

**Final Report for the Measurement and Evaluation Study of Southern
California Edison Company's
PY2002 Local In-Home Audit Program**

Submitted to

**Southern California Edison Company
8631 Rush Street, 2nd Floor
Rosemead, CA 91770**

Submitted by

**KVD Research Consulting
1371 Timberpond Dr
El Cajon, CA 92019**

April 26, 2004

Table of Contents

1	Executive Summary.....	5
1.1	Verification	5
1.2	Program Satisfaction.....	6
1.3	Energy-Efficiency Attitudes	6
1.4	Recommendation Adoptions.....	7
1.5	Effectiveness of Strategies to Recruit Hard-to-Reach	7
1.6	Program Savings.....	8
2	Introduction	9
2.1	Background.....	9
2.2	General Approach.....	10
3	Method.....	11
3.1	Program Database Verification.....	11
3.2	Telephone Verification	11
3.2.1	Verification Sample Size	11
3.2.2	The Verification Interview.....	11
3.3	Participant Impact Sample Interviewing.....	12
3.3.1	Creating the Climate Zones	12
3.3.2	Creating kWh strata	12
3.3.3	Preparing the Sample Frame.....	13
3.3.4	Sampling.....	14
3.3.5	Preparation for Interviewing.....	15
3.3.6	Interviewing Process.....	15
3.3.7	Response Rate.....	16
3.3.8	Weights	17
3.4	Estimating Savings.....	17
3.4.1	Estimating Total Program Savings	18
3.4.2	The Interview	18
4	Results	19
4.1	Verification	19
4.1.1	Telephone Verification	19
4.2	Description of Participants.....	21
4.3	Language.....	25
4.4	Satisfaction with the Program.....	26
4.5	Attitudes Toward Energy-Efficiency	28

4.6	Recommendations and Adoptions	30
4.6.1	Adoptions After the Audit	30
4.6.2	Adoptions Before the Audit.....	31
4.6.3	Recommendations and Adoptions by Sample Strata	32
4.6.4	Adoptions by Language Group.....	36
4.7	Predicting Adoption Rates	37
4.7.1	Predicting Measure Adoptions.....	37
4.7.2	Predicting Practice Adoptions.....	38
4.8	Participant Suggestions for Program Improvement.....	39
4.8.1	More specificity	39
4.8.2	Help with implementation.....	40
4.8.3	Provide information we don't already know	40
4.8.4	Increase Awareness of the Program.....	41
4.8.5	Do a More Thorough Audit	41
4.9	Awareness of Program and Past Participation	42
4.10	Program Savings	44
5	Conclusions and Recommendations.....	46
5.1	Verification	46
5.2	Program Satisfaction.....	46
5.3	Energy-Efficiency Attitudes	47
5.4	Recommendation Adoptions.....	47
5.5	Effectiveness of Strategies to Recruit Hard-to-Reach	47
5.6	Program Savings	48
6	Appendix A Literature References.....	49
7	Appendix B Questionnaire	52

List of Tables

Table 1 Sample Frame	14
Table 2 Equal Allocation Sample Design for Participant Interviews	14
Table 3 Final Sample Allocation	15
Table 4 Sample Disposition	16
Table 5 Efficiency and Completion Rates	17
Table 6 Relative Weights.....	17
Table 7 Number of Respondents Who Recall Energy Survey by Those who Recall the Recommendations.....	19
Table 8 Percent of Participant Homes of Each Type of Residence: Weighted	22
Table 9 Distribution of Total Number of People in Household: Weighted.....	22
Table 10 Distribution of Number of Adults in Household: Weighted.....	23
Table 11 Distribution of Total Household Income: Weighted	23
Table 12 Distribution of Age of Home: Weighted	24
Table 13 Distribution of Education: Weighted.....	24
Table 14 Distribution of Racial or Ethnic Background: Weighted.....	25
Table 15 Mean Ratings on Seven Items Measuring Satisfaction with Program: Weighted	26
Table 16 Ratings of Satisfaction with Program Elements by Language: Weighted.....	27
Table 17 Mean of Items Measuring Conservation Attitudes by Group: Weighted	28
Table 18 Mean of Items Measuring Conservation Attitudes by Language Group	29
Table 19 Summary Measures of Recommendations and Adoptions: Weighted	31
Table 20 Summary Measures of Adoptions Before the Audit: Weighted.....	32
Table 21 Recommendations and Adoptions by Sample Strata: Weighted	32
Table 22 Recommendations Made, Awareness of Their Benefits, and Percent Adopted: Weighted.....	33
Table 23 Summary Measures of Recommendations and Adoptions by Language Group: Weighted.....	36
Table 24 Summary Measures of Adoptions Before Audit by Language Group: Weighted	37
Table 25 Model Predicting Percent Measure Recommendation Adoptions: Weighted ..	38
Table 26 Model Predicting Percent Practices Recommendation Adoptions: Weighted..	39
Table 27 Participation in and Awareness of Programs by Program Year: Weighted.....	42
Table 28 Variables Associated with Program Participation: Weighted.....	43
Table 29 Participation in and Awareness of Programs By Ethnicity: Weighted.....	43
Table 30 Recommendations and Adoptions by Program Participation: Weighted	44
Table 31 Total Program Savings and Inputs.....	45

1 Executive Summary

The evaluation of the Program Year 2002 (PY2002) program focused on four goals. They are listed here with the methods used to address each:

- Verify the number of local energy audits completed in the PY2002 Local In-Home Audit Program. A review of the SCE database was conducted in order to determine the number of In-Home Audits completed in PY2002. A telephone survey was also conducted.
- Assess the impact of the Program on customer awareness and knowledge of energy efficiency opportunities, with particular emphasis on the hard-to-reach (HTR) customer segment targeted by the program. A survey of 270 participants assessed customer awareness, behaviors and practices, and knowledge of energy efficiency opportunities. These survey results were compared to available baseline surveys.
- Provide ongoing feedback and corrective guidance regarding program design and implementation.
The survey of 270 In-Home audit participants mentioned above were also used to assess customer satisfaction factors such as the timeliness and relevance of the audit results. Specific questions were asked concerning elements of satisfaction. Since one of the central issues of this program year is an effort to recruit HTR customers, we compared the attitudes, awareness, satisfaction and behaviors of the Spanish-speaking with the non-Spanish-speaking participants.
- Evaluate program success by estimating the savings that can be attributed to the program based on a verification of audit-recommended adoption rates for both measures and practices.

Because this is an information only program, the CPUC Energy Efficiency Policy Manual does not require an estimate of program savings. However, we did estimate kWh and kW impacts based on a billing analysis of the PY1995 In-Home Audit Program. The impacts reported in that earlier study were adjusted by current adoption rates, measured by the interview of program participants. Net kWh and kW savings were calculated using the current default net-to-gross ratio (NTGR) of 0.72 for residential audit programs.

The random sample of 270, drawn from the SCE Program database, was stratified by kWh use and CEC climate zone. Customers were asked to self-report whether they adopted each of the measures and practices that were recommended in the audit. The survey data were then merged with the Program database so that each survey respondent could be linked with their original audit data.

This study covered a variety of topics. The central findings in each area will be summarized and the recommendations that flow from each will be given.

1.1 Verification

The goals for verification were:

At least 4,500 energy-efficiency audits would be completed during PY2002

At least 50 percent of the audits would be for hard-to-reach customers

The verification determined that 5,172 energy surveys were completed and 71 percent of those customers qualified as hard-to-reach. Thus, both goals were exceeded.

A further verification was undertaken based on telephone interviews with a small sample of customers (N=67) to question them as to whether the survey had actually taken place. This resulted in an estimate of 9 percent failing to recall the event. However, it was clear that there were problems of recall involved, and it was not deemed reasonable to adjust the completed surveys by that number. Importantly, even if such an adjustment were made, both goals would still have been met.

Recommendation: Complete verification calls within 30 days after the audit in order to minimize the problem of recall.

1.2 Program Satisfaction

Satisfaction with the program among participants was high, both as measured quantitatively through specific survey questions, and qualitatively through open-ended suggestions for program improvement. The highest ratings were for the courtesy of the representative, and for the ease of understanding the recommendations. The lowest ratings were for the time to complete the survey (based on open-ended comments this probably meant that, for some customers, there was too little time spent to conduct the audit), and relevance of the recommendations to their home. The more common suggestions for program improvement fell into the categories of requesting more specificity in the recommendations and their benefits, and more help in implementing the recommendations. It should be noted that significantly more Spanish speakers found the recommendations harder to understand, and found them less relevant to their homes.

Recommendations: Providing customers with more specific benefits such as energy savings would be helpful. Also, connecting the customer to other programs that could help them with implementation could make a big difference to some customers.

1.3 Energy-Efficiency Attitudes

The participants in the PY2002 Energy Survey Program in general hold attitudes that are similar to customers across the state and the country. However, the participants in this program more strongly endorse two statements: “Conserving energy in my home is an economic necessity,” and, “There is little I can do to reduce the amount of electricity that I am now using.” These attitudes were probably shaped by the energy crisis of 2001, and the rising cost of electricity in California. The attitudes almost certainly reflect the feeling that these customers have been trying hard to conserve already.

Spanish-speakers expressed stronger endorsement of energy conservation values than the rest of the sample. However, they also more strongly endorse the statement: “My life is too busy to worry about making energy related improvements to my home.” So, these participants have very strong energy conservation attitudes but feel unable to implement hardware changes to conserve electricity.

Recommendation: A systematic effort to connect participants in the energy survey program to other programs that will facilitate measure implementation could be very beneficial.

1.4 Recommendation Adoptions

Overall, 33 percent of the recommendations offered in the in-home energy survey are adopted following the audit. This is about the same percent that were adopted before the audit since 65 percent of the total recommendations were implemented either before or after the audit. These figures are not surprising given that overall, the participants indicated that they already understood the energy benefits of 73 percent of the recommendations they were given. This does not mean that they had necessarily implemented those measures, but it would help to explain why nearly a third of the recommendations had been implemented before the audit. Another figure of interest is that 86 percent of all participants adopted at least one recommendation after the audit.

The 33 percent post-audit adoption rate applied both to measures and practices. However, the rate of adoption for practices was quite consistent across specific recommendations, while the rate for measures varied widely by recommendation.

Those who identified themselves as Hispanic/Latino tended to receive more measure recommendations, but had a lower rate of adoption for those measures when compared to other groups. Lack of resources is the most likely explanation for a low adoption rate of measures (but not practices), since there is both motivation to do so, and the perceived need.

Recommendation: Future programs will likely be more effective in promoting adoptions to the extent that *measures* are recommended more and that this is followed up by a focus on helping customers, especially hard-to-reach, to implement them.

1.5 Effectiveness of Strategies to Recruit Hard-to-Reach

If more hard-to-reach customers were brought into the program this year, we would see more hard-to-reach customers in the first time participation group compared to their number in the group that had participated earlier. First-time participants have been shown more likely to be disproportionately Latino customers, those who are low income and who consume less energy.

As would be expected, first time participants had a lower rate of awareness for the recommendations, and had higher adoption rates for measures. However, they had the same adoption rate of practices as the other groups.

About 10-12 percent of the participants interviewed availed themselves of the Spanish-language audit and/or interview. In addition, the Spanish-speaking participants had instituted fewer energy-saving measures prior to the audit than other groups, indicating the recruitment of less informed participants compared to past program years.

All of this is evidence, though not conclusive, that there has been some success in recruiting hard-to-reach.

Recommendation: Recruiting among the previously unreachable should be continued.

1.6 Program Savings

Program-level savings were calculated by using the gross household savings estimated by an earlier billing analysis for the same program (PY1995), multiplying it by the adoption ratio consisting of the gross adoption rates of the PY2002 to the PY1995 rate in order to adjust the household savings by difference between the two program years. This adjusted gross savings was multiplied by the standard net-to-gross ratio of 0.72. Program savings are estimated to be 2,398,807 kWh, and 521 kW.

Recommendation: An accurate estimate of current program savings would be best generated by direct estimates. This could take the form of a billing analysis, although the cost of this may not be justifiable. Another form that could also benefit the program is to generate recommendation-based savings estimates through RECAP software provided by Kema-Xenergy or another set of engineering algorithms. These savings could be calibrated to the energy consumption of the household and could provide more specificity in the benefits presented to the customer as well.

2 Introduction

2.1 Background

The In-Home Energy Survey program is one of Southern California Edison Company's (SCE's) oldest energy efficiency programs. It has taken a variety of forms over the years, but the current design of the Program has been implemented for the last decade. This current design is based on a two-page form that an energy auditor completes as s/he walks through the home and asks the customer questions about appliance usage patterns. The completed form, which is left with the customer, comprises a list of recommendations. Ideally, the auditor also discusses the recommendations with the customer and answers questions. When the audit is completed, the date and other basic information are recorded in a database and submitted to SCE.

