

Final Report
Measurement and Evaluation Study
of the 2003 SDG&E Residential In-
Home Audits Program

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TABLE OF CONTENTS

EXECUTIVE SUMMARY	1
FINDINGS	1
OBSERVATIONS AND RECOMMENDATIONS	2
INTRODUCTION.....	3
PROGRAM OVERVIEW	3
EVALUATION OVERVIEW	3
RESULTS	4
PARTICIPANT ACTION RESULTS	4
SATISFACTION / PROCESS RESULTS	9
OBSERVATIONS AND RECOMMENDATIONS	14
EM&V METHODOLOGY	15
SAMPLE DESIGN	15
TELEPHONE SURVEY INSTRUMENT DESIGN.....	15
TELEPHONE SURVEY DATA COLLECTION	16
DATA ANALYSIS	17
APPENDIX.....	18
TELEPHONE SURVEY INSTRUMENT	18

Executive Summary

This document is the final report for the Measurement and Evaluation Study of the 2003 SDG&E Local Residential In-Home Audits Program. This report contains an estimation of the proportion of program participants who have made physical modifications, behavioral modifications, or have participated in another SDG&E efficiency program since their audit. Additionally, this report contains measures of program effectiveness and participant satisfaction resulting from a process evaluation.

The SDG&E Local Residential In-Home Audits Program is an educational program that assists residential customers in understanding their energy usage, patterns of usage, and offers recommendations for energy savings, including referrals to other energy efficiency programs. The objectives of the audit are to provide detailed information on what the customer can do to become more energy efficient in their home, including behavior and attitude modifications, to provide information to customers on how they can participate in rebate and incentive programs offered by SDG&E, and to encourage long-term energy savings. In 2003, according to the program tracking system, the program conducted an in-home energy audit at 1,414 residences.

The primary objectives of the study are to:

1. Determine whether or not participants have attempted to implement any of the energy efficient measures or ideas suggested by the auditor during the in-home visit, and
2. Determine whether or not participants have been convinced to participate in other energy efficiency programs offered by SDG&E.

The evaluation is based on telephone surveys with 100 program participants. A total of 158 participants were called in order to complete 100 surveys (see Table 25 on page 17), resulting in a conversion rate of 63.3%. The survey responses have been statistically extrapolated to the program population.

Findings

Program participants are extremely satisfied with all key aspects of the In-Home Audits Program. On a scale of 1 to 5, with 1 meaning very unsatisfied, and 5 meaning very satisfied, participant responses ranged between 4.4 and 4.7 for eight categorical areas of program implementation discussed during the telephone survey.

Nearly 70% of program participants state they made physical modifications as a result of their energy audit. The audit's physical recommendations appear to be appropriately targeted to the individual participants, as evidenced by the fact that over 2/3 of participants have carried out a physical change as a result of their audit.

Approximately 65% of program participants state they made behavioral modifications as a result of their energy audit. This finding further reinforces the preceding finding that the audit recommendations are well thought out, and that there is a need for offering the audits to residential customers.

Approximately 25% of program participants state they participated in other SDG&E energy efficiency programs since participating in the In-Home Audits Program. This finding suggests that a sizable portion of program participants are understanding the information

conveyed through the audit, substantiated by the fact that not only do they understand that an equipment upgrade will result in energy savings, but they also seek out assistance in making that upgrade happen. However, nearly 40% of participants who have not participated in other SDG&E energy efficiency programs state the reason is because they were not aware of the other programs, suggesting another sizable portion of participants are finding the information on other programs one of the least memorable components of the audit. Therefore, the program should make an effort to place more emphasis on other SDG&E energy efficiency programs available to residential customers.

