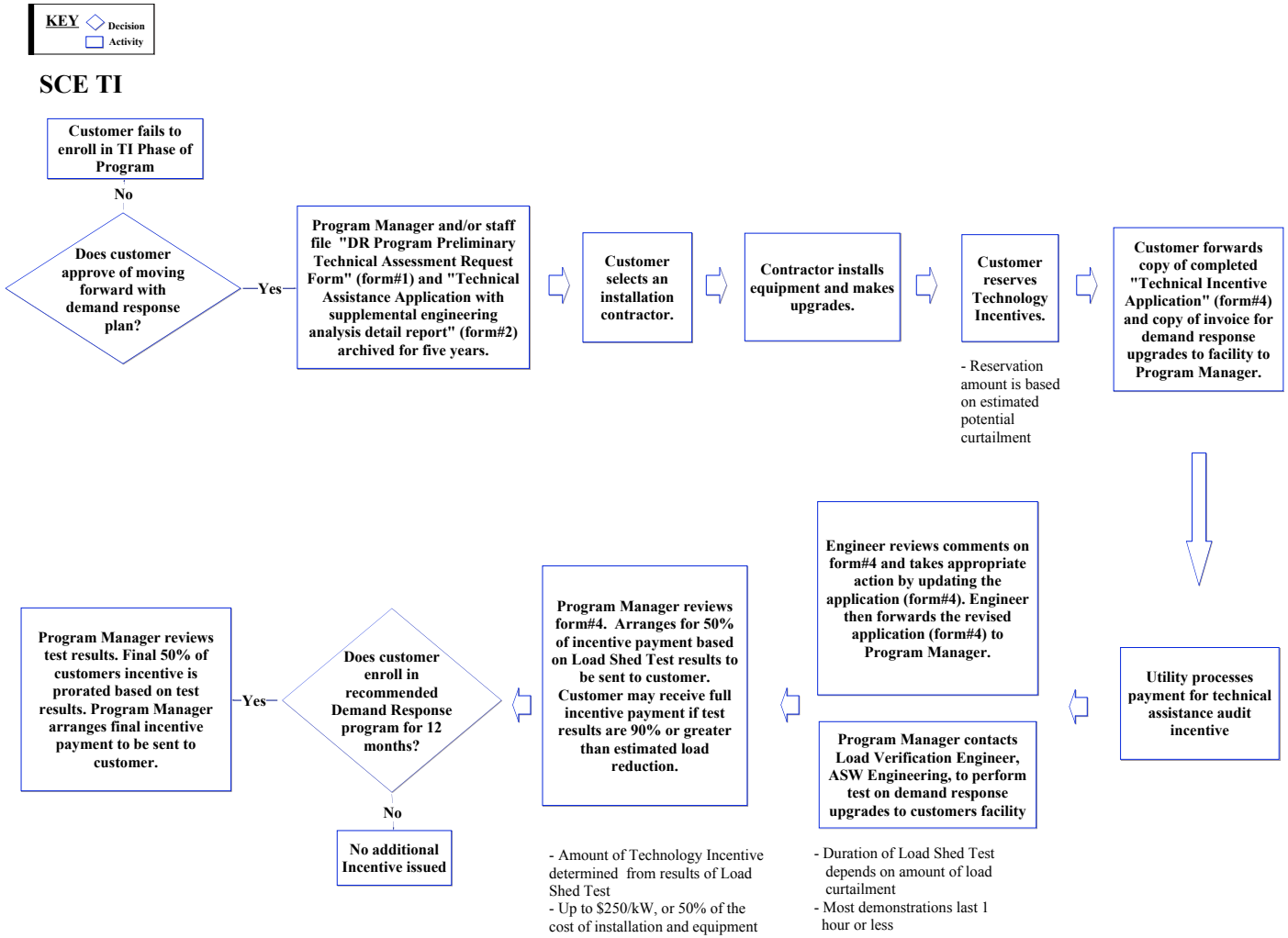


Figure 5: SDG&E Technical Assistance (TA) Program Process Diagram

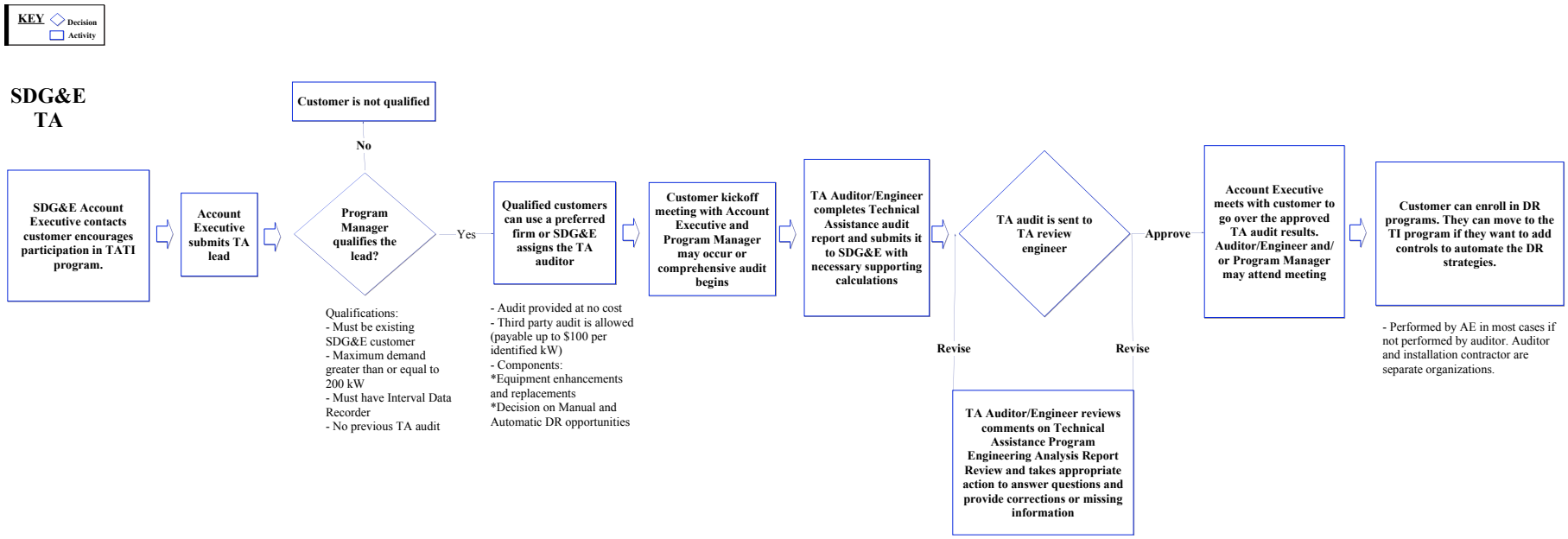


Figure 6: SDG&E Technology Incentives (TI) Program Process Diagram

Process Flow Diagram for SDG&E Technical Assistance/Technical Incentive Program

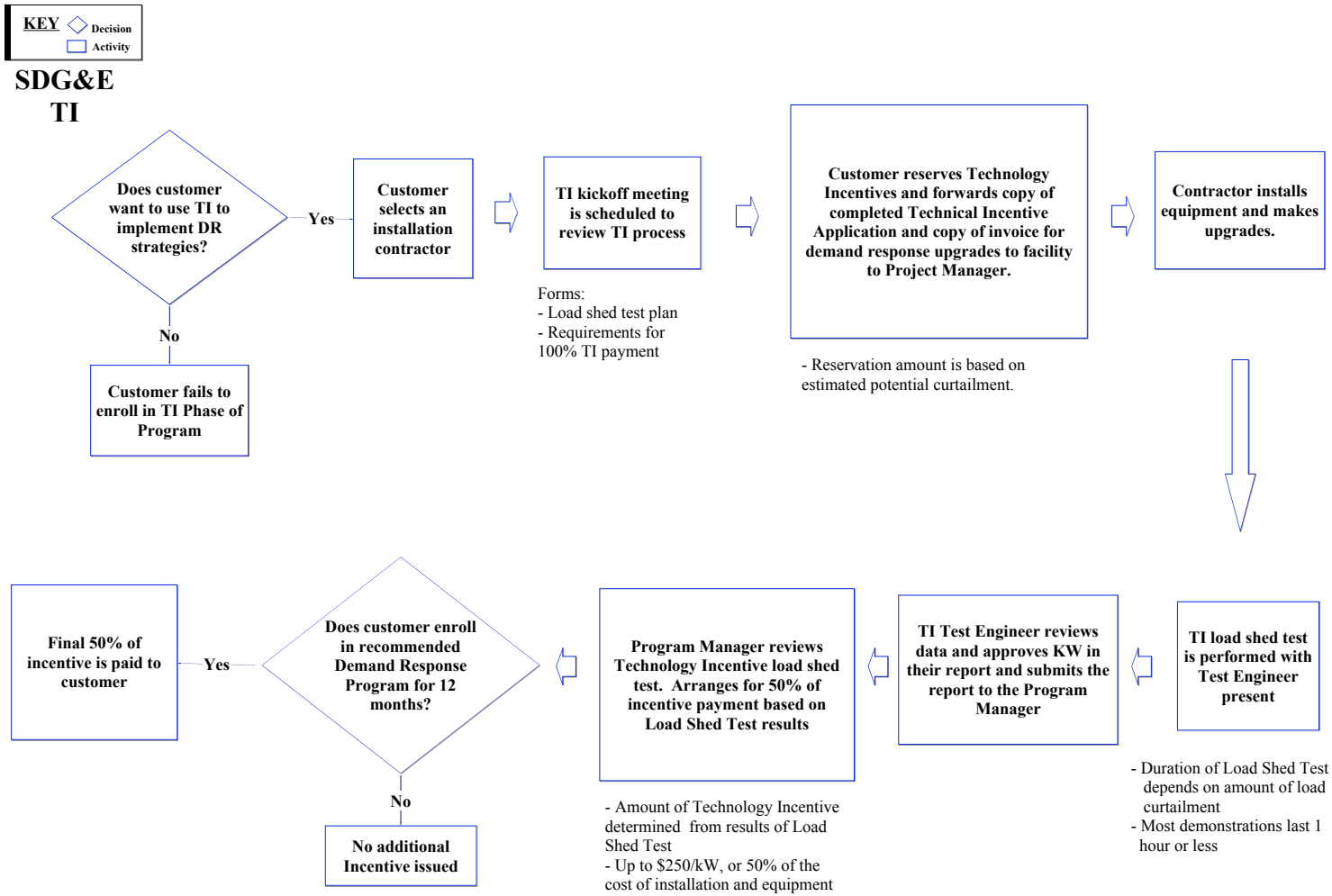
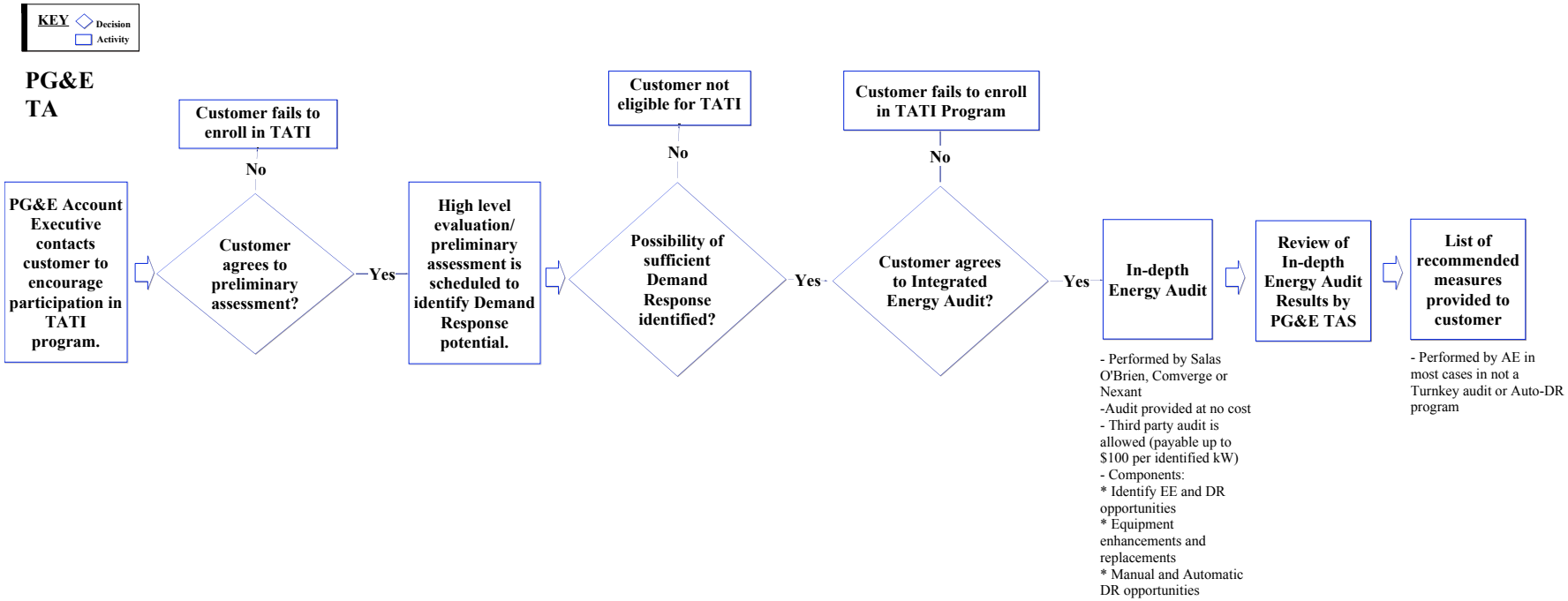
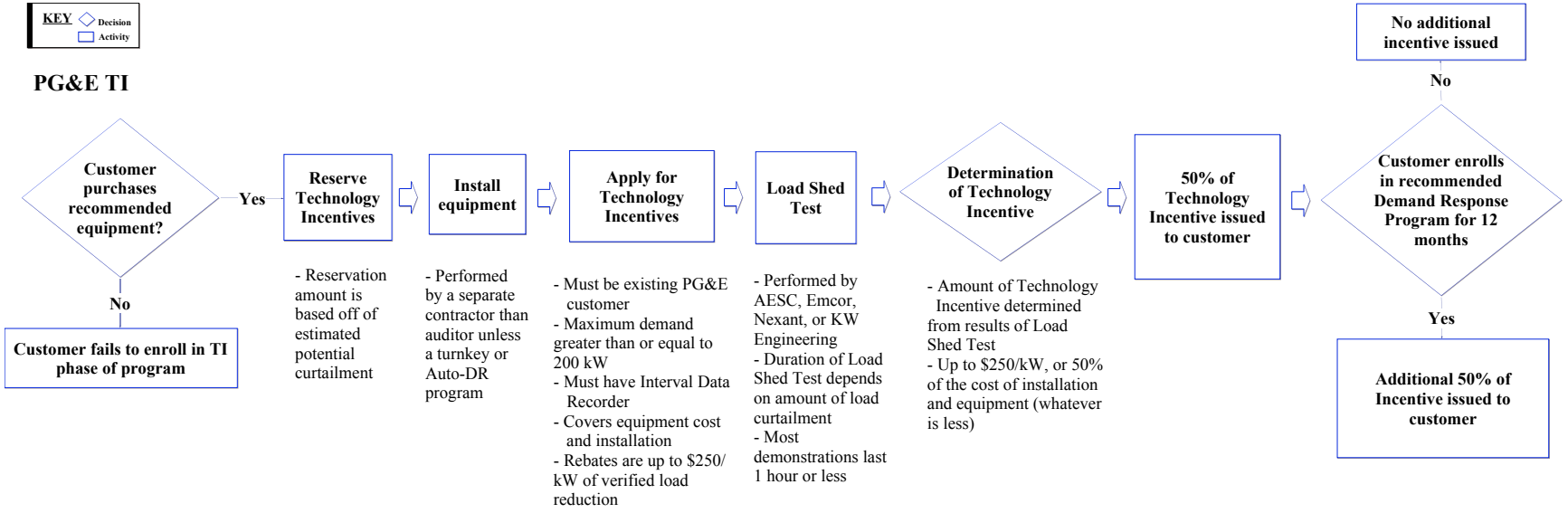


Figure 7: PG&E Technical Assistance (TA) Program Process Diagram



- **Turnkey Audit:** In-depth audit, implementation plan, and installation are all done by one contractor. This contractor is either Kema, IES, EPS, or Nexant.
- **Integrated Audit:** This type of audit identifies both demand response and energy efficiency measures during the in-depth energy audit.

Figure 8: PG&E Technology Incentives (TI) Program Process Diagram



- **Turnkey Audit:** In-depth audit, implementation plan, and installation are all done by one contractor. This contractor is either Kema, IES, EPS, or Nexant.

3. EVALUATION ANALYSIS METHODS AND RESULTS

The results of the major evaluation tasks are presented in this section. Where appropriate, results are discussed separately for each utility. A separate discussion relating to PG&E's Auto DR program is provided as a separate section.

3.1 DATA COLLECTION, SURVEY SAMPLE DESIGN, AND CALL DISPOSITION REPORT

When the TA/TI evaluation plan was originally proposed in May 2007, it was assumed that a much larger pool of participants would be available for use in the evaluation. As the evaluation progressed, it was discovered that the original data collection plan was not appropriate given the level of participation.

The original phone survey and interview data collection samples planned for the evaluation is shown in Table 1.

Table 1: Original Evaluation Data Collection and Sample Plan

Utility	TA Only Phone Surveys	TA & TI Phone Surveys	Trade Ally Interviews	Post Event Surveys
SCE	80	120	15	80
PG&E	80	120	15	60
SDG&E	80	120	15	60
Total	240	360	45	200

In addition to the generally lower than expected amount of participant data, the following factors also resulted in modifying the samples used for the evaluation:

- A single contact listed for multiple participant sites (such as chain stores and franchises). This reduced the number of participants that were actually available for surveys or interviews.
- Concerns by TA/TI program staff on the amount of customer contacting proposed.
- Difficulties in coordinating load shed test observations and post result surveys.
- Concerns that a phone interview would not get into enough detail and involve too much reliance on customer recall of their audit report. As a result, some of the planned phone surveys were shifted to in-depth interviews so that the audit report recommendations could be discussed in detail with a smaller sample of customers.
- As the evaluation worked with the DRMEC, it became apparent that it would be useful for the evaluation to interview those involved with recruiting customers to

the program and reviewing the initial audit reports. Additional interviews were then planned for program engineers, auditors, and aggregators although no fixed target for interviews was set.

To further guard against too much contact with customers, account representatives from each utility reviewed the proposed sample so that sensitive customers could be identified and removed. Despite these precautions, during the course of the survey and interviews, a couple of customer complaints were received that were likely due to overaggressive interviews trying to recruit respondents from a limited amount of sample.

Table 2 shows the revised data collection samples used in the evaluation (planned versus achieved), as well as the participant population data available for each utility. Despite the reduced sampling plan, we were not able to meet all of the quotas due to the small amount of participation data. The actual completed data collection with the amounts achieved for each task is also shown in shown Table 2. While these samples are smaller than originally proposed, the populations from which they were drawn are also smaller and we believe that the final samples are still representative. Notably, the small amount of available PG&E customer data was saved for in-depth interviews, rather than fed into the phone survey.

Table 2: Final Evaluation Data Collection and Sampling Plan

Utility	TA Only Phone Surveys (Planned)	TA Only Phone Surveys (Achieved)	TA & TI In-depth Interviews (Planned)	TA & TI In-depth Interviews (Achieved)	Auditor / Aggregator / Engineer In-depth interviews (Achieved)	Available Participant Population Data		
						TA Only	TI In Progress	TI Complete
SCE	50	55	20	20	5	288	24	6
PG&E	0	0	20	8	7	32	2	76
SDG&E	50	47	20	14	5	585	37	26
Total	100	102	60	42	17	905	63	108

Data Sources

Contact information for the participant phone survey and in-depth interviews was provided by the SCE, SDG&E, and PG&E program tracking databases. Each utility also supplied the evaluation team with program tracking information on the audit recommendations for the participant sites, along with the PDF files of all Technical Assistance audit reports and Technology Incentive applications for the 2006 and 2007 period. The utility program tracking databases only contained general information on the measures and so the evaluation team integrated the information from the PDF files (measures recommended and kW reduction) with the utility databases to create a complete dataset to feed into the discrete choice model. In addition, for each in-depth interview, the interviewer sent the respondent his or her audit report PDF file and then asked the respondent if each measure listed had been implemented.

Call Disposition Report

Figure 3 shows the call disposition report from the Itron call center, which fielded the participant phone survey and arranged participant in-depth interview appointments for the evaluation team. The participant phone survey had a 26 percent response rate (102 out of 397 calls made). The rate at which appointments were made for in-depth interviews varied by utility, ranging from 26 percent for SCE customers called to 43 percent with PG&E customers. All 20 in-depth interview appointments set for SCE customers were successfully completed by the evaluation team. However, only eight of the 13 PG&E customers and 14 of the 18 SDG&E customers who made appointments through the Itron call center actually did their in-depth interviews. Evaluation team members called each potential in-depth interview participant at the designated appointment time and appointments fell through if the customer never answered the phone, never returned the voicemail message, or rescheduled and then avoided the second call.

Table 3: Call Disposition Report

		In-Depth Interview Appointments Set By Call Center		
	Participant Phone Survey	**SCE**	**PG&E**	**SDG&E**
Total sample	397	78	30	51
Completes	102	20	13	18
Response rate	26%	26%	43%	35%
Reasons for Failed Calls				
Incompletes	2			1
Customer told Itron to call back at set time, but then never answered	112	45	5	7
Refusals	20	4	2	4
Disconnects	17	3		3
Duplicates	2			
Fax	9	2	1	3
Language Barrier	2			
Max attempts (6 calls)	70	1	6	9
Not aware of program	46	1	2	5
Designated respondent not available	15	2	1	1

3.2 Participant Phone Surveys

The TA participant survey was fielded by the Itron survey center in February of 2008. This survey targeted participants who had completed the TA portion of the program but had not yet moved to the TI phase. The sample included program participants from both SCE and SDG&E

who had completed a Technical Assistance audit.[4] Overall, there were 102 respondents: 55 were SCE and 47 were SDG&E customers.

The following analysis addresses program participation, barriers to measure implementation or equipment purchase, and program satisfaction. Survey results are presented by utility to allow for both utility-specific and cross-utility analyses.

Respondent Profile

Table 4 shows that the majority of survey respondents are from larger businesses, which is consistent with the program design targeting customers with customers larger than 200 kW. Over 70 percent of SDG&E and SCE respondents said that they have over 100 employees at the site of the TA audit.

Table 4: Number of Employees at Location

	How many Employees do you have at your Location?	
Responses	**SDG&E (N=47)**	**SCE (N=55)**
1 to 5	0%	6%
6 to 10	6%	0%
11 to 20	2%	4%
21 to 50	11%	7%
51 to 100	4%	11%
Over 100	75%	73%
Don't know	2%	0%

Table 5 highlights some of the various sectors survey respondents represented. Manufacturing is the most represented sector for both SCE (42 percent) and SDG&E (28 percent). A wide range of responses were recorded verbatim for other sectors, including amusement park, water district, food and beverage, public works, hotel, and church.

[4] There were very few sample points available from PG&E and these were reserved for the TA participant in-depth interviews discussed later in this report.

Table 5: Business Sector of Participating Firms

	What Business Sector does your Firm belong to?	
Responses	**SDG&E (N=47)**	**SCE (N=55)**
Manufacturing	28%	42%
Government	9%	6%
Hospitality	6%	4%
Medical	9%	2%
Non-Profit	0%	6%
Research	6%	0%
Media/Entertainment	2%	2%
Real Estate	2%	2%
Retail or Wholesale	2%	0%
Agricultural/Mining	0%	2%
Financial Services	2%	0%
Other	34%	36%

Table 6 shows how many respondents' facilities had an Energy Management System (EMS). About half of respondents from both SDG&E and SCE (51 percent) said their facilities had an EMS.

Table 6: Is Facility Equipped with an EMS?

	Do you have an Energy Management System at your Facility?	
Responses	**SDG&E (N=47)**	**SCE (N=55)**
Yes	51%	51%
No	45%	44%
Don't know	4%	6%

TA/TI Program Participation

Table 7 shows the various ways respondents heard about the SDG&E and SCE TA/TI Programs. Of the 102 respondents surveyed, the vast majority (79 percent) first heard about the TA/TI Program through their utility rep or account executive.

Table 7: How Respondents first heard about TA/TI Program

	How did you first hear about the TA/TI Program?	
Responses	**SDG&E (N=47)**	**SCE (N=55)**
Utility rep/Account executive	75%	84%
Word of mouth	2%	4%
Utility seminar/info	4%	2%
Audit company/consultants	4%	0%
Contractor	2%	2%
Utility website	2%	2%
Personal research	2%	0%
Equipment vendor	0%	2%
Other	9%	4%
Don't know	0%	2%

When respondents were asked if they selected their own auditor or used the auditor provided by the utility company, most of the respondents chose the auditor provided by their utility for their TA audits. In fact, 96 percent of SDG&E survey respondents and 93 percent of SCE survey respondents used the auditor provided by their utility (as seen in Table 8). Only two percent of respondents from each utility chose their own auditor for their TA audit.

Table 8: Auditor Choice

	Did you choose your own Auditor or use the one provided by the Utility?	
Responses	**SDG&E (N=47)**	**SCE (N=55)**
Used auditor provided by the utility	96%	93%
Used my own auditor	2%	2%
Don't know	2%	6%

Respondents were asked why they decided to have the TA audit performed. Of the SDG&E respondents, 53 percent said they had the audit completed to save energy, compared to 76 percent of SCE utility respondents who cited the same reason (see Table 9). A similar common response was that customers were interested in saving money and/or reducing costs.

Table 9: Reason for Having TA Audit Done

	Why did you decide to have the TA audit done?	
Responses	**SDG&E (N=47)**	**SCE (N=55)**
Save energy	53%	76%
Save money/cut costs/cost savings	26%	24%
Audit was free	4%	5%
Concern for the environment, global warming, carbon footprint	6%	4%
Already was planning on purchasing new equipment- wanted to see what rebates were available	2%	5%
Will receive more incentives for my demand response programs	2%	4%
Learn about DR programs	4%	2%
Exploring equipment upgrades	6%	0%
To see whether actions need to be taken	4%	4%
To compare with an existing audit	2%	2%
Referral	2%	4%
Determine power usage	2%	4%
Other	9%	2%

Multiple responses accepted

Table 10 shows the percentage of respondents that took action as a result of the audit's recommendations. Respondents from the SCE territory implemented a higher share of measures than those from the SDG&E territory. For SDG&E survey participants, 30 percent implemented at least some of the recommendations, while 11 percent reported that they implemented all of the recommendations. For SCE respondents, 60 percent had done at least some of the recommendations and 18 percent said they did all of the recommendations from their audits.

Table 10: Post Audit Implementations

	Have you implemented any recommendations from the audit, and if so, are there some you did not do?	
Responses	**SDG&E (N=47)**	**SCE (N=55)**
All	11%	18%
Some	19%	42%
None	60%	33%
Don't know	11%	7%

Respondents that did not do all of the recommendations or did not know if they had done all of them were asked about the reasons for not following through with all the suggested measures.[5] Responses are shown in Table 11. For SDG&E respondents, 17 percent of respondents said they did not implement audit recommendations because they never received an audit report with recommendations. SDG&E was alerted to the high rate of missing audit reports—eight out of 47 respondents—and conducted further research. SDG&E called back three of these respondents, who then realized that they actually did receive their audit reports, but were thinking of something else they wanted from the utility at the time of the phone survey. SDG&E explained that the remaining five audits were cancelled, not completed, or in review. Therefore, missing audit reports do not appear to be a problem among SDG&E phone survey respondents.

Instead, the top reasons SDG&E respondents rejected measures were that the recommendations were too expensive (17 percent), the client did not have time (10 percent), that they were in the process of starting to implement measures/would start soon (10 percent), or that the timing was not good for the company (10 percent). The percentages in these categories may be understated due to the 17 percent of respondents who mistakenly said they rejected their measure because they did not receive an audit report.

Other relevant reasons mentioned by a single respondent (included in the "Other" category) for not implementing recommendations included:

- Have not found a good way to implement them.
- We are expanding the work to other areas
- I did other things

SCE respondents most frequently rejected recommendations because the recommendations were too expensive (26 percent) and the recommendations would interfere with daily business operations (21 percent). Responses that could not be categorized and that were mentioned by a single respondent (see "Other" category) are as follows.

- Fiscal impact to the city
- We don't own our building. Plus we had similar equipment in place that was saving us energy already. The auditor focused mainly on the HVAC, and we only own six out of the 53 here. There were only two recommendations.
- Do not have a facilities manager/maintenance person
- Haven't researched it more, not sure that replacing individual parts is worth the effort, may rather change whole units

These results point to the importance of consistent follow-up with customer to ensure that the audit recommendations are thoroughly discussed. The auditor and/or Account Executive should take time to explain the cash incentives available to mitigate the initial high costs. A clear estimate of the measure costs, energy savings (kW), the length of payback, and available cash

[5] Includes respondents who said "No" or "Don't Know" to Q5: "Have you implemented any of the recommendations included in the audit" and respondents who said "Yes" to Q6: Are there recommendations in the audit that you have not done.

incentives will strengthen the argument for implementation. In addition, more time devoted to pre-audit discussions with the client may decrease complaints that the audit recommendations interfere with business operations or stretch beyond the business's financial capabilities.

Table 11: Reasons for Not Implementing Recommendations

	Why did you decide not to implement audit recommendations?	
Responses	**SDG&E (N=41)**	**SCE (N=43)**
Never received (full) audit	17%	2%
Too expensive/Initial cost too high	17%	26%
Do not have time	10%	9%
In the process of implementation/will do soon	10%	7%
Don't have the money/capital	7%	9%
They interfered with daily operations/practices	5%	21%
Timing is not good for company	10%	0%
Nothing can be done to improve our building	5%	0%
Recommendations were forgotten/never made/not followed up by utility	2%	5%
Concerned about customer or employee comfort	2%	2%
Rebate payments take too long/not structured favorably	2%	7%
Did not believe they would save energy claimed	0%	7%
Need approval from corporate office/owner	0%	2%
Do not think they are necessary/applicable	5%	7%
Other reason	10%	9%
Don't know	5%	5%

Multiple responses accepted

Table 12 shows how many survey respondents actually purchased equipment as a result of their TA audit. More SCE respondents purchased equipment than SDG&E respondents. For SDG&E survey respondents, just 17 percent (eight respondents) purchased equipment as a result of their audit: Seven of the eight respondents purchased just one type of equipment, and the most notable purchases were upgrades to the Energy Management System (two respondents).