While this program is called an in-home program, and most of the energy surveys are completed with an auditor who comes to the customer's home, an option of doing the audit over the telephone is available to the participants. Thus, a small percentage was conducted by telephone.

Customers are recruited into the program in a variety of ways, and these strategies have changed somewhat over the years. The direct-mail technique has been consistent over that time, and bill stuffers have sometimes been used. Another substantial source of recruiting participants has been the SCE Call Center where customers call with complaints and concerns about high bills. These customers are typically referred to the In-Home Energy Survey program. Finally, in recent years, before the SCE recruitment effort gets under way for the year, the contractor that completes the surveys, recruits customers directly by approaching apartment managers for access to the renters. This strategy has become especially useful since renters have been designated as hard-to-reach.

During Program Year 2002, the direct mail strategy was focused entirely on reaching the hard-to-reach, as defined by the California Public Utilities Commission (CPUC). The targeting is based on zip codes and the characteristics of those zip codes. That is, when a zip code has a high percentage of Spanish-speaking residents, it is designated as a hard-to-reach zip code. The same philosophy is applied to the other hard-to-reach categories of renters, moderate income, and rural residents. Starting at the end of 2001, and continuing through all of PY2002, the recruitment strategies focused especially on Spanish-speaking customers. In addition to targeting those zip codes, the recruitment letters and the audit forms were translated into Spanish. Some of the auditors also spoke Spanish so that the audit could be conducted in Spanish when necessary or beneficial. During this program year, all solicitation letters were targeted to hard-to-reach zip codes. Customers in non-hard-to-reach zip codes would likely come into the program from one of two sources, the SCE Call Center or the Mobile Education Unit.

The evaluation of the PY2002 program focused on four goals:

- Verify the number of local energy audits completed in the PY2002 Local In-Home Audit Program;

- Assess the impact of the Program on customer awareness and knowledge of energy efficiency opportunities, with particular emphasis on the hard-to-reach (HTR) customer segment targeted by the program;
- Provide ongoing feedback and corrective guidance regarding program design and implementation; and
- Evaluate program success by estimating the savings that can be attributed to the program based on a verification of audit-recommended adoption rates for both measures and practices.

2.2 General Approach

A brief description of our approach to achieve each of these four goals is presented below.

Goal 1: We conducted a review of the SCE database in order to determine the number of In-Home Audits completed in PY2002. We also conducted a small telephone survey for the purpose of verifying the audits.

Goal 2: A survey of 270 participants assessed customer awareness, behaviors and practices, and knowledge of energy efficiency opportunities. These survey results were compared to available baseline surveys that include the: “CBEE Baseline Study on Public Awareness and Attitudes Toward Energy Efficiency” conducted by Hagler-Bailly Consulting in 1999; and, the Phase I evaluation of the California Lighting and Appliance Program conducted by XENERGY in 1998.

Goal 3: The survey of 270 In-Home audit participants mentioned above was also used to assess customer satisfaction factors such as the timeliness and relevancy of the audit results. Specific questions were asked concerning elements of satisfaction. However, one of the central issues of this program year is an effort to recruit HTR customers, so the attitudes, awareness, satisfaction, and behaviors were compared for the Spanish-speaking versus the non-Spanish-speaking participants. The interviewed customers are characterized by the criteria used for defining HTR customers and counts are reported. Participants were asked by what method they learned of the In-Home Audit, and which methods were most effective in convincing them to participate.

Goal 4: Because this is an information only program, the CPUC Energy Efficiency Policy Manual does not require an estimate of program savings, which is appropriate since the methods required by that document are not appropriate for mass-market programs. Nevertheless, savings were estimated by adjusting the savings estimate from a prior billing analysis of the PY1995 In-Home Audit Program. That figure is adjusted by current adoption rates, measured by the interview of program participants. Net kWh and kW savings were calculated using the current default net-to-gross ratio (NTGR) for residential audit programs of 0.72.

The random sample of 270 participants, drawn from the SCE Program database, was stratified by kWh use and climate zone. Customers were asked to self-report whether they adopted each of the measures and practices that were recommended in the audit. The survey data were then merged with the Program database so that each survey respondent could be linked with their original audit data.

3 Method

3.1 Program Database Verification

We conducted a review of the Program database in order to determine the number of Audits completed in PY2002. Nearly 100 percent of these participants were expected to be hard-to-reach customer because all mail solicitations were focused only on zip codes with a predominance of hard-to-reach characteristics.

3.2 Telephone Verification

Typically, the goals for In-Home Energy Survey programs have been expressed as the number of energy surveys completed within the Program Year. The Surveys are tracked in the Program database, and figures from those databases have been used to verify whether the Program has met its goals. For Program Year 2002, a more stringent method was used to determine whether the goals have been met. A sample of participants recorded in the Program database was interviewed to determine whether those customers agreed that they had received energy surveys.

The central question addressed by this survey was whether 100 percent of the customers listed in the Program database could be assumed to have received an energy survey as claimed. Another way to think of this question is whether we can assert that 0 percent of the customers deny the energy survey event. If some are believed not to have received a survey, program claims for completed surveys and kWh savings would have to be adjusted. Thus, the hypothesis is that the rate of denial of energy surveys is 0 percent.

3.2.1 Verification Sample Size

Assuming a true proportion of denials of 0.01 (because assuming 0.00 isn't feasible for statistical power calculations), a sample of 67 provides an estimate of the proportion of denied energy surveys with 95 percent confidence, and 2 percent precision, using a one-tailed test. A one-tailed test is appropriate since direction of the hypothesis is clear (because it is not possible to find that less than 0 percent denied receiving an energy survey).

3.2.2 The Verification Interview

An outgoing sample of 154 was provided to California Survey Research Services for the purpose of interviewing 67 customers. The sample included the name, address, and telephone number of the person who participated in the energy survey, and the date of the energy survey. The interviewer first established that the person listed in the Program database was on the telephone. After this, two questions were asked:

1. Do you recall [the In-Home] energy survey conducted at [ADDRESS]?
2. Do you recall receiving a list of recommendations to reduce your energy consumption based on this energy survey?

3.3 Participant Impact Sample Interviewing

As indicated above, the survey of 270 participants was used to assess customer awareness, behaviors and practices, and knowledge of energy efficiency opportunities. These survey results are compared to available baseline surveys that include “CBEE Baseline Study on Public Awareness and Attitudes Toward Energy Efficiency” conducted by Hagler-Bailly Consulting in 1999, the “Phase I Evaluation of the California Lighting and Appliance Program” conducted by XENERGY in 1998, and the “PG&E Residential Energy Management Services Program: Market Baseline and Market Effects” conducted by Hagler-Bailly in 1999. The wording of these questions was exactly the same as those used in these baseline studies so that legitimate comparisons can be made.

The research plan called for proportional stratified random sampling to promote sample efficiency. The initial strategy was that strata would be defined by five climate zones (see Section 3.3.1 for full definitions of the climate zones) and three kWh consumption levels. A total sample of 270 was planned based on a power analysis. This sample size allowed estimates of (adoption) proportions at the 90 percent level of confidence, plus or minus 5 percent for various combinations of stratum levels. All of these initial decisions were kept in place except for two. First, there were no participants in some CEC Weather Zones so only four Climate Zones were ultimately used. Second, using proportional sampling over the 12 design cells resulted in too few cases in a few of the cells, so a number of analyses on subsamples would not be feasible. Therefore, a decision was made to use non-proportional random sampling, to produce equal cell sizes. As a result, weighting was required to estimate population parameters. The details of the stratum definitions follow.

3.3.1 Creating the Climate Zones

The CEC Title 24 Weather Zones were collapsed in the following way, as established in the PG&E Residential New Construction Project report by RER (2002):

Collapsed Climate Zone 1 (CZ1) encompasses CEC T24 Weather Zones 1,2,3,4

Collapsed Climate Zone 2 (CZ2) encompasses CEC T24 Weather Zones 6 and 7.

Collapsed Climate Zone 3 (CZ3) encompasses CEC T24 Weather Zones 8, 9, and 10.

Collapsed Climate Zone 4 (CZ4) encompasses CEC T24 Weather Zones 11, 12, and 13.

Collapsed Climate Zone 5 (CZ5) encompasses CEC T24 Weather Zones 14, 15, and 16.

Not all of the CEC T24 Weather Zones are in SCE territory. Thus, only those that are, appear in the above definition. Also, there were no program participants in CEC T24 Weather Zones 1-4. Therefore, the corresponding Climate Zone 1 was eliminated from the sample design. The remaining four climate zones were: 2 (Coastal & LA Basin), 3 (Valley & Inland Empire), 4 (San Joaquin Valley), and 5 (Low and High Desert).

3.3.2 Creating kWh strata

KWh was also used as a stratification variable. For sample efficiency it was necessary to find the best break points in the continuum of consumption for defining the kWh usage strata. The Dalenius-Hodges technique was used by first breaking the distribution of

scores into deciles. These deciles were then combined in a manner that minimized the variance within the final three strata, and maximized the variation across the strata. This method resulted in the categories with the following boundaries:

Low kWh: 51-60

Medium kWh: 641-1373

High kWh: 1374-5556

The Neymann allocation method was not necessary at this point due to the decision to use equal cell sizes.

3.3.3 Preparing the Sample Frame

Several steps were required to make the dataset ready for processing for interviewing. The first step was to rid the file of participants who did not fall within the program period. Thus, those whose energy survey dates were before April 1, 2002 were eliminated. Those who were living in master-metered complexes, who have inactive accounts, and customers who have no record of consumption had already been eliminated before solicitation letters were sent by program staff to potential participants.

The second step in data preparation was to eliminate cases without an SCE account number. It would be a waste to interview someone whose account information, including kWh, could not be connected with the interview information. There were nine such cases.

A third step in cleaning the files was to delete cases for further consideration for interviewing if they had already participated in the verification interview. Not wanting to bother these customers twice, we eliminated all verification interview participants, including those who were called and refused.

A final cleaning step was to remove one from each pair of cases where there was a duplicate account number. There were four such cases. These situations occurred due to customers requesting two audits during the same year, an unusual situation and one that, if caught in time, would not be allowed. If one was a telephone interview and the other an In-Home, the In-Home was chosen. If both were In-Home interviews, the one with the most information, including recommendations, was kept. The final sample frame for the evaluation interviews consisted of 4704 unique energy surveys that took place within the established program period, from April 1, 2002 to January 31, 2003. Extreme kWh consumption values (less than 600/month and more than 70,000/month) had already been eliminated from the pool. The sample frame that was a result of all of these decisions and process is seen in Table 1.

Table 1
Sample Frame

Collapsed CEC WZ	KWh Consumption			Total
	Low	Medium	High	
Coastal & LA Basin	170	217	55	442
Valley & Inland Empire	1311	1010	244	2565
San Joaquin Valley	166	195	41	402
Low & High Desert	697	471	131	1299
Total	2344	1893	471	1708

The original sample design, based on the plan for equal cell sizes is shown in Table 2.

Table 2
Equal Allocation Sample Design for Participant Interviews

Collapsed CEC WZ	KWh Consumption			Total
	Low	Medium	High	
Coastal & LA Basin	170	217	55	442
Valley & Inland Empire	1311	1010	244	2565
San Joaquin Valley	166	195	41	402
Low & High Desert	697	471	131	1299
Total	2344	1893	471	1708

3.3.4 Sampling

After establishing the sample frame, random samples of 67 cases from each of the 12 design cells were selected for the outgoing interview sample. A few cells had less than 67 because there were no more sample points available.

California Survey Research Services (CSRS), the survey interview firm, had been asked to fill each design cell equally; however this was difficult to do when the cells varied widely with respect to available cases. Specifically, if the quota for all design cells for

completed interviews is 22, it will be much easier to meet that quota with 300 participants as potential interviewees for that cell than if there were only 30.

The sample frame was not provided to CSRS in its entirety. Only four times the quota in each cell was provided (if available). If more were needed because every sample piece had been called at least five times with no prospect of an interview, additional sample was provided. This procedure was followed to avoid a situation where the interviewer might call all sample pieces just once in order to accumulate more interviews faster, thus limiting the completed sample to those who were easy to recruit.

Some cell quotas could not be filled with respondents; there were too few participants in the high-kWh cells. When those cells were exhausted, new quotas were developed for other cells that would maximize the number of interviews in the rows and/or columns associated with the sparse cells. This way, rates of adoption could at least be reported for all stratum marginals based on a sample size large enough to produce stable estimates at that level. Table 3 depicts the final cell quotas for the sample of 270.