Observations and Recommendations

Several observations were made about the 2003 Local Residential In-Home Audits Program through the course of conducting this evaluation. Some of these observations have resulted in recommendations for the program. Our major observations and recommendations are:

1. Audit Recommendations Are Being Implemented,
2. Program Tracking Data Excludes Participant Specific Recommendations, and
3. Participants Do Not Recall Information on Other SDG&E Energy Efficiency Programs.
4. Program Participants are Generally Highly Satisfied with the In-Home Audits Program

Detailed specifics for each observation are articulated in the chapter entitled "Observations and Recommendations".

Introduction

This is the final report for the Measurement and Evaluation Study of the 2003 SDG&E Local Residential In-Home Audits Program. In this chapter, we will describe the 2003 program as well as our general evaluation approach.

Program Overview

The SDG&E Local Residential In-Home Audits Program is an educational program that assists residential customers in understanding their energy usage, patterns of usage, and offers recommendations for energy savings, including referrals to other energy efficiency programs. The objectives of the audit are to provide detailed information on what the customer can do to become more energy efficient in their home including behavior and attitude modifications, to provide information to customers on how they can participate in rebate and incentive programs offered by SDG&E, and to encourage long-term energy savings. In 2003, according to the program tracking system, the program conducted an in-home energy audit at 1,414 residences. According to the program tracking data, 1,309, or nearly 93%, of the participants of the 2003 program are homeowners.

Evaluation Overview

The primary objectives of the study are to:

1. Determine whether or not participants have attempted to implement any of the energy efficient measures or ideas suggested by the auditor during the in-home visit, and
2. Determine whether or not participants have been informed of and convinced to participate in other energy efficiency programs offered by SDG&E.

Using the SDG&E program tracking data as a sampling frame, we selected a sample of 100 participants for the telephone survey. All results were extrapolated to the program participant population.

The telephone survey was used to determine whether participants have made any physical or behavioral modifications as a result of their audit and whether participants have been convinced to participate in other energy efficiency programs offered by SDG&E. The survey also determined how participants heard of the program, reasons for participation, program satisfaction, and whether or not the participants felt there was value to the information and services provided.

The statistical analysis of the data primarily consisted of estimating the proportion of participants who have made any physical or behavioral modifications as a result of their audit as well as estimating the proportion of participants have been convinced to participate in other energy efficiency programs offered by SDG&E. We also analyzed the responses to other components of the telephone survey, including reasons for not making any physical or behavioral modifications, reasons for participating, and participant satisfaction.

Participant Action Results

Table 1 presents the incidence of participants installing new appliances or equipment or making other physical changes as a result of their energy audit. Sixty-nine percent of participants state they have made physical changes as a result of their audit. At the 90% level of confidence, the relative precision of this estimate is $\pm 10.6\%$, yielding a 90% confidence interval of (61.7%, 76.3%).

	% of Participants
Yes	69%
No	31%

Table 1: Incidence of Physical Changes Resulting From Audit

All participants who stated they made physical changes as a result of their audit were asked to specify those changes. As shown in Table 2, 40% of all participants have installed compact fluorescent lighting, and over 20% of all participants have installed a whole house fan. Between 6% and 14% of all participants have installed a new refrigerator, a new oven, weather-stripping, a new dishwasher, or a new dryer.

	% of Participants
Installed Compact Fluorescents	40%
Installed Whole House Fan	22%
Installed Refrigerator	14%
Installed Oven	10%
Installed Weather Stripping	8%
Installed Dishwasher	7%
Installed Dryer	6%
Installed Increased Insulation	5%
Installed Programmable Thermostat	5%
Installed Heat Pump	4%
Installed Central Furnace	3%
Installed Ceiling Fan	2%
Installed Energy Efficient Lighting	2%
Installed Pool Pump	2%
Installed Air Conditioner	2%
Replaced / Removed Freezer	2%
Installed Low Flush Toilets	1%
Installed Other Equipment	5%

Table 2: Physical Changes Made As A Result of Energy Audit

All participants who did not report making any physical changes as a result of their audit were asked why. Table 3 displays the results. Ten percent of all participants state the reason is because they have no money to make physical changes, with another 9% of all participants stating they don't believe the recommended changes would result in energy savings.