When asked if they had applied for the Technology Incentive for their particular equipment purchase, four of the eight respondents said they had. One did not know and three SDG&E customers said they did not apply for the TI incentive. Their reasons were that they forgot about it, the customer had "not yet implemented the complete audit," and it was "just for a 10 HP motor, not a big deal."

36 percent of SCE survey respondents purchased equipment as a result of their TA audits. The 20 respondents had a wide array of purchases, but the most notable ones were for:

- Lighting (T8's, T5's, system or fixture) – 10 respondents

- Energy Management Systems – five respondents
- Air compressors – five respondents

When asked about the Technology Incentive, 16 of the 20 SCE respondents (80 percent) said that they had applied for it. One did not know. The remaining three people from SCE said they did not apply for the TI incentive. Their reasons were that the customer applied for the SPC incentive because it was higher, the forms were too much of a hassle, and that customer plans to apply for the Technology Incentive in the future.

Table 12: Post Audit Equipment Purchases

	Did you Purchase any New Equipment as a result of the TA audit?	
Responses	**SDG&E (N=47)**	**SCE (N=55)**
Yes	17%	36%
No	79%	62%
Don't know	4%	2%

Table 13 shows how many respondents said they had enrolled in a Demand Reduction (DR) program and if they had done so before or after their TA audit had been completed. When SDG&E respondents were asked about program enrollment, 45 percent said they were enrolled in a program and of those 21 respondents who joined, nine did so after their TA audit. For SCE survey respondents, 55 percent reported they were enrolled in a Demand Reduction program and 17 out of those 30 Demand Reduction program participants joined after their TA audit.

Table 13: Enrollment in Demand Reduction Programs

	Are you Enrolled in a Demand Reduction Program?		Did you Enroll in the Program prior to having the TA audit?	
Responses	**SDG&E (N=47)**	**SCE (N=55)**	**SDG&E (N=21)**	**SCE (N=30)**
Yes	45%	55%	48%	43%
No	51%	46%	43%	57%
Don't know	4%	0%	10%	0%

The respondents from the previous table were then asked which programs they had enrolled in. From the data in Table 14, it is clear that each utility had one program with a large enrollment. For the SDG&E respondents that said they had enrolled in a Demand Reduction program, 57 percent had joined the Critical Peak Pricing program. Similarly, out of the 30 SCE survey respondents who said they had enrolled in a Demand Reduction program, 53 percent enrolled in the Demand Bidding Program.

Table 14: Demand Reduction Programs

	Which Demand Reduction Programs are you Enrolled in?	
Responses	**SDG&E (N=21)**	**SCE (N=30)**
Demand Bidding Program	10%	53%
Critical Peak Pricing	57%	10%
Demand Response program	14%	3%
On-call program	0%	10%
Time of Use Base Interruptible Program/I6	5%	10%
Scheduled Load Reduction Program	5%	3%
Stand by Generator Programs	5%	0%
Rolling blackout prevention program	5%	0%
Retrocommissioing program	5%	0%
AC cycling program	0%	3%
EnerNOC program	0%	7%
Other	5%	7%
Don't know	14%	7%

Multiple responses accepted

Barriers

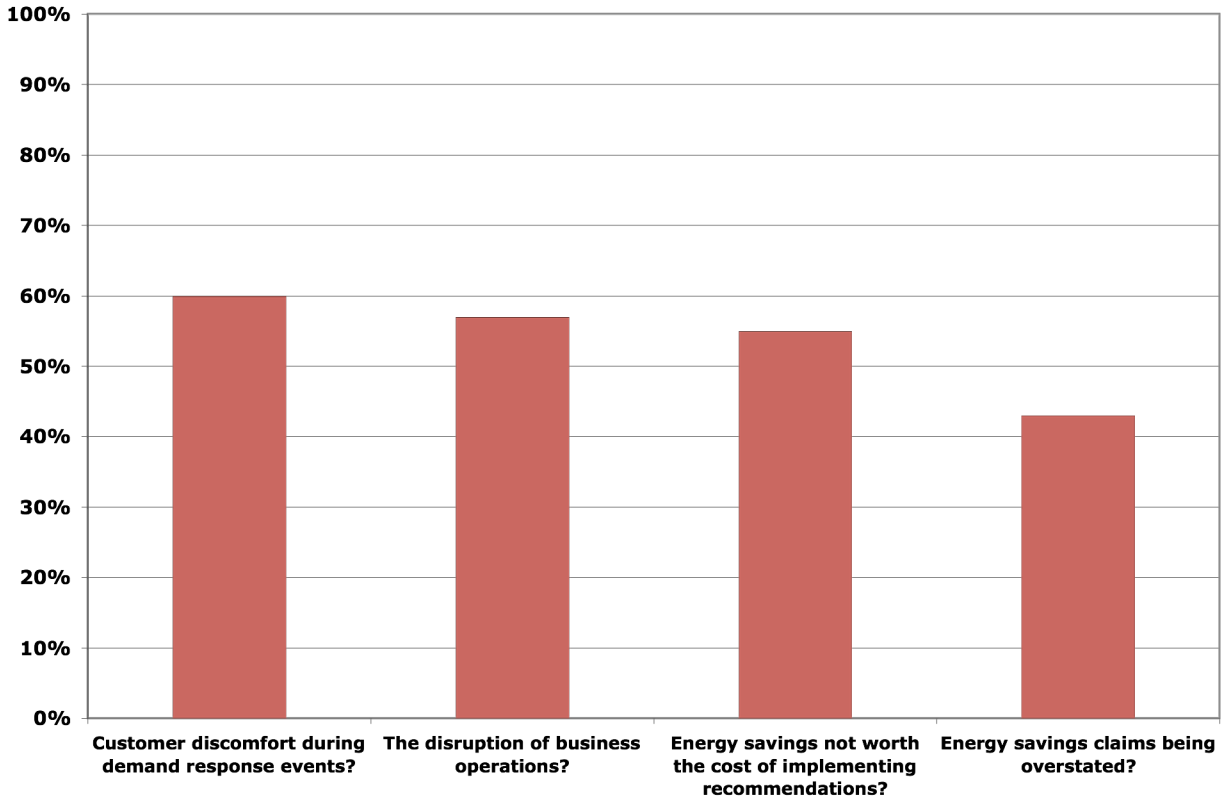
The following graphs highlight some areas of concern that TA participants have with moving on from the audit to the recommendation implementation/equipment installation phase. The findings are separated by utility and presented below.

As shown in Figure 9, SDG&E respondents' top four concerns were: customer or employee discomfort during demand response events (60 percent of SDG&E survey respondents), the disruption of business operations (57 percent), energy savings not being worth the cost of implementing audit recommendations (55 percent), and energy savings claims being overstated (43 percent).

The primary concerns about moving into the TI phase (Figure 9) can be compared with the top reasons that SDG&E respondents rejected measure, presented in Table 11 above. The top reason SDG&E respondents gave for rejecting their measures was cost, which is comparable to the concerns that the energy savings are not worth the cost of implementation and that the energy savings claims are being overstated. Notably, while the majority of respondents (60 percent) were concerned over customer or employee discomfort during demand response events, a relatively low percentage cited this as a reason for rejecting measures. Taken together, these results indicate that customer discomfort may not be a prohibitive concern among most SDG&E respondents. However, as mentioned in the discussion of Figure 10, the high percentage (17

percent) of respondents who mistakenly said that they did not receive their audit reports may underestimate the values of other categories in the table. A higher share of respondents may in fact find the concern over customer discomfort to be the primary reason for rejecting some or all of their measures.

Figure 9: SDG&E Respondent Concerns-Top 4
(N=47)



For any issue of concern, respondents were asked to categorize the severity of that concern as either a major, moderate, or minor one. For the top four concerns displayed above, Figure 10 shows how SDG&E survey respondents ranked their level of concern. For these issues, 57 percent of those respondents who identified customer discomfort as a concern reported that it was a major one and 56 percent of respondents said that a possible disruption of business operations was a major concern. The other two areas had few respondents rating the issue as a major concern.

Figure 10: SDG&E Degree of Respondent Concern

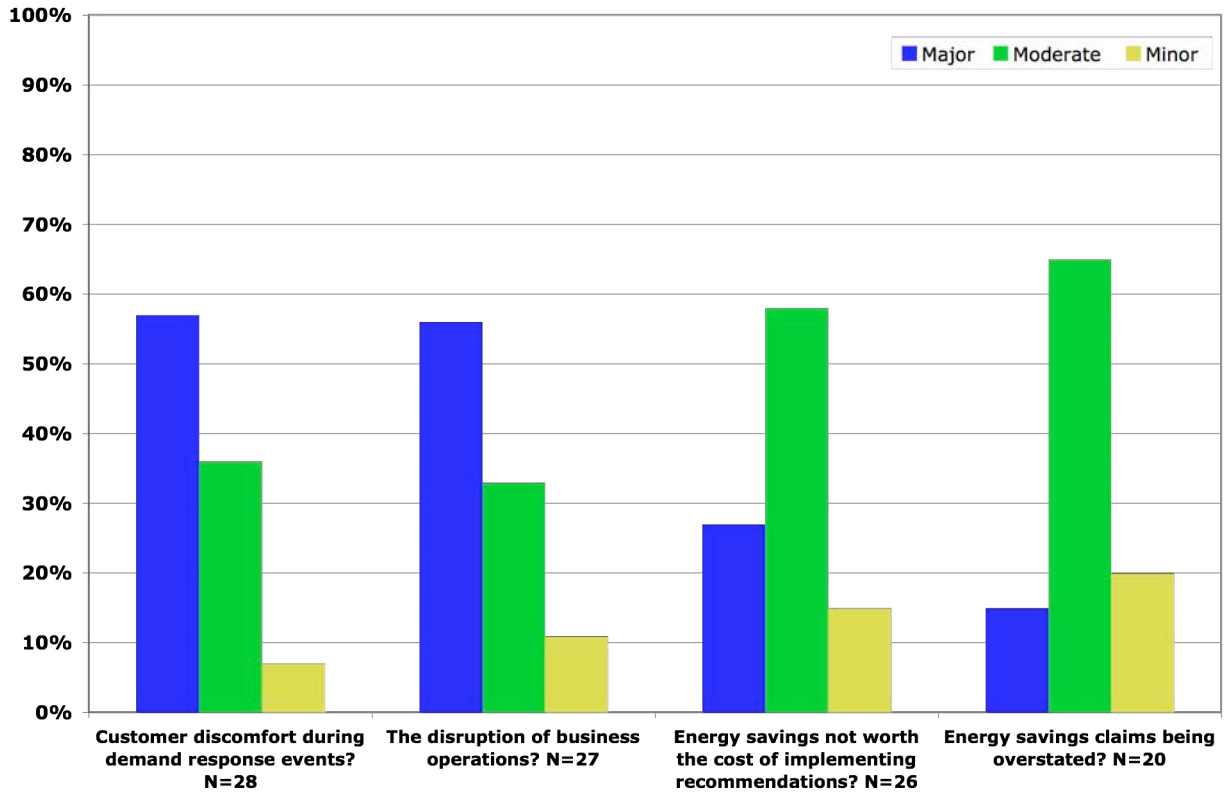


Figure 11 captures the other concerns SDG&E survey participants mentioned regarding moving forward in the TA/TI Program. (The responses were mentioned less frequently than those shown in Figure 9.) Less than 15 percent of respondents were concerned about obtaining incentive payments in a timely manner, hiring a qualified contractor to install the equipment, or finding a qualified repairman to maintain the equipment.

Figure 11: SDG&E Respondent Concerns-Other
(N=47)

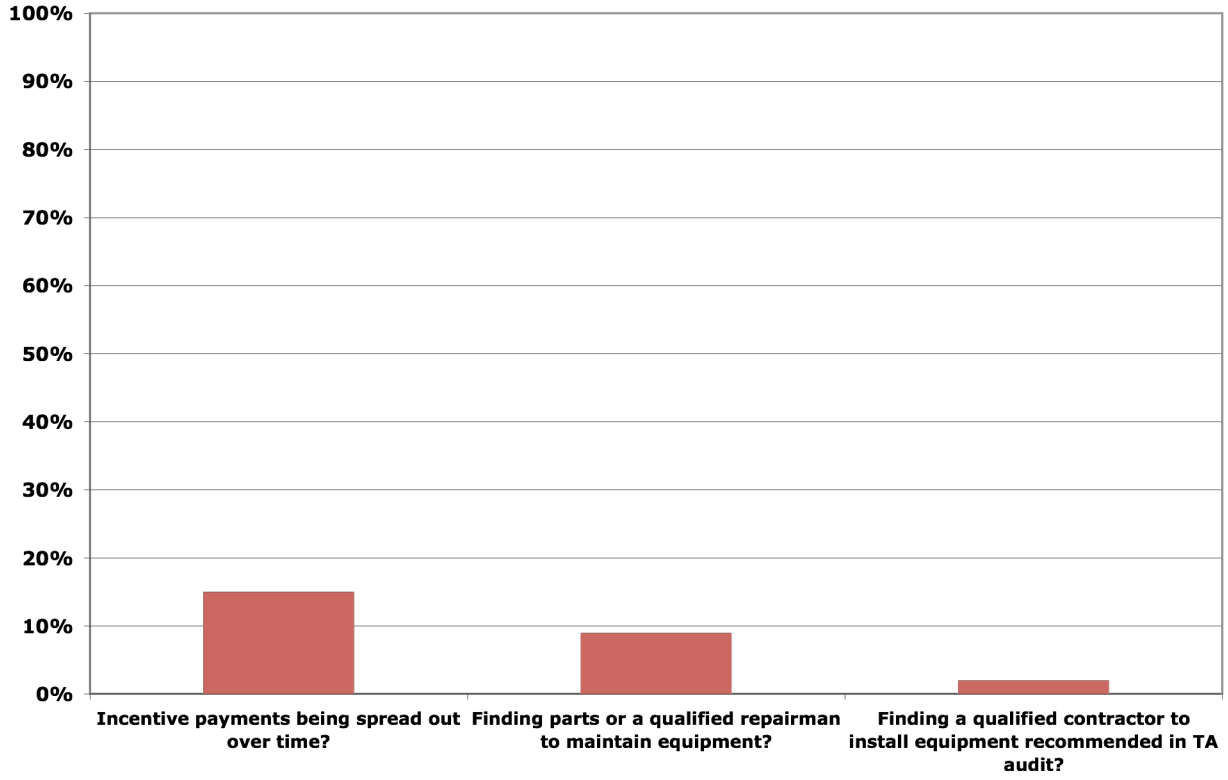
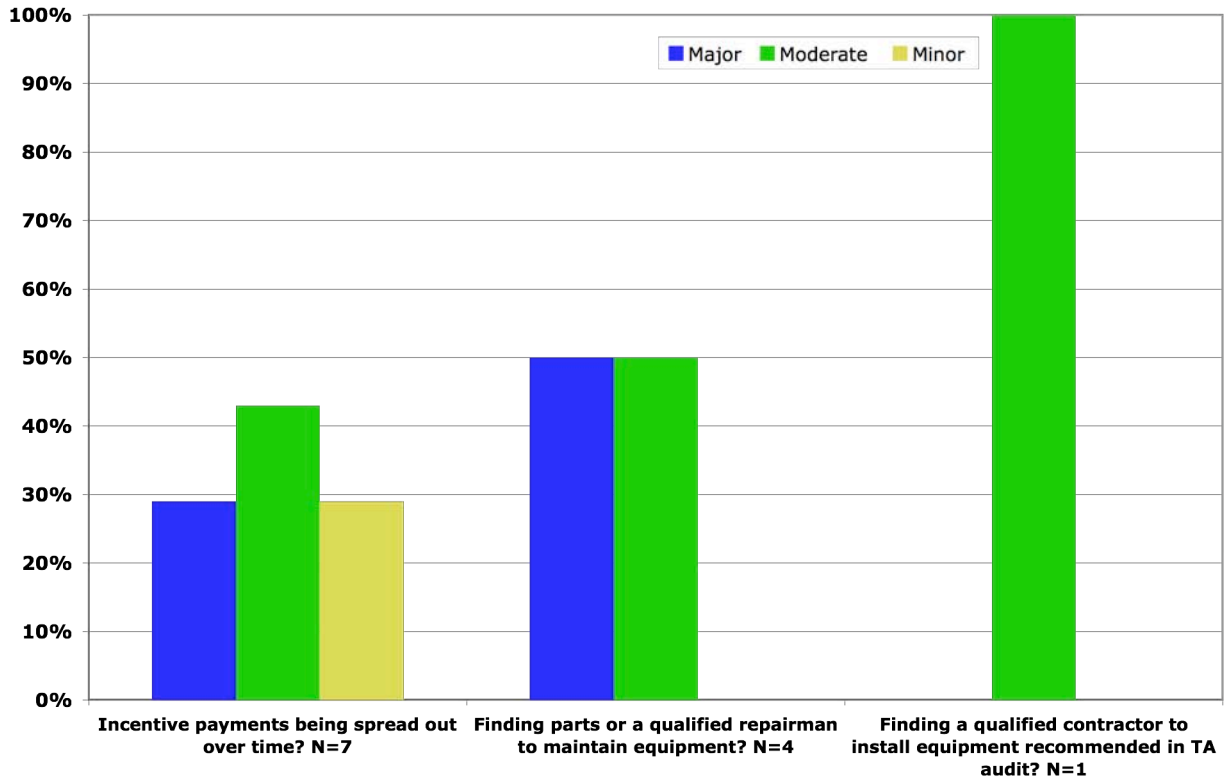


Figure 12 shows how the degree of concern shown for the other issues displayed in Figure 11. Though these concerns are smaller in magnitude, their existence makes them significant enough to report.

Figure 12: SDG&E Degree of Respondent Concern-Other



This same analysis of participation concerns is repeated for SCE respondents. Figure 13 shows that SCE respondents were concerned about energy savings not worth the implementation cost (55 percent of respondents), the disruption of business operations (53 percent), customer or employee discomfort during demand response events (46 percent) and energy savings claims being overstated (42 percent). SCE respondents noted the same top four major concerns as SDG&E respondents. However, the SDG&E participant top concern was customer discomfort, while SCE participants are most concerned with savings not being worth the cost.

Again, the top reasons SCE respondents gave for rejecting measures in Table 11 are compared to their primary concerns with moving forward to the TI phase in Figure 13. As with the analogous discussion of SDG&E respondents, the top reason SCE respondents gave for rejecting their measures was the cost, which is comparable to the concerns that the energy savings are not worth the cost of implementation and that the energy savings claims are being overstated. Disruption of business operations was a primary concern among respondents and a top reason for rejecting measures. Alternatively, while 46 percent of respondents were concerned about customer or employee discomfort during demand response events, only two percent of SCE respondents said they rejected measures due to that concern. Therefore, as proposed in the parallel SDG&E discussion, the concern of discomfort during demand response events does not seem to necessary lead to measure rejection for most SCE respondents.

Figure 13: SCE Respondent Concerns-Top 4
(N=55)

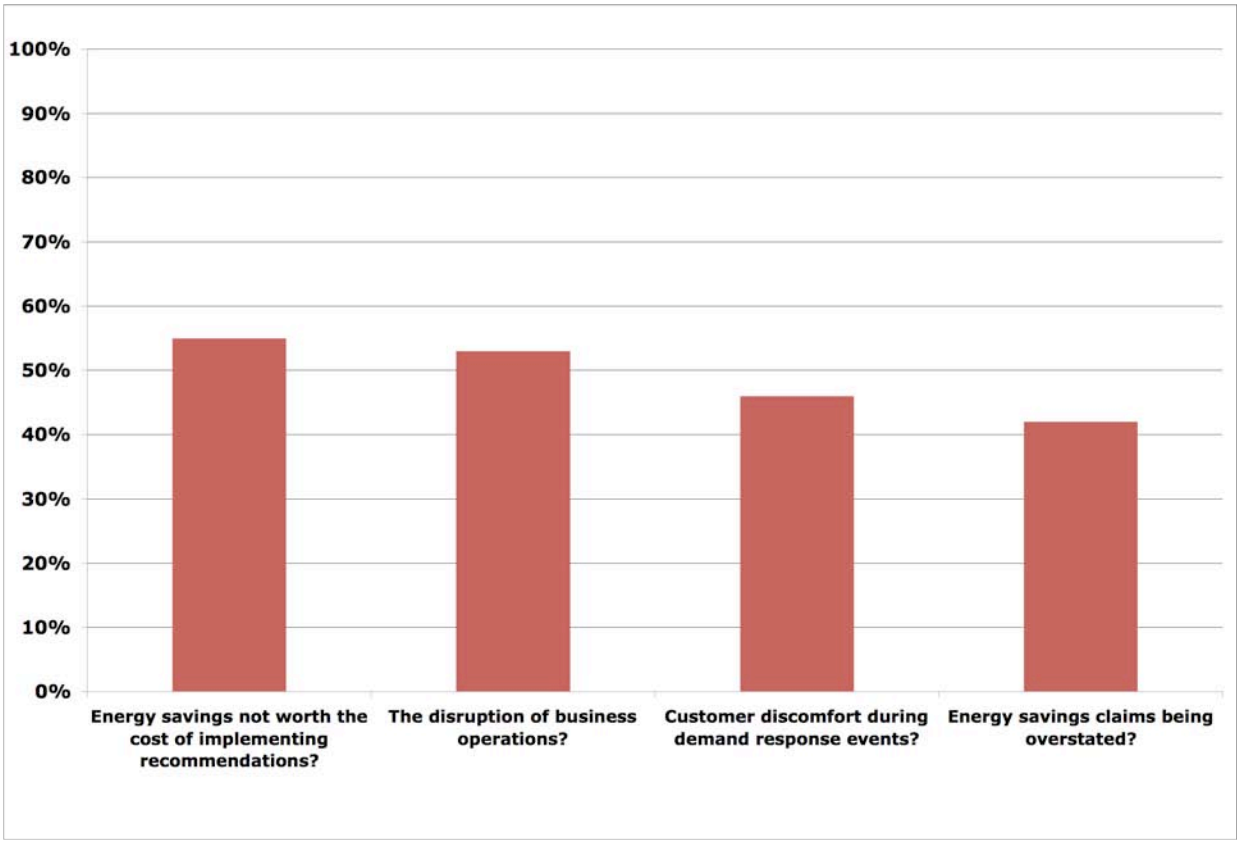


Figure 14 shows how SCE respondents ranked their level of concern (major, moderate, or minor) about their top four concerns (from Figure 13). The most frequently identified major concerns were with the disruption of business operations (83 percent) and customer discomfort during demand response events (68 percent). Also, for all four of these SCE concerns, the major ranking is the most frequent.

Figure 14: SCE Degree of Respondent Concern

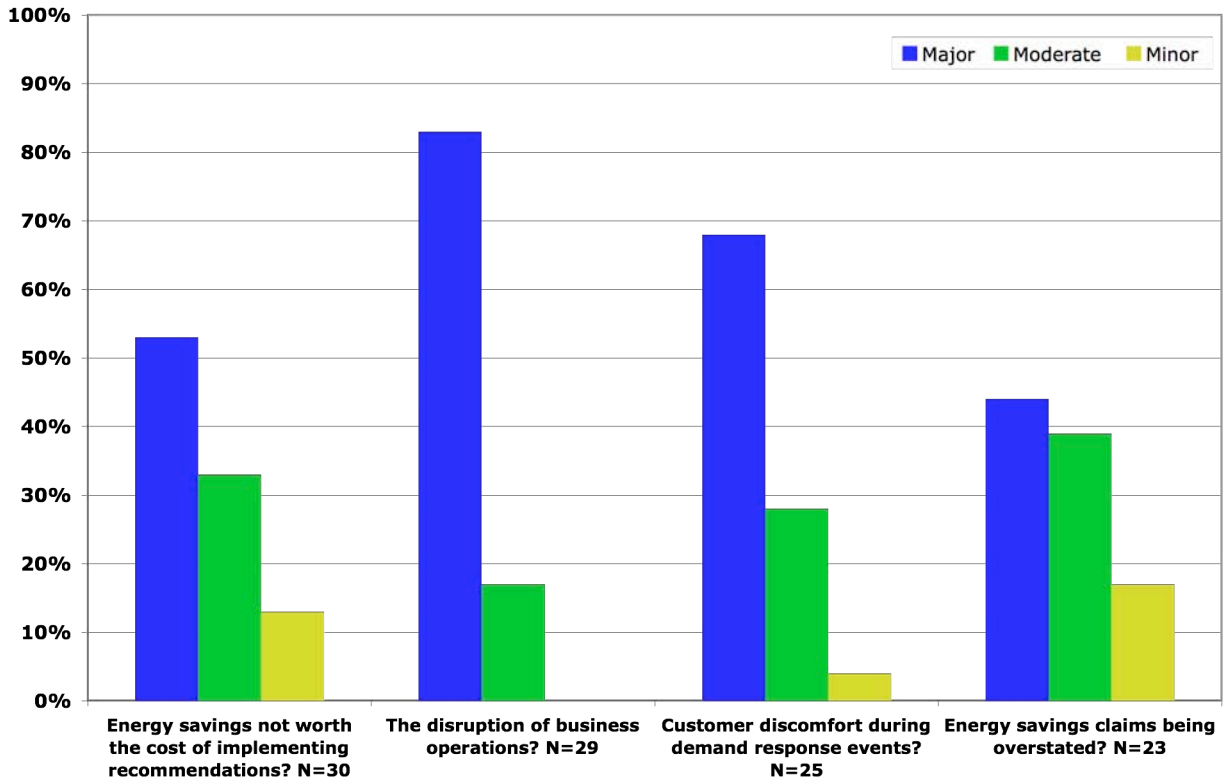


Figure 15 shows the other concerns SCE respondents mentioned. The most frequent of these concerns was finding a qualified contractor to install equipment (20 percent), a concern that only two percent of SDG&E respondents had.

Figure 15: SCE Respondent Concerns-Other

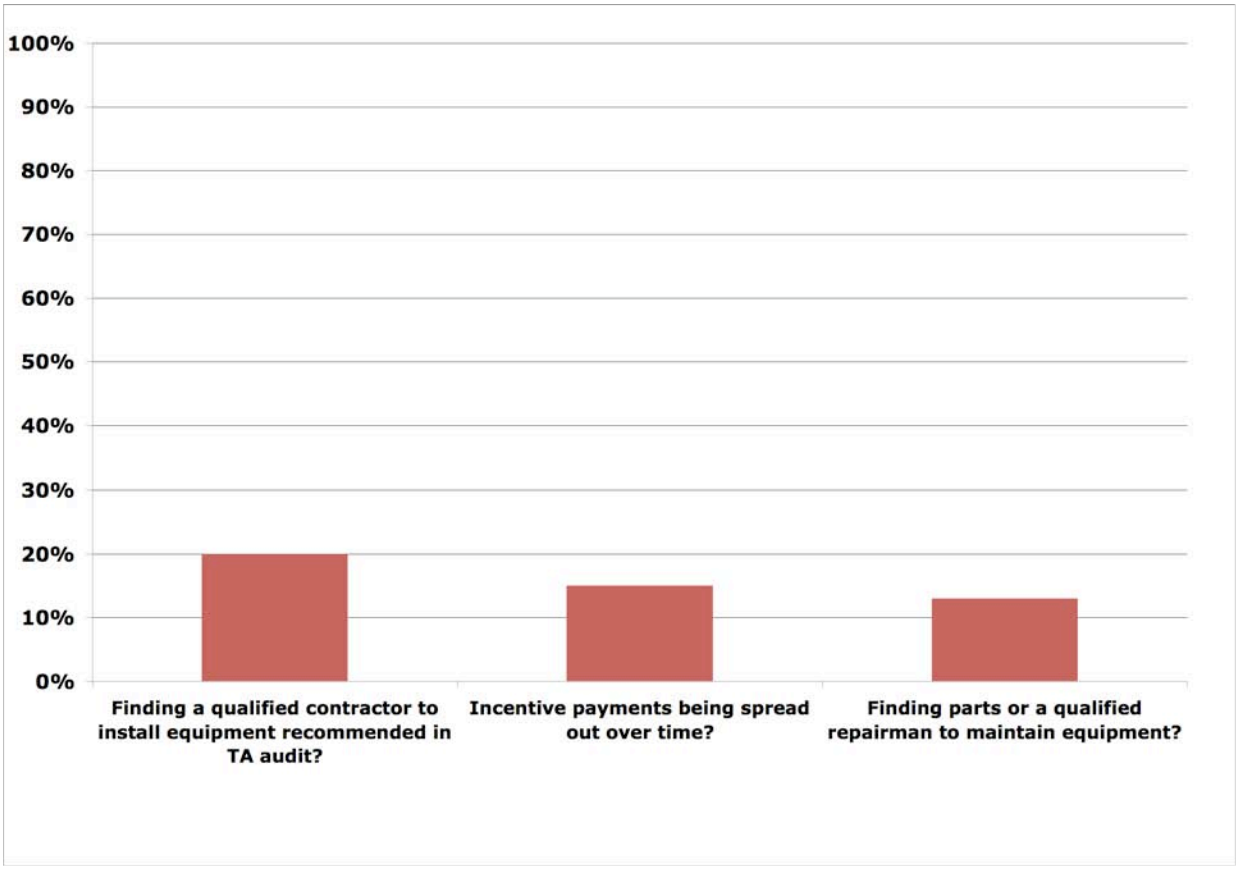
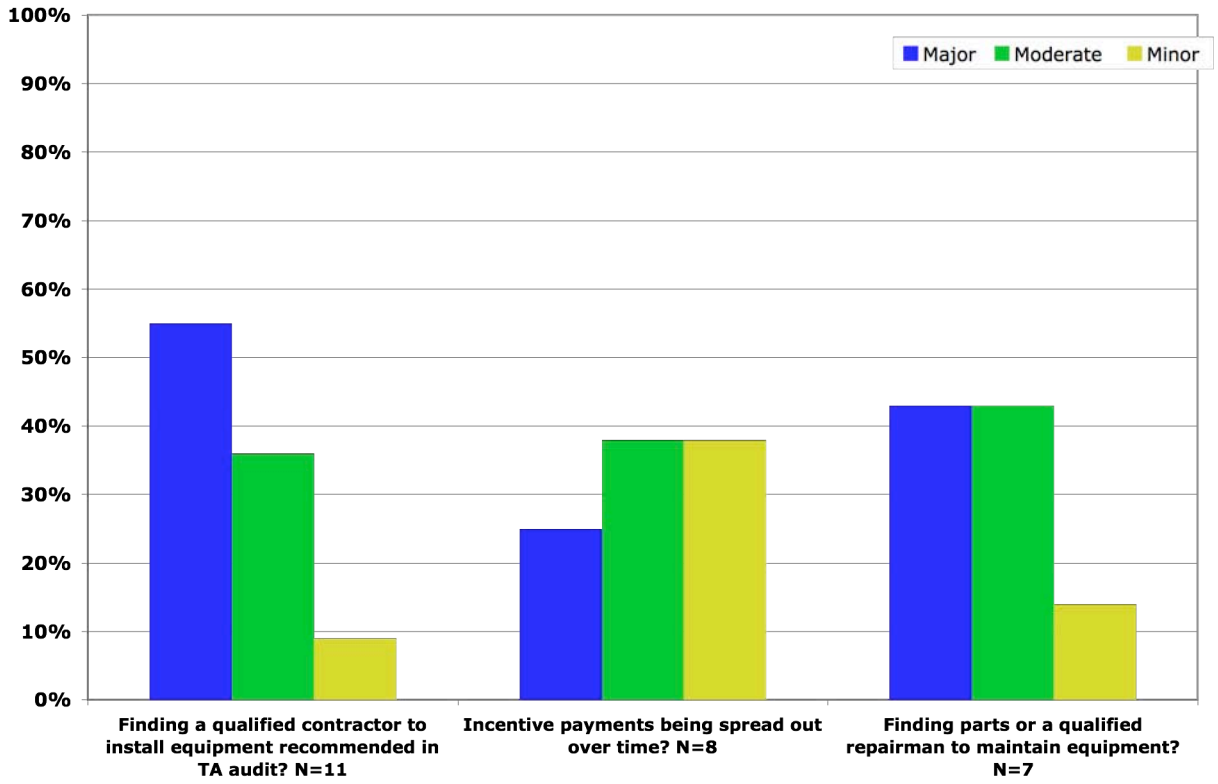


Figure 16 highlights the remaining concerns SCE survey respondents had about moving on to the TI phase. Of these, the most significant concern is with finding a qualified contractor to do the installation.