Table 3
Final Sample Allocation

Collapsed CEC WZ	KWh Consumption			Total
	Low	Medium	High	
Coastal & LA Basin	27	26	7	60
Valley & Inland	24	23	34	81
Empire				
San Joaquin Valley	26	27	7	60
Low & High Desert	24	24	21	69
Total	101	100	69	270

3.3.5 Preparation for Interviewing

The sample frame file was trimmed to the essential variables needed for interviewing, including the recommendations and personal contact information. Narrative forms of the recommendations were created and added to the file, with each recommendation made by the auditor appearing in the record for the relevant customers. The actual wording of the recommendations on the energy survey form was quite cryptic, so more complete wording was provided.

3.3.6 Interviewing Process

The interview process was organized into three waves. The purpose of the waves was to interview the participants as close to one year after the audit as possible. It was essential to allow a full year for recommendation adoptions to take place, but it was equally important not to wait longer, which could create problems of recall. The three waves

made the post audit period no longer than 15 months. No attempt was made to keep the three interview periods equal in sample size. Fewer customers received energy surveys in the first quarter of the program, so fewer appear in the interview sample for the first wave.

3.3.7 Response Rate

The interview effort resulted in 270 completions. The sample disposition is presented in Table 4.

Table 4
Sample Disposition

Disposition	Wave 1	Wave 2	Wave 3	Total	Percent
Completed	45	81	144	270	34.2%
Terminated	8	16	47	71	9.0%
Did not pass screening question	7	27	33	67	8.5%
No answer	22	1	0	23	2.9%
Wrong number/disconnected	34	55	109	198	25.1%
Refused	11	25	90	126	15.9%
Unable to answer questions	5	2	4	11	1.4%
Language barrier	0	2	5	7	0.9%
Business or fax machine	1	6	10	17	2.2%
Total Calls	133	215	442	790	100.0%

Table 5 provides efficiency and completion rates for the survey. It includes the pool efficiency rate, the gross completion rate, and the eligible completion rate. The pool efficiency rate is a measure of how efficient the sample frame was in reaching working numbers. That is, of all the numbers called, what percent were working residential telephone numbers? The gross completion rate is the number of completions divided by the total number of call sheets. A more relevant number is the eligible completion rate, which is the number of completions divided by the number of households reached that were eligible. Ineligible households were ones in which neither English nor Spanish was spoken, the respondent was hearing impaired, there was no answer, telephones were disconnected, telephone number was blocked, etc. The eligible completion rate of 50.6 percent was reasonable.

Table 5
Efficiency and Completion Rates

Completion Rates	Wave 1	Wave 2	Wave 3	Total
Pool Efficiency Rate	73.7%	71.6%	73.1%	72.8%
Gross Completion Rate	33.8%	37.7%	32.6%	34.2%
Eligible Completion Rate	63.4%	54.4%	45.9%	50.6%

However, it clearly declined over time, likely because of customer mobility between the time of the audit solicitation and the interview. The audit itself was not further from the interview in Wave 3 than in Wave 1. However, more time would have passed between the solicitation letter, when residence and account number were first established for this program, and the interview.

3.3.8 Weights

Because some strata were over-sampled to assure adequate representation of each group, it was necessary to create weights to apply where the whole territory should be proportionately represented, as in satisfaction scores, and adoption rates. Traditional expansion weights have the drawback that they increase apparent sample size, thus reducing standard errors artificially. To avoid this problem, relative weights were applied. Table 6 depicts the weights used in the analyses.

Table 6
Relative Weights

Collapsed CEC WZ	h Consumption		
	Low	Medium	High
Coastal & LA Basin	0.3611	0.4786	0.4506
Valley & Inland Empire	3.1327	2.5184	0.4116
San Joaquin Valley	0.3662	0.4142	0.3359
Low & High Desert	1.6655	1.1255	0.3577

3.4 Estimating Savings

The original plan for estimating program savings rested on the assumption that savings estimates were available by measure from the program tracking system. When it was learned that savings are not calculated for the customer and therefore were not recorded in the Program database, alternative sources of such estimates were sought, but none

were available that covered the same recommendations used in the SCE In-Home Energy Survey. Based on these findings, a different method was required. The most recent study of the SCE In-Home Energy Survey Program that focused on savings was conducted on the PY1995 (SCE2, 1997), and produced estimated net and gross household savings. These savings estimates form the basis for the current study's savings estimates.

3.4.1 Estimating Total Program Savings

Using the savings from Study 528A directly would implicitly assume that the adoption rates for the two studies are the same. Assuming that some adjustment for different adoption rates would be necessary, the following algorithm was used to estimate the savings for the PY2002 Program.

$$\text{Net kWh Savings} = \left(\frac{\text{Adoption Rate}_{2002}}{\text{Adoption Rate}_{528-A}} \right) \times \text{Per Household Gross kWh Savings}_{528-A} \times \text{NTGR} \quad (3)$$

$$\text{Net kW Savings} = \left(\frac{\text{Adoption Rate}_{2002}}{\text{Adoption Rate}_{528-A}} \right) \times \text{Per Household Gross kW Reduction}_{528-A} \times \text{NTGR} \quad (4)$$

Note that the value for the NTGR of 0.72 is currently the default NTGR for residential audits (CPUC, 2001).

3.4.2 The Interview

The data collected included:

- self-reported recall, awareness, and adoption of specific measures and practices recommended as a result of the audits,
- attitudes toward energy efficiency and energy conservation,
- knowledge of energy conservation and energy efficiency,
- past participation in the DSM programs,
- satisfaction with the audit program,
- demographic characteristics,
- how they were informed about the audit, and
- suggestions for program improvement.

The interview was translated into Spanish, and interviews were conducted in English and Spanish, depending on the desire of the respondent. The interviewer did not know what language was used for the audit as this information was not recorded. Therefore, the interviewer asked the respondent what language was used for the audit. In addition, the language used for the interview was recorded at the end of the interview. The full questionnaire is provided in Appendix A.

4 Results

The results of this study will be presented in five sections. The first will address the verification efforts. Section 4.2 will describe the nature of the participant group and compare that to the characteristics of the SCE residential sector as measured by the most recent saturation survey. Section 4.3 will deal with customer awareness and knowledge, while market issues will be addressed in Section 4.4. The final section will analyze the adoption patterns for recommended measures and practices.

4.1 Verification

The traditional SCE end-of-year, independent verification process was followed to reveal the final count of 5,172 audits after eliminating invalid service account numbers and duplicate records. This figure was reported in the 2002 Program Year Residential & Small Business Verification Audit Final Report, filed as part of the Annual Earnings Assessment Proceeding. Also calculated as part of that verification process, but not reported in the Final Report was that 3,662 or 71 percent of the participants qualified as hard-to-reach. Thus, the program goals of 4,500 audits, at least 50 percent of which are hard-to-reach, were attained. In addition, we completed a further verification process involving a telephone survey of participants to verify that an audit had taken place.

4.1.1 Telephone Verification

The results of the survey are shown in Table 7. To qualify as remembering some essential aspect of the energy survey experience, a customer should be able to say “Yes” to at least one of the two questions listed on Table 7. This table indicates that 39 respondents said “Yes” to both questions. On the other hand, 14 respondents said “Yes” to Question 1 (about recalling the energy survey), but said “No” to Question 2 (about recalling the recommendations). A total of 61 respondents gave a definitive “Yes” to at least one of the

Table 7
Number of Respondents Who Recall Energy Survey
by Those who Recall the Recommendations

Recall Survey? (Q1)	Recall Report? (Q2)			Total
	Yes	No	Don't Know	
Yes	39	14	4	57
No	2	2	1	5
Don't Know	2	2	1	5
Total	43	18	6	67

two questions (57 said “Yes” to Question 1, and four said “Yes” to Question 2, but not to question 1; specifically two said “No” and two said “Don’t Know” to Question 2). Six

failed to give a definitive “Yes” to at least one of the questions. They said “No” or “Don’t Know” to one of the questions, plus “No” or “Don’t Know” to the other (these cases are found in the lower right four cells of the table, excluding the Totals). This means that six of 67 or 8.96 percent of the sample claim to have no memory of the energy survey process or result. The 95 percent confidence interval around this figure is 1.95 to 15.97. This interval does not include zero, so the conclusion must be drawn that the number of people in the Program database who do not recall receiving the energy survey is greater than zero.

4.1.1.1 Adjustments to Program Database Figures

The best estimate of the percentage of Program database customers who do not recall the energy survey that is claimed by the Program is 8.96%. Thus, the recall adjustment to claimed completed energy surveys would be based on this figure. The number of claimed energy surveys for PY2002 is 5,176. The number of surveys recalled by customers up to 15 months later is 4,712.

If recollection of the survey were taken as the basis for verifying that the survey took place, then the verified number of surveys would be estimated as 4,712. The goal for the program was 4,500. Therefore, even with this adjustment, the Program would achieve its goal for the number of completed energy surveys.

4.1.1.2 Problems of Recall

However, there are reasons to be skeptical of the conclusion that these energy surveys did not take place. It is quite possible that the surveys took place as documented by the Program tracking database. Some of these energy surveys took place, according to the database, up to 15 months prior to the verification interview. While the same person who requested the audit was interviewed, the possibility of forgetting what actually did take place 15 months ago can’t be dismissed. If memory is a problem in this type of survey, it could be assumed that the further in the past the event took place, the more likely it is to be forgotten. To test this idea, the mean number of days from the audit date recorded in the Program database to the date of the interview was calculated for the customers who remembered the audit, and for those who denied it. The mean for those remembering it was 262 days, and it was 340 days for those who denied the survey. This difference is statistically significant at the .01 level, indicating that those who denied the survey tended to receive the services at a much earlier date than the others. While not conclusive, this certainly provides evidence that one reason for the denials that the energy survey took place could well be that it was simply forgotten because it took place so long ago.

Two other possibilities for explaining recall problems come to mind. First, the tracking system records the person who requested the survey, not the one who was present for it. This presents the possibility that the person requesting it could be unaware of what ultimately took place.

This information implies that it would be wise, if this method were to be used for verification of program accomplishments in the future, to conduct verification surveys on a regular basis during the program period so that relatively little time would elapse for the participants before they receive a verification call. Consideration was given in this round of verification interviews to sampling only those customers who had participated in the

last quarter of the program. This would have minimized the potential recall problem. However, covering only one period of the program would have incurred other problems. One cannot assume that the program is implemented uniformly across the entire period. Answers based on one period would not necessarily represent the others. Therefore, it would be more advisable to implement a rolling verification design so that no participant would wait more than 30 days between participation and verification.

4.1.1.3 Conclusion

The telephone interview method of verification was a supplemental method that was undertaken for this program year. It supplemented the traditional approach to verification that SCE has used to verify its residential and small commercial energy efficiency programs. The traditional approach reached the conclusion that all goals had been met, including the Hard-to-Reach goal. No adjustments were necessary based on that method. The supplemental method would be valuable if done during the program year to minimize problems of recall. It was clear that at least some of the respondents' denials of receiving the energy surveys were a result of recall problems. Thus, the traditional method of verification will be the basis for establishing that the Program has met its goals. It is important to note though, that even if the supplemental method had been the basis of this judgment, the Program would have met both of its goals.

4.2 Description of Participants

Demographic information was collected on all evaluation interview participants and compared to the analogous information collected on utility customers through the Statewide Residential Lighting and Appliance Saturation Study (2000) to assess the representativeness of the participant sample. The saturation data are presented in both statewide form, without the Sacramento Municipal Utilities District (SMUD) customers and then separated out to show the SCE territory customers for a more direct comparison. Table 8 shows the comparison of the distribution of residence type. The program participants are clearly different from the general utility population. The largest difference is that the program participants are much more likely to reside in a single family attached home (28.0 percent compared to 2.6 percent of SCE territory overall). Participants are also substantially less likely to live in apartment complexes with more than five units.

Table 8
Percent of Participant Homes of Each Type of Residence:
Weighted

Type of Residence	Saturation Survey Total*	Saturation Survey SCE Territory	PY2002 In-Home Program
Single Family Attached	2.7%	2.6%	28.0%
Single Family Detached	65.7%	67.6%	51.3%
Apartment < 5 Units	5.6%	4.1%	5.8%
Apartment 5+ Units	23.3%	22.5%	9.6%
Mobile Home	2.6%	3.2%	5.3%

*Total without SMUD

The composition of the participants' households is similar to that of the territory or the State (See Table 9 and Table 10).