	% of Participants
Financial Considerations / No Money	10%
I don't believe the recommended physical changes would result in energy savings	9%
My audit report didn't contain any recommended physical changes	2%
No Time	2%
Participant is a Renter	1%
Other	7%

Table 3: Reasons for Not Making Physical Changes

Table 4 displays the incidence of participants planning to make future physical changes. Overall, 45% of all participants plan to make physical changes in the near future. As shown in the table, participants who have already made at least one physical change as a result of their energy audit are significantly more likely to have plans to make physical changes in the near future (52%) than those who have not already made a physical change (29%).

Physical Changes Already Made	% of Participants Planning to Make Future Physical Changes	% of Participants with No Plans to Make Future Physical Changes
Yes	52%	48%
No	29%	71%
Total	45%	55%

Table 4: Incidence of Plans to Make Future Physical Changes

Table 5 presents the incidence of participants making behavioral changes as a result of their energy audit. Sixty-seven percent of participants state they have made behavioral changes as a result of their audit. At the 90% level of confidence, the relative precision of this estimate is $\pm 11.1\%$, yielding a 90% confidence interval of (59.5%, 74.5%).

	% of Participants
Yes	67%
No	33%

Table 5: Incidence of Behavioral Changes Resulting From Audit

All participants who stated they made behavioral changes as a result of their audit were asked to specify those changes. As shown in Table 6, about 40% of all participants are turning off unnecessary lights, and nearly 20% of all participants are adjusting their thermostat settings. Fifteen percent are turning off unnecessary electronic equipment. Over 5% of all participants are turning off the heater or AC in the evenings or using laundry / dishwasher only when full.

	% of Participants
Turn Off Unnecessary Lights	41%
Adjust thermostat settings	19%
Turn off unnecessary electronic equipment	15%
Turn off heater / AC in evenings	7%
Using laundry / dishwasher only when full	6%
Close blinds & curtains	4%
Dress in layers	4%
Used alternate form of heating, other than ce	4%
Adjust pool / hot tub pump settings	3%
Unplug unused appliances	3%
Using fan instead of AC	3%
Using timers to control usage	3%
Used dimmer switches	2%
Limit Shower time	1%
Line-dry clothes when possible	1%
Other	6%

Table 6: Behavioral Changes Made As A Result of Energy Audit

All participants who did not report making any behavioral changes as a result of their audit were asked why. Table 7 displays the results. Fifteen percent of all participants say they were not sure of what else they could do that they aren't already doing, and over 10% state that it is already a common practice. Seven percent of participants say it is too difficult or that they are too indolent to modify their behavior.

	% of Participants
Not sure of what else we could do that we haven't already done	15%
Already A Common Practice	11%
It's Too Difficult / I Am Too Lazy	7%
Don't Want to Adjust Comfort Level	3%
I Don't Believe Behavioral Modifications Are Necessary	2%
Other	2%

Table 7: Reasons for Not Making Behavioral Changes

Table 8 displays the incidence of participants planning to make future behavioral changes. Almost 10% of participants report they do have plans to make other behavioral changes in the

near future. There was no significant difference between participants who have already made behavioral changes and those who have not.

	% of Participants
Yes	9%
No	89%
Don't Know	2%

Table 8: Incidence of Plans to Make Future Behavioral Changes

Table 9 displays the incidence of participants participating in other SDG&E energy efficiency programs. Twenty-seven percent of participants state they have participated in other SDG&E program as a result of the information they received through the audit. At the 90% level of confidence, the relative precision of this estimate is $\pm 26.1\%$, yielding a 90% confidence interval of (20.0%, 34.0%).