Figure 16: SCE Degree of Respondent Concern-Other



Program Satisfaction

SDG&E Satisfaction

Table 15 shows how SDG&E survey respondents ranked their satisfaction with the TA audit process and other aspects of the TA program. The largest amount of very satisfied responses (83 percent) came from respondents who were asked about their satisfaction with the courteousness and professionalism of the TA auditors. The top three areas of satisfaction (where respondents answered either somewhat or very satisfied) were in the courteousness and professionalism of the TA auditors (94 percent), the ease of scheduling the TA audit (90 percent) and the amount of time taken to complete the audit (90 percent). Satisfaction responses regarding the TA audit overall were high: 77 percent of respondents said they were either very or somewhat satisfied.

Table 15: SDG&E: Satisfaction with TA Audit

Satisfaction with… (N=47)	Very Satisfied	Somewhat Satisfied	Neither Satisfied nor Dissatisfied	Somewhat Dissatisfied	Very Dissatisfied	Don't Know
Ease of scheduling the TA audit	60%	30%	2%	6%	0%	2%
Application process for TA audit	49%	34%	6%	4%	2%	4%
Amount of time taken to complete TA audit	43%	47%	6%	2%	0%	2%
Clarity of information received from TA audit	47%	28%	9%	9%	6%	2%
Usefulness of information received from TA audit	40%	28%	11%	11%	9%	2%
How well audit recommendations took into account business operations	30%	32%	19%	9%	11%	0%
Courteousness and professionalism of auditors who performed TA audit	83%	11%	6%	0%	0%	0%
Amount of encouragement received from auditors to move forward and implement audit results	38%	32%	17%	9%	2%	2%
Your own understanding of demand response and the various program opportunities (after the audit)	43%	38%	4%	6%	4%	4%
Overall satisfaction with TA audit	43%	34%	11%	9%	2%	2%

SDG&E Areas of Dissatisfaction

Many of the satisfaction questions listed in Table 15 had a significant percentage of respondents who were dissatisfied with that particular aspect of the TA program. A respondent who answered a satisfaction question with either somewhat or very dissatisfied was then asked to explain in what ways they had not been completely satisfied. There were 15 SDG&E respondents (27 percent of the SDG&E sample) who were dissatisfied with some aspect of the program or audit. Those 15 respondents accounted for 40 dissatisfaction comments. This section of the report will present some of these comments, beginning with the areas that had the most dissatisfied respondents.

Given the complex participation process, it is not surprising that there is some dissatisfaction with certain program elements. Since the TA/TI Program is new and this is the first formal evaluation, additional detail on customer dissatisfaction is presented here in order to help inform future program design changes. It should be reiterated here that most of the respondents expressed high levels of satisfaction with the program.

Responses relating to dissatisfaction with specific program elements for SDG&E are discussed below.

Usefulness of information received from TA audit

For SDG&E, 20 percent of respondents said they were either somewhat dissatisfied or very dissatisfied with the usefulness of the information received from the TA audit. Three of the nine dissatisfied respondents said they never received audit recommendations or the report. Most of the other respondents mentioned that the audit report was not complete, that they needed clarification, or that the report was too difficult to understand. These comments included:

- Difficult to comprehend, especially [the] financial part of it.
- Complete information was not provided.
- Have a broader scope of what to do, even though I did a lot.

How well audit recommendations took into account business operations / Clarity of information received.

Moreover, 20 percent of SDG&E respondents were dissatisfied with how well the audit took into account their business operations. Respondents wanted the auditors to spend more time familiarizing themselves with company operations, which would allow for more valuable recommendations during the audit. Another repeated theme was the lack of follow through from the utility company after the audit. Seven respondents also indicated that they were dissatisfied with the clarity of the information received from the audit.

Amount of encouragement received from auditors to move forward and implement audit results

SDG&E respondents who were dissatisfied with the amount of encouragement they received from auditors to move forward and implement audit results (five respondents), offered varied responses, but often with irrelevant content. One valid response is listed below:

- They didn't do any follow up conversation with me, to motivate me into implementing recommendations

Overall satisfaction with TA audit

Of the SDG&E survey respondents, 11 percent were dissatisfied with the TA audit overall. Respondents felt that the report should have been more specific or provided more information. A few of the most pertinent responses included:

- [The audit] didn't benefit us.
- Follow up was non-existent
- I never heard back from SDG&E. Nothing ever came from this. It would have been nice to have received a response.

Your own understanding of demand response and the various program opportunities (after the audit)

There were five respondents (10 percent of the SDG&E survey respondents) that were dissatisfied with their understanding of demand response and the program opportunities SDG&E provided. Most respondents felt that the auditor or the utility company did not provide enough information regarding program opportunities; they wanted an explanation that was better and more complete. Specific responses include:

- Better explanations as to what programs are and benefits
- There was not enough information provided for us to move forward in the program
- I never received any one-on-one consultation on how to sign up for the demand response program after asking for it lots of times

Application process for TA audit

When SDG&E survey respondents were asked about their level of satisfaction regarding their application process for the TA audit, six percent reported they were dissatisfied with that process. Two of the responses vaguely fit into the topic: one respondent was a hospital that said there was not much they could do (referring likely to their inflexibility with implementing measures) and another respondent appeared to indicate that they never had the audit because they needed to know more information about the program and what it involved before they could try and apply. The third and most relevant comment reported:

- The paperwork killed me. There was too much. The bureaucracy was suffocating.

Ease of scheduling the TA audit

There were three respondents (six percent) who were dissatisfied with the process of scheduling the TA audit. Two respondents wanted more follow-up from SDG&E:

- More follow up on SDG&E's part
- It took forever to get something scheduled and then there was no follow up: We were told rebate money was not available so there was no reason to do anything.

Respondents did not express any dissatisfaction regarding the courteousness and professionalism of TA auditors and there was just one respondent that was dissatisfied with the amount of time it took to complete the audit.

SCE Satisfaction

Table 16 shows how SCE survey respondents ranked their satisfaction with different aspects of the TA program and audit. Once again, the largest amount of very satisfied responses (84 percent) came from respondents who were asked about their satisfaction with the courteousness and professionalism of the TA auditors. When asked about their satisfaction with the TA audit overall, 93 percent of respondents said they were either very satisfied or somewhat satisfied with the TA audit. There were three other areas where satisfaction was equal to 91 percent: clarity of information received from the TA audit, how well audit recommendations took into account business operations, and the courteousness and professionalism of the TA auditors.

Table 16: SCE: Satisfaction with TA Audit

Satisfaction with… (N=55)	Very Satisfied	Somewhat Satisfied	Neither Satisfied nor Dissatisfied	Somewhat Dissatisfied	Very Dissatisfied	Don't Know
Ease of scheduling the TA audit	56%	31%	9%	2%	0%	2%
Application process for TA audit	42%	44%	9%	0%	0%	6%
Amount of time taken to complete TA audit	46%	36%	5%	7%	4%	2%
Clarity of information received from TA audit	62%	29%	2%	6%	2%	0%
Usefulness of information received from TA audit	46%	40%	4%	7%	2%	2%
How well audit recommendations took into account business operations	40%	51%	5%	2%	2%	0%
Courteousness and professionalism of auditors who performed TA audit	84%	7%	4%	0%	0%	6%
Amount of encouragement received from auditors to move forward and implement audit results	44%	31%	18%	2%	2%	4%
Your own understanding of demand response and the various program opportunities (after the audit)	58%	30%	6%	4%	2%	2%
Overall satisfaction with TA audit	51%	42%	2%	6%	0%	0%

SCE Areas of Dissatisfaction

There were 10 SCE respondents (21 percent of the entire pool of SCE respondents) that were dissatisfied[6] with some aspect of the TA program or audit. Those 10 respondents accounted for 21 dissatisfaction comments, which are discussed separately below.

[6] Again, dissatisfaction includes both somewhat dissatisfied and very dissatisfied responses.

As with SDG&E, the SCE dissatisfaction issues are reported in detail to assist with future program design. In general, the majority of SCE participants' surveys indicated that they were satisfied with all aspects of the TA program component.

Amount of time taken to complete TA audit

When SCE respondents were asked about the amount of time needed to complete the TA audit, 11 percent said they were dissatisfied with how much time it took. While only one SDG&E respondent was dissatisfied with this program area, time is the primary source of dissatisfaction for SCE respondents. Of the five responses, four described a desire for a quicker audit or for the audit report to arrive faster. The specific responses included:

- Could have been quicker
- The reports could have been faster. We would have liked to receive them faster.
- Doing [the audit] on schedule.
- Took so long to get the report. Report took months to get.
- I never received the results. The whole process seemed lengthy to start with, but the fact that nobody ever finished up with or followed through with the process and never gave us the information is very concerning.

Usefulness of information received from TA audit / Clarity of information received

Of the SCE survey respondents, nine percent (five respondents) were dissatisfied with the usefulness of information received from the audit. Four of these respondents indicated that they were unsatisfied with the clarity of the audit. The five responses varied in content: one respondent said they never received that information (the audit), while another said there was not anything of real use in the audit. Three of the more detailed responses included:

- The ability to implement recommendations. They didn't give us viable options.
- We were not comfortable with the numbers we got and we were not comfortable with some of the claims made. We were unhappy with the lack of support from Edison in verifying the numbers that came from the audit. We asked for Edison's help and assistance in verifying the numbers the contractor gave us and we got no response from them at all.
- I think that because the report is very technical in nature, I would have liked to have someone review the recommendations and explain them to me.

Your own understanding of demand response and the various program opportunities (after the audit)

Of the SCE survey respondents, six percent said they were dissatisfied with their own understanding of demand response and the various SCE program opportunities after the TA audit. The three responses given were quite varied. One respondent said they never discussed any of their recommendations like he/she wanted to, while another respondent said there was no follow up and he/she assumes rates have now gone up since the audit. The final respondent reported:

- We were not convinced that we were looking at the best or fairest program, or that the numbers given to us by the contractor were accurate. We couldn't get any verification or assistance from Edison.

Overall satisfaction with TA audit

As far as the overall level of satisfaction with the TA audit, six percent of SCE respondents were dissatisfied. One respondent wanted to see more follow through from SCE and the audit report itself. Another respondent also echoed the importance of follow through: they wanted help explaining or interpreting results of the audit, and because nothing was ever done, felt it was a big waste of time. The third respondent said that nothing came out of the audit and the process was unable to meet even their low expectation level.

Amount of encouragement received from auditors to move forward and implement audit results

When asked about the encouragement received from auditors to move forward and implement recommendations, four percent of SCE respondents said they were dissatisfied with that amount of encouragement. The two responses included:

- There wasn't any encouragement or follow-up
- We never received any results

How well audit recommendations took into account business operations

This question, which was one of the two largest sources of dissatisfaction for SDG&E respondents, was a small source of dissatisfaction among SCE survey respondents: four percent reported their dissatisfaction with how well the audit recommendations took into account their business operations. One of the two respondents based their dissatisfaction on never receiving the audit report. The other response was more revealing:

- The nature of the audit. The auditor couldn't come up with anything good in four hours. He couldn't learn our business and make anything but minor observations on how we could save.

The remaining three satisfaction questions had little, if any, dissatisfied respondents. Of the total SCE survey respondents, one respondent (two percent) was dissatisfied with the ease of

scheduling the TA audit, saying the auditor had to postpone/schedule another appointment. There was no dissatisfaction regarding the courteousness and professionalism of the TA auditors or the application process for the TA audit.

Missing Audit Findings

The evaluation team was asked to identify and quantify the number of survey respondents that said they never received the audit report. These respondents were identified by scanning through all verbatim responses and found relevant complaints in responses to two question types: why respondents did not implement all of their audit recommendations and the satisfaction questions follow-ups. It was determined that nine survey respondents did not receive the audit report. Eight of these nine respondents were SDG&E customers.

Respondent Recommendations

All respondents were then asked to provide some suggestions for changes regarding the TA audit. Some of the most pertinent verbatim responses will be presented, along with a discussion of common trends among each utility's respondents.

Respondents were first asked what information they would have liked to receive that either was not covered during the audit or not covered in enough detail. Of the SDG&E respondents, 26 percent offered suggestions for additional information. Similarly for the SCE respondents, 20 percent had specific suggestions on additional information they would

Table 17: Received more Information during Audit?

	What Information would you have liked to receive during the audit that was left out or not covered in enough detail?	
Responses	**SDG&E (N=47)**	**SCE (N=55)**
Can't think of anything	75%	80%
Response (Record and probe)	26%	20%

For the twelve SDG&E respondents that wanted more information during the audit, one of the most frequent responses involved the audit report they never received (two responses). Another identifiable category of responses included receiving more information on other programs relevant to the respondent (two responses). Otherwise, responses were varied enough to make categorization difficult. Some of the most pertinent responses included the following:

- I would have like to see more information about the rebates for equipment purchased and when the paperwork needed to be turned in to SDG&E (with regard to the purchased equipment).
- A calculation of the equipment that uses the most energy.
- More information on how our electricity is used; that could have been provided.

- What other programs would best suit our facility and operation, whether it be industry specific or facility specific opportunities.

For the SCE respondents, the 11 responses given were unique and varied widely in content. However, the majority of responses were valuable and echoed some themes already mentioned in the survey results. Some of the most pertinent responses included:

- The report. We never received the recommendations or report.
- Verification. A second point of view. Some help from Edison.
- I think the recommendations themselves. I don't know what all this stuff means. I would have liked help going through results or receive some sort of interpretation. I feel like the audit focused on large, fringe solutions, but didn't involve simple, basic, everyday things that may be less expensive and less involved.
- A follow up on savings and rate changes. Proof that the recommendations were working.
- I'm unclear about the process of getting the rebates through. Help with filling out the paperwork.

The survey respondents were then asked what one thing they would add or change about the TA audit. The proportion of responses is nearly identical between utility groups: 60 percent of both populations could not think of anything to add or change. For SDG&E respondents, 38 percent gave a response while 40 percent of SCE respondents answered.

Table 18: Change Something about Audit?

	If you could add or change one thing about the TA audit, what would it be?	
Responses	**SDG&E (N=47)**	**SCE (N=55)**
Can't think of anything	60%	60%
Response (Record and probe)	38%	40%
Don't know	2%	0%

SDG&E respondents offered 18 recommendations not just on how to change the TA audit and the recommendations inside it, but also on how to make the program better in all regards. Some of the recommendations included making the TA audit:

- Less complicated
- Faster
- Take into account a business's plans for the future
- More specific to evaluating the effectiveness of equipment

- More detailed, also outlining what happens with implementation (consequences)

Additional responses included:

- Better auditors (2 responses)
- Receiving the full audit report (2 responses)
- More follow through from SDG&E and assistance with implementation (2 responses)
- Make recommendations (and different equipment options) specific to one business (2 responses)

Of the SCE respondents, most of the 22 responses were quality recommendations about the audit or the TA program. Many of the responses centered on the amount of time the audit took to complete or for the report to be delivered. Recommendations included:

- Shorten the time is takes to send out audit reports (4 responses)
- Make audit quicker

Another prevalent theme amongst respondents was follow-ups: three respondents wanted more follow-ups. In addition to these types of recommendations, several other relevant ideas included:

- Overall, it was a good process, but they should try and speed up the whole process in general. In the early stages, do a better job analyzing the overall business model. They also need to just follow through and complete it. Provide the reports that are supposed to be provided. Somebody should be familiar with all the incentives and opportunities that are available. They should be able to answer questions about all the programs, not just one particular program.
- Spend more time at the facility to make the audit more effective.
- I would like to have some input from the utility as far as how the information we were receiving compared to other facilities and other programs.
- Alternate energy and how that might work with the TA/TI Program
- To have a follow-up meeting in person to go over and discuss the audit.
- Maybe a back up to the claims made. An audit for the audit, just for the claims made.
- More explanations about the auditing; how they came up with the saving estimates.

Conclusions

The following are key findings from the TA participant phone survey.

- **Respondents primarily heard of the TA/TI Program through their Utility Reps/Account Executives.** 75 percent of SDG&E respondents and 84 percent of SCE respondents learned of the TA/TI Program first from their Utility Reps/Account Executives.

- **Nearly all survey respondents used an auditor provided by their utility company.** A large majority of both SDG&E respondents (96 percent) and SCE respondents (93 percent) choose the auditor provided by their utility, instead of finding one on their own.

- **The TA/TI Program design is effective in getting customers to implement at least some of the recommended measures.** Notably, SCE respondents were implementing a higher share of their recommendations than SDG&E respondents. For SCE, 60 had completed at least some of the recommended measures and 18 percent had adopted all of the recommendations Among SDG&E participants, 30 percent had implemented at least some of the recommended measures while 11 percent had completed all of them.

- **Of those who purchased equipment as a result of their audit, more respondents from SCE applied for an incentive than those from SDG&E.** 36 percent of SCE survey respondents purchased equipment as a result of their TA audits, of which 80 percent applied for an incentive. For SDG&E survey respondents, just 17 percent purchased equipment as a result of their audit, and 50 percent had applied for an incentive.

- **The level of enrollment in Demand Reduction programs between SDG&E and SCE respondents is similar.** 45 percent of SDG&E respondents and 55 percent of SCE respondents said they were enrolled in a Demand Reduction program. Those enrolled were then asked if they had started in their respective program before or after their TA audit: 48 percent of SDG&E respondents and 43 percent of SCE respondents enrolled before having their TA audit, while 43 percent of SDG&E and 57 percent of SCE respondents enrolled after their audit.

- **The top reasons respondents rejected their audit recommendations were that they were too expensive, they interfered with daily operations (primarily SCE customers), and the client did not have time.**

- **The four largest areas of concern by survey respondents with regards to moving forward to the implementation phase are the same between utility groups.** The top four concerns are as follows:

    - Customer discomfort during demand response events (60 percent of SDG&E survey respondents and 46 percent of SCE respondents)

    - The disruption of business operations (57 percent of SDG&E respondents and 53 percent of SCE respondents),

- Energy savings not being worth the cost of implementing audit recommendations (55 percent of SDG&E respondents and 55 percent of SCE respondents)

- Energy savings claims being overstated (43 percent of SDG&E respondents and 42 percent of SCE respondents).

- **SDG&E respondents were on average satisfied with various aspects of the TA program.** Satisfaction levels for different areas ranged from 62 to 94 percent. Respondents were most satisfied with the courteousness and professionalism of the TA auditors who performed the audit (94 percent of respondents were either somewhat or very dissatisfied), the ease with which they scheduled their TA audit (90 percent satisfaction) and the amount of time taken to complete the audit (90 percent).

- **SCE respondents were on average satisfied with various aspects of the TA program.** Satisfaction levels ranged from 75 to 91 percent. Respondents reported three areas where satisfaction equaled 91 percent: clarity of information received from the TA audit, how well audit recommendations took into account business operations, and the courteousness and professionalism of the TA auditors.

- **Areas of dissatisfaction varied across utilities, though the usefulness of information received from the TA audit ranks in the top two in dissatisfaction for both.**

  - For SDG&E respondents, the top two areas of dissatisfaction include the usefulness of information received from the TA audit (20 percent dissatisfied) and how well audit recommendations took into account business operations (also 20 percent).

  - The top area of dissatisfaction for SCE respondents was the amount of time taken to complete the TA audit (11 percent dissatisfied) and the usefulness of information received from the TA audit (nine percent of respondents were dissatisfied).

- **There were several recurring issues brought up by respondents.**

  - A need to make recommendations more viable and business specific

  - The report taking a long time to arrive (mostly SCE respondents)

  - Lack of follow-through by the utility/auditor. (mostly SCE respondents)

3.3 TA/TI Participant In-Depth Interviews

This section of the report describes the results of the 38 participant interviews that were completed in March 2008 with both TA and TI participants. These participants are not included in the phone survey sample and were selected for the in-depth interviews because of their facility sizes (mostly larger, manufacturing facilities), the sophisticated nature of the measures recommended in the audit reports, and their progress within the TA/TI Program.

These interviews were designed to be more in depth and to discuss each of the audit recommendations individually. Prior to conducting the interview, each respondent was sent a copy of the audit report to discuss during the call. The interviews lasted 30 to 60 minutes and primary areas of research included:

- Which audit measures were accepted/rejected and why
- The importance of the incentive
- Usefulness of the audit report
- Role of the auditor
- Concerns about implementing the measures and enrolling in a demand response programs
- Satisfaction with the program

Selected results from the interviews are discussed below. During the interviews, special attention was given to identify responses that may be unique to a particular service territory. An additional four interviews with conducted with participants in the PG&E Auto DR program, and the results from these interviews are presented separately in the Auto DR section of this report (section 3.8).

Table 19 below shows the breakdown by utility service territory and program stage for the 38 participant interviews within the SCE, SDG&E, and PG&E standard TA/TI programs. Roughly half the customers interviewed had completed only the audit portion of the TA phase, and the other half had moved into the TI phase. Of the 20 SCE respondents, nine participants were in the TA phase and 11 were in the TI phase. Of the 14 respondents in SDG&E's service territory, nine were in TA phase and five were in the TI phase. All four customers interviewed for PG&E were in the TI phase.

Table 19: Participating Customer Sample By Utility and Program Phase

Program Phase	SCE	SDG&E	PG&E	Total
TA Participants	9	9	0	18
TI Participants	11	5	4	20
Total	**20**	**14**	**4**	**38**

Recommended Measures

Table 20 shows the frequency of recommendations among the four measure categories: HVAC, lighting controls, process systems, and other. The most common type of recommendation was for process systems (39 percent of all recommendations made). The 38 interviews covered a total of 241 recommended demand response measures, with 128 of these measures accepted and 113 rejected.

The HVAC systems category includes HVAC systems that require an adjustment, installation, or reprogramming of energy management system (EMS), HVAC systems that cycle on and off or shut down completely to create a temperature set point adjustment ranging four to six degrees during a demand response event, and other HVAC activities. Lighting controls systems can require adjustment, installation, or reprogramming of an EMS and can be systems where the usage is manually curtailed or manually shut off completely. Finally, process systems shut down either manually, through an EMS, or are shifted to off-peak hours.

Table 20: Recommended Measures, By Category

Measure Category (241 total measures)	Percent (N=38)
HVAC	31%
Lighting Controls	23%
Process Systems	39%
Other	7%

As shown in Table 21, the most frequently accepted measures were those in the lighting controls category (60 percent accepted) and the lowest acceptance rate is in the process systems category (38 percent). In total, the respondents said that they accepted 53 percent of the recommendations they received.

Table 21: Accepted and Rejected Measures, By Category

Measure Category	Accepted	Rejected
HVAC (N=74)	51%	49%
Lighting Controls (N=56)	59%	41%
Process Systems (N=93)	43%	57%
Other (N=18)	94%	6%
Total	53%	47%

Table 22 shows a more detailed breakdown of the 128 accepted and 113 rejected measures.

Table 22: Accepted and Rejected Measures

Measure Category (241 total measures)	Accepted	Rejected
Adjust/Reprogram/Install Energy Management System to control HVAC systems (N=21)	52%	48%
Cycle/Curtail/Shut Down HVAC UNITS to create Temperature set point adjustment (N=53)	51%	49%
Adjust/Reprogram/Install Energy Management System to control lighting (N=4)	75%	25%
Curtail the usage of lighting or shut lighting off completely (N=52)	58%	42%
Adjust/Reprogram/Install Energy Management System to control process equipment (N=13)	15%	85%
Shutting down process equipment (Motors, Pumps, Refrigeration, Elevators) entirely during DR hours or delaying activities until to off-peak hours (N=80)	48%	53%
Adjust/Reprogram/Install an Energy Management System to control various types of equipment (N=9)	100%	0%
Shutting down various types of equipment entirely during DR hours or curtailing their usage (N=1)	100%	0%
Misc. (Re-wire, Perform Maintenance) (N=8)	88%	13%

Accepted Measures

For the 128 accepted measures, respondents were asked why they decided to go ahead and implement the measures. About one-third of the respondents said that they implemented the measures to save energy and money (the most common response). Customers were also more willing to implement measures that would have little or no affect on their overall business operations.

Specific responses providing additional details on why customers accepted the audit recommendations include:

- Most of the manufacturers pointed out that it was an easy decision, and it could be done while still meeting production. As their facilities are heavily reliant on electricity for their manufacturing processes, energy was one of their highest costs.
- A large number of respondents all described the measures as straightforward and non-intrusive, so they were considered viable.
- Several customers highlighted that they wanted to maximize the effectiveness of their systems. The proposed demand response measures did not affect the condition of their products, so they moved forward with the recommendations.
- Two respondents cited the culture for saving energy at their businesses as a reason for implementing the recommended measures.

- One respondent stated that his company cannot tolerate a black out because they have other locations outside the state that depend on the California location.
- One customer in SDG&E's territory said he had a fairly robust EMS system, and the strategic energy plan for the county was to implement demand response so there was good support from county leadership.
- One respondent mentioned that the implemented equipment allowed the company to take part in energy efficiency and energy conservation, as well as demand response. The system upgrade also allowed him to read the facility data more accurately and thoroughly.
- The manager of a municipal building stated that the company chose to implement the recommended measures because it allowed the organization to increase the efficiency and use of the city's energy, which in turn is taxpayer money.

Rejected Measures

For each of the 113 rejected measures, respondents were asked why they declined that recommendation. Table 23 shows the primary reasons respondents gave for rejecting measures. Most frequently, respondents said that the measures would interfere with optimal or required business operating conditions. Many industrial facilities have strict temperature requirements for their equipment and retail facilities often depend on optimal lighting and temperature settings to show off their products and to make their customers comfortable. A second common reason for rejection was that the auditors or utility representatives never followed up with the customer site after the audit was completed, and so a plan for implementation was never developed. In addition, customers were frequently concerned about the high cost of the measures.

Table 23: Reasons for Rejecting Measures

Response	HVAC (N=12)	Lighting (N=11)	Process Systems (N=9)	Other (N=1)
Does not align with business operations	50%	36%	44%	0%
No follow-up from auditor/utility	17%	27%	22%	0%
Too expensive	8%	18%	11%	0%
Not enough time	8%	0%	0%	0%
Do not have necessary equipment	8%	0%	11%	0%
Conflicts with energy efficiency measures	8%	9%	0%	0%
Liability concerns with equipment vendor	0%	9%	0%	100%
Demand response a low priority	0%	0%	11%	0%

Reasons for rejecting recommendations are provided below by end use category.

Reasons for Rejecting HVAC Measures

TA/TI participants rejected about half of the HVAC recommendations made (see Table 23), most frequently because changing the temperature set point would be too disruptive to business operations. Two respondents said that the temperature of their equipment must be maintained and two others considered a consistent temperature an essential amenity for their employees and/or customers. Several respondents also mentioned that an EMS system would be required to create a temperature set point, but that the cost of one was prohibitively expensive. In addition, three respondents cited a lack of follow-up from their auditor or utility representative as the reason for rejecting the measures. Another respondent said that it would conflict with his energy efficiency measures.

Specific comments relating to why measures were rejected include the following:

- We cannot increase the temperature set points because our thermostats support critical equipment that will break down if they run hot.
- Our equipment has to be at the right temperature. Our primary concern is to keep the hoses at the right temperature, so we cannot jeopardize our production in order to save energy.
- All the HVAC measures are considered an amenity and we are not willing to give up changing temperature set points.
- We would consider turning off one of the three heat pump compressors and the condenser fans for a 10-minute period every hour, but not all three units.
- When we tested increasing the temperature set points, we received complaints from staff. People get headaches, are nauseous, and it prohibits production via customer complaints.
- We have tried raising the temperature set points but people have the tendency to adjust the thermostats. A computer-controlled system is expensive and we don't really have the means right now to implement that type of system.
- It does not make sense to send a person to our control room to manually adjust the temperature settings.
- We do not have an energy management system to control our HVAC units.
- There hasn't been any coordination between the equipment vendor, the energy consultant, and the company that manages our HVAC systems.
- We do not have enough time to implement the measures and I have never seen the results of audit before.
- I have never received follow-up between our management and our utility representative.

- We have implemented a temperature set point adjustment on our own and we are doing this on a consistent basis as energy conservation, which cancels out demand response opportunities.

Reasoning for Rejecting Lighting Measures

A higher percentage of lighting measures were accepted (59 percent) than HVAC measures. Lighting measures, like temperature, were often rejected because a certain lighting level was considered essential for productive business operations. For example, two retail facilities were concerned that lower lighting might reduce product sales and another respondent said his employees were dissatisfied with reduced lighting. Four respondents mentioned that their auditor/utility representative had not followed through with them after the audit, and so no measures were implemented. Other explanations included: it was too expensive (2), conflicts with energy efficiency measures (1), liability concerns with equipment manufacturer (1), and that it is not a high priority (1).

Specific comments on rejecting lighting measures include the following:

- We have not determined if we will implement the lighting strategy. We are still deciding, but some merchandisers feel that turning off lamps might reduce sales.