Table 9
Distribution of Total Number of People in Household:
Weighted

Number in HH	Saturation Survey Total*	Saturation Survey SCE Territory	PY2002 In-Home Program
1	17.8%	18.9%	12.8%
2	33.1%	30.1%	26.9%
3	18.4%	16.3%	15.1%
4	17.5%	21.5%	17.9%
5	7.0%	7.1%	15.8%
6	3.8%	3.1%	7.0%
7	1.3%	1.2%	2.5%
8+	1.1%	1.7%	2.2%

*Total without SMUD

Table 10
Distribution of Number of Adults in Household:
Weighted

Adults in HH	Saturation Survey Total*	Saturation Survey SCE Territory	PY2002 In-Home Program
1	23.8%	23%	17.4%
2	58.7%	58%	54.6%
3	11.6%	12%	16.3%
4	3.9%	5%	6.9%
5+	2.0%	2%	5.2%

*Total without SMUD

However, there are differences in income (Table 11). Program participant households are considerably more likely to earn less than \$25,000 per year (32.7 percent versus 21.6 percent for SCE territory and 19.4 percent of the statewide population). The final comparison is on the age of the residence (Table 12). Program participants are more likely to live in homes built later than 1994 (19.3 percent compared to 4.4 percent for SCE customers, and 6.1 percent statewide).

Data were not available for the state on education or ethnicity. However, this information is shown for participants in Table 13 and Table 14. About 83 percent of the participants have at least a high school education, and almost 36 percent have at least a college education. Caucasians comprise almost 60 percent of the group, while almost 30 percent are Latino customers.

Table 11
Distribution of Total Household Income:
Weighted

Income Range	Saturation Survey Total**	Saturation Survey SCE Territory	PY2002 In-Home Program
<\$25,000	19.4%	21.6%	32.7%
\$25,001-50,000	31.0%	29.9%	27.2%
\$50,001-75,000	21.2%	22.0%	16.3%
\$75,001-100,000	15.6%	15.6%	10.1%
>\$100,000	12.7%	10.9%	13.7%
Refused, DK, Vacant*	18.3%	17.6%	17.6%

*Not counted in category percentages & no vacancies in this survey

**Total without SMUD

Table 12
Distribution of Age of Home:
Weighted

Age of Home	Saturation Survey Total**	Saturation Survey SCE Territory	PY2002 In-Home Program
Older than 1950	11.0%	10.0%	4.6%
1950-1954	6.0%	6.8%	3.2%
1955-1959	5.2%	5.0%	3.5%
1960-1964	8.2%	10.2%	5.2%
1965-1969	7.7%	8.0%	6.2%
1970-1974	9.3%	10.0%	7.8%
1975-1979	8.7%	7.6%	5.9%
1980-1984	5.5%	6.7%	8.2%
1985-1989	11.0%	13.0%	9.5%
1990-1994	7.4%	7.7%	9.3%
Later than 1994*	6.1%	4.4%	19.3%
DK/ Refused	13.7%	10.5%	17.3%

*Saturation survey covered years only through 2000

**Total without SMUD

Table 13
Distribution of Education:
Weighted

Level of Education	PY2002 In-Home Program
Less than High School	9.4%
Some High School	7.2%
High School Graduate	25.6%
Trade or Technical College	3.2%
Some College	17.9%
College Graduate	19.6%
Some Graduate School	2.4%
Graduate Degree	14.7%
Don't Know/Refused*	3.5%

*Not counted in category percentages

Table 14
Distribution of Racial or Ethnic Background:
Weighted

Racial/Ethnic Background	PY2002 In-Home Program
Hispanic	28.6%
African-American	4.9%
Caucasian	58.8%
Asian-American	3.1%
Native American	1.7%
Multi-Racial	2.6%
Other	0.3%
<u>Don't Know/Ref*</u>	<u>5.1%</u>

*Not counted in category percentages

4.3 Language

A major focus of the effort to contact hard-to-reach customers in PY2002 was customers whose first language is Spanish. For this reason the audit form was translated into Spanish and some of the auditors spoke Spanish. In addition, the evaluation questionnaire was translated into Spanish, and some of the interviewers were Spanish speakers. These actions and the priority they represent beg the question of how many participants felt the need of such services. In other words, are the hard-to-reach customers being reached?

Although the capability of serving customers who speak only or mainly Spanish was provided, the language in which each audit was conducted was not tracked. However, since the audit consulting firm retains a copy of each audit, it was possible to make a manual count of the Spanish language audits. This count produced an estimate that about 10 percent of the audits were completed in Spanish.

As further efforts to estimate the extent of the need for Spanish language services, the evaluation interviewers were asked to record the language in which the interview took place. In addition, they asked the participants what language was used during the audit. Over 10 percent of the interviews were conducted in Spanish; and over 12 percent of the *audits* were reported in the interview as being conducted in Spanish. These three methods of estimating the use of the provided language resource converge impressively. The range encompassed by the three estimates is 10 percent to 12 percent.

The distribution of language use for the interviews was crosstabulated with the distribution of language use reported for the audits by the interviewees. There was very high correspondence between the two. However, there were a few customers who

responded to the interview primarily in Spanish, but reported receiving the audit in English, and vice versa. When considering both sources cumulatively, about 13 percent of the interviewed sample availed themselves at least partially of the Spanish-language services provided by SCE. Among the 270 interviewed participants, there were 33 customers who used Spanish-language services. This group will constitute a point of comparison for several analyses that follow.

4.4 Satisfaction with the Program

The mean ratings displayed in Table 15 show a high level of satisfaction with the program, where a “1” represents “Strongly Disagree” and a “4” represents “Strongly Agree”. The highest rating is for the courteousness of the auditor, followed by the ease of understanding recommendations. The two issues receiving lowest satisfaction ratings were the amount of time to complete the survey and the relevance of the recommendations to the participant’s home.

Table 15
Mean Ratings on Seven Items Measuring Satisfaction with Program:
Weighted

Satisfaction Question	Measure*	PY2002 In-Home Program
The survey was scheduled in a reasonable time	Mean	3.37
	S.D.	0.493
The auditor was courteous	Mean	3.46
	S.D.	0.527
The amount of time to complete the survey was right	Mean	3.27
	S.D.	0.613
The recommendations were delivered in a timely manner	Mean	3.39
	S.D.	0.609
The recommendations were easy to understand	Mean	3.44
	S.D.	0.511
The recommendations were relevant to my home	Mean	3.28
	S.D.	0.652
The information in the recommendations was informative	Mean	3.37
	S.D.	0.634

*Ratings were from 1 to 4, with 4 being most favorable

It is important to note, though, that the range of satisfaction across the issues is quite narrow. Thus, too much focus should not be put on the differences in satisfaction across aspects of the program since satisfaction is quite consistent.

Another set of analyses was completed to determine whether there were differences in satisfaction across sample strata. No differences were found overall, or for individual items. One exception concerns how informative the participants found the

recommendations. Those in the low-consumption group rated this significantly higher than the other two consumption groups. On one hand, this finding makes some intuitive sense; on the other, this is just one significant result over many comparisons, so should not be viewed too seriously unless it is replicated elsewhere.

A final set of comparisons was made based on language since that is a focus of the PY2002 Program and of this report. A group of interviewed participants was defined by their use of Spanish in either or both the audit process or in the evaluation interview. These participants are identified in this study as Spanish speakers, and there are 34 of them. While not a large group, it is large enough to support stable estimates to compare with the larger group.

Comparing overall satisfaction (the mean of all satisfaction item ratings) showed a small but significant difference between Spanish- and English-speakers. Based on this finding, all of the satisfaction items were compared by language group to see what elements of satisfaction contributed to the overall difference. Table 16 depicts those comparisons.

Table 16
Ratings of Satisfaction with Program Elements by Language:
Weighted

Satisfaction Question	Measure	Speaking	Speaking
The survey was scheduled in a reasonable time	Mean	3.40	3.14*
	S.D.	.502	.352
The auditor was courteous	Mean	3.48	3.32
	S.D.	.532	.474
The amount of time to complete the survey was right	Mean	3.28	3.22
	S.D.	.636	.418
The recommendations were delivered in a timely manner	Mean	3.39	3.39
	S.D.	.626	.496
The recommendations were easy to understand	Mean	3.49	3.03*
	S.D.	.517	.180
The recommendations were relevant to my home	Mean	3.31	3.10*
	S.D.	.679	.358
The information in the recommendations was informative	Mean	3.36	3.45
	S.D.	.649	.508

*Difference between English and Spanish speaking means is Sig at $p < .05$

The largest difference between the language groups concerned the ease of understanding the recommendations. The other two group differences were similar in size; one involved the time the customer had to wait for the audit, and the other is the relevance of the

recommendations for the participant’s home. Spanish-speaking participants were more doubtful about relevance and less accepting of the time they had to wait for an audit appointment.

4.5 Attitudes Toward Energy-Efficiency

Attitudes toward energy efficiency have been measured consistently over the state and the country using the same questions since 1998 (see Section 3). One question, specific to the California energy crisis of 2001 was added to the current study. It can be valuable to compare this group of program participants to the larger population of customers in the state and country. Table 17 shows these ratings.

Table 17
Mean of Items Measuring Conservation Attitudes by Group:
Weighted

Item	US Respondents	California Respondents	PY2002 In-Home Program
My life is too busy to worry about making energy-related improvements in my home	3.38	3.70	3.32
Scarce energy supplies will be a major problem in the future	7.13	6.89	7.87
Instead of building new power plants, customers should use less electricity	6.32	6.24	6.57
It is possible to save energy without sacrificing comfort by being energy efficient	7.86	7.69	8.04
It is worth it to me for my household to use less energy in order to help preserve the environment	7.69	7.71	8.69
Conservation efforts helped reduce the effects of the energy crisis during the summer of 2001			7.80
Conserving energy in my home is an economic necessity	7.15	6.79	8.46
There is very little I can do to reduce the amount of electricity I am now using	4.78	4.85	6.11

Note: Responses ranged from 1 to 10, with 10 being strongest agreement with the statement

For the most part, the PY2002 In-Home Energy Survey participants hold energy views consistent with the rest of the state and the country. However, they rate the statement, “Conserving energy in my home is an economic necessity” substantially higher than the larger group (Mean=8.46 out of 10 versus 6.79 for California residents, and 7.15

nationwide). Similarly, these participants rate the statement, “There is very little I can do to reduce the amount of electricity I am now using” noticeably higher (mean=6.11 out of 10 versus 4.85 for California residents and 4.78 nationwide). The differences seen here may well be more due to the results of the 2001 energy crisis in California than to differences in geography or utility territory. All of the statewide and nationwide responses shown in the table were gathered well before the California crisis, while the current sample was drawn after. It is likely that California residents generally (as represented by these program participants) feel that they really must conserve electricity due to cost, and that they have already done what they can.

Further analyses of these items were completed to see if there were cultural or language differences in attitudes toward energy efficiency. Table 18 portrays the ratings of each item broken out by Spanish- versus English-speaking participants.

Table 18
Mean of Items Measuring Conservation Attitudes by Language Group

Energy Efficiency Question	Measure	English Speaking	Spanish Speaking
My life is too busy to worry about making energy-related improvements in my home	Mean	3.00	5.73*
	S.D.	2.737	3.337
Scarce energy supplies will be a major problem in the future	Mean	7.78	8.46
	S.D.	2.673	2.742
Instead of building new power plants, customers should use less electricity	Mean	6.16	9.29*
	S.D.	3.068	1.031
It is possible to save energy without sacrificing comfort by being energy efficient	Mean	7.87	9.23*
	S.D.	2.306	1.463
It is worth it to me for my household to use less energy in order to help preserve the environment	Mean	8.53	9.81*
	S.D.	2.201	0.590
Conservation efforts helped reduce the effects of the energy crisis during the summer of 2001	Mean	7.61	9.12*
	S.D.	2.720	1.658
Conserving energy in my home is an economic necessity	Mean	8.24	9.95*
	S.D.	2.284	0.527
There is very little I can do to reduce the amount of electricity I am now using	Mean	6.07	6.43
	S.D.	3.321	3.358

Note: Responses ranged from 1 to 10, with 10 being strongest agreement with the statement

*Difference between language groups significant at <.05.

Clearly, the Spanish-speaking participants in this program are expressing a strong orientation to energy efficiency as exemplified by their response to the statement, “Instead of building new power plants, customers should use less electricity”. The gap between Spanish and English speakers is quite large on this item (9.29 [out of 10] compared to 6.16 for English-speakers). The pattern across a number of other items is similar. However, the first item, “My life is too busy to worry about making energy-related improvements in my home” seems to contradict the pattern. Interestingly, Spanish-speakers also significantly more strongly endorse the statement, “Conserving energy in my home is an economic necessity”. This combination of responses would seem to paint a picture of families who feel it is necessary for their own economic well-being to conserve, and it is important to society as well, but who feel they have little time in which to address these values.

4.6 Recommendations and Adoptions

A total of 66 recommendations are listed on the audit form, including some other, unspecified recommendations. Of these recommendations, an average of 14.95 were made to the sample participants, 4.15 of which were measure recommendations, and 10.79 of which were practice recommendations (Table 19). The audit is quite heavily weighted toward practices.