	% of Participants
Yes	27%
No	73%

Table 9: Incidence of Participating in Other SDG&E Programs

Participants who have participated in other SDG&E energy efficiency programs were asked to specify the programs. Table 10 displays the results. Fourteen percent of all participants have participated in Single-Family Home Improvement Rebates and eight percent have participated in the Refrigerator-Freezer Recycling Program.

	% of Participants
Single-Family Home Improvement Rebates	14%
Refrigerator-Freezer Recycling	8%
Hard-to-Reach Lighting Program	2%
Smart Thermostat Program	1%
Low Income Energy Efficiency Program	1%
Other	3%
Don't Know	2%

Table 10: Other SG&E Energy Efficient Programs

Table 11 summarizes the reasons for not participating in other SDG&E energy efficiency programs. Nearly 40% of participants who haven't participated in another program state this is because they weren't aware of the other programs, suggesting that participants do not remember this component of the energy audit very well. The program should make an effort to better emphasize the information provided on how to learn of and participate in other SDG&E energy efficiency programs. Approximately 30% of participants report they have not participated in other SDG&E programs because they are not interested right now. Only about

10% of participants who haven't participated in another program report that this is due to financial considerations or a lack of money.

	% of Participants Who Haven't Participated in Other Programs
I Wasn't Aware of the Other Programs	38%
Not Interested Right Now	29%
Financial Considerations / No Money	11%
No Time	7%
I Haven't Seen a Program Matching My Needs	4%
Program ran out of funding	4%
Incentives not enough	3%
Too Much Money	1%
Other	1%
Don't Know	1%

Table 11: Reasons for Not Participating In Other SDG&E Programs

In the Measurement and Evaluation Study of the 2002 SDG&E Local Residential In-Home Audits Program, we found that about 33% of participants who had not participated in other SDG&E programs stated the reason was because they hadn't seen a program meeting their needs. For the 2003 evaluation, we added a question to the survey asking what type of program would match their needs in the event a respondent provided such a response. Many of the responses provided to this question revealed that participants were not aware of the other SDG&E programs; these respondents were re-categorized as unaware of the other programs for reporting purposes.

Table 12 presents the likelihood that participants will participate in another SDG&E energy efficiency program in the near future. Over 40% of participants state they are very likely to do so, with approximately another 20% stating they are likely. Fewer than 10% of participants state they are either unlikely or not at all likely to participant in another SDG&E energy efficiency program in the near future.

	% of Participants
Not At All Likely	3%
Unlikely	5%
Not Sure	30%
Likely	16%
Very Likely	43%
Don't Know	3%

Table 12: Likelihood of Participating In SDG&E Energy Efficiency Program in Near Future

Satisfaction / Process Results

Table 13 shows how participants first became aware of SDG&E's Residential In-Home Audits Program. Nearly 40% of participants became aware of the program through a bill insert. About 10% of participants learned of the program because they called SDG&E to discuss either their bill or their meter, with another 10% learning of the program through a friend or colleague. Twenty percent of participants do not know how they first became aware of the program.

	% of Participants
Bill Insert	36%
Called SDG&E About Bill / Meter	11%
Friend / Colleague	10%
Cold Call	8%
Letter or Mailing (Other Than Bill Insert)	6%
Community Group or Organization	1%
Other	8%
Don't Know	20%

Table 13: Source of Awareness of Residential In-Home Audits Program

Table 14 summarizes why participants chose to participate in the program. Nearly 60% of participants state their reason was to reduce their energy bill and save money. Just under 20% of participants wanted to evaluate the efficiency of their home. Nearly 10% wanted to either save energy and nearly another 10% wanted to learn more about the energy characteristics of their homes.

	% of Participants
Reduce Energy Bill / Save Money	58%
Evaluate the Efficiency of My Home	18%
Save Energy	8%
Learn More About Energy Characteristics of My Home	8%
Friend / Relative Advised Me To	2%
Environmental Concerns	2%
Other	4%

Table 14: Primary Reason for Participating in Residential In-Home Audits Program

Nearly 90% of participants are at least somewhat satisfied overall with the In-Home Audits Program, with 65% stating they are very satisfied, as shown in Table 15. Only 4% of participants indicated they were unsatisfied.