- Lighting measures have not been done because our on-site management is against negatively affecting their selling environment. They do not want business to be damaged or lessened due to darker showrooms, etc. In a sales environment, we cannot afford to participate in lighting demand response.

- We got complaints from our staff about the reduced lighting.

- To implement these lighting measures manually I would have to rewire the lighting, which is expensive. I do not have the budget right now.

- The audit was performed a long time ago and there has not been any follow through. In short, it is just too costly.

- I don't have enough time and I have never seen the results of audit until this interview.

- There has not been any follow up with our utility representative.

- We just got the audit report and have not had time to go over the recommendations in detail.

- We are already curtailing lighting as a means of energy conservation, which leaves little room for demand response.

- Liability concerns kept one manager from implementing his lighting recommendations. The protection against faulty installation by one vendor kept lighting equipment and an energy management system from being installed.

- The problem with implementing the proposed measures is that there are just two building engineers for this company across North America, including myself. This makes it very difficult to attend to these small demand response measures.

Reasons for Rejecting Process System Measures

43 percent of process system measures were accepted. Respondents offered a variety of reasons for rejecting process system recommendations. Three respondents said that the process activities are essential (i.e., for customer satisfaction, health and safety, and emergency restrictions) and could not be temporarily stalled. Other cited reasons for rejecting process measures included a lack of follow-up by the utility, that the site did not have an EMS system, the equipment was too expensive, the customer did not know how to work the equipment, and that the measure no longer applied.

Additional comments on process measures include:

- In the hospitality sector, several individuals interviewed stated that their management considers elevators, fountains, and pools to be essential for operations. Shutting down this equipment during demand response events leads to customer dissatisfaction.

- Health and safety issues can also be a reason for lack of following measure recommendations. During an interview, one respondent said "Last year the health and safety department said that we cannot exceed certain temperatures in our buildings. Certain products have to be kept at near freezing temperatures, so we can't shut down refrigeration equipment during peak periods."

- Two respondents both stated that the nature of wastewater management requires them to supply water twenty-four hours a day, seven days a week. Coupled with strict emergency restrictions, these aspects make it challenging to move around production. Violating emergency restrictions can result in heavy penalties.

- Two respondents pointed out that because they do not have an energy management system, they would have to manually perform the audit recommendations. This would require extra labor that they needed for other tasks.

- Similar to lighting and HVAC recommendations, again a respondent relayed that the lack of follow up left him on his own regarding the audit recommendations.

- One respondent stated the audit recommendations were not implemented because the warehouse personnel was not educated on how the equipment will work and what needs to be done to institute the recommendations.

- The recommendation from the audit report, as one facility manager explained, was to purchase a storage tank to meet the company's water reserve requirement, which would enable them to take part in demand response events. This recommendation was unrealistic because he would have to purchase the tank upfront and there was still not enough demand reduction potential to pay for the tank.

- New equipment can present a problem for audit recommendations. When interviewed, a facility manager stated that his firm recently acquired a new and different type of mill compared to the one that was in place during the audit. This respondent commented that the recommendations from the audit would not work with the new mill.

- One facility manager pointed out that demand response was "not high on the priority list of things to do at the warehouse." This, in turn, led to the recommendations "falling through the cracks."

Overall, respondents are rejecting measures that they think will significantly disturb their daily business operations or are beyond their financial capacities. Therefore, the rejection rate may be minimized if auditors devote more resources to understanding a business's needs and budget, and as a result, present only realistic measures in the audit report. The audit reports should clearly indicate the estimated costs of the equipment needed, the available cash incentives, and the approximate length of payback so that client can easily understand the measure's feasibility. In addition, frequently busy business owners forget about their audits once they are completed or are not sure what to do next, and so abandon the project. Diligent follow-up with the customer sites may also encourage increased measure implementation.

The following section presents results associated with participation drivers, value of the audit report, the role of the auditor, and satisfaction with various aspects of the TA/TI process.

Influence of Incentive

Respondents were asked how influential the Technology Incentive was on their decisions to implement the audit recommendations. Table 24 shows that about half of all respondents found the incentive very influential on their decisions. 67 percent of respondents in the SCE program said that the incentive amounts were very influential. Less than half of respondents in the SDG&E and PG&E programs said that the incentive was very influential.

Respondents said that the incentive amount was not influential because the incentive was not high enough (4), the measures did not align with business operations (3), and because the respondent had no personal stake in the financial ramifications (1).

Table 24: Influence of the Incentive Amount in Decision

Response	SCE (N=18)	SDG&E (N=13)	PG&E (N=4)	Total (N=35)[7]
Very Influential	67%	46%	25%	54%
Somewhat Influential	17%	15%	50%	20%
Not Influential	17%	31%	25%	23%
Don't Know	0%	8%	0%	3%

Value of Audit Report

In addition, respondents were asked how they would rate the usefulness of the audit report. As shown in Table 19, the majority (84 percent) of respondents found the audit report to be useful or very useful. Respondents from SDG&E found the report to be less useful than the respondents from SCE and PG&E.

Those respondents who indicated that the audit report was not useful were asked to provide additional information:

- Two respondents from SCE said that the report was not useful. One said the audit did not identify substantial kW savings and the other said that the audit results were received after the firm had implemented the recommendations of a different audit.
- Three respondents from SDG&E said that the report was not useful because the recommendation conflicted with energy efficiency measures that he has implemented, the audit recommended a measure he was already aware of, and that the audit recommendations no longer apply to new equipment.

Table 25: Usefulness of Audit Report

Response	SCE (N=18)	SDG&E (N=14)	PG&E (N=4)	Total (N=36)
Very Useful	50%	21%	75%	42%
Useful	39%	50%	25%	42%
Not Useful	11%	21%	0%	14%
Don't Know or N/A	0%	7%	0%	3%

Similarly, respondents were asked to what extent impractical measures that did not fit their business operations were screened out before the final audit report was presented to them. Table 26 shows that the majority of SDG&E (70 percent) and all PG&E respondents thought that all of their recommendations were appropriate. However, only 44 percent of SCE respondents said that

[7] While there are 38 respondents, the total sample for each question varies, as some respondents refused to answer.

all the recommendations fit their business operations. 28 percent of SCE respondents said that most or all of the measures were not reasonable.

Table 26: Impractical Measures Screened Out?

Response	SCE (N=18)	SDG&E (N=10)	PG&E (N=4)	Total (N=32)
Yes	44%	70%	100%	59%
Somewhat	28%	20%	0%	22%
No	28%	10%	0%	19%
N/A	0%	0%	0%	0%

About half of respondents said that the audit report adequately described the cost of each recommended measure (see Table 27). Only 29 percent of SDG&E respondents recalled receiving this information in their audit reports and two instead obtained this information from their installation contractors. Almost 40 percent of SCE respondents said that they did not receive any cost information by measure. However, three of the four PG&E respondents said that their audit reports had this information.

Table 27: Report Adequately Described Cost of Each Measure?

Response	SCE (N=16)	SDG&E (N=14)	PG&E (N=4)	Total (N=34)
Yes	63%	29%	75%	50%
No	38%	57%	25%	44%
Don't Know	0%	14%	0%	6%

Role of the Auditor

Respondents were also asked if their auditors helped them to understand their audit recommendations. Over 70 percent of respondents from the SCE and SDG&E programs said that their auditors provided this service. All PG&E respondents worked with their auditors to understand the recommendations.

Table 28: Auditor Help You Understand Audit Recommendations?

Response	SCE (N=18)	SDG&E (N=14)	PG&E (N=4)	Total (N=36)
Yes	72%	79%	100%	80%
No	22%	21%	0%	18%
Don't Know	6%	0%	0%	3%

However, as shown in Table 29, less than half of SCE and SDG&E program respondents said that their auditors encouraged them to implement the audit recommendations. Five SCE respondents and one PG&E respondent said that they received encouragement from their Account Executives, rather than their auditors. Several respondents said that their auditors offered a neutral analysis and left it up to the client to decide if they wanted to proceed.

Table 29: Auditor Encourage You To Implement Recommendations?

Response	SCE (N=18)	SDG&E (N=14)	PG&E (N=4)	Total (N=36)
Yes	39%	43%	50%	42%
Neutral	6%	7%	25%	8%
No	56%	43%	25%	47%
Don't Know or N/A	0%	7%	0%	3%

In addition, respondents were asked if their auditors were knowledgeable about relevant issues concerning the audit recommendations and possible next steps. 64 percent of SCE respondents said "yes," and about 30 percent of SCE respondents said that their auditors were not well informed. 83 percent of SDG&E respondents and all of PG&E respondents said that "yes" their auditors were knowledgeable. Notably, it seems that most respondents who gave positive reviews were referring to the technical knowledge of their auditors about the audit recommendations (rather than about the logistics of moving to the TI process). The three respondents from the SCE and SDG&E programs who "did not know" did not ever discuss the audit results with their auditors.

Table 30: Auditor Knowledgeable About Recommendations & Next Steps?

Response	SCE (N=14)	SDG&E (N=12)	PG&E (N=4)	Total (N=30)
Yes	64%	83%	100%	76%
No	29%	0%	0%	12%
Don't Know	7%	17%	0%	12%

In the interviews, the respondents were also asked if they would have liked to receive any additional information during their discussions with their auditors:

- One SCE respondent wanted a detailed cost and savings analysis. Another wanted to see all the calculation sheets. The third would have liked to see how all of SCE's programs fit together and what the best combination of programs would be for his company.

- Most commonly, respondents in the SDG&E program said that they would have liked to hear more information about moving ahead and implementing the recommendations (four respondents). Another respondent would have like a cost and savings summary and a translation of what kW means in terms of dollar savings.

- One PG&E respondent said that he would have liked to hear about other PG&E programs.

Table 31 shows that after their audits, most respondents felt that they had an adequate understanding of demand response and the various program opportunities. Three of the SCE respondents were well-versed in demand response programs before their audits were conducted and three SDG&E respondents said that they learned about demand response opportunities due to other conversations with their Account Executives or utility seminars, rather than from their auditors.

The four PG&E customers were also asked a follow-up question. PG&E customers are provided with a description of the current PG&E demand response programs within their audit reports and the respondents were asked about the helpfulness of this section of the report. Three of the respondents said that the description was informative, and the other did not offer a comment.

Table 31: Understand Demand Response Program Opportunities?

Response	SCE (N=18)	SDG&E (N=14)	PG&E (N=4)	Total (N=36)
Yes	89%	79%	100%	86%
No	11%	21%	0%	14%

Concerns About Moving Forward

Furthermore, respondents were asked if they had any concerns about completing the next steps of the TA/TI Program after the audit is complete. The comments for this question are aggregated across all three utilities in Table 32. The most frequently cited concern was that there was uncertainty about how to move forward to implement the measures, receive incentives, and enroll in demand response programs. Several respondents were also concerned about how the measures would affect their business operations or the comfort of their customers. Notably, none of the four PG&E respondents mentioned any concerns.

Table 32: Concerns About Next Steps of TA/TI

A need for further guidance (5)
How measures will affect day to day business operations/customer satisfaction (4)
Incentive amount is not enough (2)
Technical aspects of equipment (2)
Internal timeline (1)
Requirements of demand response programs (1)
SCE Account Executive knowledge is poor (1)

A follow-question was posed to these respondents to find out how the utility could address their concerns. Responses to this question included the following:

- Two respondents enrolled in the SCE program said that there should be a discussion after the audit results are received that clearly outlines the next steps.
- Two others said that there should be better training for their SCE Account Representatives.
- One respondent from the SDG&E program said that there should be a better screening process for impractical recommendations and another said that there should be a periodic report to clients that tells them where they currently are in the TA/TI process.

Participant Satisfaction

During the interviews, respondents were also asked to rate their satisfaction with various elements of the TA/TI process. Figure 17 displays respondent satisfaction with the initial, logistical activities of the program, including applying for the audit, scheduling the audit, and the time required to complete the audit.

Figure 18 shows respondent satisfaction with other elements of the audit process, including the professionalism of the auditor, the clarity and usefulness of the information received from the audit, the incentive payment process (respondents in TI phase only), and the overall satisfaction with the audit process and report. Respondents who did not know or did not recall are omitted from these results.

The highest satisfaction ratings were for the audit scheduling process (72 percent extremely satisfied) and the courteousness and professionalism of the auditor (80 percent extremely satisfied. With the exception of incentive payment processing, at least 75 percent of respondents were satisfied or extremely satisfied across all categories. Most respondents gave the incentive payment process a neutral rating. Depending on satisfaction category, between zero and six percent of respondents were dissatisfied or extremely dissatisfied. The highest rates of dissatisfaction were for the time required to complete the audit and the audit's clarity and usefulness. None of the PG&E respondents said that they were dissatisfied or extremely dissatisfied with any aspects of the program.

Respondents from SCE who were dissatisfied with any aspect of the program were asked for additional information on the source of their dissatisfaction:

- Three respondents from the SCE program explained their dissatisfaction and all commented on the lengthy application, audit, and incentive payment process.
    - One said that there are "a lot of steps to complete to get the [application] forms correctly routed to the proper person."
    - After the audit was completed, one respondent said that it took six months to year to receive the results. Another said that it took 3.5 months to receive the incentive check.

- In addition to the protracted process, one respondent said that there could be increased "handholding" and "help to get the resources necessary for implementation."

SDG&E program respondents also provided additional detail for the areas where they were dissatisfied:

- Two of the four respondents who elaborated on their dissatisfaction did not receive any information or application forms for an incentive payment.
- The other two respondents said that they needed more help after they received the report to understand the engineering and to know "how to move on in the program."

Figure 17. Satisfaction with Audit Logistics

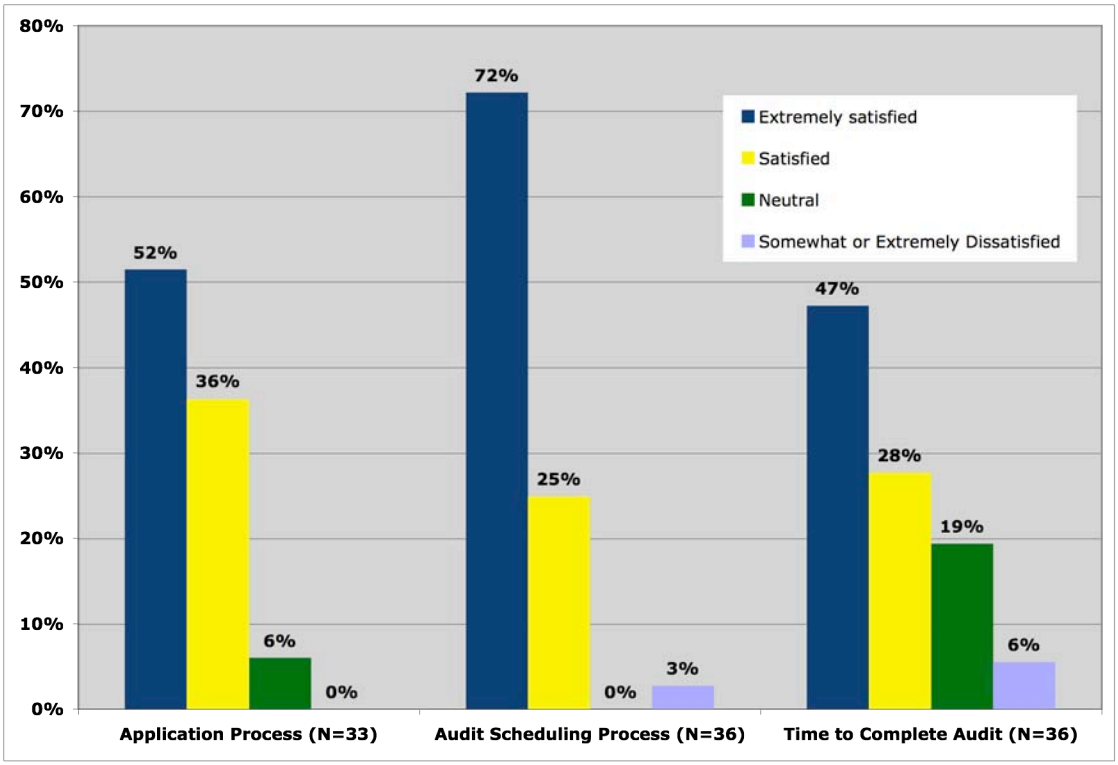
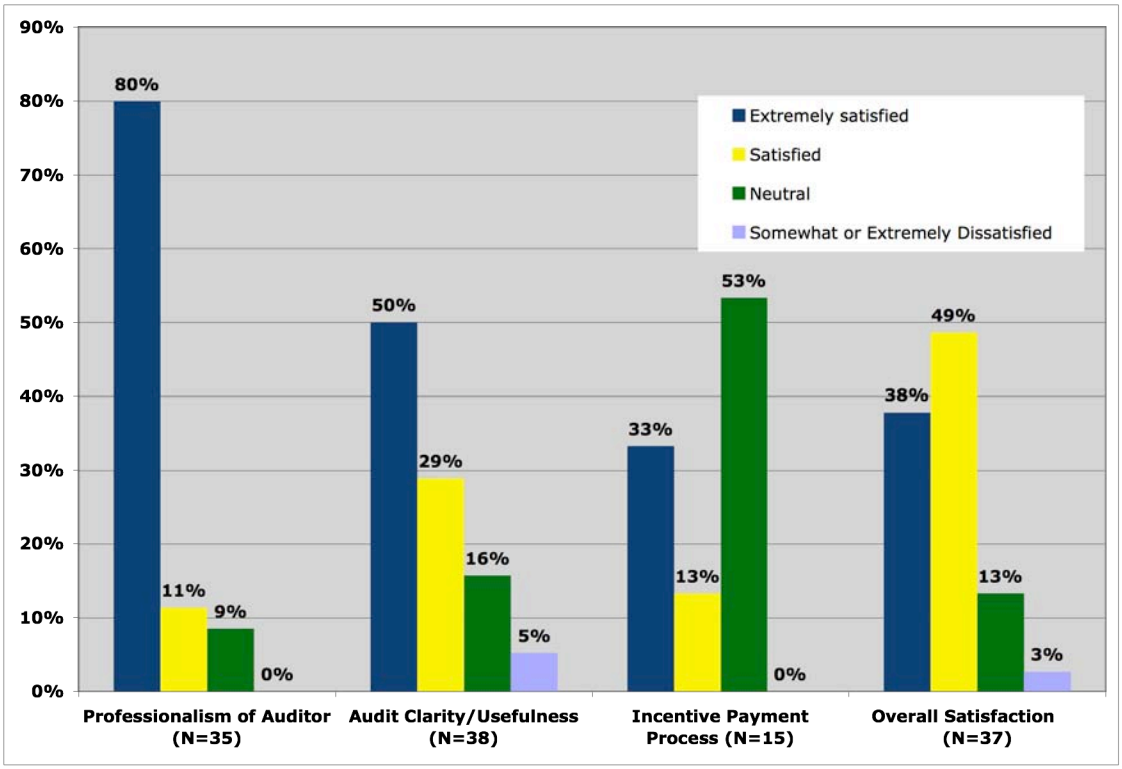


Figure 18. Other Audit Satisfaction Ratings



Suggestions for Program Improvement

What would you change about the audit process?

Respondents were asked what they would change about the audit process. The most common suggestion for the SCE program was to have a more comprehensive audit (5 respondents). Specific changes included spending more time at the facility to identify more savings opportunities (3), include energy efficiency measures in the audit (1), and provide real time monitoring (1). Alternatively, two respondents requested a faster process, saying that it took too long to receive the audit report after the on-site audit was conducted. One respondent said that they would like SCE to provide more information about how to go about implementing the measures. Another said that the technical jargon of the TA/TI application was confusing and should be simplified.

Almost all (nine out of 10) of the SDG&E respondents who commented on the audit process wanted to have more follow-up by the auditor and the utility so that there is clear understanding about how to move forward, install the measures, and receive the cash incentives. The other respondent wanted a better screening process for impractical measures.

One of the respondents enrolled in the PG&E program said that the contracted engineers made too many callbacks.

What additional information would you like on the audit report?

Similarly, respondents were also questioned about what additional information they would like to see on the audit report. Two SCE respondents requested more specific breakdowns of measure costs and different costs savings for various combinations of measures. A further suggestion was to include the audit methodology and the professional background of the auditors.

SDG&E respondents (four out of five who answered) said they wanted the audit report to contain explicit information about how to implement the measures, receive incentives, and enroll in demand response programs. The other respondent said he would like the audit report to detail dollar savings associated with the measures.

One PG&E respondent thought the audit report would benefit from including case studies of other successful projects.

Conclusions

The following are general conclusions that can be drawn from the in-depth interview results:

- **In general, satisfaction with the TA/TI Program is high.** At least 75 percent of respondents were satisfied or extremely satisfied across all aspects of the standard TA/TI programs.
- **Respondents accepted 53 percent of the recommendations they received.** The most frequently recommended type of measure was for process systems but the most frequently implemented measure was lighting.

- **The top two reasons respondents reject recommendations are that the measures interfere with an optimal business environment and that the customer did not receive any follow-up from the auditor or the utility.**

- **About half of respondents in the standard TA/TI programs found the incentive very influential in their decisions to implement the recommendations.** 26 percent of respondents in the programs said the incentive was not influential, primarily because it was not high enough in relation to the total equipment cost or because the recommendations were not appropriate for their business operations.

- **The majority (84 percent) of respondents in the standard TA/TI programs found the audit to be useful or very useful.** Only 11 percent of respondents from SCE and 21 percent of respondents from SDG&E said that their audit reports were not at all useful, for a variety of reasons.

- **Many SCE respondents received recommendations that did not align with their daily business operations.** Most SDG&E and PG&E respondents said that impractical measures that did not fit their business model were screened out, but 56 percent of SCE respondents received audit reports with some or many unreasonable recommendations. 28 percent of SCE respondents said that their audit recommendations were completely inappropriate for their business operations.

- **About half of respondents said that their audit report did not adequately describe the cost of each recommended measure.** Furthermore, many respondents mentioned that they would like specific information on dollar costs and savings for each measure.

- **Many auditors did not actively encourage the respondents to implement their recommendations.** Most respondents said that their auditors were knowledgeable and helped them to understand their audit recommendations. However, only 42 percent of respondents said their auditors encouraged them to implement the measures. Instead, in some cases, the Account Executives provided further information about incentives and demand response programs. Specifically, many SDG&E respondents said that their primary concern about moving forward with the recommendations was that they were uncertain about what to do after they received their audit reports.

- **Top respondent requests were for further guidance on how to move forward (implement the recommendations, receive incentives, and enroll in demand response programs) and for specific information on dollar costs and savings for each measure.** Lack of follow-up was a particular concern among SDG&E customers and a desire for a report with more dollar cost and savings information was highlighted by SCE customers. Other common suggestions were for audits that included energy efficiency measures, for more in-depth audits, and for a faster overall audit process.

3.4 VERIFICATION ENGINEER / AUDITOR INTERVIEWS

This section presents the results of interviews conducted with participating TA/TI auditors and program verification engineers. In total, eleven auditor and six verification engineer interviews were completed in October and November 2007.

Of the eleven auditor interviews, two interviews were conducted with engineers known as turnkey auditors and one engineer known as an aggregator. Additional details on each of these types are presented below.

- **Auditors.** Auditors are specialists providing third-party audits to measure the demand response potential for certain earmarked facilities within a utility's service territory.

- **Turnkey Auditors.** Although performing similar roles, turnkey auditors are a sub-group of auditors and are unique to PG&E's TA/TI program. Turnkey auditors not only perform the audit portion of the TA program phase, but also interface with the utility customer from the start of the program at the preliminary audit, and through installation and load shed verification. This is where the divergence between the roles of the auditor and the turnkey auditor start. In the case of the auditor, once the audit is performed, the results are written up, approved and submitted to the client, the auditor has completed his or her responsibility to the customer and utility. In some cases, the auditor may never even explain the results of the audit to the client.

- **Aggregator.** The aggregator's role in the TA/TI program is similar to that of the turnkey auditor. What separates the two is the aggregator's interface with the utility. Aggregators form partnerships with utilities to find and secure KW curtailment within the utility's service territory. Aggregators can do this by partnering with one, or many utility customers. When the potential curtailment is identified, the aggregator uses the procedures and incentives outlined by the TA/TI program to secure the KW necessary to satisfy their agreement with the utility. Once the curtailment is secured, the aggregator is responsible to meet their negotiated KW curtailment during demand response events. Like the turnkey auditor, the aggregator stays with the customer throughout the entire program. Because of the arrangement formed with the utility and the customer, the aggregator has an added incentive to ensure customers will shed load in accordance with a utility's demand response. Unlike the turnkey auditor, aggregators may contract out any portion of the TA/TI program if they are unable to perform the task in-house.

- **Program Verification Engineers.** Program verification engineers (PVEs) are used by the utilities to verify audit results and equipment installations. PVEs are used to evaluate engineering calculations, look for missed demand response opportunities, verify proper installation and ensure facilities can shed sufficient load in accordance with their TA/TI contract. PVEs are contracted by the utilities to perform audit reviews and verify load shed tests except in the case of PG&E. Only internal engineering staff reviews audit results for PG&E.

The purpose of these interviews is to provide the auditor and PVE perspectives on the various TA/TI program components and processes. The interviews also provide the engineers' perspective on how customers perceive the audit process and the TA/TI program delivery. The

analysis is generally qualitative in scope, although percentages or numbers of respondents are cited to help the reader understand the relative importance of findings.

The seventeen interviewed engineers combined for a total of 211 separate installation audits and 936 audit and load shed test reviews. Table 33 shows the breakdown of the number and type of interviews conducted for each utility. In general, the audits took place at installations ranging in size from medium to large utility customers. These audits were evenly distributed among both commercial and industrial customers. As a special note, two of the engineers interviewed specialized in the auditing of large municipal wastewater facilities, two auditing firms performed turnkey audits for PG&E, one engineer was an aggregator working for all three utilities, a second engineer specialized in conducting integrated audits for PG&E while the remaining five auditors worked in various sectors performing demand response audits.

Table 33: Verification Engineer/Auditor Interviews Conducted By Utility

Utility	SDG&E	PG&E	SCE	Total
Auditor	3	2	3	8
Turnkey Auditor	0	2	0	2
Aggregator	1	0	0	1
PVE	1	3	2	6
Total	**5**	**7**	**5**	**17**

Most of the contractors interviewed have been performing demand response audits since late 2006 or early 2007. One auditor began conducting audits as early as November 2005 in SCE's service territory and a second auditor began working for PG&E in late 2003. The remaining contractors became utility auditors in the late spring and early summer of 2007.

Clarification on Compensation Mechanism

The payment mechanisms for each of the three utilities vary depending on the type of audit. Preliminary audits, where initial negotiations take place to determine if there is a potential for demand response, and the demand response audit are each handled differently. For all utilities, preliminary audits are done for a set fee. SDG&E, through the delivery of their program, has found the preliminary audit to provide little value and is no longer conducting this type of audits. Both the program staff and the auditors shared this opinion. In SCE's territory, preliminary audits are paid on a fixed basis not to exceed $1,000. One SCE auditor commented that the majority of their preliminary audits go over budget because of transportation costs incurred when auditing facilities in outlying areas. For PG&E, the cost of the preliminary audit is rolled into the demand response audit.

Both SCE and SDG&E share similar payment mechanisms to cover the cost of the demand response audit. Each utility pays for time and materials not to exceed the amount of the demand response potential identified at the time of the audit. This demand response reimbursement is paid on a KW basis; $100 for every KW of curtailment identified during the audit. One auditor commented that this type of mechanism could lead to a distortion in payment for services. This is

the case when the auditor spends a lot of time at a large facility and does not find a significant dispatchable load. A second engineer commented that this mechanism does not provide the incentive to find more demand response that is not readily identifiable because the auditor will not take a chance and spend time additional looking for dispatchable load that may not exist.

PG&E's mechanism, however, is based on a set fee depending upon the size and type of facility being audited. Again, rolled into this fee is the cost of the preliminary audit. PG&E has an additional mechanism to cover the cost of developing what they call an implementation plan once the auditor determines the potential for demand response. Under the PG&E Auto Demand Response program (Auto-DR), PG&E negotiates a per program fee with its sole Auto-DR vendor. In cases where PG&E uses a turnkey audit, this engineer performs the preliminary audit, the full technical audit, the implementation plan, and represents the utility and customer at the equipment installation. When commenting on the PG&E payment mechanism none of the auditors interviewed said they found this mechanism to create complications.

PVEs were also asked to address their payment mechanism. In the case of each of the three utilities, engineers performing audit and load shed test verifications were paid for their time and materials.

TA Audit Procedures

The extent to which auditors and engineers discuss customer business and operational requirements before conducting the audit is extensive across all three utilities, according to those interviewed. In the case of SCE and PG&E, these discussions are performed prior to, or during the preliminary audit. As for SDG&E, which does not conduct a preliminary audit, these discussions take place in a negotiated environment prior to the audit. In larger facilities such as wastewater treatment plants, one SDG&E auditor mentioned that his experience in these types of facilities is of significant value when trying to negotiate the types of demand response measures that facility personnel will consider implementing. Only a person with significant knowledge about the intricate procedures at larger facilities will know and understand which operational requirements are and are not negotiable.

When addressing customer business considerations, all the auditors were in agreement. Customer and employee comfort and productivity were the top two priorities for facility personnel. If demand response was to be considered, neither of these two considerations could be violated. For the most part, the industrial sector was concerned about demand response affecting their production, while the commercial sector, mainly office buildings and the hospitality sector; customers were concerned with employee and patron comfort. For manufacturers, this meant production could not stop and production schedules could not be rearranged. In the office building and hospitality sectors, this meant temperatures could not be adjusted to relieve HVAC systems. Additionally, one auditor commented that many facilities in the industrial sector run extensive operations at night, outside of the demand response window, so many of the operational or procedural demand response considerations were irrelevant. In the wastewater treatment sector, one engineer specializing in this industry pointed out that the facility faced heavy fines, because of their connection to public health and safety, if their production failed. A third engineer pointed out "Shutting down an oil refinery for one hour is $300,000. With output versus energy, output wins, however a foundry may be more receptive to energy over output".

For the most part, the auditors were in agreement about obtaining corporate buy-off prior to conducting the audit. The commitment of an organization's decision makers to demand response is foremost in increasing the probability and ease of measure adoption. Ten of the eleven auditors all had experience in determining the level of corporate buy-off; the last auditor did not take part in these negotiations. This engineer only performed audits and at his stage of involvement, executive level management was already sold on demand response.