4.6.1 Adoptions After the Audit

The adoption rates of each type, however, are extremely similar (0.33 versus 0.34). Strikingly, a very large majority of participants adopted at least one recommendation (86 percent).

Table 19
Summary Measures of Recommendations and Adoptions:
Weighted

Summary Measure	Mean	SD
Total Recommendations Made	14.95	8.69
Measure Recommendations Made	4.15	3.32
Practice Recommendations Made	10.79	6.07
Total Adoptions after Audit	4.92	5.34
Measure Adoptions after Audit	1.24	1.35
Practice Adoptions after Audit	3.67	4.39
Percent of Recommendations Adopted	0.65	0.22
Percent of Recommendations Adopted after Audit	0.33	0.27
Percent of Measure Recommendations Adopted after Audit	0.33	0.33
Percent of Practice Recommendations Adopted after Audit	0.34	0.30
Percent of Participants Adopting at Least One Recommendation after Audit	0.86	0.35

4.6.2 Adoptions Before the Audit

A question that arises in considering the fairly low adoption rate is whether these participants had already adopted these measures before the audit, and that is why they didn't do so after it. Table 20 shows the adoption patterns reported by the participants as occurring before the audit took place. This table shows that just about the same number of adoptions before the audit as after. This is particularly true of practices, where an average of 4.05 pre-audit adoptions were reported, compared to 3.67 after. There were, however, fewer measure adoptions before (Mean=0.75) compared to post-audit adoptions (Mean=1.24). Still, these numbers make it clear that a substantial number of the recommendations made by the auditors had already been implemented, and this would certainly depress the rate of post-audit adoptions.

Table 20
Summary Measures of Adoptions Before the Audit:
Weighted

Summary Measure	Mean	SD
Adoptions Before Audit	4.80	5.27
Measure Adoptions Before Audit	.75	1.31
Practice Adoptions Before Audit	4.05	4.26

4.6.3 Recommendations and Adoptions by Sample Strata

The number of recommendations offered to customers was somewhat different by climate zone (Table 21). The main difference is between the desert compared to the other three zones. Noticeably fewer recommendations were made to desert residents (Mean=12.59), and the highest number was provided to residents of the San Joaquin Valley (Mean=18.83). A similar difference occurs across the kWh consumption categories. The highest number was given to customers in the highest consumption group (Mean=19.08), while the lowest was in the lowest consumption group (Mean=13.35). The rate of adoptions, however, is strikingly similar across all strata.

Table 21
Recommendations and Adoptions by Sample Strata:
Weighted

Climate Zone	Mean No. Recommendations	Mean Pct Adoptions
Coastal & LA Basin	17.73	0.31
Valley & Inland Empire	15.06	0.34
San Joaquin Valley	18.83	0.33
Low & High Desert	12.59	0.33

KWh Category	Mean No. Recommendations	Mean Pct Adoptions
51-640 kWh	13.35	0.33
641-1373 kWh	15.90	0.35
1374-5556	19.08	0.32

Note: Mean recommendations significantly different across climate zones ($p < .002$) and across kWh categories ($p < .002$). The adoption rate does not vary across either category.

Table 22 depicts the 66 individual recommendations available to the auditors along with how often each recommendation was made, in what percent of the cases the participant was aware of the benefits of the recommendation before it was made, and, in what percentage of the times the recommendation was made, it was adopted. Some recommendations are made to almost everyone. Examples of these include setting refrigerator and freezer temperatures with specified limits, replacing incandescents with CFLs, and cleaning refrigerator coils. However, most people who received each of these recommendation indicated that they were aware of the benefits before the recommendation was made. Some low-awareness items were installing water heater timers, floor insulation, keeping bedroom windows closed to keep waterbed warm, making the waterbed with a comforter, repairing leaky pipes and faucets connected to pumps, and putting refrigerators inside air-conditioned spaces. However, all of these were seldom recommended.

Table 22
Recommendations Made, Awareness of Their Benefits, and Percent Adopted:
Weighted

Recommendations	Measures	% of Sample Receiving Recommen	% Aware of Recomm	% Receiving Recomm that Adopted
Check seals on refrigerator and freezer doors		30%	84%	59%
Clean and replace dirty filters in air conditioners		44%	76%	43%
Clean and replace dirty filters in heaters		7%	72%	39%
Cover the pool or spa when not in use		11%	86%	3%
Install a water heater timer		3%	29%	0%
Install automatic setback thermostats		5%	62%	8%
Install floor insulation		4%	40%	0%
Install heater duct insulation		4%	82%	0%
Install low flow showerheads and aerators		4%	36%	18%
Install R11 wall insulation		17%	78%	4%
Install R19 ceiling insulation		12%	63%	3%
Install reflective coating or solar screening on windows		41%	63%	24%
Install storm doors and windows		6%	73%	47%
Install timers or photocells on security lighting		39%	57%	10%
Install vents in the attic		24%	62%	9%
Insulate hot water pipes		7%	78%	17%
Repair leaky faucets and pipes connected to the water heater		2%	60%	20%
Repair leaky tanks pipes and faucets connected to the pumps		5%	46%	54%
Replace incandescent bulbs with compact fluorescent bulbs		82%	80%	42%
Seal ducts in the air distribution system		0%		
Shade window areas from direct sunlight		25%	94%	37%
Vent the clothes dryers exhaust to the outside and check vents and filters regularly		6%	60%	40%
Weatherize doors and windows		36%	82%	41%
Wrap the water heater		3%	89%	0%

PY2002 Local In-Home Energy Survey Program Evaluation

Recommendations	Practices	% of Sample Receiving Recommen	% Aware of Recomm	% Receiving Recomm that Adopted
Clean refrigerator and freezer condenser coils		77%	63%	33%
Clean the lint filter in the clothes dryer regularly		5%	79%	57%
Close fireplace dampers		28%	75%	29%
Close windows when it is cold		5%	93%	43%
Keep pool or spa filters and strainers clean		11%	66%	14%
Keep refrigerators and freezers as full as possible		51%	53%	36%
Keep the bedroom window closed to help keep the waterbed warm		1%	33%	0%
Limit bathroom and portable heater use		10%	86%	46%
Maintain freezer temperatures at 0 to 10 degrees F		93%	62%	40%
Maintain refrigerator temperatures at 37 to 40 degrees F		94%	62%	44%
Make the waterbed with a comforter		1%	33%	0%
Minimize the operating time of the pump and pool sweep		11%	79%	66%
Operate pool equipment during cool times of day or evening before 12pm or after 6pm		11%	55%	52%
Operate pumps during cool times of the day or evening		3%	75%	38%
Operate the clothes dryer during cool times of the day or evening		9%	68%	32%
Operate the clothes washer during cool times of the day or evening		44%	72%	29%
Operate the dishwasher during cool times of the day or evening		36%	56%	34%
Preheat the oven only when necessary		27%	79%	28%
Put refrigeration appliances in a conditioned space		4%	10%	30%
Reduce use of heat generating appliances during the day		34%	90%	43%
Set air conditioner thermostats for 78 degrees or higher		31%	78%	52%
Set heater thermostats for 68 degrees during the day and 58 degrees at night		10%	85%	22%
Test ducts in the air distribution system		0%		
Test your home for carbon monoxide		0%		
Turn any extra refrigerators and freezers off when not in use		34%	95%	22%
Turn down the temperature on the waterbed .		1%	100%	0%
Turn down water heater thermostats to 120 degrees		6%	59%	35%
Turn heaters off or down when away for extended periods		4%	100%	50%
Turn off air conditioning when away for extended periods		25%	94%	30%
Turn off home electronics when not used for extended periods		53%	88%	37%
Turn off unnecessary decorative lighting		43%	86%	30%
Turn other types of refrigeration e.g. water coolers beer or wine coolers off when not in use		4%	70%	30%
Turn the dishwasher off during the dry cycle		39%	66%	28%
Turn water heater off or down when away for extended periods		9%	58%	29%
Use a microwave or toaster oven for small meals		55%	80%	28%
Use cool or warm water when possible in the clothes washer		47%	87%	25%
Use full and consecutive loads in the clothes dryer		10%	73%	42%
Use outside air for cooling when possible		26%	94%	23%
Use portable or whole house fans when possible		58%	84%	31%
Use the self-cleaning feature in ovens sparingly and during cool times		26%	63%	23%
Wash full loads in the clothes washer		27%	89%	26%
Wash full loads in the dishwasher		18%	100%	38%

The similar overall adoption rates for measures and practices reported in Table 22 masks some real differences. There is a great deal of variability in the adoption rates of measures, while they are more homogeneous for practices. Most of the more substantial measures such as installing insulation of any kind, were seldom implemented. The measures that account for the adoption rate being the same, overall, as practices, are: cleaning and replacing dirty filters in air conditioners, weatherizing doors and windows, replacing incandescent bulbs with compact fluorescent bulbs, installing reflective coating or solar screening on windows, and shading window areas from direct sunlight. These measures were frequently recommended and had quite high adoption rates. Most of the other measures were either seldom recommended, or very rarely adopted. The practices, on the other hand, were much more generally implemented.

Almost all of the recommendations that were commonly made had high awareness before the audit. Overall the prior awareness of the benefits of the recommendations was 73 percent; i.e., 73 percent of the recommendations were known to the participant before the audit. This number was somewhat different for those who spoke Spanish during the audit and/or the interview. For Spanish-speakers, 64 percent of the recommendations made were known to them already, compared to 75 percent for English speakers.

4.6.4 Adoptions by Language Group

A final issue concerning recommendation and adoption rates is the comparison of language groups. Because of the focus on hard-to-reach, especially Spanish-speaking customers, it is of interest to know what that group's responses are to energy efficiency information, as compared to other groups' responses. Table 23 shows the summary information on recommendations and adoptions by language group. The number of recommendations made does not differ significantly by group, although this masks a language group difference between measure and practice recommendations. Spanish-speaking customers, on average, received more measure recommendations than did English-speaking, and the opposite is true of practice recommendations. Interestingly, the *rate* of adoption among Spanish-speaking participants for measures is lower for measures and higher for practices when compared to English-speaking participants. So, Spanish-speaking people had more measure recommendations but were less likely to adopt them.

Table 23
Summary Measures of Recommendations and Adoptions
by Language Group:
Weighted

Summary Measure	English Mean	Spanish Mean
Total Recommendations Made	15.02	14.43
Measure Recommendations Made	3.98	5.36*
Practice Recommendations Made	11.04	9.07
Total Adoptions after Audit	4.69	6.47
Measure Adoptions after Audit	1.22	1.39
Practice Adoptions after Audit	3.47	5.08*
Percent of Recommendations Adopted	0.33	0.39
Percent of Measure Recommendations Adopted	0.35	0.22*
Percent of Practice Recommendations Adopted	0.32	0.46*
Percent of Participants Adopting at Least One Recommendation	0.87	0.76

* Language groups statistically significantly different ($p < .05$)

This pattern suggests that the Spanish-speaking customers were less able or less willing to invest in measures, but substantially more willing to invest the effort in adopting energy-efficiency practices. Presumably the higher rate of measure recommendations reflects the fact that Spanish-speaking customers tend to be less likely to have already installed efficient equipment prior to the audit. This might be because they could not

afford the more expensive efficient measures or that they did not have enough information about the efficient measures. However, when receiving the information, these customers were less likely to implement them, perhaps narrowing the possible explanations to affordability. This seems particularly likely since we have seen that Spanish-speaking customers tend to more strongly endorse energy-efficiency attitudes than English-speaking. We can check the assumption that higher numbers of measure recommendations reflect fewer existing efficient measures in the home by analyzing the number of measures installed prior to the audit.

Table 24 supports this interpretation. The Spanish-speaking group had taken fewer energy-efficient actions of any kind, measures or practices, prior to the audit. This, together with the fact that they received more measure recommendations, but implemented them at a lower rate, we may assume that financial resources are the issue since neither lack of information nor motivation seems to be the explanation.

Table 24
Summary Measures of Adoptions Before Audit
by Language Group:
Weighted

Summary Measure	Mean	SD
Adoptions Before Audit	4.80	5.27
Measure Adoptions Before Audit	.75	1.31
Practice Adoptions Before Audit	4.05	4.26

4.7 Predicting Adoption Rates

Earlier sections have revealed a number of factors that are related to the willingness of program participants to adopt the recommendations that the energy auditor has made. This section creates models to summarize the various influences on the actions taken. One of the patterns we have seen is that customers' reactions to the recommendations are quite different depending on whether it is a measure or a practice recommendation. Thus, separate models have been estimated for measure and practice adoptions.