Several auditors provided interesting insight into management approval at the larger industrial facilities. These auditors were in agreement that the larger the facility, the more important higher-level management approval was to the success of the project. The procurement of management buy-off at smaller facilities was easier as the demand response measures tended to be less intrusive and executive leadership was easier to reach. Also, one auditor mentioned that with industrial facilities, prior knowledge of the particular type of industry is essential when trying to convince management of the benefits that come with demand response.

When asked about framing the audit results in perspective to the customer's operational requirements, many of the auditors were clear that this was a priority. Specifically, auditors provided the following comments on framing demand response solutions:

- "We consider a customer's operational requirements as much as possible; energy audits are more effective when the results are placed in the customer's perspective."
- "We understand waste treatment facilities so we know which measures can and can't be proposed."
- "The message is given in a way the company will understand and touches on their goals, belief values, and most important the return on investment."
- "We always try focusing on areas where the customer might say yes, but too much emphasis on demand response may frighten the customer away, especially if the measures can risk business processes."
- "We only present results that are viable based on a customer's operational and business requirements. Some utilities tend to put non-viable demand response measure in a report to get them documented."

Auditors were also asked about customer questions when presenting the audit results. Responses from auditors ranged from customers asking simple questions such as how long is the payback, to more complicated questions about the methodology used to perform the energy savings calculations. One auditor said his clients usually ask him about the equipment return on investment, what value the equipment can add to their production process if any, the time requirement needed from internal plant staff, and most ask if the equipment will have a negative impact on production. Other auditors stated that their customers ask them about the reliability of the demand response estimates, and some go even as far as to question the potential demand response calculations. Still other auditors pointed out that some customers ask about the history of the program. One auditor in PG&E's territory said that no one has questioned the measures recommended, no one has questioned KW potential, but sometimes they question the cost of

controls upgrades. Finally, one engineer in SCE's territory said that he does not present the audit findings to the customer so he does not know which questions they ask.

PVEs were asked to address their procedures for verifying the results of the audit. Across the three utilities, verification engineers said that five to fifteen percent of audits they review are adjusted or corrected. One engineer added that as the process has progressed, the audit results have improved.

When asked to list the reasons for rejecting audit results, most engineers offered the following responses:

- Audit results are rejected mostly because of incorrect engineering calculations.
- The auditor didn't understand the program.
- They auditor was not looking at the interval data. If they had looked, they would have seen the load was not there in the summer to be curtailed.

Next, PVEs were asked to talk about the accuracy of the audit results. In general, the comments from PVEs varied. One engineer stated that audits are generally overestimating curtailment, but weather is affecting accuracy and that is uncontrollable. A second engineer reported that his audits are off the estimated KW twenty to forty percent of the time. The last three PVEs stated that their audits tended to be accurate.

Auditor Perspectives on Customer Views of Demand Response

Auditors were asked about how customers view demand response measures as they relate to operational flexibility, control or payback. One auditor working as an aggregator stated that customers, when looking at automated demand response, are hesitant to give up control of the decision-making power and prefer the ability to decide when and if they participate in a demand response event. Water treatment facilities are concerned about lack of control. As one auditor put it, "we have to consider flexibility, loss of control, and operational control when shutting off equipment, and how long it will take them to bring it back up, this could affect their sludge transfer process and affect employee and public health and safety. This can also result in a major domino effect or chain reaction if they turn equipment off, it effects many processes down the line." The second wastewater auditor stated that many treatment facilities are open to demand response because the demand response measures can also, as an added benefit, help them optimize their entire system along with providing them the ability to take part in a demand response program.

Two engineers, operating in PG&E's territory, added that loss of flexibility is very unpopular when dealing with manufacturing facilities. One of these engineers went on to say that even with the override capability and given the choice to opt out of a demand response activity, manufacturing facilities are still not open to fully automated demand response.

When asked about the types of measures that are more often identified than others, across the board and across each utility the auditors were in agreement. In the commercial sector, the most frequent opportunities are increasing temperatures during demand response events to relieve

HVAC systems and the curtailment of a building's lighting load. In the industrial sector, auditors tend to focus more on identifying loads that can be shifted as much as possible to off-peak hours during demand response events. As one auditor pointed out, curtailing lighting and increasing temperature set points can also be performed in the industrial sector, but many times the lighting and HVAC systems aren't present in manufacturing facilities.

Auditors were then asked if there was a certain bias against the selection of certain measures for installation. Responses to this question were usually either that the auditor did not know because they were never informed of the measures installed or that they only recommended measures they knew were viable. Additionally, one auditor in SDG&E's territory stated that the equipment payback was very important. Decisions to install measures involve choosing which measure is not intrusive and provides a good payback; usually a payback within two years is acceptable. If there is a green push at the facility, the payback period may be extended, but not always. A second auditor in PG&E's territory stated that customers are hesitant to install measures that will fully automate their facility while some may do so if the equipment allows them to optimize their production in some way. An example of this would be the upgrade of a SCADA system at a water treatment facility. This upgrade allows the facility to take part in demand response and at the same time allows them to optimize and learn more about their facility.

Auditors were asked to what extent they educate and encourage customers to participate in demand response activities. This question highlights the advantages gained through working with an aggregator or a turnkey auditor. In the case of the aggregator, there is an added incentive for the aggregator firm to encourage participation in demand response activities. As the auditor responded, customers taking part in a demand response is "built into our business model." In the case of the turnkey audit firm, one firm goes so far as to locate personnel on the day of a demand response event at the facility to help and instruct facility personnel on how to use the equipment. In a post-implementation environment, these personnel will remain at the facility to assist during demand response events for two to three months and this is negotiated as part of their contract. In all other cases, responses from the other auditors showed that encouraging customer participation in demand response is mostly an implied, and not specified task. Only in the case of the turnkey engineer and aggregator was educating the client on demand response a contractual obligation.

Responses from auditors, when asked about the extent to which customers do not know about demand response opportunities, versus how much they need to overcome their resistance, were varied. Each auditor seemed to have a different experience from the next. One auditor stated "Engineers know from the beginning if customers will or will not take part in the demand response program based on the reactions of management. It's my job to sell, I know the clients." A second auditor added, "In nine out of 10 cases, the customer is afraid of their equipment, and once they have it they can't operate it."

Most auditors explained that their customers are aware of demand response, but view it with great hesitation. Auditor comments about customer knowledge of demand response are listed below:

- Customers need to be educated more than overcome their resistance.

- Customers have a lot of knowledge and know what they are and are not capable of in terms of demand response opportunities.

- Larger customers are familiar with demand response. Some firms have corporate mandates for demand response.

- Reliability concerns make for an uphill battle with demand response.

- Almost every customer knows what demand response is before the audit, so a lot of time is spent breaking down resistance.

- Customers have a limited knowledge of demand response and a built in resistance. Until they have had an audit, they will not find a load to curtail, and some have done it themselves. Usually, only those with on-site engineering staff.

- Generally, the level of customer sophistication is trailing technology.

Responses when asked to characterize customers' attitudes toward demand response were again varied. Most of the auditors characterized customer attitudes in a positive light. One auditor added that response was excellent, and that he saw the social responsibility aspect of demand response as a motivating factor. Generally, most of the auditors agreed that customer attitudes got better over the course of the audit process.

Others offered the following comments:

- "It's a bit of a challenge, and the challenge is from the time of audit assignment to the time of audit result presentation, it is too long, and because of this, customers don't have a great feeling, it's not fresh in their mind, it was fresh at beginning, but not three months later."

- "For municipal water treatment facilities, if they have the capability, and if you explain how they can do it, they will do it. Their purpose is to supply water, not make money."

- "After demand response is explained to include its benefits, they are interested."

- "Customers will do it if it does not cost them money."

- "Customers are open but skeptical. Open because of the rolling blackouts and their continued possibility. Some firms are willing to be leaders. Others are open to the idea but lack sophistication."

- "Moderate attitude. Some have no idea what demand response actually means. There should be more education at the beginning, customers are not sure of the differences between demand response and energy efficiency."

Auditors were next asked to address any bottlenecks they saw in the program delivery. Responses ranged from lack of feedback to lack of customer sophistication, customer

intimidation, the lengthy period between completing the audit and getting the audit reviewed, the lack of ability to qualify a client from the beginning and the lack of incentive by the engineer performing the audit to push the client toward an installation. Additionally, one engineer added that the timing of TA/TI contracts is not always conducive to the utility's goals. If they want quicker turnaround, they have to award contracts in a timelier manner.

Barriers to TI

In light of the large volume of audits and the relatively few verified equipment installations and TI enrollment, auditors and PVEs were asked to address what they considered were the major barriers that stop customers moving from TA to TI. Common barriers include the upfront cost of equipment installation and lack of understanding of the technical requirements of demand response.

Engineers offered the following comments regarding program barriers during their interviews:

- Requiring the customer to pay the cost of installation and equipment up front is stopping people from moving forward.
- Not having subject matter experts involved during the presentation of the audit results does not help obtain the corporate buy-off necessary for moving forward.
- One of the turnkey engineers mentioned that the lack of prescreening served as a hindrance to TI installations.
- Two auditors mentioned that demand response does not provide enough incentive, especially for manufacturers; there is too much risk involved and not enough incentive to save money. The incentives for getting new equipment are good but it is only worth it occasionally to take part in demand response.
- One engineer pointed to the payback as a barrier to program success; there needs to be a higher payback in order to entice firms into an installation.
- The absence of the auditing engineer involved in guiding the customer through the entire TA and TI process is a barrier to installations.
- Customers lacking the education on how incentives work is a common barrier.
- The lack of turning the audit suggestions into a specific implementation plan for the facility keeps customers from moving forward.
- In general, customers lack the education on how complex measures and demand response work.
- Some customers may not have the expertise on their staff to implement the recommended measures.
- Customers do not understand what to do with the audit results.

- Installation requires the plant manager's time and effort, which is not always available.
- Customers have trouble procuring demand response equipment on their own.

3.5 AUDIT RIDE-ALONGS

This section presents the results of ride-alongs made by the evaluation team with auditors conducting technical audits at facilities taking part in the TA/TI Program. For PG&E and SCE, a technical audit is performed after a preliminary assessment has been conducted. If a determination is made that the facility has sufficient potential for demand response, a technical audit is scheduled. The technical audit identifies demand response methods and specific measures that will help the facility take part in demand response. The end purpose of the audit is to identify as much potential KW load reduction as possible.

Audit ride-alongs were conducted between December 2007 and February 2008. Eight days of ride-alongs were completed while visiting seven separate facilities with seven different auditing firms. For all the audit ride-alongs, the customers had previously had one or more interactions with the auditor as the audit process can normally involve multiple visits and take up to several months from initial recruitment to audit completion. Consequently, we did not observe any audit visits that involved the initial interaction between the customer and the auditor attempting to promote the program.

Table 34 shows the breakdown of technical audits conducted in each utility's service territory. Typically, the personnel present at the technical audit include the auditor and the facility staff. Ideally, the facility engineer, or facility manager, would also be available during the audit.

Table 34: Ride-Alongs Conducted by Utility

	SDG&E	PG&E	SCE	Total
Number of Audits	3	3	1	7

The measures suggested during the audit ride-alongs included:

- Lighting curtailment.
- Install an EMS to curtail lighting from a central location.
- Temperature Set Point Adjustments.
- Install thermostats in rooms.
- Curtail the use of elevators during a demand response event.
- Shut off and cycle ice makers for 2 hours during demand response events.
- Cogeneration.

- Limiting the use of pumps during demand response events.

Audit Observations

Auditors find that in some cases, energy management systems have already been installed at facilities. This can sometimes make the accessibility of demand response easier for the customer. During the audit ride-alongs, three of the seven facilities had management systems already in place.

At each facility, discussions about demand response were conducted before the audit took place. Many of these discussions were done before the auditors ever visited the facilities. Depending on the size and type of facility, discussions may take up to several weeks or last only a few hours. The larger the facility, and the more complex the measures, the longer and more involved the discussions are around demand response. Issues generally discussed between auditors and facility personnel include how demand response measures and processes work, advantages and disadvantages of automated vs. manual demand response, potential energy savings and the TI incentive structure. Specific issues include:

- Only two of the customers expressed some concern over the length of potential demand response events. One customer was concerned about the effect of demand response on production and the facility manager of the Tribune was concerned about curtailing HVAC usage. The facility manager explained that the pressroom, printing room and front offices all tend to run extremely warm in the summer because of production and their location to the afternoon sun.

- The potential loss of control and flexibility during demand response events did not raise much concern at each facility. The override capability of every customer participating in demand response was comforting to each facility manager

- The overall willingness to curtail seemed high so long as it did not come at the expense of production. Demand response was feasible unless it meant shutting down mission critical equipment. Facility managers also did not seem opposed to the frequency (12–16 events per demand response season) of demand response events.

- Payback was mainly a strong variable for the private facilities with two years or less being the standard. At public facilities, payback was not so much a concern. The facility staff at a wastewater treatment facility said that being a public entity meant they were more concerned with following directives from public officials. They considered increasing the efficiency of a state facility within the scope of their public responsibility. They further suggested that payback was more of a management decision. Once the decision was made, they would follow through with it just like any other directive.

Next, auditors were observed on their ability to educate and encourage customers to participate in demand reduction activities rather than simply presenting the results of the audit. At one facility, the auditor encouraged participation by describing the equipment to the customer. The auditor's previous experience with demand response made it possible to relate the intricacies of

equipment operation to the customer. Another auditor showed the customer an example kW curtailment calculation of similar demand response equipment.

Customers were asked by the auditor to describe what they saw as the next step in the TA/TI process. One of the facilities visited was currently obligated to the TI portion of the program and as a result, new exactly their next step in the process. The other six facilities all said they expected to hear back from the auditor or their utility account representative as the next step in the program.

Overall, customer response to the audit and the TA/TI process was moderate to high. Facility staff seemed genuinely interested and willing to work with auditors. Facility staff were knowledgeable on their equipment and knew what equipment was off limits to curtailment. One auditor commented that the customer's attitude toward demand response did improve as the audit progressed.

Auditors across the board neglected to talk about additional demand response programs or energy efficiency programs. Throughout the course of the audits, it did not seem as though auditors felt this was an obligation. At only one facility did an auditor describe the difference between fully automated and manual demand response, but additional programs were not mentioned.

3.6 Load Shed Testing Observations

This section presents the results of site visits made by evaluation engineers to observe the load shed testing of equipment installed at facilities taking part in the TA/TI program. A load shed test is performed after demand response measures are instituted to verify the equipment is operating effectively and will shed the required amount of energy under the terms of the TI phase of the program. There were limited load shed test opportunities during the course of this evaluation and consequently we were able to observe only four of the planned 10 load shed tests.

The purpose of these observations is to provide the evaluating engineers' perspective on the conduct of the energy curtailment procedures and testing. This type of observation also provides the opportunity to witness the process first hand and identify anything that may not be apparent in the verifier reports.

The load shed test is a vital stage of the TA/TI Program as incentive payments are calculated based on the testing results. The incentive amount is calculated by multiplying $250 by the difference in the Recorded Test Energy (RTE), or the load reduction shown during the test, and the Customer Specific Summer Baseline (CSSB), or the amount of energy used on average by the facility during summer months.

Table 19 shows the breakdown of load shed tests conducted in each utility's service territory. Typically, the personnel present at the load shed verification test include the TI installation contractor staff, the utility account manager, load shed testing engineers, equipment vendor staff, facility staff and the evaluation engineer.

Table 35: Load Shed Test Observations By Utility

	SDG&E	PG&E	SCE	Total
Load Shed Tests Observed	1	2	1	4

The measures observed to curtail load during the four load shed tests included the following:

- Curtailing process equipment for the purification of CO2.
- Curtailing process equipment for the manufacturing of rubber products.
- Shutting down HVAC systems.
- Curtailing building lighting.
- Curtailing refrigeration system components
- Shutting down cold box fans, hydraulic pumps, chiller compressors, condenser pumps and evaporator side cooling fans.
- Cycle agitator motors to alternate operation every 15 min.
- Shut down waste blower motors during demand response event.
- Shut down drag chain motors during demand response event.
- Shut down the blow mold machine, blower, heater, annealing tunnel, and auxiliary equipment during demand response events.

Testing Parameters

During the four observed events, the time required to initiate curtailment ranged from immediate to fifteen minutes. The ramp down rate, or time required to reach the curtailment load, took anywhere from five to thirty minutes. Once this point was achieved, the actual curtailment of load lasted in two facilities a full two hours, one hour in the third facility and twenty minutes in the fourth facility.

One engineer reported that changes in weather and production from the time of the load shed test to the demand response season can severely impact a firm's load shed test results. Depending on the type of equipment, load shedding may have to be demonstrated and observed for a lengthy period of time to prove to the verification engineer that during demand response events the reported load listed on the audit can be curtailed. A second engineer stated that longer load shed tests can increase a plant's ability to illustrate more load shed potential or that the approved curtailment KW level can be reached. These changing conditions from the day of testing to the day of demand response event pose a challenge for load shed test verifiers.

Maximum curtailment levels demonstrated varied greatly at each facility. At two facilities, the maximum curtailments reached were twelve and sixteen percent of each location's normal operating load. For the last two facilities, 82 and 98 percent of normal operating load was shed. These last two cases represent a full, or near full, shut down of the plant's operating ability. Additionally, one engineer reported that multiple tests might be required to obtain the maximum load shed levels. A second engineer stated that maximum load shed levels from the audit are sometimes never obtained or are only reached for periods of ten to fifteen minutes. It is important to demonstrate the ability to shed load for long periods of time because actual demand response events can require equipment to shed load for up to seven hours.

One engineer commented that planning by load shed verification and facility staff a day ahead is critical for conducting an accurate and thorough load shed test. The length of time that the equipment must be curtailed could be jeopardized if prearrangements are not made with facility staff and equipment operators.

Post-event ramp-up rate, or the time needed to bring the plant back to its normal operating load also varied from facility to facility. The time required to bring the plant back online in the two cases of full shut down took twenty and thirty minutes at each plant. Interestingly, the plants shedding smaller percentages of load required one and one and a half hours to return to normal operating loads.

During one test an engineer noted that the basic design of the demand response system initially laid out changed after installation and prior to the load shed testing. This engineer pointed out that unforeseen changes in equipment and process configuration can cause a discrepancy between the amount of curtailment estimated at the time of the audit and the amount of curtailment found during the load shed test.

Impacts of Curtailment on Business Operations

Load curtailment affected operations at each of the four locations differently. At one location, where eighty-two percent of the operating load was shed, the entire production was shut down. Oppositely, at the facility with ninety-eight percent curtailment, production personnel could perform tasks not dependent on machinery being curtailed and production continued in spite of the large amount of curtailment.

Evaluation personnel recorded the following additional comments involving the impacts of curtailment on production:

- Some of the laboratories at one facility are required to maintain specific temperatures, which resulted in an increased need for monitoring these spaces.
- Employees of one facility experienced a moderate level of discomfort due to increased temperatures and diminished air quality.
- One engineer remarked that initially, at the time of the audit, it might appear productivity will go unaffected but the load shed test can reveal the opposite outcome.
- During demand response events work may continue but at a slower production rate.

- Higher levels of production during the demand response season can affect a firm's ability to reach its maximum KW curtailment. This can cause a false KW load shed result if production at the time of a load shed test is different from production during the demand response season.

Non-Demand Response Benefits

In certain cases demand response equipment provides benefits to the customer outside the scope of load curtailment. In each of the four facilities where testing was observed, engineers and customers realized non-demand response benefits. As a result of demand response equipment, three of the four plants recorded having a better understanding, better control and an increased monitoring capability for plant supervisors. At the last facility, the observing engineer stated the new system installed has the ability to interface with the plant's existing equipment, not part of the initial demand response strategy. Finally, one contractor indicated that his clients invariably find other uses for the demand response equipment he installs.

3.7 DISCRETE CHOICE ANALYSIS

In addition to the survey and in-depth interviews, a separate evaluation task involved using a discrete choice model to simulate the decision to move from the TA to the TI program phase. The discrete choice model is a useful addition to the survey data as it relies on the revealed actions of customers rather than the stated preferences obtained during the surveys. The model also provides a way to identify influential factors from a large amount of customer and program information. The discrete choice model estimation results can also be easily converted to "importance statistics" that provide a more intuitive way to understand the relative importance of each variable included in the model.

The steps used for the discrete model were as follows:

1. Collect participant data and format for use in the discrete choice model
2. Estimate discrete choice model (2 separate specifications explored)
3. Calculate "importance statistics" to show what factors are most influential in the decision to move from TA to the TI program phase.

Each of these steps is discussed below.

Discrete Choice Model Data

The data used for the discrete choice model are from the TA/TI Program tracking databases of SCE, SDG&E, and PG&E. As we analyzed the data in the participant tracking databases, it became apparent that the information contained on the specific measures being recommended was too general for use in the discrete choice model. To address this, we reviewed electronic copies of the audit reports to get additional measure detail. The audit file information was entered by hand into a database for use in the discrete choice analysis.

The sample from each utility is shown in Table 36 and includes customers that are in either the TA or TI part of the program. The first two columns show the number of customers that are in the TA phase and the number of customers that have progressed to the TI phase for each utility. In some cases, customers made decisions for multiple sites, such as with chain stores or schools. Those customers that were responsible for multiple sites are shown in Table 36 as a single participant as there is only a single decision maker. Note that with PG&E, there was not enough information to determine if customers were making decisions for multiple sites. For this reason, the PG&E observations were dropped from the Participation Model discussed below.

Table 36 also shows the number of individual measures recommended and accepted through the program.

Table 36: Discrete Choice Model Sample

Utility	TA Participants	TI Participants	Recommended Measures	Accepted Measures
SCE	320	30	1,903	188
SDG&E	250	73	982	259
PG&E	458	73	458	73
Total	**1,028**	**176**	**3,343**	**520**

The data on total participants and the number of measures recommended and accepted are used to estimate two separate discrete choice models, as discussed below. The Measure Model estimates the likelihood that an individual recommendation is accepted, while the Participation Model estimates the likelihood that a particular customer will move from the TA phase to the TI phase of the program.

Table 37 provides a detailed view of the accepted and rejected measures among all three utilities.

Table 37: Recommended Measures, Percent Accepted and Rejected

Measure Category (3,343 measures total)	Percent Accepted	Percent Rejected
Cycle/Curtail/Shut Down HVAC UNITS to create Temperature set point adjustment (N=1,130)	15%	85%
Adjust/Reprogram/Install Energy Management System to control HVAC systems (N=99)	9%	91%
Curtail the usage of lighting or shut lighting off completely (N=836)	18%	82%
Adjust/Reprogram/Install Energy Management System to control lighting (N=72)	3%	97%
Shutting down process equipment (Motors, Pumps, Refrigeration, Elevators) entirely during DR hours or delaying activities until to off-peak hours (N=455)	10%	90%
Adjust/Reprogram/Install Energy Management System to control process equipment (N=59)	22%	78%
Shutting down various types of equipment entirely during DR hours or curtailing their usage (N=527)	17%	83%
Adjust/Reprogram/Install an Energy Management System to control various types of equipment (N=108)	21%	79%
Miscellaneous (re-wire, perform maintenance, etc.) (N=57)	21%	79%

Discrete Choice Model Estimation Results

Measure Model

The Measure Model is specified as a logit model with a dependent variable having a value of either zero or one. In this specification, the dependent variable has a value of one if the

recommended measure is adopted through the TI program and value of zero if the measure is not adopted. For this specification, each measure recommendation is considered a separate decision and therefore treated as a separate observation. Customers that are making decisions for multiple sites also have each separate measure observations included for each site.

The specific form of the Measure Model TI is as follows:

$$ADOPTION = \alpha_{PG\&E} + \alpha_{SCE} + \alpha_{SDG\&E} + \beta' BUSINESS_i + \beta' RECOS_{i,j} + \beta' KWSAVINGS_{i,j} + \varepsilon_i$$

Where

$ADOPTION$ = *Variable indicating whether measure was adopted (0,1)*

$a_{PG\&E}$ = *Constant term indicating a PG & E customer*

a_{SCE} = *Constant term indicating an SCE customer*

$a_{SDG\&E}$ = *Constant term indicating an SDG & E customer*

$BUSINESS$ = *Vector of indicator variables for business type*

$RECOS$ = *Vector of indicator variables for types of audit recommendations*

$KWSAVINGS$ = *kW savings associated with each audit recommendation*

i = *Index for customers*

j = *Index for audit recommendations*

ε = *Error term assumed logistically distributed*

α, β = *Coefficients to be estimated*

The specific variables used in the measure model specification are described in Table 38.

Table 38: Measure Model Variable Definitions

Variable Name	Units	Description
PGE	0,1	Constant term indicating PG&E customer
SCE	0,1	Constant term indicating SCE customer
SDGE	0,1	Constant term indicating SDG&E customer
HVAC	0,1	Cycle/Curtail/ShutDown HVAC UNITS to create Temperature set point adjustment
HVAC_EMS	0,1	Adjust/Reprogram/Install Energy Management System
Lighting	0,1	Curtail the usage of or Shutting off Lighting Completely
Lighting_EMS	0,1	Adjust/Reprogram/Install Energy Management System
Process	0,1	Shutting down process equipment (Motors, Pumps, Refrigeration, Elevators) entirely during DR hours or delaying activities until to off-peak hours
Other	0,1	Shutting down various types of equipment entirely during DR hours or curtailing their usage
Other_EMS	0,1	Adjust/Reprogram/Install an Energy Management System to control various types of equipment
max_kw	KW	Estimated potential kW reduction per measure
Ag	0,1	Industry: Agriculture Forestry Fishing and Hunting
Arts	0,1	Industry: Arts Entertainment and Recreation
MMC	0,1	Industry: Manufacturing, Construction, Mining
Tech	0,1	Industry: Professional Scientific and Technical Services
PA	0,1	Industry: Public Administration
Realty	0,1	Industry: Real Estate and Rental and Leasing
Retail	0,1	Industry: Retail
Trans	0,1	Industry: Transportation and Warehousing
Whsle	0,1	Industry: Wholesale Trade
Hos	0,1	Industry: Hospitality
Util	0,1	Industry: Utilities

Measure Model Estimation Results

The estimation results from the Measure Model are given in Table 39. A likelihood ratio test yields a test statistic of over 2,258 with 22 degrees of freedom, indicating that the model has significant explanatory power.

The three utility-specific constants are all positive and significant at less than one percent. All but one of the measure groups shown in the model results below have positive effects on the decision to move from TA to TI. OTHER_EMS equipment is the only measure group shown to have a negative effect on the move to TI and is significant at 14 percent. The LIGHTING_EMS

measure category has the largest positive effect on moving to the TI phase and is also the most statistically significant of all the measure groups at 3 percent. This suggests that customers who were recommended to implement an energy management system for their lighting equipment in the audit stage are the most likely to continue on to the TI phase of the program.

Customers in the technology, public administration, realty, hospitality, and utilities industries are also more likely to move from TA to TI. Of these, customers in the utility industry are most likely to adopt recommendations made during the audit. All other industry types included in the model were shown to have a negative effect on influencing customers to adopt the measure recommendations and move to the TI phase.

Table 39: TI Participation Measure Model Estimation Results (N=3,343)

Variable Name	Coefficient Estimate	Standard Error	Significance Level
PGE	1.7	0.31	<1%
SCE	2.3	0.30	<1%
SDGE	1.6	0.31	<1%
HVAC	0.44	0.28	11%
HVAC_EMS	0.52	0.45	24%
Lighting	0.54	0.28	5%
Lighting_EMS	1.7	0.77	3%
Process	0.54	0.30	7%
Other	0.44	0.29	12%
Other_EMS	-0.52	0.36	14%
max_kw	-0.0021	0.00042	<1%
Ag	-0.66	0.35	6%
Arts	-0.73	0.31	2%
MMC	-0.49	0.21	2%
Tech	0.44	0.42	29%
PA	0.82	0.35	2%
Realty	0.91	0.48	6%
Retail	-1.3	0.17	<1%
Trans	-3.0	0.27	<1%
Whsle	-1.7	0.21	<1%
Hos	0.48	0.36	19%
Util	1.4	0.63	2%

Measure Model Relative Importance Statistics

While coefficient estimates provide some information on the influence of each variable on the decision to implement measures, it can be misleading to only look at the coefficient estimates to gauge the influence of a variable. For example, the value of the max_kw variable ranges from 0 to 4,011 while all other variables in the model take a value of zero or one. Only looking at the coefficient on max_kw will give the impression that it is not as influential on the decision to move to the TI phase as it actually is.

To address this issue, relative importance statistics were calculated that combine both the coefficient and variable value to get an overall measure of the influence on TI participation. This statistic measures each feature's contribution to the observed portion of participation based on the variables included in the model. Using the coefficient estimates and the values for the variables used in the above model, the importance statistic is defined as:

$$\text{Imp}_i = \frac{\Delta\text{Part}_i}{\Delta\text{Part}} = \frac{\text{Maximum participation change due to variable i}}{\text{Maximum participation change from all variables combined}}$$

The relative importance statistic is used to show the relative value placed on each variable, with the sum of the relative importance statistics totaling 100 percent. The relative importance can then be interpreted as measure of the influence each variable has on the overall likelihood of adopting a measure (or participating in the TI program, as in the TI Participation Model discussed next).

Table 40 shows the calculated relative importance statistics for each variable in the model. Max_kw has the most influence on TI participation, at 28 percent, and it should be noted that this influence is negative based on the coefficient estimate in Table 39. Whether or not the customer is in the transportation industry has a 10 percent influence on the decision to participate in the TI phase of the program. Third in relative importance is being an SCE customer, which contributes 8 percent of the influence to TI participation. Both wholesale facilities and EMS lighting projects have relative importance values of 6 percent, and PG&E, SDG&E, and the utility industry have values of 5 percent. All other variables in the model have relative importance values of less than 5 percent.

Table 40: Relative Importance Statistics for Model Variables

Variable Name	Relative Importance
max_kw	28%
Trans	10%
SCE	8%
Whsle	6%
Lighting_EMS	6%
PGE	5%
SDGE	5%
Util	5%
Retail	4%
Realty	3%
PA	3%
Arts	2%
Ag	2%
Lighting	2%
Process	2%
HVAC_EMS	2%
Other_EMS	2%
MMC	2%
Hos	2%
Tech	1%
Other	1%
HVAC	1%

TI Participation Model

The Measure Model is designed to show those factors that are most important in determining the likelihood that a measure will be accepted and installed through the TI program. A related question is to identify those characteristics that influence the decision of an individual customer to participate in the TI program. This participation decision can also be modeled using the discrete choice format.

The general form of the Participation Model is similar to the Measure Model, with the exception that each observation represents a customer instead of an individual measure recommendation. The dependent variable in this model reflects the customer decision on whether to proceed to the TI program phase for ANY of the measures recommended in the TA audit.

Because there was not enough information on PG&E customers to determine if there was a

single decision maker for multiple sites, the PG&E observations were dropped from the Participation Model. This was to done to prevent undue influence from multiple observations if in actuality these decisions were being made by a smaller subsample of customers.[8]

The Participation Model form is as follows:

$$PARTICIPATION = \alpha_{SCE} + \alpha_{SDG\&E} + \beta' BUSINESS_i + \beta' RECOS_{i,j} + \beta' KWSAVINGS_{i,j} + \varepsilon_i$$

Where

$PARTICIPATION$ = *Variable indicating whether customer particpated in TI (0,1)*

a_{SCE} = *Constant term indicating an SCE customer*

$a_{SDG\&E}$ = *Constant term indicating an SDG & E customer*

$BUSINESS$ = *Vector of indicator variables for business type*

$RECOS$ = *Vector of indicator variables for types of audit recommendations*

$KWSAVINGS$ = *kW savings associated with each audit recommendation*

i = *Index for customers*

j = *Index for audit recommendations*

ε = *Error term assumed logistically distributed*

α, β = *Coefficients to be estimated*

The specific variables used in the Participation Model are described in Table 41 and are very similar to those shown previously for the Measure Model. It should be noted that the PGE-specific constant was removed from the model since there are no PGE customers in this specification. The variables HVAC_EMS and Lighting_EMS were combined into HVAC_Lighting_EMS because of the small number of these measures in the sample. All other variables in this model are the same as the Measure Model specification described above.

[8] To test this, the Participation Model was also run using a sample that contained all the PG&E customers. These results were very similar to the results shown above, with the exception that the Realty sector was less influential and the Transportation, Retail, and Wholesale sectors were slightly more influential in the decision to participate.

Table 41: Model Without PGE Customers Variable Definitions

Variable Name	Units	Description
SCE	0,1	Constant term indicating SCE customer
SDGE	0,1	Constant term indicating SDG&E customer
HVAC	0,1	Cycle/Curtail/ShutDown HVAC UNITS to create Temperature set point adjustment
Lighting	0,1	Curtail the usage of or Shutting off Lighting Completely
HVAC_Lighting_EMS	0,1	Adjust/Reprogram/Install Energy Management System for HVAC or lighting equipment
Process	0,1	Shutting down process equipment (Motors, Pumps, Refrigeration, Elevators) entirely during DR hours or delaying activities until to off-peak hours
Other	0,1	Shutting down various types of equipment entirely during DR hours or curtailing their usage
Other_EMS	0,1	Adjust/Reprogram/Install an Energy Management System to control various types of equipment
max_kw	KW	Estimated potential kW reduction per measure
Ag	0,1	Industry: Agriculture Forestry Fishing and Hunting
Arts	0,1	Industry: Arts Entertainment and Recreation
MMC	0,1	Industry: Manufacturing, Construction, Mining
Tech	0,1	Industry: Professional Scientific and Technical Services
PA	0,1	Industry: Public Administration
Realty	0,1	Industry: Real Estate and Rental and Leasing
Retail	0,1	Industry: Retail
Trans	0,1	Industry: Transportation and Warehousing
Whsle	0,1	Industry: Wholesale Trade
Hos	0,1	Industry: Hospitality
Util	0,1	Industry: Utilities

TI Participation Model Estimation Results

The estimation results from the TI Participation Model without PGE customers are given in Table 42. A likelihood ratio test yields a test statistic of over 388 with 20 degrees of freedom, indicating that the model has significant explanatory power.

The two utility-specific constants (SCE and SDGE) are positive and significant at less than one percent. PROCESS equipment was the only measure group in the model shown to have a positive effect on the decision to move from TA to TI, but this result was not significant. HVAC, OTHER, and OTHER_EMS equipment groups have the strongest negative effects on TI participation and are all statistically significant. This suggests that customers who were

recommended to implement these types of equipment changes in the audit stage are the least likely to continue on to the TI phase of the program. Customers in the agriculture, transportation, and wholesale industries have a negative effect on the decision to move from TA to TI. All other industry types in the model were shown to have positive effect on the move to TI. Of those industries, customers in the realty, public administration, and hospitality sectors are most likely to adopt recommendations made during the audit.

Table 42: TI Participation Model Estimation Results (N=570)

Variable Name	Coefficient Estimate	Standard Error	Significance Level
SCE	3.9	0.58	<1%
SDGE	2.5	0.53	<1%
HVAC	-0.92	0.38	2%
Lighting	-0.63	0.4	12%
HVAC_Lighting_EMS	-0.14	0.53	80%
Process	0.13	0.41	75%
Other	-1.1	0.28	<1%
Other_EMS	-1.2	0.58	4%
max_kw	-0.0016	0.00044	<1%
Ag	-0.84	1.5	56%
Arts	1.1	0.89	22%
MMC	0.89	0.54	10%
Tech	1.6	1.1	16%
PA	1.9	0.76	1%
Realty	2.5	1.1	2%
Retail	0.29	0.38	45%
Trans	-1.6	0.6	<1%
Whsle	-0.047	0.46	92%
Hos	1.9	0.82	2%
Util	1.5	1.1	20%

Table 43 shows the calculated relative importance statistics for each variable in the model. Max_kw has the most influence on TI participation, with a relative importance statistic value of 18 percent. Note that this represents a negative influence based on the coefficient estimate in Table 42. Whether or not the business is a customer of SCE has a 13 percent relative influence on the decision to participate in the TI phase of the program. Third in relative importance are being in the realty industry or being an SDG&E customer, which both have a relative importance statistic value of 8 percent. Both public administration and hospitality industries have relative importance values of 6 percent. All other variables in the model have relative importance values of 5 percent or less.

Table 43: TI Participation Model Relative Importance Statistics

Variable Name	Relative Importance
max_kw	18%
SCE	13%
Realty	8%
SDGE	8%
PA	6%
Hos	6%
Trans	5%
Tech	5%
Util	5%
Other_EMS	4%
Arts	4%
Other	4%
HVAC	3%
MMC	3%
Ag	3%
Lighting	2%
Retail	1%
HVAC_Lighting_EMS	0%
Process	0%
Whsle	0%

Discrete Choice Analysis Conclusions

The discrete choice model was designed as separate analysis task to complement the survey and interview findings. The model has the potential advantage of identifying influential factors from the participation data that hopefully corroborate results derived from other the evaluation tasks. To facilitate this, the discrete choice model coefficient estimates were used to calculate importance statistics for each variable included in the model to provide a more intuitive method for interpreting the model results.

The following are general conclusions are made from the discrete choice model exercise:

- The size of potential savings is a negative and relative important deterrent for adopting measures through the TI program. This is consistent with the findings from the survey and in-depth interviews where customers are concerned about the costs of the recommended measures, as higher kW savings are usually more expensive. This is also consistent with customer concerns regarding demand reduction strategies that

will have a significant effect on their business operations, as the more intrusive strategies are also more likely to have higher kW savings.

- Lighting/EMS measures are more likely to be adopted through the TI program, while EMS recommendations relating to HVAC or other measures are less likely. This is consistent with customer concerns about the degree to which demand is reduced, as lighting reductions will have less of an effect on customer comfort that HVAC controls.

- From both models, customers from SCE are more likely to adopt measures through the TI program than for the other participants. Without additional information included in the model, however, it is not possible to determine if this is due to program design aspects unique to SCE or whether there are other factors with SCE customers that are driving this results.

- Customers that are in the realty, public administration, hospitality, technology, and utility sectors are somewhat more likely to participate in the TI program. Conversely, customers in the transportation, wholesale, and agriculture industries are less likely to participate, which may be due to a greater sensitivity to power disruption in these industries.

4. PG&E AUTOMATIC DEMAND RESPONSE PROGRAM

PG&E's Automatic Demand Response (Auto DR) program was also evaluated as part of the larger TA/TI evaluation effort. Although participation in this program was limited, the Auto DR evaluation included the same analysis activities as TA/TI to the extent allowed by the data. Since this program is significantly different from traditional TA/TI, the evaluation methods and results are presented separately in this report.

The Auto DR program was a pilot program in 2005 and 2006 and became a commercialized PG&E program in 2007.[9] The Auto DR program utilizes a turn-key process through its Auto DR program implementer, Global Energy Partners (GEP). GEP subcontracts with a Third Party control and EMCS (Energy Monitoring and Control System) company to provide Technical Coordinators. Technical Coordinators are assigned to each Auto DR project to guide the customer through the entire automation process. The Technical Coordinators are paid up to $70/kW for their services and are responsible for:

- Assisting the customer in understanding the selected Auto DR control strategies for their facilities
- Assisting the customer in selecting the equipment vendors
- Participating in the verification of the installed Auto DR equipment
- Maintaining contact with the customer during the DR season to ensure that the Auto DR equipment is properly operating and that estimated load reductions are being realized.

Participants in the Auto DR program receive a field assessment to identify curtailable load that can be automated at the business site. The results are presented to the customer and the demand response measures to be implemented are formalized in an Implementation Plan. There are two types of Auto DR customers, hardware clients and software clients (and the majority are hardwire clients). For hardware clients, a CLIR (Client & Logic with Integrated Relay) box is installed at the facility site that automatically triggers a load curtailment during a demand response event. Alternatively, for software clients, a XML signal is sent directly to the site's Energy Monitoring and Control System. Participants receive financial incentives up to $300/kW reduction through the Auto DR program.

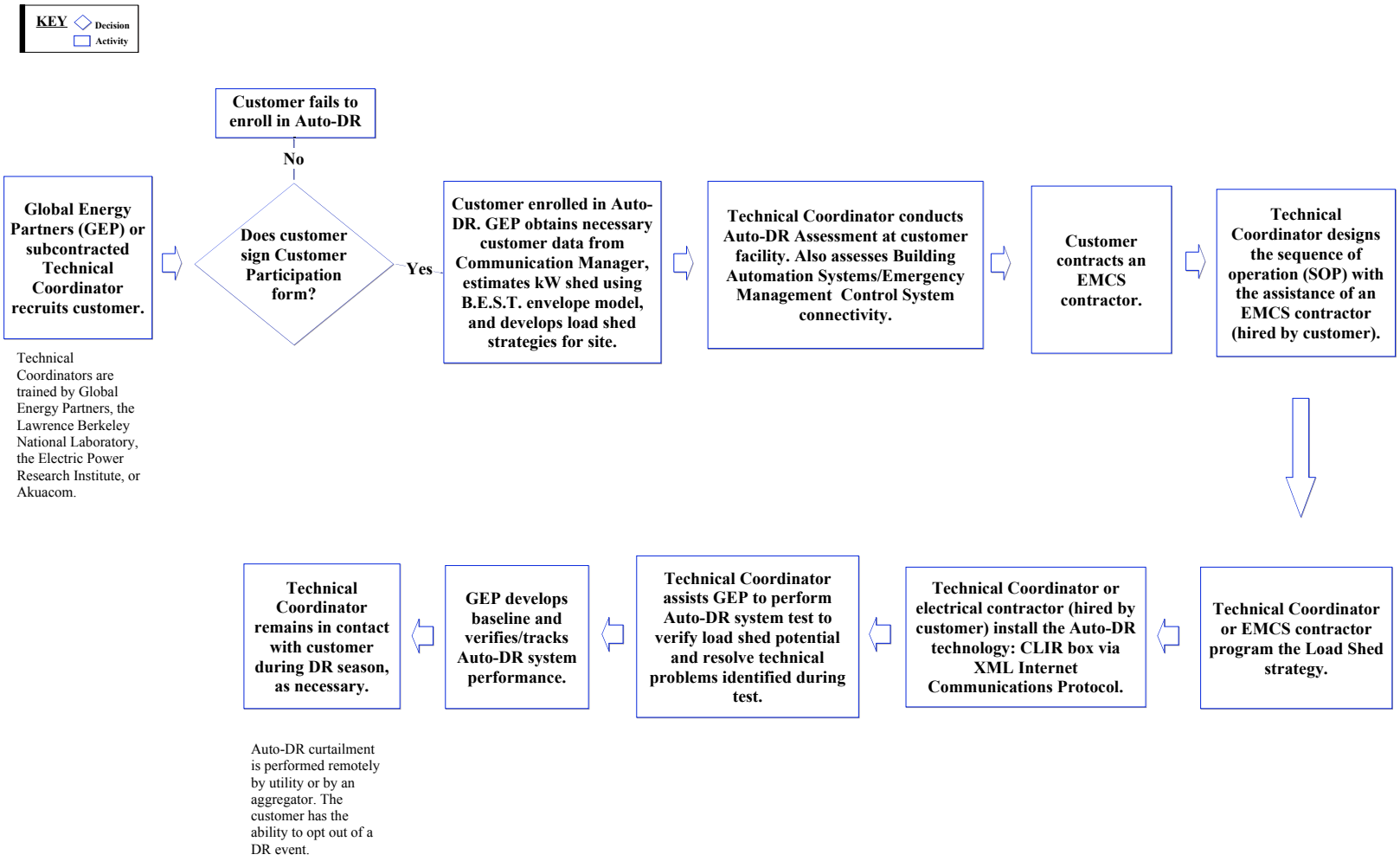
The evaluation tasks for the Auto DR program were the same as those for the overall TA/TI program evaluation. Due to limit sample, no participant phone surveys were conducted and only a small number of in-depth interviews (4) were completed. The in-depth interview results are supplemented by a Post-Auto DR Event survey fielded by PG&E to 11 of its Auto DR customers. Additionally, the evaluation team developed a process flow diagram for the Auto DR program and in-depth interviews were conducted with the firm contracted to implement the program.

[9] The Auto DR program is funded by the PG&E TA/TI program.

4.1 Process Diagram for Auto DR Program

The process diagram for the Auto DR program is presented in Figure 19, which traces the basic path to complete the program from start to finish. As with the standard TA/TI programs, diamond-shaped boxes represents decision points, where the customer must make a decision to continue with the demand reduction project. If "no" is chosen at this point, the customer drops out of the program. In the Auto DR program, the only decision point is enrollment in the program. The subsequent steps are mandatory.

Figure 19: PG&E Automatic Demand Response Program Process Diagram



4.2 AUTO DR PARTICIPANT IN-DEPTH INTERVIEWS

The primary evaluation task for the Auto DR programs was in-depth interviews with program participants. This section presents the interview results from the four in-depth interviews conducted in March 2008. The same survey instrument was used for these interviews as with the standard TA/TI program.

Table 44 shows the Auto DR participant sample available for the evaluation. In most cases, a single participant would represent multiple sites within a store chain or franchise. Of the total of 23 participants in the program covering 81 different sites, PG&E offered a sample of 19 customers—all of which had contact information—and ultimately four were recruited for an in-depth interview.

Table 44: Auto DR In-depth Interview Sample

Auto DR Group	Number of Contacts	Number of Sites
PG&E's Auto DR customer list	19	71
Number with contact information	19	71
Number recruited for in-depth interviews	4	31

Recommended Measures

Table 45 shows the frequency of recommendations among the four measure categories: HVAC, lighting controls, process systems, and other. The four Auto DR respondents received a combined total of 14 recommended demand response measures. The most common type of recommendations were for HVAC and process systems.

Table 45: Recommended Measures, By Category

Measure Category	Percent (N=14)
HVAC	43%
Lighting Controls	14%
Process Systems	43%
Other	0%

Table 46 shows the breakdown of these recommended measures among more specific categories.

Table 46: Recommended Measures, More Specific Categories

Measure Category (14 measures total)	Percent (N=14)
Adjust/Reprogram/Install Energy Management System to control HVAC systems (N=3)	21%
Cycle/Curtail/Shut Down HVAC UNITS to create Temperature set point adjustment (N=3)	21%
Adjust/Reprogram/Install Energy Management System to control lighting (N=1)	7%
Curtail the usage of lighting or shut lighting off completely (N=1)	7%
Shutting down process equipment (Motors, Pumps, Refrigeration, Elevators) entirely during DR hours or delaying activities until to off-peak hours (N=6)	43%
Shutting down process equipment (Motors, Pumps, Refrigeration, Elevators) entirely during DR hours or delaying activities until to off-peak hours (N=6)	43%

Influence of Incentive

Auto DR participants were asked how influential the Technology Incentives were on their decisions to join the program and implement the measures. Table 47 shows that three of the four Auto DR respondents found the incentive very influential on their decisions. The respondent who said that the incentive was not influential said that he already had most of the equipment in place and the software programming that was needed was not covered by the incentive.

Table 47: Influence of the Incentive Amount in Decision

Response	Percent (N=4)
Very Influential	75%
Somewhat Influential	0%
Not Influential	25%
Don't Know	0%

Value of Audit Report

Furthermore, respondents were asked about the usefulness of their audit reports. As shown in Table 48, one of the Auto DR respondents said that the report was useful, but that his "facility manager is a certified energy manager and knew as much or more than the auditors." The other three respondents did not remember or said that they did not receive a formal report because that is not part of the Auto DR process.

Table 48: Usefulness of Audit Report

Response	Percent (N=4)
Very Useful	0%
Useful	25%
Not Useful	0%
Don't Know or N/A	75%

In addition, Table 49 shows that three of the respondents in the PG&E Auto DR program said that the final measures were practical and appropriate for their business operations. One said that this screening was not done at first ("with a tech company, data center temperatures can not be adjusted."), but the facility manager worked with the auditor to fine tune the recommendations. Other comments included: "very collaborative, was a working relationship" and "very well done, it was part of the process not to have those."

Table 49: Impractical Measures Screened Out?

Response	Percent (N=3)
Yes	100%
Somewhat	0%
No	0%

As shown in Table 50, all of the Auto DR respondents said that their reports adequately described the cost of each measure.

Table 50: Report Adequately Described Cost of Each Measure?

Response	Percent (N=4))
Yes	100%
No	0%
Don't Know	0%

Role of the Auditor

Similarly, Table 51 shows that all of the Auto DR respondents said that their auditors helped them to understand the audit recommendations.

Table 51: Auditor Help You Understand Audit Recommendations?

Response	Percent (N=4)
Yes	100%
No	0%
Don't Know	0%

Table 52 shows that two of the Auto DR respondents said that their auditors were knowledgeable about all the relevant issues concerning the audit recommendations and possible next steps. The other respondent said that his company served as was one of the first pilot programs and that his audit "was not representative of the current audits because it was so long ago."

Table 52: Auditor Knowledgeable About Recommendations & Next Steps?

Response	Percent (N=3)
Yes	67%
No	0%
N/A	33%

In the interviews, the respondents were also asked if they would have liked to receive any additional information during their discussions with their auditors. One Auto DR respondent said that he would have liked to hear about "case studies of success stories, not just equipment handouts."

Table 53 shows that after their audits, all four of the Auto DR respondents felt that they had an adequate understanding of demand response and the various program opportunities. PG&E customers are provided with a description of the current PG&E demand response programs in their audit reports. The interviews explored the helpfulness of this section of the audit report. Only one Auto DR customer had trouble with the descriptions; he said that the information about "calculating the benchmark" was confusing. Another respondent mentioned that the description was "better than the first time is was presented to them, in 2003."

None of the Auto DR respondents mentioned any concerns about moving forward.

Table 53: Understand Demand Response Program Opportunities?

Response	Percent (N=4)
Yes	75%
No	0%
N/A	25%

Customer Satisfaction

Table 54 shows how the Auto DR respondents rated their satisfaction with various aspects of the program. Three respondents were extremely satisfied or satisfied in every category. The other respondent, however, rated all categories as somewhat or extremely dissatisfied or N/A. This respondent was primarily unhappy with his engineering consultant and offered the following comments:

- Application Process: Very disappointed, they created a lot of unnecessary hoops. Has not received all of their payments.
- Scheduling Process: Had to audit every site, but did not receive additional payment for this.
- Time to Complete Audit: The third party slowed down the [audit review] process.
- Professionalism of Auditor: Third party made lots of last minute changes
- Incentive Payment: Took way too long and haven't received all of their funding.
- Overall Satisfaction: Third party is just getting in the way.

Table 54: Satisfaction with Auto DR Program

Program Aspect (N=4)	Extremely Satisfied	Satisfied	Neutral	Somewhat or Extremely Dissatisfied	N/A
Application Process	50%	25%	0%	25%	0%
Audit Scheduling Process	75%	0%	0%	25%	0%
Time to Complete Audit	75%	0%	0%	25%	0%
Professionalism of Auditor	75%	0%	0%	25%	0%
Audit Clarity/Usefulness	25%	50%	0%	0%	25%
Incentive Payment Process	50%	25%	0%	25%	0%
Overall Satisfaction	75%	0%	0%	25%	0%

Post-Auto DR Event Survey Results

PG&E also surveyed 11 of its Auto DR customers after they had experienced a demand response event and the results of this survey are summarized in this section.

All the respondents said that their firm was informed of the demand response event (and 10 out of the 11 were personally informed) through e-mails. Additional alerts took the form of text messages (3), phone calls (3), pagers (2), Orb (1), faxes (1), or paper notifications (1). Almost all (10 out of 11) respondents were alerted through multiple communication mediums. Two respondents indicated that there were too many reminders:

- "One text is sufficient. Please cease texting me multiple times."

- "Seven e-mails and 11 faxes. A little overkill."

In addition, nine of the 11 customers said that they informed their employees about the event, primarily through a general employee e-mail (seven sites), and other alerts included orb and verbal communication (one site) and posters (one site).

As shown in Table 55, most customers (73 percent) said that they noticed a difference (lighting change, zone temperature) in their facilities during the demand response events. Similarly, the majority of customers said that their employees noticed a difference.

Table 55: Physically Notice A Difference?

Response	Self-Report of Customer Percent (N=12)	Customer Perception of Employees Percent (N=12)
Yes	73%	64%
No	9%	9%
Don't know	18%	27%

Moreover, as shown in Table 56, nine of the 11 respondents said that their demand response strategies worked as planned, seven of which had verified correct operation by checking their EMS systems (3), reviewing energy consumption data (2), using Trane Software (1), and unspecified (1). Another respondent said he did not know and the other said that the strategy did not work quite right, as the "load decreased a small amount between noon and three and significantly between three and six."

Table 56: Demand Response Strategy Worked As Planned?

Response	Percent (N=12)
Yes	82%
No	9%
Don't know	9%

The majority (seven out of 11) of respondents said that they heard complaints, comments, or concerns from their employees or customers. Most comments addressed the change in temperature. Three respondents said that they heard from some employees that the building was too warm at certain points, but none of these respondents indicated that it was a significant issue. Alternatively, two respondents said that their employees appreciated the higher building temperature. The other two comments heard were procedural: One respondent said that some staff members complained that they were not informed that the event was occurring and the other respondent said that there was some concern among staff members that the load curtailment would be a permanent setting.

Three respondents reported that they had operational issues with the demand response strategy, two of which were technical problems with their demand response equipment (computer that runs XML program was having power issues and the T1 line was down). The other respondent found the frequency of demand response events to be problematic: "With so many events called in a row, we were not able to make our whole time frame goal for the fifth day…Please let it be known that so many events all in a row are very costly and make compliance difficult."

Six of the respondents implemented additional measures to further reduce their electrical demand using manual methods during the demand response event. Two respondents asked their employees turn to off unnecessary lighting (although both were unsure how well their staffs followed the request), and two others said that they took measures to reduce the lighting load. Other manual measures included shutting down nonessential equipment such as laboratory equipment (one site) and forklifts (one site). Another respondent turned off five RTUs and raised the cooling set point two degrees for units in his core sales area.

4.3 AUTO DR EVALUATION CONCLUSIONS

The following are general conclusions that can be drawn from the in-depth interview results and the Post-Auto DR Event survey:

- **Satisfaction with the Auto DR program is high.** Three of the four interviewed respondents in the PG&E Auto DR program were extremely satisfied or satisfied in every category. The fourth respondent had problems with his engineering consultant, resulting in frequent delays.

- **The incentive is important to encourage participation.** Three of the four respondents said that the incentive was very influential. The other respondent already had the hardware in place, and the incentive would not apply to the software upgrades he needed.

- **Auto DR auditors work closely with their customers to determine appropriate measures and to explain the associated costs of each measure.** Respondents in the PG&E Auto DR program said that the final measures were practical and appropriate for their business operations (the other respondent did not answer). All of the Auto DR respondents said that their reports adequately described the cost of each measure.

- **Respondents report that their auditors helped them to move forward with the recommendations.** Auto DR respondents said that their auditors helped them to understand the audit recommendations, the auditors were knowledgeable about the next steps, and that they had an adequate understanding of demand response after their audits.

- **The demand response events are generally running smoothly for surveyed participants.** All 11 firms were informed of the demand response event, often through multiple communication mediums. Nine of the 11 respondents said that their demand response strategies worked as planned and none of the respondents reported any significant complaints from employees or customers. However, one respondent was dissatisfied with the frequency of demand response events which becomes "costly and

makes compliance difficult." Two other respondents had technical issues with their demand response equipment.

5. EVALUATION ASSESSMENT

The previous sections of this report have presented results from several independent analysis tasks. To assist with the interpretation of these results, this section is designed to synthesize the findings from these various research efforts.

In general, participants have been satisfied with their experience with both the TA and TI program components. At least 70 percent of respondents were satisfied or extremely satisfied across all categories. The majority of participants (77 percent) also found the audit to be useful or very useful. The high levels of satisfaction were consistent across utilities. Because this is the first time the TA/TI program has been evaluated, a disproportionate amount of time in this evaluation is spent discussing areas of dissatisfaction and potential program improvements. While much of the evaluation focuses on these issues, it is important to keep in mind that the vast majority of participants report that they have been satisfied with their program experience.

A key question explored in phone surveys and in-depth interviews was why participants chose to reject some or all of the recommendations received from the TA audit. Phone survey respondents said that they rejected measures primarily because they were too expensive and because they interfered with business operations. Similarly, in-depth interview participants most frequently rejected measures because they would impede business operations or because they received no follow-through from the auditor or utility representative. In several cases, respondents said that they received the paper audit report, but never sat down with the auditor or utility representative to discuss it, and therefore did not know how to move forward. Only 30 percent of the 38 interviewees said their auditors encouraged them to implement the measures. Many in-depth interview respondents also mentioned the high cost of the recommended measures as a reason for rejecting measures. This was consistent with the discrete choice analysis, where the large impact projects (and therefore more costly) were a deterrent to adopting the recommendations.

During the phone survey, TA participants were asked to rate their satisfaction with various elements of the TA/TI process and, as discussed above, the majority of participants were satisfied with all the aspects of the program. However, a substantial share of phone survey respondents from both utilities (20 percent of SDG&E respondents and nine percent of SCE respondents) expressed some dissatisfaction with the usefulness of the audit report. The usefulness of the audit report was also rated with one of the highest levels of dissatisfaction in the in-depth interviews. Some respondents were also dissatisfied with how well audit recommendations took into account their business operations.

Findings from the in-depth interviews point to several areas in which the audit report can be improved so that it is more useful for the customer and encourages action. First, a significant share (40 percent) of interviewees said that their audit reports contained impractical measures that did not fit their business operations. In addition, about half said that their audit reports did not adequately describe the cost of each recommended measure. When asked what they would add to the audit report, many respondents said that they would like a section of the report to explain the next steps (installing the measures, applying for incentives, and enrolling in demand response programs). Another frequent request was a more detailed breakdown of the costs and savings for each measure. A more user-friendly audit report that clearly details the costs and savings associated with the measures and the next steps to move forward may help to alleviate

ambiguity about the financial feasibility of each measure and uncertainly about how to move forward. The high rate of respondents who received audit reports with recommendations that did not fit their business models also indicates that more should be done to filter out unsuitable measures.

As with the participant phone surveys and in-depth interviews, a main area of inquiry with the auditor interviews was identifying the major barriers that stop customers moving from TA to TI. From the auditor perspective, common barriers included the upfront cost of equipment installation and lack of understanding of the technical requirements of demand response. The latter implies that more structured post-audit handholding is necessary to guide customers from TA to TI, which is also reflected in previous participant comments about a need for increased follow-through from the auditor or utility representative. A more detailed explanation—in person and in the report itself—of the costs and available incentives for each measure may also help to minimize measure rejection due to high equipment/installation costs.

In addition, the top area of dissatisfaction for SCE respondents was the amount of time taken to complete the audit (11 percent), specifically referring to the long lag time between the walk-through audit completion date and receiving the final audit report. The long lag times were also mentioned in the in-depth interviews among SCE respondents. Some of the SCE interviewees also requested a more comprehensive audit that looked for more demand response and also energy efficiency opportunities. However, some of these respondents were already participating in the TI program and therefore had a natural desire for more information. A more general comment received from the phone survey (involving customers that are not in the TI program) is that the audit report is too complicated. This latter finding indicates a need for more program assistance for the customer in understanding their demand response opportunities.

In addition, the interviewees said that customers are hesitant to give up control of the decision-making power in their facilities and prefer the ability to decide when and if they will participate in a demand response event. Interestingly, ride-along observations at seven facilities presented contrary results. The potential loss of control and flexibility during demand response events did not raise much concern at each of these facilities. However, these ride alongs were completed with customers that had already agreed to adopt the recommended measures and therefore are by definition more comfortable with the demand reduction strategies proposed.

The auditor interviews also probed the level of pre-audit discussion that took place between the auditor and the facility staff. Interviewed auditors reported that they discuss customer business and operational requirements extensively before conducting the audit, and all said that customer and employee comfort and productivity were the top two priorities for facility personnel. Moreover, most auditors were in agreement about the importance of obtaining corporate buy-off prior to conducting the audit in order to increase the probability and ease of measure adoption. These interview results indicate that many auditors do engage in extensive pre-audit work so that they can provide valuable recommendations and to increase the chances of measure adoption.

Auditors were also asked about the extent that they educate and encourage customers to participate in demand response activities. Results indicate that many auditors do explain the audit recommendations, but few educate and explicitly encourage their customers to participate in demand response programs. The exception is the turn-key model of the TA/TI program, in which

the auditing firm also works with the client to install the equipment and participate in the demand response event.

From these various data collection activities, several overarching needs for the TA/TI program are apparent:

- Audit reports that take better account of each customer's business operation
- More assistance for customers trying to navigate through the program
- Shorter time periods between the various stages of the program, including delivery of the audit report to the customer
- More information on the likely costs of the recommended measures

One way to address all these issues is to move toward a turn-key model for the TA/TI program, similar to the option currently available for PG&E. With the turn-key model, the auditing firm would provide more continuous support to the customer, which will help navigate the process needed to go from TA to TI. The auditing firm will also be able to provide information on measure costs at the beginning of the process, as well as assist with identifying incentives available from other programs. The turn-key approach also appears to be more in-tune with customer business operations, as the customer are basically agreeing at the beginning to do the audit and accept at least a portion of the recommended measures. The turn-key design approach should also shorten the time between audit and measure installation as the same firm will handle both components. Finally, a turn-key approach would also allow for more guidance to be provided to the customer on how to interpret the audit report.