4.7.1 Predicting Measure Adoptions

To summarize what variables are related to measure adoptions, zero-order correlations were run between the variables discussed in this report and the percent of measure recommendations that were adopted. This matrix revealed the following variables to have statistically significant correlations with percent measure adoptions: Number of adoptions before the audit ($r=-0.541$), number of adoptions of measures before the audit $r=(-0.380)$, the percent of recommendations the customer said influenced their actions ($r=-0.184$), the number of practices adopted before the audit ($r=-0.552$), the feeling that one's life is too busy to worry about energy-efficiency ($r=-0.222$), and the belief that there is little one can do to reduce energy use ($r=-0.122$). The variables were entered into a stepwise regression

model. The result is seen in Table 25. The most predictive factor is the number of measures that had been installed by the customer prior to the audit, which is negatively related to adoptions after the audit. The other two variables were similar in strength: satisfaction with the audit (positively related to post-audit adoptions), and being a Spanish-speaking participant (negatively related to post-audit adoptions). About 16 percent of the variance in measure adoptions is explained by these three variables.

Table 25
Model Predicting Percent Measure Recommendation Adoptions:
Weighted

Variable	B	Std Error	Beta	p
Measures Installed Before Audit	-0.086	0.015	-0.340	0.000
Satisfaction with Audit	0.129	0.045	0.164	0.005
Spanish-Speaking	-0.151	0.058	-0.151	0.010
Constant	-0.012	0.153		0.935

R²=0.158

4.7.2 Predicting Practice Adoptions

The zero-order correlation analysis showed the following factors to be related to the percent of practice recommendations that were adopted: Age of home, where the newer the home, the more likely the adoption ($r=0.161$), being a Spanish-speaking participant, where this predicts more practice adoptions ($r=0.153$), the number of adoptions of any kind before the audit (-0.551), the number of measure adoptions before the audit ($r=-0.351$), the number of recommendations that influenced the customer ($r=-0.336$), the percent of recommendations that influenced the customer ($r=-0.323$), the number of practices adopted before the audit ($r=-0.574$), and the belief that conservation is an economic necessity for one's own home ($r=0.157$). When entered into a stepwise regression model, four variables remained, predicting a total of over 53 percent of the variance in percent practice adoptions (Table 26). The strongest predictor in this model is what actions the customer had taken prior to the audit, such that the more the person had done before, the less they adopted these recommendations. This is clearly a reflection of the fact that for some customers, there was already awareness of the benefits of energy-efficiency practices, and they had already taken these actions. A close second to this factor in predicting post-audit adoptions of practices is the statement of the participant that the recommendation did influence them. This may seem obvious, but is not, given that this variable did not predict measure adoptions. Clearly in that case, other factors beyond the audit determined the adoption behavior of the customer. In addition to the number of recommendations that influenced the participant, the percent of recommendations that influenced them had an additional effect. Finally, the age of the home was predictive, but in the opposite direction from what we would expect. i.e., the newer the home, the more likely practice recommendations were to be adopted.

Table 26
Model Predicting Percent Practices Recommendation Adoptions:
Weighted

Variable	B	Std Error	Beta	p
Practices Adopted Before Audit	-0.071	0.006	-1.077	0.000
# Recs that Influenced Partic	0.036	0.005	0.788	0.000
% Recs that Influenced Partic	-0.346	0.058	-0.380	0.000
Age of Home	0.011	0.004	0.116	0.015
Constant	0.464	0.042		0.000

R²=0.526

Perhaps the most striking difference between the two models is the difference in the total variance that can be explained by factors involved in the participant's history and attitudes and in the audit experience itself. It is clearly much easier to explain adoption of energy-efficient practices than it is to explain measures (R=0.526 versus 0.158) using these factors. This observation leads one to consider that the most important factors involved in the decision to adopt measures is not included in this type of study. Prior sections have provided suggestions that these factors are likely not a lack of information or awareness, and probably not a lack of motivation. The missing factor is more likely to be a perception that the cost involved in installing an energy-efficiency measure is prohibitive. This may argue for making a concerted effort to make these customers aware of rebate programs or other programs that help with the cost of the measures.

4.8 Participant Suggestions for Program Improvement

It is often helpful to hear what customers have to say about the program in their own words. At the end of the interview, participants were asked what they would do to improve the program. A section on this topic can easily take on a negative tone because the focus is on what can be improved. However, it should be made clear that the vast majority of comments were very positive, with the participants being unable to think of a way to improve what they thought was a great program. Of those suggestions for improvement that were made, most fell into one of five categories: A request for more specificity, more help with implementation, a complaint that the audit only told them what they already knew, a request for a more thorough audit, and a suggestion that customers be made more aware of the program.

4.8.1 More specificity

Here are some quotes that fell into this category (the parenthetical Ps represent pauses):

...Another thing would be that the company would see and visit homes and for example say, "you need this kind of refrigerator and we're here to help you..."

...They might do a little more on how people use their energy as far as air conditioning (AC). (P) I live in Santa Barbara and 90 percent of the time people are using their AC when they wouldn't have to...

...Have a piece of equipment that can pin point where a problem might be, like a refrigerator is drawing too much energy...

...It would have been very nice to give us one page of the typical cost of electrical items, like a clock, an answering machine, a VCR, a Ti-vo unit's usage. (P) If we were aware of the cost, we might not use any of these items so much, that's it. (P) If you would give us an example that to use the fan instead of the air conditioner would save us \$100 or \$50, would be helpful to encourage us to save money...

...I wanted numbers. (P) I wanted to know how much of a difference it would make to go from 78 degrees to 76 degrees. (P) How much would that change my bill? (P) How much money or percentage would I save each month...Like about this small heater I had. How much it cost's and that's basically it. How much was it to run it?

4.8.2 Help with implementation

Following are some quotations from customers who would like more help of some kind with implementing the recommendations:

...That the company would loan out money and add it to your bill...

...Handing out the expensive light bulbs. (P) Or, lowering the prices on them...

...The only one is they could inform about different programs. Programs people could benefit from. Programs that offer savings

...I think they could tell you more about the rebates they have to help us. They did a wonderful job, but I wish they would have told us about some of the other programs they have, instead of us having to look into it ourselves...

...I think that some help in implementing some of the changes would also be very helpful. And if there was a rebate for their evaluation...

...If you give coupons to go get those light bulbs, I would've got more, but they're very expensive. If they let more people know that they have these programs, if they add that to the bill as a brochure, with tips and such, like what temperature to keep the fridge. If you do a big letter, no one reads it, but you do little things, here and there, people remember...

...Maybe adding ideas on how to implement the recommendations...

...Some things I'm not able to do, I'm on a fixed income...

4.8.3 Provide information we don't already know

Some participants expected to learn things beyond what they consider common knowledge. Here are some examples:

...I was told things that I already knew on how to save energy and I was hoping to hear new things that would make a dramatic difference in my energy consumption and bill. I didn't learn anything new and some of the things I was already doing so I have seen no difference in my bill...

...I have the Energy Star on all my major appliances, that's an incentive to save money. And, I do use fluorescent bulbs...

...No, I mean I think the program gives someone who doesn't understand energy issues is productive, but I knew these things. But if someone calls in with the understanding they have, prior to coming out they should know all that stuff...

...When they do the survey, when the person knows that the recommendation is common knowledge, don't recommend it...

4.8.4 Increase Awareness of the Program

A number of participants felt the program should be better promoted:

...Well, I think they should keep informing people. They should use television because we sometimes don't read the inserts in the bills. (P) Well, at an agricultural level, they should send pamphlets to the owners because sometimes they'll have 125-130 people working...

...Just keep placing inserts in the bills...

...Calling up people and reminding them how to save energy...

...More advertising...

...they should do it more often; they need to extend the program to other people...

4.8.5 Do a More Thorough Audit

Some people expected a more thorough experience:

...I think it has to be a little more detailed. He just looked around...

...Yes, send somebody out who can really inspect the house to find out where the energy is really being used on or what's using up the energy. And not to send somebody for a 5-minute walk-through who doesn't even inspect your house or check your electrical appliances...

...Maybe a more thorough search of electrical problems...

...I just feel like he should have spent a little more time, less general and more specific...

...Yes. Would you like to hear them? (P) Better-qualified people. (P) That could answer my questions...

...There was too many assumptions made. They were assuming we had adequate insulation. I would have liked to have them actually go up there and see if there was adequate insulation. Rather than have them tell me there was...

...Yes, the auditor should have an open mind. (P) He came here, saw the extra refrigerator in the garage and said "that's your problem, right there". He never looked at anything else; he never considered other options...

...I think they could be a little more informative. (P) All that stuff about insulation, he needed to be more knowledgeable...

...I think it needs to have more exposure...

...Sending a brochure about all the things we've talked about in order to remember the things I need to do about the pool, refrigerator, lights...

4.9 Awareness of Program and Past Participation

A goal of the Program is to reach customers who haven't been reached before, and to reach hard-to-reach customers. If new customers are being reached with new strategies, there should be an increase in first-time participants. The only point of comparison that we have on the question of program awareness and first-time participation is from the evaluation of the PY2000 residential audit programs (SCE, 2002). The same awareness and participation questions were asked in that interview that were asked in the PY2002 participant interview. The first question in the series of two asked whether the participant was aware of any other energy conservation programs. If the answer was yes, a second question was asked: Have you participated in any SCE programs within the past three years? The answers to these questions can be categorized into three meaningful groups: Those who were unaware of energy programs (and therefore had not participated in others), those who were aware of the programs but had not participated, and those who have participated in other programs. The results are compared in Table 27. This table doesn't provide good evidence for an increase in new participants. There is actually a slightly lower rate of participants who had not participated before, and a slightly lower rate of participants who were unaware of past programs in PY2002 compared to PY2000.

Table 27
Participation in and Awareness of Programs
by Program Year:
Weighted

Awareness/Participation	PY2002	PY2000
Unaware of Programs	59.8%	64.0%
Aware but No Participation	17.7%	21.7%
Participated in Past Programs	22.5%	13.3%

It is still possible that the current participants are more hard-to-reach than past participants. Here, it suffices to compare the categories of awareness/participation within the PY2002 since it refers to the past programs, making a comparison implicit. Some of the variables associated with more hard-to-reach customers are broken down by three categories of program awareness/participation in Table 28. We should expect the variables associated with hard-to-reach customers to be more concentrated in the "Unaware of Programs" category, or possibly the "Aware of Programs but No Participation" category, compared to the "Participated in Past Programs" group. In this case, we do find that household income is lowest in the unaware group, and highest in the past participation group, and these differences are statistically significant. Similarly education is lowest in the unaware group and highest in the past participation. In addition, first-time participants have a lower monthly kWh than past participants. Following the same pattern, Table 29 shows that those participants who listed themselves as Latinos or Hispanics, are somewhat over-represented in the unaware and the aware but first-time

participant groups. These findings show a pattern of somewhat more inclusion of groups defined as hard-to-reach.

Table 28
Variables Associated with Program Participation:
Weighted

Variable	Unaware of Program	Aware but No Participation	Participated in Past	Sig?
Household Income	4.54	5.72	6.20	Yes
Education	3.15	3.76	4.39	Yes
Average Monthly KWh	739	720	898	Yes

Note: Income was measured on an ordinal scale ranging from 1 (Under \$15,000) to 10 (Over \$150,000).

Education was measured on an ordinal scale ranging from 0 (less than HS) to 7 (Graduate Degree).

Table 29
Participation in and Awareness of Programs
By Ethnicity:
Weighted

Awareness/Participation	Non-Latino	Latino
Unaware of Programs	57.7%	66.2%
Aware but No Participation	16.8%	20.3%
Participated in Past Programs	25.5%	13.5%

Linear $\chi^2=3.33$ ($p=0.034$, 1-tailed)

Another set of questions revolves around recommendations, customer awareness of their benefits, and adoptions. Are customers who are first-time participants, or who were entirely unaware of these programs less likely to be aware already of the benefits of energy efficiency measures? Are they more likely to adopt because the information is new to them? Are they more influenced by the recommendations than experienced participants? In other words, is the effort to include more hard-to-reach customers paying off in terms of adoptions, and therefore, savings?

Table 30 provides some data pertinent to these questions. On average, first-time participants, including those unaware of programs previously, were less likely to be aware of the benefits of the recommendations they were given. The picture is more complex for adoption patterns. Overall, those who were unaware of energy-efficiency programs had about the same rate of adoptions as past participants. It is the group that was aware of programs but failed to participate in the past that had low rates of adoption. This same pattern holds for the adoption of practice recommendations. However, for measures, the first-time participants who, earlier, were unaware of the programs, have a substantially higher adoption rate than the other groups. However, all three groups report approximately equivalent influence on their behavior from the auditor's

recommendations. One interpretation of these results is that first-time participants are generally less aware of the benefits of energy-efficient actions, and are more likely to implement recommended measures, though not necessarily practices.