6. CONCLUSIONS AND RECOMMENDATIONS

The following are conclusions and recommendations developed from the evaluation research presented in this report. In addition to the overall program recommendations, we have also included recommendations for future evaluation research.

6.1 CONCLUSIONS

The following are general conclusions drawn from the TA phone survey data (SCE and SDG&E customers only):

- **In general, customers had high levels of satisfaction with the TA/TI Program and found the audit to be useful.** At least 70 percent of respondents were satisfied or extremely satisfied across all categories. The majority of participants (77 percent) also found the audit to be useful or very useful.

    - SDG&E respondents were on average satisfied with various aspects of the TA program. Satisfaction levels for different areas ranged from 62 to 94 percent. Respondents were most satisfied with the courteousness and professionalism of the TA auditors who performed the audit (94 percent of respondents were either somewhat or very satisfied), the ease with which they scheduled their TA audit (90 percent satisfaction) and the amount of time taken to complete the audit (90 percent).

    - SCE respondents were on average satisfied with various aspects of the TA program. Satisfaction levels ranged from 75 to 91 percent. Respondents reported three areas where satisfaction equaled 91 percent: clarity of information received from the TA audit, how well audit recommendations took into account business operations, and the courteousness and professionalism of the TA auditors.

- **Areas of dissatisfaction for the two utilities varied, though the usefulness of information received from the TA audit ranks high in dissatisfaction for both.**

    - For SDG&E respondents, the top two areas of dissatisfaction include the usefulness of information received from the TA audit (20 percent of SDG&E survey respondents reported being either somewhat or very dissatisfied with this satisfaction area) and how well audit recommendations took into account business operations (also 20 percent dissatisfaction).

    - The top area of dissatisfaction for SCE respondents was the amount of time taken to complete the TA audit (11 percent dissatisfied) and the usefulness of information received from the TA audit (nine percent of respondents were dissatisfied).

    There were several recurring issues brought up by respondents.

    - A need to make recommendations more viable and business-specific

- The report taking a long time to arrive (mostly SCE respondents)
- Lack of follow through by the utility/auditor (mostly SCE respondents)

- **The four largest areas of concern by survey respondents with regard to moving forward to the implementation phase are the same between utility groups.** The top four concerns are as follows:
  - Customer discomfort during demand response events (60 percent of SDG&E survey respondents and 46 percent of SCE respondents)
  - The disruption of business operations (57 percent of SDG&E respondents and 53 percent of SCE respondents),
  - Energy savings not being worth the cost of implementing audit recommendations (55 percent of SDG&E respondents and 55 percent of SCE respondents)
  - Energy savings claims being overstated (43 percent of SDG&E respondents and 42 percent of SCE respondents).

The following are general conclusions drawn from the other evaluation tasks and are applicable to all three utilities:

- **Respondents accepted 53 percent of the recommendations they received.** The most frequently recommended type of measure was for process systems but the most frequently implemented measure was lighting. The top two reasons respondents reject recommendations are that the measures interfere with an optimal business environment and that the customer does not know how to move forward with the recommendations.

- **Many SCE respondents received recommendations that did not align with their daily business operations.** Most SDG&E and PG&E respondents said that impractical measures that did not fit their business model were screened out, but 56 percent of SCE respondents received audit reports with some or many unreasonable recommendations. 28 percent of SCE respondents said that their audit recommendations were completely inappropriate for their business operations.

- **About half of in-depth interview respondents said that their audit report did not adequately describe the cost of each recommended measure.** Furthermore, many respondents mentioned that they would like specific information on dollar costs and savings for each measure.

- **Customers desire more assistance with following through with the TA recommendations.** Only 30 percent of respondents said their auditors encouraged them to implement the measures. Instead, in some cases, the Account Executives provided further information about incentives and demand response programs. Specifically, many SDG&E respondents said that their primary concern about moving forward with the recommendations was that they were uncertain about what to do after they received their

audit reports. Requests for further guidance on how to move forward and implement recommendations were also common suggestions for how to improve the program.

- **PG&E Auto DR participants report that they are satisfied with the process and received sufficient support and guidance from their auditors.** Three of the four interviewed respondents in the PG&E Auto DR program were extremely satisfied or satisfied in every category. Respondents said that the final measures were practical and appropriate for their business operations, their auditors helped them to understand the audit recommendations, and the auditors were knowledgeable about the next steps.

- **Customers are hesitant to give up control of the decision-making power in their facility and prefer the ability to decide when and if they will participate in a demand response event.** This is an important point to consider when addressing a customer's viability for automated demand response. Even with the override capability, and given the choice to opt out of a demand response activity, most manufacturers are still not open to fully automated demand response, especially if it means reducing production.

- **Shifting operations to off-peak hours and curtailing HVAC and lighting are popular demand response measures**. In the commercial sector, the most frequent demand response opportunities tend toward increasing temperatures during demand response events to relieve HVAC systems and curtailing a building's lighting load. In the industrial sector, auditors tend to focus more on identifying loads that can be shifted as much as possible to off-peak hours.

- **Audit recommendations for lighting controlled by an energy management system are most likely to be adopted by customers.** Results of the discrete choice Measure Model showed that this measure recommendation group was relatively more likely to be accepted by customers. This is also consistent with other evaluation findings that showed that customers preferred lighting measures and generally preferred recommendations (like lighting) that would be less disruptive to their business operations. This finding is tempered by the fact that the amount of demand response potential identified (maximum kW) had a negative influence on program participation, which is likely reflecting the associated higher costs and greater perceived disruption associated with the higher impact recommendations.

6.2 RECOMMENDATIONS

Based on the conclusions above and the evaluations findings presented earlier in this report, we offer the following recommendations for the TA/TI Program:

- **Move toward a more turn-key program design, where more and continuous assistance is available to customers at each stage of the program.** A turn-key approach would help minimize or eliminate completely several of the issues discussed by participants. Specifically, the turn-key approach would address customer desire for more assistance with the program process, provide an audit report that is tailored more to customer concerns regarding business operations, provide more information on measure

costs, and result in a faster progression from the audit stage to the measure implementation stage.

The following recommendations relate to adjusting the current program design:

- **Develop a business information form for participants to fill out prior to the initial TA audit.** This form would collect information on business operations and equipment holdings to assist the auditor in where to look for potential demand savings. Part of this form should be a set list of questions that will identify areas where customers will not consider any form of demand response. Completing a short questionnaire will help address the issue of auditors not understanding business operations and avoid making recommendations that customers do not view as viable options given their type of business.

- **Develop a standard audit process with a checklist of areas that must be assessed during the audit.** Given the audit payment structure based on $/kW of DR potential identified (for SCE and SDG&E), some auditors indicated that they were reluctant to spend extra time searching for additional demand response opportunities if it seemed unlikely that this would be productive. That is, the auditors are reluctant to spend additional time in audits searching for incremental demand response potential if the extra time spent may not result in additional kW (and consequently a higher payment for the auditor). This increases the likelihood that some viable demand response opportunities will be missed as the auditor focuses more on the easily identified opportunities.

  The business questionnaire from the previous recommendation could also be used to structure the audit. Based on the business and building characteristics, a required review list for the audit covering end uses and equipment can be developed for each customer that the auditor must follow during the audit. This will help ensure that all of the reasonable potential demand response opportunities are investigated.

- **Develop a standard and consistent process for following up with customers after they have completed the TA audit.** A common complaint among TA participants was that there was no follow up or assistance in moving on to the next phase of the program. This tended to stall the participation process as customers did not know how to apply for TI incentives. Each program should assign a specific person to follow up with the customer after the audit to assist them with getting the recommended measures installed and enrolling in the TI program component.

- **Create a consistent tracking database for both TA and TI program participants.** A better database is needed for tracking participation, documenting recommended measures in detail, and tracking participation status. For this evaluation, much of the data needed had to be entered by hand from the original TA audit reports as detail on the audit recommendations was not consistently tracked electronically by the utilities. For the TA program phase, this database should also include a field to record when the audit report was sent to the customer.

- **Provide more information on the expected measure costs and savings as part of the TA audit.** Customers indicated that they would like to have a better understanding of the equipment costs and expected energy savings benefits associated with the audit recommendations. Additionally, respondents in the TA phone survey indicated that saving energy and money were the two primary reasons that the implemented the recommended measures from the audit. Providing additional information in this regard should help increase the numbers of participants moving from TA to the TI phase. For those measures that will vary substantially across applications, a range of cost and savings values adjusted by building type and size could be provided.

- **Deliver the audit reports more quickly to the customers.** Several respondents discussed their dissatisfaction with the audit reports: either they never received them, received them very late or the audit report content was not what they expected or desired. The program should work to improve how quickly the reports are provided to the customer in order to capitalize on any momentum that is built during the audit. The utility company and the contractors should clearly describe to participants how the audit reports are compiled and when the participant should expect to receive it. This issue has stalled measure adoption and is a major obstacle to moving between the TA and TI phases of the program.

In addition to program recommendations, we also offer the following recommendations for future TA/TI Program evaluations:

- **Conduct more customer interviews and surveys and include adequate up-front customer notification to facilitate this process.** The most valuable information from this evaluation was obtained from the TA participant phone survey and the TA/TI in-depth interviews where each element of the audit report and auditing process was discussed. These should be continued in future evaluations.

  To prevent customer complaints, a letter should be sent alerting participants prior to fielding the survey or recruiting for in-depth interviews. This will also help increase the participation in the survey as well as help identify early those customers that do not wish to respond. Having a larger participant population from which to draw sample will also decrease the likelihood of customer complaints.

- **Eliminate load shed test observations from the process evaluation.** The four that were observed in this evaluation were too varied to allow for drawing general conclusions. While the load test observations (or at least a review of the load shed test report) is of use for an impact evaluation, it seems to have limited value for a process evaluation.

- **Attempt audit ride-alongs for visits that involve the initial contact between the auditor and the customer.** This will allow the evaluation to observe first-hand how the program is being promoted and customer concerns and initial reactions. Ride-alongs that are done later in the audit process after the customers have agreed to the program and are comfortable with the auditor are of less value to the evaluation.

7. APPENDIX A: INTERVIEW GUIDES AND SURVEY INSTRUMENTS

TA PARTICIPANT PHONE SURVEY INSTRUMENT

S1. Hello, my name is _____ and I am calling from Itron. May I speak with [READ CONTACT NAME]?

If contact is not available, ask for best time to call back.

CALL BACK DATE/TIME: _____

This study is being conducted on behalf of [UTILITY].

We are conducting a study on the Technical Assistance and Technology Incentive program. Our records show that you recently and a Technical Assistance Audit performed through this program to identify ways to reduce your energy use during peak usage times. We are calling to get feedback on your experience with this program and we estimate the interview will take about ten minutes. All responses you provide will be confidential.

Our records show that you had a Technical Assistance Audit done in [MONTH] of [YEAR], is this correct?

1. Yes
2. No (Get correct date)
3. Don't Know / Refused [THANK AND TERMINATE]

Participation

1. How did you first hear about the Technical Assistance and Technology Incentive Program - also known as the TA/TI Program?

1. Contractor
2. Utility rep / Account executive
3. Utility website
4. Other energy efficiency program
5. Demand response program
6. Friend / Coworker
7. Equipment Vendor
8. Trade association
9. Other (Specify):_____
10. Don't know

2. Why did you decide to have the Technical Assistance Audit done?

1. Save energy
2. Audit was free
3. Concern for the environment
4. Will receive more incentives for my demand response programs
5. Was already planning to purchase new equipment, wanted to see what rebates are available
6. Other (Specify):_____

3. How many hours did the Technical Assistance Audit take to complete?

[NUMBER]

4. Did you choose your own Auditor or did you use the auditor provided by the utility?

1. Used my own auditor
2. Used auditor provided by my utility
3. Don't Know

5. Have you implemented any of the recommendations included in the audit?

1. Yes
2. No
3. Don't Know / Refused

6. Are there recommendations in the audit that you have not done?

1. Yes
2. No
3. Don't Know / Refused

7. Why did you decide not to implement these recommendations?

1. Did not believe they would save energy claimed
2. Did not understand recommendation
3. Interfere with daily business practices
4. Too expensive/initial cost is too high
5. Could not find contractor to install equipment
6. Do not have time
7. Rebates offered not large enough
8. Rebate payments take too long
9. Too much paperwork
10. Concerned about customer or employee comfort
11. Need approval from corporate office / owner
12. Do not think they are necessary
13. Other (Specify)

8. For the recommendations you have not done, do you plan on implementing any in the future?

1. Yes

2. No [SKIP to Q10]

3. Don't know [SKIP to Q10]

9. When?

1. Within the next month
2. Within the next 3 months
3. Within the next 6 months
4. Within the next year
5. Within the next 2 years
6. Longer than 2 years
6. Don't know

10. [IF NOT OBVIOUS FROM ABOVE, ASK] Did you purchase any new equipment as a result of the Technical Assistance Audit?

1. Yes (Specify):_____
2. No [SKIP TO 13]
3. Don't Know [SKIP TO 13]

11. Have you applied for the Technology Incentive for this equipment (any equipment purchased as a result of the Technical Assistance Audit)?

1. Yes [SKIP TO 13]
2. No
3. Don't Know [SKIP TO 13]

12. Why have you decided not to apply for the Technology Incentive for this equipment?

[MULTIPLE RESPONSE]

1. Got incentive from a different program
2. Equipment didn't qualify for TI incentive
3. Application was refused
4. Application process is a hassle
5. Have to wait too long to receive incentive check
6. Did not want to join a Demand Response program
7. Just wanted the free audit
8. Load Shed test has not been performed
9. Interfere with daily business practices
10. Need approval from corporate office
11. Don't have time
12. Other (Specify):_____
13. Don't know

13. Are you enrolled in a Demand Reduction program such Critical Peak Pricing or Demand Bidding?

1. Yes
2. No [SKIP TO 16]
3. Don't Know / Refused [SKIP TO 16]

If Yes, ask:

14. Which program?

1. Automated DR
2. Peak Day Credit Program for Business
3. Critical Peak Pricing
4. Demand Bidding Program (DBP)
5. Capacity Bidding Program (CBP)
6. Time of Use Base Interruptible Program (TOU-BIP)
7. Stand by Generator Programs
8. Optional Binding Mandatory Curtailment (OBMC)
9. Scheduled Load Reduction Program (SLRP)
10. Other (Specify):_____
11. Don't know

15. Did you enroll in the program(s) PRIOR to having the Technical Assistance audit done?

1. Yes
2. No
3. Don't Know / Refused

Barriers

Some people may have doubts or reservations about purchasing energy efficient equipment or implementing some of the recommendations made in the Technical Assistance Audit. Please tell me if any of the follow items are a concern for you:

16. Finding a qualified contractor to install equipment recommended in the Technical Assistance Audit?

1. Yes
2. No
3. Don't Know

ASK IF PREVIOUS Q=1

17. How big of a concern is this, is it…?

1. Major concern
2. Moderate concern
3. Minor concern

18. Being able to find parts or a qualified repairman to maintain equipment?

1. Yes
2. No
3. Don't Know

ASK IF PREVIOUS Q=1

19. How big of a concern is this, it is…..?

1. Major concern
2. Moderate concern
3. Minor concern

20. Energy savings claims being overstated?

1. Yes
2. No
3. Don't Know

ASK IF PREVIOUS Q=1

21. How big of a concern is this, is it…?

1. Major concern
2. Moderate concern
3. Minor concern

22. Energy savings not worth the cost of implementing the recommendations?

1. Yes
2. No
3. Don't Know

ASK IF PREVIOUS Q=1

23. How big of a concern is this, is it…

1. Major concern
2. Moderate concern
3. Minor concern

24. Disruption of business operations?

1. Yes
2. No
3. Don't Know / Refused

ASK IF PREVIOUS Q=1

25. How big of a concern is this, is it…

1. Major concern
2. Moderate concern
3. Minor concern

26. Customer discomfort during demand response events?

1. Yes
2. No
3. Don't Know / Refused

ASK IF PREVIOUS Q=1

27. How big of a concern is this, is it…

1. Major concern
2. Moderate concern
3. Minor concern

28. Incentive payments are spread out over time?

1. Yes
2. No
3. Don't Know / Refused

ASK IF PREVIOUS Q=1

29. How big of a concern is this, is it…

1. Major concern
2. Moderate concern
3. Minor concern

Satisfaction

Next, I'd like you to rate your satisfaction with various aspects of the Technical Assistance Program and the audit process. For each question I read, please tell me if you are very satisfied, somewhat satisfied, neither satisfied nor dissatisfied, somewhat dissatisfied, or very dissatisfied.

30. How satisfied are you with the ease of scheduling the Technical Assistance Audit?

1. Very satisfied
2. Somewhat satisfied
3. Neither satisfied nor dissatisfied
4. Somewhat dissatisfied
5. Very dissatisfied
6. Don't Know

ASK IF PREVIOUS Q=4 OR 5

31. In what ways were you not completely satisfied?

[OPEN END]

32. How satisfied are you with the application process for the Technical Assistance Audit?

1. Very satisfied
2. Somewhat satisfied
3. Neither satisfied nor dissatisfied
4. Somewhat dissatisfied
5. Very dissatisfied
6. Don't Know

ASK IF PREVIOUS Q=4 OR 5

33. In what ways were you not completely satisfied?

[OPEN END]

34. How satisfied are you with the amount of time taken to complete Technical Assistance Audit?

1. Very satisfied
2. Somewhat satisfied
3. Neither satisfied nor dissatisfied
4. Somewhat dissatisfied
5. Very dissatisfied
6. Don't Know

ASK IF PREIOUS Q=4 OR 5

35. In what ways were you not completely satisfied?

[OPEN END]

36. How satisfied are you with the clarity of the information you received from the Technical Assistance Audit?

1. Very satisfied
2. Somewhat satisfied
3. Neither satisfied nor dissatisfied
4. Somewhat dissatisfied
5. Very dissatisfied
6. Don't Know

37. How satisfied are you with the usefulness of the information you received from the Technical Assistance Audit?

1. Very satisfied
2. Somewhat satisfied
3. Neither satisfied nor dissatisfied

4. Somewhat dissatisfied
5. Very dissatisfied
6. Don't Know

ASK IF PREIOUS Q=4 OR 5

38. In what ways were you not completely satisfied?

[OPEN END]

39. How satisfied are you with how well the audit recommendations took into account your business operations?

1. Very satisfied
2. Somewhat satisfied
3. Neither satisfied nor dissatisfied
4. Somewhat dissatisfied
5. Very dissatisfied
6. Don't Know

ASK IF PREVIOUS Q=4 OR 5

40. In what ways were you not completely satisfied?

[OPEN END]

41. How satisfied were you with the courteousness and professionalism of the auditors who performed the Technical Assistance Audit?

1. Very satisfied
2. Somewhat satisfied
3. Neither satisfied nor dissatisfied
4. Somewhat dissatisfied
5. Very dissatisfied
6. Don't Know

ASK IF PREVIOUS Q=4 OR 5

42. In what ways were you not completely satisfied?

[OPEN END]

43. How satisfied are you with the amount of encouragement you received from the auditors to move forward and implement the audit results?

1. Very satisfied
2. Somewhat satisfied
3. Neither satisfied nor dissatisfied
4. Somewhat dissatisfied
5. Very dissatisfied
6. Don't Know

ASK IF PREVIOUS Q=4 OR 5

44. In what ways were you not completely satisfied?

[OPEN END]

45. After the audit, how satisfied are you with your understanding of demand response and the various program opportunities?

1. Very satisfied
2. Somewhat satisfied
3. Neither satisfied nor dissatisfied
4. Somewhat dissatisfied
5. Very dissatisfied
6. Don't Know

ASK IF PREVIOUS Q=4 OR 5

46. In what ways were you not completely satisfied?

[OPEN END]

47. What information would you have liked to have received during the audit that was left out or was not covered in enough detail?

[OPEN END]

48. Overall, what is your level of satisfaction with Technical Assistance Audit?

1. Very satisfied
2. Somewhat satisfied
3. Neither satisfied nor dissatisfied
4. Somewhat dissatisfied
5. Very dissatisfied
6. Don't Know

ASK IF PREVIOUS Q=4 OR 5

49. In what ways were you not completely satisfied?

[OPEN END]

50. If you could add or change one thing about the Technical Assistance Audit, what would it be?

[OPEN END]

Firmographics

51. What business sector does your firm belong to?

1. Retail or wholesale
2. Manufacturing
3. Agricultural/Mining
4. Financial Services
5. Real Estate
6. Transportation
7. Marketing and Sales
8. Medical
9. Non-Profit
10. Research
11. Government
12. Law
13. Media/Entertainment
14. Other (Specify):_____

52. How would you categorize your building type?

1. Multiple office, office building
2. Hospital
3. Small Medical
4. Primary/Secondary School
5. College/University
6. Small retail mall space
7. Warehouse
8. Residential house
9. Hotel/Motel
10. Grocery/Convenience store
11. Agriculture

53. Do you have an Energy Management System (EMS) at your facility?

1. Yes
2. No [SKIP TO 52]
3. Don't know [SKIP TO 52]

54. Does your company have an Interval Data Recorder (IDR) or a Communicating Interval Meter as part of your Energy Management System (EMS)?

1. Interval Data Recorder
2. Communicating Interval Meter
3. Both
4. Neither
5. Don't Know

55. Do you lease or own your facility?

1. Lease
2. Own

3. Don't Know

56. What is the approximate TOTAL square footage of your facility at this location (IF NEEDED, [SITE_ADDR1])?

1. Less than 1,500 sq ft
2. 1,500 – 4,999 sq ft
3. 5,000 – 9,999 sq ft
4. 10,000 – 24,999 sq ft
5. 25,000 – 49,999 sq ft
6. 50,000 – 74,999 sq ft
7. 75,000 – 99,999 sq ft
8. Over 100,000 sq ft
9. Don't Know / Refused

57. About how many employees do you have at this location (IF NEEDED, [SITE_ADDR1])?

1. 1 to 5
2. 6 to 10
3. 11 to 20
4. 21 to 50
5. 51 to 100
6. Over 100
7. Don't Know / Refused

That's all the questions I have for you today, thank you very much for helping us with this survey!

IN-DEPTH INTERVIEW GUIDE FOR PARTICIPANTS

During the interview, both the customer and the interviewer will have the audit report so that each recommendation can be reviewed in detail.

Name:

Company:

Phone:

Customer of: [UTILITY]

Year & Month of Audit

Measures recommended in audit:

Specific Audit Recommendations

Review each recommendation included in the audit report

For each recommendation, ACCEPTED, ask the following questions:

1. Why did you decide to go ahead and implement this recommendation? (Probe for details)?

2. Were you already considering implementing this recommendation? If so, when were you planning to do this (within next 6 months, 1 year, 2 year)?

3. How influential was the incentive in your decision to implement the measures? Was it very influential, somewhat influential, or not at all influential?

4. Did you have any issues finding a contractor to help install these measures? How were these issues resolved? How can the TA/TI program help resolve similar issues in the future?

5. Any concerns about implementing this recommendation? How were these issues resolved?

For each recommendation REJECTED, ask the following questions:

6. Why did you decide to NOT to implement this recommendation? (Probe for details)

7. Are you planning to implement the recommendation in the near future? If so, when?

8. [If not going to implement, ask:] What would you need to change in order to implement this recommendation?

9. How influential was the incentive amount in your decision?

General Issues

10. In general, how useful was the audit report? Was the information clearly presented? Was there any part of the audit report that you found confusing?

11. Did the audit report adequately describe the cost of each measure? (If not, probe for specific information that was missing)

12. For PG&E customers only: Did you find the description of the current demand response programs in the audit report to be informative?

13. How well does the audit recommendations take into account your business and operational requirements? How relevant was the audit to your overall business operation?

14. To what extent were impractical measures that did not fit your business model/operations screened out before the audit report was presented to you?

15. Do you believe that the recommendations you received from the audit are reasonable or practical given the nature of your business operations?

16. Did your auditor work with you to help you understand the audit recommendations? How did this discussion go? (Probe on level of detail provided – was it too technical, not technical enough?)

17. Did the auditor encourage you to move forward with the recommendations? Would you like to have received any additional information during these discussions? (Probe for any issues?)

18. Was the auditor knowledgeable about all the relevant issues concerning the audit recommendations and possible next steps?

19. After the audit, do you feel that you have an adequate understanding of demand response and the various program opportunities? What additional information would you like to have received from your auditor?

20. After reviewing the audit, do you have any concerns about completing the next steps in the TA/TI program now that the audit is complete? What are your concerns? (Probe to see if respondent knows what the next steps are.)

21. How can the TA/TI program help address these concerns?

For each of the following, ask level of satisfaction on a 1 to 5 scale, where 1 is very satisfied and 5 is very dissatisfied. For any responses of 4 or 5, get additional detail on why they are dissatisfied.

22. How satisfied are you with the application process for the Technical Assistance Audit? Please rate on a 1 to 5 scale, where 1 is very satisfied and 5 is very dissatisfied.

23. How satisfied are you with the audit scheduling process? (1=Very Satisfied, 5 =Very Dissatisfied)

24. How satisfied are you with the amount of time taken to complete the audit? (1=Very Satisfied, 5 =Very Dissatisfied)

25. How satisfied are you with the clarity and usefulness of the information you received from the audit? (1=Very Satisfied, 5 =Very Dissatisfied)

26. How satisfied were you with the courteousness and professionalism of the auditor who performed the audit? (1=Very Satisfied, 5 =Very Dissatisfied)

27. (For those currently in the TI Phase) How satisfied are you with the incentive payment process? (parts of the incentive paid in stages over time) (1=Very Satisfied, 5 =Very Dissatisfied)

28. Overall, what is your level of satisfaction with the audit process and report? (1=Very Satisfied, 5 =Very Dissatisfied)

29. What did you like most about the audit process?

30. What would you change about the audit process?

31. What would you add to the audit report?

32. Any final comments on the audit and the TA/TI program in general?

IN-DEPTH INTERVIEW GUIDE FOR TA/TI PROGRAM VERIFICATION ENGINEERS

Name:

Title:

Phone:

Primary business/clients of company:

Date became TA/TI program evaluation engineer:

How many TA audits have you reviewed in 2007?

How many did you review in 2006? Earlier?

What other work does company perform for utilities – either for DR or EE programs?

Clarification on compensation mechanism:

- ❑ Fixed fee basis per audit review/load shed test? Or time and materials?

What's in the interval data analysis report (ASW only)?

- ❑ Done for each preliminary TA audit? How does report affect decision whether customer is eligible for technical audit?

Evaluating TA Audits/Initiating TI

To what extent do program verification engineers discuss customer business/operational requirements or have contact with customers before reviewing technical audit results?

- ❑ Are those requirements presented in the audit report? Discussed informally?
- ❑ What business considerations have been most important?

What are the main criteria used to evaluate technical TA audit results:

- ❑ Primarily evaluate engineering calculations? Look for missed opportunities?
- ❑ Only cost-effective opportunities? Cost-effective compared to what?
- ❑ Size of kW reductions? Preference for large, chunky (and therefore predictable) resources as opposed to collection of diffuse resources?
- ❑ Coincidence of resource with summer afternoon peak periods?
- ❑ Response time associated with resource?
- ❑ Reliability/predictability of load reductions (i.e. automation)

- Feasibility from customer perspective?
- Do you evaluate/scrutinize the auditors' capital cost estimates?
- Do you focus on EE opportunities as well as DR?

What percentage of technical audits reviewed by your firm have been questioned or adjusted?

- For what reasons?
- What was the outcome?

When you have questions about an audit, who do you contact? The auditor? Customer?

What DR technologies/opportunities are being identified most commonly in technical audits, and what is the implementation rate for each?

Does there tend to be a bias in the types of DR technologies/strategies that customers actually chose to install/apply for TI? Least likely? Why?

- Are there certain types of DR measures that are generally perceived to be too intrusive on business operations, thereby keeping customers from taking the next step?
- Do TI installations/applications tend to also represent significant non-DR benefits for customers (e.g. optimize production/energy consumption overall, improved operational flexibility)?

Do verification engineers make recommendations or discuss the most suitable DR programs for a given site, measure or technology?

Do plant/facility staff tend to frame DR-related decision-making in terms of operational impacts/flexibility/control or payback?

- payback/cost-effectiveness relative to the TI incentive?
- payback/cost-effectiveness relative to TI incentive plus incentives from participating in voluntary DR programs?
- SDG&E: An interval meter is required, is this something that is looked at as part of the audit (i.e. when estimating capital cost requirements), or is it only looked at when they are applying for TI incentives?

TI Load Shed Testing

In retrospect, what is the general accuracy of DR potential estimates developed in technical TA audits relative to installed/verified DR capacity of TI installations?

- Has this type of assessment been conducted systematically for the TI program?

Are there standard verification testing protocols for load shed tests?

- ❑ Number of tests?
- ❑ Length of tests?
- ❑ Time of day/day of the week/season?

Apart from load shed demonstration, what methods are used to determine the final TI incentive level?

- ❑ Average of multiple load shed tests?
- ❑ Interval data from pre-installation?
- ❑ Weather data from pre-installation?

Overall TA/TI Process

Barriers to recruitment – In light of the large volume of audits and the very few tested installations, what are the barriers to moving from TA to TI; what are the main reasons customers are not moving forward?

- ❑ Can you tell from reviewing the technical audit which applications are more or less likely to move forward? How do you determine that?
- ❑ Is there a need for additional support/handholding to get customers to take the next step?
- ❑ Does the program make available information that plant-level staff can use to secure approval from corporate decision makers?
- ❑ Are financial incentives adequate? Is the incentive structure (and long payout period) limiting participation? Is it easier to just go through Express or some other program to get things installed? How often does this occur?

Do you see any significant process bottlenecks in the entire TA/TI process that would impact the customer's experience or satisfaction with the program and willingness to move forward to the TI phase?

- ❑ Are utilities/ utility program staff responsive to auditor needs? In any issues with dealing with the utilities?

How would you characterize the attitude that customers have towards DR overall? Does it typically change over the course of the TA/TI process?

Perspectives on TA auditors

What is the relationship between the auditor/engineer and the vendor? Do auditors tend to recommend specific vendors (perhaps through recommending a specific technology only available through that vendor) or are there prohibitions against that?

IN-DEPTH INTERVIEW GUIDE FOR TA AUDITORS

Name:

Title:

Phone:

Primary business/clients of company:

Date became TA auditor:

Number of TA audits conducted to date:

- ❑ Tend to be large or small customers?
- ❑ Tend to be commercial, institutional, or industrial?