Table 30
Recommendations and Adoptions by Program Participation:
Weighted

Variable	Unaware of Program	Aware but No Participation	Participated in Past	Statistically Significant?
% of Rec Already Aware of	0.71	0.75	0.80	Yes
% of Recs Adopted After Audit	0.36	0.24	0.34	Yes
% Measures Adopted After Audit	0.37	0.25	0.29	Yes
% Practices Adopted After Audit	0.38	0.23	0.31	Yes
% Recs that Influenced Partic	0.50	0.55	0.53	No

4.10 Program Savings

The estimate of total program savings follows the method outlined in the Method section. The gross savings were taken from Study 528-A (SCE2, 1997), as was the adoption rate that was based on that study's participant interview. That rate reflects questions that ask the participants what they installed, regardless of when (before versus after the audit). This method would not be appropriate for the current study, but made sense for that study which involved both participants and non-participants in a billing analysis where all installations for both groups were modeled in order to estimate net savings. To use the results of that study, it was necessary to employ the gross savings rather than the net, and to adjust their gross savings by the ratio of adoption rates between the two studies, multiplied by the standard net-to-gross ratio. The adoption rate for the current study that is comparable to theirs is the adoption rate that uses both before-audit and after-audit installations. The inputs to the net savings calculations for the current study are shown in Table 31. The top figures in that table show the weather-normalized estimates of per-household kWh and kW savings in the earlier program. This is followed by the estimates of the NTG ratios and the adoption ratios for that study.

As seen in that table, there were 4,557 audits completed in-home during PY2002, and 615 were completed by telephone. The final savings estimates for PY2002 totaled to 2,398,807 kWh, and 521 kW.

Table 31
Total Program Savings and Inputs

Parameter Estimate	In-Home	Telephone	Total
Per-household, normal-weather gross kWh	601.0	214.0	
Per-household, normal- weather gross kW	0.130	0.05	
Net-to-Gross Ratio	0.72	0.72	
Adoption rate from study producing gross savings	0.56	0.56	
Adoption rate for current study	0.65	0.65	
Number of Participants	4,557	615	5,172
Net KWh Savings	2,288,818	109,988	2,398,807
Net KW Savings	495	26	521

5 Conclusions and Recommendations

This study has covered a variety of topics. The central findings in each area will be summarized and the recommendations that flow from each will be given.

5.1 Verification

The goals that were to be verified were that:

- At least 4,500 energy-efficiency audits would be completed during PY2002.
- At least 50 percent of the audits would be for hard-to-reach customers.

The verification determined that 5,172 energy surveys were completed and 71 percent of those customers qualified as hard-to-reach. Thus, the goals were met and exceeded.

A further verification was undertaken that telephoned a small sample of customers (N=67) to query them on whether the survey had taken place. This resulted in an estimate of 9 percent failing to recall the event. However, it was clear that there were problems of recall involved, and it was not deemed reasonable to adjust the completed surveys by that number. Importantly, even if such an adjustment were made, both goals would still have been met.

Recommendation: In the future, if a decision is made to complete verification calls, these should be completed within 30 days of the audit so that the problem of recall will be minimized.

5.2 Program Satisfaction

Satisfaction with the program among participants was high, both as measured quantitatively, and qualitatively through open-ended suggestions for program improvement. The highest ratings were for the courtesy of the representative, and for the ease of understanding the recommendations. The lowest ratings were for the time to complete the survey (based on open-ended comments this probably meant there was too little time spent for some customers), and relevance of the recommendations to their home. The more common suggestions for program improvement fell into the categories of requesting more specificity in the recommendations and their benefits, and more help in implementing the recommendations. It should be noted that those customers who took advantage of the availability of Spanish-language services for the energy survey and/or the evaluation interview, significantly found the recommendations harder to understand, and found them less relevant to their homes.

Recommendations: Providing customers with more specific benefits such as energy savings would be helpful. Also, connecting the customer to other programs that could help them with implementation could make a big difference to some customers.

5.3 Energy-Efficiency Attitudes

The participants in the PY2002 Energy Survey Program in general hold attitudes that compare to customers across the state and the country. However, the participants in this program more strongly endorse two statements: “Conserving energy in my home is an economic necessity” and “There is little I can do to reduce the amount of electricity that I am now using.” These attitudes probably reflect the energy crisis of 2001, and the rising cost of electricity in California. The attitudes almost certainly reflect the feeling that these customers have been trying hard to conserve already.

Spanish-speakers expressed stronger endorsement of energy conservation values than the rest of the sample. However, they also more strongly endorse the statement: “My life is too busy to worry about making energy related improvements to my home.” So, these participants have very strong energy conservation attitudes but feel unable to implement hardware changes to conserve electricity.

Recommendation: A systematic effort to connect participants in the energy survey program to other programs that facilitate measure implementation could be very beneficial.

5.4 Recommendation Adoptions

Overall, 33 percent of the recommendations offered in the in-home energy survey are adopted following the audit. This is about the same percent that were adopted before the audit since 65 percent of the total recommendations were implemented either before or after the audit. These figures are not surprising given that overall, the participants indicated that they already understood the energy benefits of 73 percent of the recommendations they were given. This does not mean that they had necessarily implemented those measures, but it would help to explain why nearly a third of the recommendations had been implemented before the audit. Another figure of interest is that 86 percent of all participants adopted at least one recommendation after the audit.

The 33 percent post-audit adoption rate applied both to measures and practices. However, the rate of adoption for practices was quite consistent across specific recommendations, while the rate for measures varied widely by recommendation.

Those who identified themselves as Hispanic/Latino tended to receive more measure recommendations, but had a lower rate of adoption for those measures when compared to other groups. Lack of financial resources is the most likely explanation for a low adoption rate of measures (but not practices), since there is both motivation to do so, and the felt need.

Recommendation: Future programs will likely be more effective in promoting adoptions to the extent that *measures* are recommended more and that this is followed up by a focus on helping customers, especially hard-to-reach, to implement them.

5.5 Effectiveness of Strategies to Recruit Hard-to-Reach

If more hard-to-reach customers were brought into the program this year, we would expect first-time participants to have lower incomes, have lower kWh, and be more likely to be Latino compared to those who have participated before in this or other programs. All three were found to be characteristic of the first-time participants.

As would be expected, first time participants had a lower rate of awareness for the recommendations, and had higher adoption rates for measures. However, they had the same adoption rate of practices as the other groups.

About 10-12 percent of the participants interviewed availed themselves of the Spanish-language audit and/or interview. In addition, the Spanish-speaking participants had instituted fewer energy-saving measures prior to the audit than other groups, indicating the recruitment of less informed participants compared to past program years.

All of this is evidence, though not conclusive, that there has been some success in recruiting hard-to-reach.

Recommendation: Recruiting among the previously unreachable should be continued.

5.6 Program Savings

Program-level savings were calculated by using the gross household savings estimated by an earlier billing analysis for the same program (PY1995), multiplying it by the adoption ratio consisting of the gross adoption rates of the PY2002 program to the PY1995 rate in order to adjust the household savings by difference between the two program years. This adjusted gross savings was multiplied by the standard net-to-gross ratio of 0.72. Program kWh savings are estimated to be 2,398,807, and kW savings are estimated at 521.

Recommendation: An accurate estimate of current program savings would be best generated by direct estimates. This could take the form of a billing analysis, although the cost of this may not be justifiable. Another form that could also benefit the program is to generate recommendation-based savings estimates through RECAP [the method used for the Statewide Mail-In Home Energy Efficiency Survey Program] or another set of engineering algorithms. These savings could be calibrated to the energy consumption of the household and could provide more specificity in the benefits presented to the customer as well.

6 Appendix A Literature References

California Board for Energy Efficiency (CBEE) (1999). "Baseline Study on Public Awareness and Attitudes Toward Energy Efficiency (Vol 1)." Prepared for CBEE and PG&E by PHB Hagler Bailly, Inc.

California Public Utilities Commission (CPUC). (2001). "D0111066 Interim Decision Adopting Energy Efficiency Policy Rules and Setting Forth Criteria For Post-2001 Energy Efficiency Programs."

California Public Utilities Commission. (1995) "Protocols and Procedures for the Verification of Costs, Benefits, and Shareholder Earnings from Demand-Side Management Programs." As adopted by the California Public Utilities Commission Decision 93-05-063. Revised March 1999. Pursuant to Decision 94-05-063, 94-10-059, 94-12-021, 95-12-054, 96-12-079, and D.908-03-063.

California Public Utilities Commission. (2001) "Energy Efficiency Policy Manual." Prepared by the Energy Division of the California Public Utilities Commission.

Cochran, William G. (1977). Sampling techniques. New York: John Wiley & Sons.

Conlon, Tom. (2001). Residential audits. E-mail from Tom Conlon to Angela Jones.

Conlon, Tom. (2000). Time-of-sale home inspection program: Evaluation report: Participating homeowners. Prepared by GeoPraxis, Inc. for the Southern California Gas Company.

Hansen, M.H., H.N. Hurwitz, and M. Gurney. (1946). Problems and methods of the sample survey of business. *Journal of the American Statistical Association*, 41, 173-189.

Kish, Leslie. (1965). Survey sampling. New York: John Wiley & Sons.

PG&E1. (1999). "1998 PG&E Residential Energy Management Services Program: Market Baseline and Market Effects: Study ID #420ms-c." Prepared for PG&E by PHB Hagler Bailly, Inc.

PG&E2 (1999). "Impact Evaluation of Pacific Gas and Electric Company's 1997 Residential Energy Management Services Programs: PG&E Study ID Number 397." Prepared for PG&E by Hagler Bailly Consulting and XENERGY Consulting, Inc.

Pacific Gas & Electric Company, Southern California Edison Company, San Diego Gas & Electric Company, and the Southern California Gas Company. (2000). Proposed

effective useful life for measures for PY 2001 program elements: Discussion paper 2: Attachment A. Submitted to the California Public Utilities Commission, in response to Ordering Paragraph #8 contained in Decision 00-07-017.

Richardson, Valerie and Skumatz, Lisa A. "Measure retention in residential new construction." A paper presented at the American Council for and Energy Efficient Economy Conference in August, 2000.

SDG&E. (2000) "Statewide Residential Lighting and Appliance Saturation Study." Prepared by RLW Analytics for the San Diego Gas & Electric Company.

Southern California Edison & San Diego Gas & Electric. (1996). Residential appliance efficiency incentives program: Fluorescent lighting (CFL): 1994 first year statewide load impact study (Study Ids #920 & #513)." Prepared by Xenergy, Inc. for Southern California Edison.

SCE1. (1995). "Southern California Edison 1993 Energy Use Profile: Impact Evaluation Study: Study ID #508(A)." Prepared by Southern California Edison Company.

SCE2. (1997). "Evaluation of SCE's In-Home Energy Audit Program: Study 528A". Prepared by Regional Economics Research for the Southern California Edison Company.

SCE3. (1997). "Evaluation of SCE's Mail-In Audit Program: Study 528B". Prepared by Regional Economics Research for the Southern California Edison Company.

SCE4. (2002). "Evaluation of Southern California Edison's Residential Audit Programs: Final Report." Prepared by Ridge & Associates for Southern California Edison Company.

SCG. (1999). "Residential Energy Management Services: First Year Load Impact Evaluation (Home Energy Fitness Program): Study ID No. 715." Prepared by AAG & Associates for the Southern California Gas Company.

SDG&E (1999). "1997 Residential Energy Management Services: First Year Load Impact Evaluation: Study ID No. 1026." Prepared by San Diego Gas & Electric, 1999.

SDG&E (1999). "Compilation and Analysis of Currently Available Baseline Data on California Energy-Efficiency markets." Prepared for San Diego Gas & Electric by XENERGY and Hagler Bailly.

Thompson, Steven K. (1992). Sampling. New York: John Wiley & Sons.

7 Appendix B Questionnaire

Customer Interview for In-Home Energy Survey Program

Name: _____
Address: _____
Telephone Number: _____
Program: _____
ID: _____
Cell: _____
Account Number: _____

Introductory Script

Hello, my name is [FIRST/LAST NAME] from CSRS, calling on behalf of Southern California Edison. I'd like to speak with (INSERT NAME FROM LIST) about their participation in an Energy Survey Program.

INTERVIEWER: Re-introduce yourself if necessary.
(IF RESPONDENT IS NOT AVAILABLE SCHEDULE CALL BACK TIME)

Q: INTRO

In the year 2002, you participated in an energy efficiency Program operated by Southern California Edison Company. As part of the Program, a representative of Edison came to your home [OR IF PHONE AUDIT: called you] at [ADDRESS] and conducted an energy survey of this home, the appliances you use, and the way you use them. After completing this energy survey, Edison provided you with a list of recommendations for saving energy. The purpose of this telephone interview is to gather information on the effectiveness of this Program.

General Information

Q1. Do you recall this energy survey conducted for [INSERT ADDRESS]?

- 1 ___ YES
- 2 ___ NO
- 7 ___ NOT CORRECT ADDRESS – [NQ-Q1]
- 8 ___ DON'T KNOW

Q2. Do you recall receiving a list of recommendations to reduce your energy consumption based on this energy survey?

- 1 ___ YES
- 2 ___ NO → SKIP TO Q4; IF NO TO BOTH Q1 AND Q2 THANK & TERMINATE
- 8 ___ DON'T KNOW → SKIP TO Q4
- 9 ___ REFUSED → SKIP TO Q4

Q3. Would you say that you . . .

- 1 ___ Read the list of recommendations thoroughly
- 2 ___ Read some portions of the list
- 3 ___ Just glanced through it
- 4 ___ Did not read the list of recommendations at all
- 8 ___ DON'T KNOW
- 9 ___ REFUSED

Habitation

Q4. Do you live at this residence year round?
(MUST LIVE AT ADDRESS AT LEAST 9 MONTHS OUT OF THE YEAR TO CODE AS "YES")

- 1 ___ YES
- 2 ___ NO → THANK, TERMINATE, NQ.4

Q5. When did you move to this address?

___ MONTH

___ YEAR

Q6A. Do you own or rent the home at [INSERT ADDRESS]?

- 1 ___ Own
- 2 ___ Rent
- 8 ___ Don't Know
- 9 ___ Refused

Q6B. Do you pay your own electric bill or is it included in your mortgage or rental payment each month?

- | | |
|---|--------------------|
| 1 Pay Own Electric Bill | [CONTINUE] |
| 2 Included in Mortgage and Rental Payment | [THANK, TERMINATE] |
| 8 Don't Know | [THANK, TERMINATE] |
| 9 Refused | [THANK, TERMINATE] |

Recollection and Implementation of Audit Recommendations: See Call Sheet for Complete List of Recommendations (Asking a maximum of 49.)
--

It is our understanding that your energy survey was conducted in (INSERT MONTH FROM SAMPLE) of 2002. I'm going to read a series of recommendations that were made as a result of your energy survey. We would like you to provide a few pieces of information for each of these recommendations.

IF "YES" TO Q2, ASK:

R1a. From the list of recommendations you received, do you recall [INSERT FIRST RECOMMENDATION]?

- 1 ___ YES – RECALL
- 2 ___ YES – SOMEWHAT RECALL
- 3 ___ NO
- 8 ___ DON'T KNOW
- 9 ___ REFUSED

R1b. Before receiving the list of recommendations, were you aware that [INSERT FIRST RECOMMENDATION] could save energy?

- 1 ___ YES – AWARE
- 2 ___ YES – SOMEWHAT AWARE
- 3 ___ NO
- 8 ___ DON'T KNOW
- 9 ___ REFUSED

R1c. IF "NO" OR "DK" OR "RF" TO Q.R1a, ADD: (Even though you don't remember this recommendation,...)

Have you [INSERT FIRST RECOMMENDATION]?

- 1 ___ YES – COMPLETED
- 2 ___ YES – IN PROCESS OF COMPLETING
- 3 ___ NO
- 4 ___ DONE PRIOR TO SURVEY
- 5 ___ NO – LANDLORD
- 7 ___ DOES NOT APPLY
- 8 ___ DON'T KNOW
- 9 ___ REFUSED

R1d. Was this before or after [INSERT MONTH FROM SAMPLE] of 2002

- 1 ___ Before **SKIP TO END OF THIS RECOMMENDATION**
- 2 ___ After **GO TO R1e.**
- 7 ___ DOES NOT APPLY **SKIP TO END OF THIS RECOMMENDATION**
- 8 ___ DON'T KNOW **SKIP TO END OF THIS RECOMMENDATION**
- 9 ___ REFUSED **SKIP TO END OF THIS RECOMMENDATION**

R1e. Did the recommendation influence your decision to do this?

- 1 ___ YES
- 2 ___ NO
- 3 ___ NOT SURE
- 9 ___ REFUSED

END OF THIS RECOMMENDATION SKIP TO NEXT RECOMMENDATION

IF “NO”, “DON’T KNOW”, OR “REFUSED” TO Q2, ASK

R1f. Even though you don’t recall receiving a list of recommendations to reduce your energy consumption, before [INSERT MONTH FROM SAMPLE] of 2002, were you aware that [INSERT FIRST RECOMMENDATION] could save energy?

- 1 YES – AWARE
- 2 YES – SOMEWHAT AWARE
- 3 NO
- 8 DON’T KNOW
- 9 REFUSED

R1g. Even though you don’t recall receiving a list of recommendations to reduce your energy consumption, did you [INSERT FIRST RECOMMENDATION] after [INSERT MONTH FROM SAMPLE] of 2002?

- 1 YES – COMPLETED
- 2 YES – IN PROCESS OF COMPLETING
- 3 NO
- 4 DONE PRIOR TO SURVEY
- 5 NO – LANDLORD
- 7 DOES NOT APPLY
- 8 DON’T KNOW
- 9 REFUSED

SKIP TO NEXT RECOMMENDATION

COMPLETE R1a-g FOR EACH RECOMMENDATION, ONCE ALL RECOMMENDATIONS HAVE BEEN COMPLETED CONTINUE

Program Satisfaction

P1. Now, I'll read you a series of statements. For each statement, please tell me whether you strongly disagree, disagree, agree, or strongly agree. [If Q1=1 ask a, b, c, d; If Q2=1 ask e, f; g, otherwise skip to Attitudes section]

	SD 1	D 2	A 3	SA 4	DK -8	Refused -9
a. The energy survey was scheduled within a reasonable time frame						
b. The auditor who came to my home was courteous						
c. The amount of time to complete the energy survey was about right						
d. The energy survey recommendations were delivered to me in a timely manner						
e. The energy survey recommendations were easy to understand						
f. The recommendations were relevant to my house						
g. The information contained in the energy survey recommendations were informative						

Attitudes

P2. People have different opinions about energy efficiency and the availability of natural resources such as energy. Using a 10-point scale, with a "1" meaning you "Strongly Disagree" and a "10" meaning you "Strongly Agree," please tell me how much you disagree or agree with each of the following statements [ROTATE STATEMENTS]

		Strongly Disagree									Strongly Agree	Don't Know
		1	2	3	4	5	6	7	8	9	10	-8
a.	My life is too busy to worry about making energy related improvements to my home.											
b.	Scarce energy supplies will be a major problem in the future											
c.	Instead of building new power plants, customers should use less electricity											
d.	It is possible to save energy without sacrificing comfort by being energy efficient											
e.	It is worth it to me for my household to use less energy in order to help preserve the environment											
f.	Conservation efforts helped reduce the effects of the energy crisis during the summer of 2001											
g.	Conserving energy in my home is an economic necessity											
h.	There is little I can do to reduce the amount of electricity that I am now using											

Awareness

P3. Over the years, the electric utilities and others, including the State of California, have offered a variety of energy conservation programs such as energy surveys. They have also offered energy efficiency programs that have provided rebates for such items as energy efficient refrigerators and insulation. Not counting the program we have been talking about, are you aware of any other energy conservation or energy efficiency programs?

- 1 ___ YES
- 2 ___ NO → SKIP TO D1
- 8 ___ DON'T KNOW → SKIP TO D1

P4. Have you participated in any Southern California Edison programs in the past?

- 1 ___ YES
- 2 ___ NO → SKIP TO D1
- 8 ___ DON'T KNOW → SKIP TO D1
- 9 ___ REFUSED → SKIP TO D1

P5. What programs have you participated in during that period?

Demographic Characteristics

D1. What type of home do you live in?

IF MENTION CONDOMINIUM OR TOWNHOUSE, PROBE BY RE-READING LIST.

- 1 ___ Single family **attached** home
- 2 ___ Single family **detached** home
- 3 ___ An Apartment with **less** than 5 units [SKIP TO D4]
- 4 ___ An Apartment with five or **more** units [SKIP TO D4]

- 5 ___ Mobile home
- 7 ___ OTHER [PLEASE SPECIFY] _____
- 8 ___ DON'T KNOW [SKIP TO D4]
- 9 ___ REFUSED [SKIP TO D4]

D2. In what year was your home built?

_____ YEAR [SKIP TO D4]

- 88 DON'T KNOW [CONTINUE]
- 99 REFUSED [SKIP TO D4]

D3. Was it built . . . [READ RANGE]?

- 0 ___ Within the last five years (i.e., since 1997)
- 1 ___ Between 1992 and 1996
- 2 ___ Between 1987 and 1991
- 3 ___ Between 1982 and 1986
- 4 ___ Between 1977 and 1981
- 5 ___ Between 1960 and 1976
- 6 ___ Between 1940 and 1959
- 7 ___ Before 1940
- 8 ___ DON'T KNOW
- 9 ___ REFUSED

D4. How many square feet of living space do you now have?

_____ SQUARE FEET [SKIP TO D6]

- 88 DON'T KNOW [CONTINUE]
- 99 REFUSED [SKIP TO D6]

D5. Is it . . . [READ]

- 01 ___ Less Than 800
- 02 ___ 800 to less than 1,000
- 03 ___ 1,000 to less than 1,250
- 04 ___ 1,250 to less than 1,500
- 05 ___ 1,500 to less than 1,750
- 06 ___ 1,750 to less than 2,000
- 07 ___ 2,000 to less than 2,250
- 08 ___ 2,250 to less than 2,750

- 09 ___ 2,750 to less than 3,000
- 10 ___ 3,000 to less than 3,500
- 11 ___ 3,500 to less than 4,000
- 12 ___ Or over 4,000
- 88 ___ DON'T KNOW
- 99 ___ REFUSED

D6. How many people live at this residence?

- _____ NUMBER OF PEOPLE
- 88 DON'T KNOW [SKIP TO D7]
 - 99 REFUSED [SKIP TO D7]

D7. What are the ages of the residents of your household? [INSERT NUMBER OF PEOPLE IN HOUSEHOLD], [READ]

- a. How many are 17 years or younger? _____
 - b. How many are between 18 and 59? _____
 - c. How many are 60 or over? _____
- 88 = Don't Know
99 = Refused

D8. What is the approximate annual household income from all sources in 2001, before taxes?

This information will be kept confidential.

- 01 ___ Under \$15,000
- 02 ___ \$15,000 to less than \$20,000
- 03 ___ \$20,000 to less than \$25,000
- 04 ___ \$25,000 to less than \$30,000
- 05 ___ \$30,000 to less than \$40,000
- 06 ___ \$40,000 to less than \$50,000
- 07 ___ \$50,000 to less than \$75,000
- 08 ___ \$75,000 to less than \$100,000
- 09 ___ \$100,000 to less than \$150,000
- 10 ___ Over \$150,000
- 99 ___ REFUSED

D9. What is the highest level of education you have completed? **READ IF NECESSARY**

- 0 ___ Less than High School
- 1 ___ Some High School
- 2 ___ High School Graduate

- 3 ___ Trade or Technical School
- 4 ___ Some College
- 5 ___ College Graduate
- 6 ___ Some Graduate School
- 7 ___ Graduate Degree
- 8 ___ DON'T KNOW
- 9 ___ REFUSED

D10. Which of the following *best* describes your racial or ethnic background? [**ONE ANSWER ONLY**] READ LIST

- 1 ___ Hispanic/Latino/Latina
- 2 ___ African American
- 3 ___ Caucasian
- 4 ___ Asian American
- 5 ___ Native American
- 6 ___ Multi-racial
- 7 ___ OTHER (PLEASE SPECIFY: _____)
- 8 ___ DON'T KNOW
- 9 ___ REFUSED

D11. How did you learn about the In-Home energy audit? [**CHECK ALL THAT APPLY**] DON'T READ LIST

- 1 ___ I've known for a long time
- 2 ___ A letter from Edison
- 3 ___ A bill insert
- 4 ___ Media advertising
- 5 ___ Mobil Education Unit
- 6 ___ Internet
- 7 ___ Trade association
- 8 ___ Community association
- 9 ___ Other, specify _____
- 88 ___ DON'T KNOW
- 99 ___ REFUSED

D12. What convinced you to participate in this program?
VERBATIM ANSWER

D13. Was the energy audit conducted in English or Spanish?

- 1 ___ English
- 2 ___ Spanish
- 3 ___ A combination
- 7 ___ OTHER (PLEASE SPECIFY: _____)
- 8 ___ DON'T KNOW
- 9 ___ REFUSED

D13. Do you have suggestions for improving this program?

VERBATIM ANSWER

Thank you very much for your time and your help.

INTERVIEWER: WAS THIS INTERVIEW CONDUCTED IN ENGLISH OR SPANISH?

- 1 English
- 2 Spanish
- 3 A combination