Clarification on how TA audit jobs flow to them:

- ❑ IOU program manager assigns them according to firms' niche? What if there are multiple firms with same niche?
- ❑ Does their contract allow them to decline an assignment? Have they ever done so?
- ❑

Clarification on compensation mechanism:

- ❑ IOU always pays full cost of both the preliminary and full technical audit? Is compensation related to quantity of DR potential identified? The quantity of DR finally pursued?

TA Audit Procedures

To what extent do auditors/engineers discuss customer business/operational requirements before conducting the preliminary audit? The full technical audit?

- ❑ What business considerations have been most important?

Are plant/facility staff typically present during the audit? Can you speak to the level of corporate buy-off that tends to exist at the beginning of the TA/TI process?

- ❑ If there is a significant level of buy-off going in to TA/TI, does that seem impact the criteria that customers use to evaluate TA results?

Who provides the audit results to the customer? (Auditor, account rep?)

- ❑ To what extent are the results simply "presented" as opposed to being used to encourage installation?
- ❑ To what extent are the audit results put in perspective relative to the customer's business/operational requirements?
- ❑ What kinds of questions/issues do customers raise when you present the results?

How do auditors estimate capital costs of enabling technologies?

- Do auditors recommend specific vendors (perhaps through recommending a specific technology only available through that vendor) or are there prohibitions against that?

TA Auditor Perspectives

Do plant/facility staff tend to frame DR-related decision-making in terms of operational impacts/flexibility/control or payback?

- payback/cost-effectiveness relative to the TI incentive?
- payback/cost-effectiveness relative to TI incentive plus incentives from participating in voluntary DR programs?

Do certain types of DR opportunities tend to be identified more frequently than others?

- EMCS (lighting, HVAC, process controls)
- Lighting circuits/controls
- Process controls
- Other

Does there tend to be a bias in the types of applications/technologies that customers actually chose to install/apply for TI? Least likely? Why?

- Are there certain types of DR measures that are generally perceived to be too intrusive on business operations, thereby keeping customers from taking the next step?

To what extent do auditors or reps educate and encourage customers to participate in demand reduction activities?

- If so, by what means (literature, one-on-one discussions, calculations of estimated revenue streams, etc)?
- To what extent do customers not know about DR opportunities versus how much they need to overcome their resistance to DR activities?

How would auditors characterize the attitude that customers have towards DR overall? Does it typically change over the course of the audit process?

Do you see any significant process bottlenecks in the entire TA process (from the initial audit request to the delivery/discussion of results with the customer) that would impact the customer's satisfaction with the program and willingness to move forward to the TI phase?

- Are utilities/ utility program staff responsive to auditor needs? In any issues with dealing with the utilities?

Barriers to TI – In light of the large volume of audits and the very few tested installations, what are the barriers to moving from TA to TI; what are the main reasons customers are not moving forward?

- Is there a need for additional support/handholding to get customers to take the next step?
- Does the program make available information that plant-level staff can use to secure approval from corporate decision makers?"
- Are financial incentives adequate? Is the incentive structure (and long payout period) limiting participation? Is it easier to just go through Express or some other program to get things installed? How often does this occur?

8. APPENDIX B: PARTICIPANT PHONE SURVEY FREQUENCY TABLES

The following tables show the frequency table results for the participant phone survey. Questions 12, 31, 33, 35, 38 , 42, 44, 46, and 49 had only verbatim responses and are not presented here.

		Utility		
		SDG&E	Edison	Total
<Q1> How did you FIRST hear about the TA/TI Program?	Contractor	1	1	2
		2.1%	1.8%	2.0%
	Utility rep/acct exec	35	46	81
		74.5%	83.6%	79.4%
	Utility website	1	1	2
		2.1%	1.8%	2.0%
	Word of Mouth	1	2	3
		2.1%	3.6%	2.9%
	Equipment Vendor	0	1	1
		.0%	1.8%	1.0%
	Utility seminar/info	2	1	3
		4.3%	1.8%	2.9%
	Audit company/consultants	2	0	2
		4.3%	.0%	2.0%
	Personal research	1	0	1

	2.1%	0%	1.0%
Other - RECORD	4	2	6
	8.5%%	3.6%	5.9%
DON'T KNOW	0	1	1
	.0%	1.8%	1.0%
Total	47	55	102
	100.0%	100.0%	100.0%

		Utility		
		SDG&E	**Edison**	**Total**
<Q2> Why did you decide to have the Technical Assistance Audit done?	Save energy	25	42	67
		53.2%	76.4%	
	Save money/cut costs/cost savings	12	13	25
		25.5%	23.6%	
	Audit was free	2	3	5
		4.3%	5.5%	
	Concern for the environment, global warming, carbon footprint	3	2	5
		6.4%	3.6%	
	Will receive more incentives for my demand response programs	1	2	3
		2.1%	3.6%	

Already planning-purchase new equipment-wanted to see rebates available	1 2.1%	3 5.4%	3
Learn about DR programs	2 4.3%	1 1.8%	3
Exploring equipment upgrades	3 6.4%	0 .0%	3
To see whether actions need to be taken	2 4.3%	2 3.6%	4
To compare with an existing audit	1 2.1%	1 1.8%	2
Referral	1 2.1%	2 3.6%	
Determine power usage of equipment	1 2.1%	2 3.6%	
Other - RECORD	4 8.5%	1 1.8%	5
Total	47	55	102

		Utility		
		SDG&E	Edison	Total
<Q3> How many hours did the Technical Assistance Audit take to complete?	1	3	1	4
		6.4%	1.8%	3.9%
	2	9	8	17
		19.1%	14.5%	16.7%
	3	2	3	5
		4.3%	5.5%	4.9%
	4	3	7	10
		6.4%	12.7%	9.8%
	5	1	1	2
		2.1%	1.8%	2.0%
	6	1	2	3
		2.1%	3.6%	2.9%
	7	1	1	2
		2.1%	1.8%	2.0%
	8	0	6	6
		.0%	10.9%	5.9%
	More than 8 hours	10	12	22
		21.3%	21.8%	21.6%

	DON'T KNOW	17	14	31
		36.2%	25.5%	30.4%
	Total	47	55	102
		100.0%	100.0%	100.0%

		Utility		
		SDG&E	**Edison**	**Total**
<Q4> Did you choose your own Auditor or did you use the auditor provided by the utility?	Used my own auditor	1	1	2
		2.1%	1.8%	2.0%
	Used auditor provided by my utility	45	51	96
		95.7%	92.7%	94.1%
	DON'T KNOW	1	3	4
		2.1%	5.5%	3.9%
	Total	47	55	102
		100.0%	100.0%	100.0%

		Utility		
		SDG&E	Edison	Total
<Q5> Have you implemented any of the recommendations included in the audit?	YES	15	35	50
		31.9%	63.6%	49.0%
	NO	28	18	46
		59.6%	32.7%	45.1%
	DON'T KNOW	4	2	6
		8.5%	3.6%	5.9%
	Total	47	55	102
		100.0%	100.0%	100.0%

		Utility		
		SDG&E	Edison	Total
<Q6> Are there recommendations in the audit that you have not done?	YES	9	23	32
		60.0%	65.7%	64.0%
	NO	5	10	15
		33.3%	28.6%	30.0%
	DON'T KNOW	1	2	3
		6.7%	5.7%	6.0%
	Total	15	35	50

		Utility		
		SDG&E	Edison	Total
	YES	9	23	32
		60.0%	65.7%	64.0%
	NO	5	10	15
		33.3%	28.6%	30.0%
	DON'T KNOW	1	2	3
		6.7%	5.7%	6.0%
		15	35	50
		100.0%	100.0%	100.0%

		Utility		
		SDG&E	Edison	Total
<Q7> Why did you decide not to implement these recommendations?	Never received (full) audit	7	1	8
		17.1%	2.3%	
	Too expensive/ Initial cost too high	7	11	18
		17.1%	25.6%	
	Do not have time	4	4	7
		9.8%	9.3%	
	In the process of implementing/ will do soon	4	3	7

	9.8%	7.0%	
Don't have the money/ capital	3 7.3%	4 9.3%	7
Interfered with daily business operations/ practices	2 4.9%	9 21%	11
Nothing can be done to improve our building	2 4.9%	- 0%	2
Concerned about customer or employee comfort	1 2.4%	1 2.3%	2
Rebate payments take too long	1 2.4%	3 7.0%	4
Did not believe they would save energy claimed	0 .0%	3 7.0%	3
Need approval from corporate office / owner	0 .0%	1 2.3%	1
Do not think they are necessary/applicable	2 4.9%	3 7.0%	5
Recommendations were forgotten/never made/not followed up by utility	1 2.4%	2 4.6%	3
Timing is not good	4	0	4

		9.8%	0%	
	RECORD OTHER REASON	4	4	8
		9.8%	9.3%	
	DON'T KNOW	2	2	4
		4.9%	4.7%	
	Total	41	43	84

		Utility		
		SDG&E	**Edison**	**Total**
<Q8> For the recommendations you have not done, do you plan on implementing any in the future?	YES	25	23	48
		61.0%	53.5%	57.1%
	NO	5	13	18
		12.2%	30.2%	21.4%
	REFUSED	0	1	1
		.0%	2.3%	1.2%
	DON'T KNOW	11	6	17
		26.8%	14.0%	20.2%
	Total	41	43	84
		100.0%	100.0%	100.0%

		Utility		
		SDG&E	Edison	Total
<Q9> When do you plan on implementing them?	Within the next month	0	1	1
		.0%	4.3%	2.1%
	Within the next 3 months	2	2	4
		8.0%	8.7%	8.3%
	Within the next 6 months	7	4	11
		28.0%	17.4%	22.9%
	Within the next Year	7	8	15
		28.0%	34.8%	31.2%
	Within the next 2 year	4	5	9
		16.0%	21.7%	18.8%
	Longer than 2 years from now	1	1	2
		4.0%	4.3%	4.2%
	DON'T KNOW	4	2	6
		16.0%	8.7%	12.5%
	Total	25	23	48
		100.0%	100.0%	100.0%

		Utility		
		SDG&E	Edison	Total
<Q10> Did you purchase any new equipment as a result of the Technical Assistance Audit? [OR What new equipment did you purchase as a result of the Technical Assistance Audit?]	DIDN'T PURCHASE ANY NEW EQUIPMENT	37	34	71
		78.7%	61.8%	69.6%
	RECORD EQUIPMENT NAME	8	20	28
		17.0%	36.4%	27.4%
	DON'T KNOW	2	1	3
		4.3%	1.8%	2.9%
	Total	47	55	102
		100.0%	100.0%	100.0%

		Utility		
		SDG&E	Edison	Total
<Q11> Have you applied for the Technology Incentive for this equipment that you purchased as a result of the Technical Assistance Audit?	YES	4	16	20
		50.0%	80.0%	71.4%
	NO	3	3	6
		37.5%	15.0%	21.4%
	DON'T KNOW	1	1	2
		12.5%	5.0%	7.1%
	Total	8	21	28
		100.0%	100.0%	100.0%

		Utility		
		SDG&E	Edison	Total
<Q13> Are you enrolled in a Demand Reduction program such as Critical Peak Pricing or Demand Bidding?	YES	21	30	51
		44.7%	54.5%	50.0%
	NO	24	25	49
		51.1%	45.5%	48.0%
	DON'T KNOW	2	0	2
		4.3%	.0%	2.0%
	Total	47	55	102
		100.0%	100.0%	100.0%

		Utility		
		SDG&E	Edison	Total
<Q14> [If Yes] Which program?	Critical Peak Pricing	12	3	15
		57.1%	10.0%	
	Demand Bidding Program (DBP)	2	16	18
		9.5%	53.3%	
	Time of Use Base Interruptible Program (TOUBIP)/I6	1	3	4
		4.8%	10.0%	
	Stand by Generator Programs	1	0	1

	4.8%	.0%	
Scheduled Load Reduction Program (SLRP)	1 4.8%	1 3.3%	2
Demand Response Program	3 14.3%	1 3.3%	4
On call Program	0 .0%	3 10%	3
Rolling blackout prevention program	1 4.8%	0 0%	1
Retrocomissioning program	1 4.8%	0 0%	1
AC cycling program	0 0%	1 3.3%	1
EnerNOC program	0 0%	2 6.7%	2
RECORD OTHER REASON	1 4.8%	2 6.7%	3
DON'T KNOW	3 14.3%	2 6.7%	5
Total	21	30	51

		Utility		
		SDG&E	Edison	Total
<Q15> Did you enroll in the program(s) PRIOR to having the Technical Assistance audit done?	YES	10	13	23
		47.6%	43.3%	45.1%
	NO	9	17	26
		42.9%	56.7%	51.0%
	DON'T KNOW	2	0	2
		9.5%	.0%	3.9%
	Total	21	30	51
		100.0%	100.0%	100.0%

		Utility		
		SDG&E	Edison	Total
<Q16> Are you concerned about ...Finding a qualified contractor to install equipment recommended in the Technical Assistance Audit?	YES	1	11	12
		2.1%	20.0%	11.8%
	NO	45	44	89
		95.7%	80.0%	87.3%
	DON'T KNOW	1	0	1
		2.1%	.0%	1.0%

	Total	47	55	102
		100.0%	100.0%	100.0%

		Utility		
		SDG&E	**Edison**	**Total**
<Q17> How big of a concern is this? Would you say it's a...	Major	0	6	6
		.0%	54.5%	50.0%
	Moderate or	1	4	5
		100.0%	36.4%	41.7%
	Minor concern	0	1	1
		.0%	9.1%	8.3%
	Total	1	11	12
		100.0%	100.0%	100.0%

		Utility		
		SDG&E	**Edison**	**Total**
<Q18> Are you concerned about...Being able to find parts or a qualified repairman to maintain equipment?	YES	4	7	11
		8.5%	12.7%	10.8%
	NO	43	48	91
		91.5%	87.3%	89.2%

	Total	47	55	102
		100.0%	100.0%	100.0%

		Utility		
		SDG&E	**Edison**	**Total**
<Q19> How big of a concern is this? Would you say it's a...	Major	2	3	5
		50.0%	42.9%	45.5%
	Moderate or	2	3	5
		50.0%	42.9%	45.5%
	Minor concern	0	1	1
		.0%	14.3%	9.1%
	Total	4	7	11
		100.0%	100.0%	100.0%

		Utility		
		SDG&E	**Edison**	**Total**
<Q20> Are you concerned about.... Energy savings claims being overstated?	YES	20	23	43
		42.6%	41.8%	42.2%
	NO	27	32	59
		57.4%	58.2%	57.8%

	Total	47	55	102
		100.0%	100.0%	100.0%

		Utility		
		SDG&E	Edison	Total
<Q21> How big of a concern is this? Would you say it's a...	Major	3	10	13
		15.0%	43.5%	30.2%
	Moderate or	13	9	22
		65.0%	39.1%	51.2%
	Minor concern	4	4	8
		20.0%	17.4%	18.6%
	Total	20	23	43
		100.0%	100.0%	100.0%

		Utility		
		SDG&E	Edison	Total
<Q22> Are you concerned about....Energy savings not worth the cost of implementing the recommendations?	YES	26	30	56
		55.3%	54.5%	54.9%
	NO	19	25	44
		40.4%	45.5%	43.1%

	DON'T KNOW	2	0	2
		4.3%	.0%	2.0%
	Total	47	55	102
		100.0%	100.0%	100.0%

		Utility		
		SDG&E	**Edison**	**Total**
<Q23> How big of a concern is this? Would you say it's a...	Major	7	16	23
		26.9%	53.3%	41.1%
	Moderate or	15	10	25
		57.7%	33.3%	44.6%
	Minor concern	4	4	8
		15.4%	13.3%	14.3%
	Total	26	30	56
		100.0%	100.0%	100.0%

		Utility		
		SDG&E	**Edison**	**Total**
<Q24> Are you concerned about....the Disruption of business operations?	YES	27	29	56
		57.4%	52.7%	54.9%

	NO	19	25	44
		40.4%	45.5%	43.1%
	DON'T KNOW	1	1	2
		2.1%	1.8%	2.0%
	Total	47	55	102
		100.0%	100.0%	100.0%

		Utility		
		SDG&E	**Edison**	**Total**
<Q25> How big of a concern is this? Would you say it's a...	Major	15	24	39
		55.6%	82.8%	69.6%
	Moderate or	9	5	14
		33.3%	17.2%	25.0%
	Minor concern	3	0	3
		11.1%	.0%	5.4%
	Total	27	29	56
		100.0%	100.0%	100.0%

		Utility		
		SDG&E	Edison	Total
<Q26> Are you concerned about....Customer discomfort during DEMAND response events?	YES	28	25	53
		59.6%	45.5%	52.0%
	NO	19	30	49
		40.4%	54.5%	48.0%
	Total	47	55	102
		100.0%	100.0%	100.0%

		Utility		
		SDG&E	Edison	Total
<Q27> How big of a concern is this? Would you say it's a...	Major	16	17	33
		57.1%	68.0%	62.3%
	Moderate or	10	7	17
		35.7%	28.0%	32.1%
	Minor concern	2	1	3
		7.1%	4.0%	5.7%
	Total	28	25	53
		100.0%	100.0%	100.0%

		Utility		
		SDG&E	Edison	Total
<Q28> Are you concerned about....that Incentive payments are spread out over time?	YES	7	8	15
		14.9%	14.5%	14.7%
	NO	35	47	82
		74.5%	85.5%	80.4%
	DON'T KNOW	5	0	5
		10.6%	.0%	4.9%
	Total	47	55	102
		100.0%	100.0%	100.0%

		Utility		
		SDG&E	Edison	Total
<Q29> How big of a concern is this? Would you say it's a...	Major	2	2	4
		28.6%	25.0%	26.7%
	Moderate or	3	3	6
		42.9%	37.5%	40.0%
	Minor concern	2	3	5
		28.6%	37.5%	33.3%

	Total	7	8	15
		100.0%	100.0%	100.0%

		Utility		
		SDG&E	**Edison**	**Total**
<Q30> How satisfied are you with the ease of scheduling the Technical Assistance Audit?	Very satisfied	28	31	59
		59.6%	56.4%	57.8%
	Somewhat satisfied	14	17	31
		29.8%	30.9%	30.4%
	Neither satisfied nor dissatisfied	1	5	6
		2.1%	9.1%	5.9%
	Somewhat dissatisfied	3	1	4
		6.4%	1.8%	3.9%
	DON'T KNOW	1	1	2
		2.1%	1.8%	2.0%
	Total	47	55	102
		100.0%	100.0%	100.0%

		Utility		
		SDG&E	Edison	Total
<Q32> How satisfied are you with the application process for the Technical Assistance Audit?	Very satisfied	23	23	46
		48.9%	41.8%	45.1%
	Somewhat satisfied	16	24	40
		34.0%	43.6%	39.2%
	Neither satisfied nor dissatisfied	3	5	8
		6.4%	9.1%	7.8%
	Somewhat dissatisfied	2	0	2
		4.3%	.0%	2.0%
	Very dissatisfied	1	0	1
		2.1%	.0%	1.0%
	DON'T KNOW	2	3	5
		4.3%	5.5%	4.9%
	Total	47	55	102
		100.0%	100.0%	100.0%

		Utility		
		SDG&E	Edison	Total
<Q34> How satisfied are you with the amount of time taken to complete Technical Assistance Audit?	Very satisfied	20	25	45
		42.6%	45.5%	44.1%
	Somewhat satisfied	22	20	42
		46.8%	36.4%	41.2%
	Neither satisfied nor dissatisfied	3	3	6
		6.4%	5.5%	5.9%
	Somewhat dissatisfied	1	4	5
		2.1%	7.3%	4.9%
	Very dissatisfied	0	2	2
		.0%	3.6%	2.0%
	DON'T KNOW	1	1	2
		2.1%	1.8%	2.0%
	Total	47	55	102
		100.0%	100.0%	100.0%

		Utility		
		SDG&E	Edison	Total
<Q36> How satisfied are you with the clarity of the information you received from the Technical Assistance Audit?	Very satisfied	22	34	56
		46.8%	61.8%	54.9%
	Somewhat satisfied	13	16	29
		27.7%	29.1%	28.4%
	Neither satisfied nor dissatisfied	4	1	5
		8.5%	1.8%	4.9%
	Somewhat dissatisfied	4	3	7
		8.5%	5.5%	6.9%
	Very dissatisfied	3	1	4
		6.4%	1.8%	3.9%
	DON'T KNOW	1	0	1
		2.1%	.0%	1.0%
	Total	47	55	102
		100.0%	100.0%	100.0%

		Utility		
		SDG&E	Edison	Total
<Q37> How satisfied are you with the usefulness of the information you received from the Technical Assistance Audit?	Very satisfied	19	25	44
		40.4%	45.5%	43.1%
	Somewhat satisfied	13	22	35
		27.7%	40.0%	34.3%
	Neither satisfied nor dissatisfied	5	2	7
		10.6%	3.6%	6.9%
	Somewhat dissatisfied	5	4	9
		10.6%	7.3%	8.8%
	Very dissatisfied	4	1	5
		8.5%	1.8%	4.9%
	DON'T KNOW	1	1	2
		2.1%	1.8%	2.0%
	Total	47	55	102
		100.0%	100.0%	100.0%

		Utility		
		SDG&E	Edison	Total
<Q39> How satisfied are you with how well the audit recommendations took into account your business operations?	Very satisfied	14	22	36
		29.8%	40.0%	35.3%
	Somewhat satisfied	15	28	43
		31.9%	50.9%	42.2%
	Neither satisfied nor dissatisfied	9	3	12
		19.1%	5.5%	11.8%
	Somewhat dissatisfied	4	1	5
		8.5%	1.8%	4.9%
	Very dissatisfied	5	1	6
		10.6%	1.8%	5.9%
	Total	47	55	102
		100.0%	100.0%	100.0%

		Utility		
		SDG&E	Edison	Total
<Q41> How satisfied were you with the courteousness and professionalism of the auditors who performed the Technical Assistance Audit?	Very satisfied	39	46	85
		83.0%	83.6%	83.3%
	Somewhat satisfied	5	4	9

		10.6%	7.3%	8.8%
	Neither satisfied nor dissatisfied	3	2	5
		6.4%	3.6%	4.9%
	DON'T KNOW	0	3	3
		.0%	5.5%	2.9%
	Total	47	55	102
		100.0%	100.0%	100.0%

		Utility		
		SDG&E	**Edison**	**Total**
<Q43> How satisfied are you with the amount of encouragement you received from the auditors to move forward and implement the audit results?	Very satisfied	18	24	42
		38.3%	43.6%	41.2%
	Somewhat satisfied	15	17	32
		31.9%	30.9%	31.4%
	Neither satisfied nor dissatisfied	8	10	18
		17.0%	18.2%	17.6%
	Somewhat dissatisfied	4	1	5
		8.5%	1.8%	4.9%
	Very dissatisfied	1	1	2
		2.1%	1.8%	2.0%

	DON'T KNOW	1	2	3
		2.1%	3.6%	2.9%
	Total	47	55	102
		100.0%	100.0%	100.0%

		Utility		
		SDG&E	**Edison**	**Total**
<Q45> After the audit, how satisfied are you with your understanding of demand response and the various program opportunities?	Very satisfied	20	32	52
		42.6%	58.2%	51.0%
	Somewhat satisfied	18	16	34
		38.3%	29.1%	33.3%
	Neither satisfied nor dissatisfied	2	3	5
		4.3%	5.5%	4.9%
	Somewhat dissatisfied	3	2	5
		6.4%	3.6%	4.9%
	Very dissatisfied	2	1	3
		4.3%	1.8%	2.9%
	DON'T KNOW	2	1	3
		4.3%	1.8%	2.9%
	Total	47	55	102

		Utility		
		SDG&E	Edison	Total
	Very satisfied	20	32	52
		42.6%	58.2%	51.0%
	Somewhat satisfied	18	16	34
		38.3%	29.1%	33.3%
	Neither satisfied nor dissatisfied	2	3	5
		4.3%	5.5%	4.9%
	Somewhat dissatisfied	3	2	5
		6.4%	3.6%	4.9%
	Very dissatisfied	2	1	3
		4.3%	1.8%	2.9%
	DON'T KNOW	2	1	3
		4.3%	1.8%	2.9%
		47	55	102
		100.0%	100.0%	100.0%

		Utility		
		SDG&E	Edison	Total
<Q47> What information would you have liked to have received during the audit that was left out or was not covered in enough detail?	CAN'T THINK OF ANYTHING	35	44	79
		74.5%	80.0%	77.5%
	RECORD and PROBE	12	11	23
		25.5%	20.0%	22.5%
	Total	47	55	102
		100.0%	100.0%	100.0%

		Utility		
		SDG&E	Edison	Total
<Q48> Overall, what is your level of satisfaction with Technical Assistance Audit? Would you say you are....	Very satisfied	20	28	48
		42.6%	50.9%	47.1%
	Somewhat satisfied	16	23	39
		34.0%	41.8%	38.2%
	Neither satisfied nor dissatisfied	5	1	6
		10.6%	1.8%	5.9%
	Somewhat dissatisfied	4	3	7
		8.5%	5.5%	6.9%
	Very dissatisfied	1	0	1

		2.1%	.0%	1.0%
	DON'T KNOW	1	0	1
		2.1%	.0%	1.0%
	Total	47	55	102
		100.0%	100.0%	100.0%

		Utility		
		SDG&E	**Edison**	**Total**
<Q50> If you could add or change one thing about the Technical Assistance Audit, what would it be?	Q50C: Can't think of anything	28	33	61
		59.6%	60.0%	
	Q50C: RECORD and PROBE	18	22	40
		38.3%	40.0%	
	Q50C: DON'T KNOW	1	0	1
		2.1%	.0%	
	Total	47	55	102

		Utility		
		SDG&E	Edison	Total
<Q51> What business sector does your firm belong to?	Retail or wholesale	1	0	1
		2.1%	.0%	1.0%
	Manufacturing	13	23	36
		27.7%	41.8%	35.3%
	Agricultural/Mining	0	1	1
		.0%	1.8%	1.0%
	Financial Services	1	0	1
		2.1%	.0%	1.0%
	Real Estate	1	1	2
		2.1%	1.8%	2.0%
	Medical	4	1	5
		8.5%	1.8%	4.9%
	Non-Profit	0	3	3
		.0%	5.5%	2.9%
	Research	3	0	3
		6.4%	.0%	2.9%
	Government	4	3	7
		8.5%	5.5%	6.9%

	Media/Entertainment	1	1	2
		2.1%	1.8%	2.0%
	Hospitality	3	2	5
		6.4%	4.3%	4.9%
	RECORD	16	20	36
		34.0%	36.4%	35.3%
	Total	47	55	102
		100.0%	100.0%	100.0%

		Utility		
		SDG&E	**Edison**	**Total**
<Q52> How would you categorize your building type?	Multiple office, office building	10	13	23
		21.3%	23.6%	22.5%
	Hospital	4	0	4
		8.5%	.0%	3.9%
	Primary/Secondary School	1	1	2
		2.1%	1.8%	2.0%
	College/University	3	1	4
		6.4%	1.8%	3.9%
	Warehouse	2	7	9

		4.3%	12.7%	8.8%
	Hotel/Motel	2	2	4
		4.3%	3.6%	3.9%
	Grocery/Convenience store	0	1	1
		.0%	1.8%	1.0%
	RECORD	25	29	54
		53.2%	52.7%	52.9%
	DON'T KNOW	0	1	1
		.0%	1.8%	1.0%
	Total	47	55	102
		100.0%	100.0%	100.0%

		Utility		
		SDG&E	**Edison**	**Total**
<Q53> Do you have an Energy Management System (EMS) at your facility?	YES	24	28	52
		51.1%	50.9%	51.0%
	NO	21	24	45
		44.7%	43.6%	44.1%
	DON'T KNOW	2	3	5
		4.3%	5.5%	4.9%

	Total	47	55	102
		100.0%	100.0%	100.0%

		Utility		
		SDG&E	**Edison**	**Total**
<Q54> Does your company have an Interval Data Recorder (IDR) or a Communicating Interval Meter as part of your Energy Management System (EMS)?	Interval Data Recorder	4	2	6
		16.7%	7.1%	11.5%
	Communicating Interval Meter	1	4	5
		4.2%	14.3%	9.6%
	Both	7	6	13
		29.2%	21.4%	25.0%
	Neither	7	12	19
		29.2%	42.9%	36.5%
	DON'T KNOW	5	4	9
		20.8%	14.3%	17.3%
	Total	24	28	52
		100.0%	100.0%	100.0%

		Utility		
		SDG&E	Edison	Total
<Q55> Do you lease or own your facility?	Lease	13	17	30
		27.7%	30.9%	29.4%
	Own	32	35	67
		68.1%	63.6%	65.7%
	Both	1	2	3
		2.1%	3.6%	2.9%
	DON'T KNOW	1	1	2
		2.1%	1.8%	2.0%
	Total	47	55	102
		100.0%	100.0%	100.0%

		Utility		
		SDG&E	Edison	Total
<Q56> What is the approximate TOTAL square footage of your facility at this location?	Less than 1,500 sq ft	0	1	1
		.0%	1.8%	1.0%
	1,500 to 4,999 sq ft	1	2	3
		2.1%	3.6%	2.9%
	5,000 to 9,999 sq ft	1	1	2

	2.1%	1.8%	2.0%
10,000 to 24,999 sq ft	1	3	4
	2.1%	5.5%	3.9%
25,000 to 49,999 sq ft	6	5	11
	12.8%	9.1%	10.8%
50,000 to 74,999 sq ft	2	5	7
	4.3%	9.1%	6.9%
75,000 to 99,999 sq ft	4	7	11
	8.5%	12.7%	10.8%
Over 100,000 sq ft	29	29	58
	61.7%	52.7%	56.9%
DON'T KNOW	3	2	5
	6.4%	3.6%	4.9%
Total	47	55	102
	100.0%	100.0%	100.0%

		Utility		
		SDG&E	Edison	Total
<Q57> About how many employees do you have at this location?	1 to 5	0	3	3
		.0%	5.5%	2.9%
	6 to 10	3	0	3
		6.4%	.0%	2.9%
	11 to 20	1	2	3
		2.1%	3.6%	2.9%
	21 to 50	5	4	9
		10.6%	7.3%	8.8%
	51 to 100	2	6	8
		4.3%	10.9%	7.8%
	Over 100	35	40	75
		74.5%	72.7%	73.5%
	DON'T KNOW	1	0	1
		2.1%	.0%	1.0%
	Total	47	55	102
		100.0%	100.0%	100.0%