	% of Participants
Very Satisfied	65%
Somewhat Satisfied	24%
Neither Satisfied Nor Unsatisfied	7%
Somewhat Unsatisfied	3%
Very Unsatisfied	1%

Table 15: Overall Satisfaction with In-Home Audits Program

Participants who were either somewhat unsatisfied or very unsatisfied overall were asked why. Their verbatim responses are:

"The energy audit didn't help us determine why our bills are so unreasonably high." (Somewhat Unsatisfied)

"We were disappointed because we assumed they would walk around the house and make suggestions. Instead the auditor gave us some literature that we had already received." (Somewhat Unsatisfied)

"I thought they would check my electric meter to see that it's running properly. My bills are three times more than my neighbors and I'm never home where they're home all of the time so it doesn't make sense. The program didn't identify why our bills are so high. (Somewhat Unsatisfied)

"There wasn't any information provided that we didn't already know." (Very Unsatisfied)

All respondents were read a list of items about the In-Home Audits Program and asked to rate their satisfaction with each, using a scale of 1 to 5, where 1 means very unsatisfied and 5 means very satisfied. Table 16 displays the mean satisfaction rating and associated standard deviation for each item. The program is experiencing high levels of satisfaction among the participants, as the mean rating of each item is 4.41 or higher. Overall, participants are most satisfied with the expertise level of the energy audit specialist and the convenience of scheduling the audit, followed by the completeness of the energy report. Participants are least satisfied with the practicality and usefulness of the audit recommendations and the clarity of the information on how to participate in other SDG&E energy efficiency programs.

However, as evidenced by the high mean satisfaction ratings, the majority of participants are quite satisfied with even these aspects. Nearly two-fifths (40%) of participants cannot rate their satisfaction with the clarity of the information on how to participate in other SDG&E energy efficiency programs, further reinforcing the finding that this component of the energy audit is the least memorable for the participants and the program should make an effort to better emphasize the information provided on how to participate in other SDG&E energy efficiency programs.

	Mean Rating	Standard Deviation	% Don't Know
Convenience of Scheduling the Audit	4.69	0.63	1%
Quality & Completeness of Energy Inspection	4.57	0.80	1%
Review & Discussion of Audit Recommendations	4.54	0.83	0%
Expertise Level of Energy Audit Specialist	4.69	0.70	1%
Clarity & Ease of Understanding Energy Report	4.58	0.77	8%
Completeness of Energy Report	4.65	0.73	7%
Practicality & Usefulness of Audit Recommendations	4.41	1.00	7%
Clarity of Info. On How to Participate in Other SDG&E Programs	4.41	0.87	37%

Table 16: Satisfaction with Various Aspects of the Program

Table 17 summarizes the number of times participants have looked at or referred to their energy audit report. Twelve percent of participants have never looked at their energy report, and about 30% have only looked at the report once. Just over 10% of participants have looked at their energy audit report 4 or more times.

	% of Participants
Have not Looked at Report	12%
1 Time	32%
2 Times	20%
3 Times	17%
4 Times	3%
5 Times	4%
6 Times	3%
10 Times	1%
Don't Know	7%
Refused	1%

Table 17: Number of Times Looked At / Referred to Energy Report

Participants were asked how much more they knew about how to save energy and manage their bill as a result of the audit. As shown in Table 18, 25% of participants state they know about the same, and almost 75% of participants say they know somewhat more or much more.

	% of Participants
I Know Much Less	1%
I Know Somewhat Less	-
I Know About the Same	25%
I Know Somewhat More	43%
I Know Much More	31%

Table 18: Audit's Effect on Participant Knowledge On How to Save Energy & Manage Their Bill

Demographics

Table 19 presents the home ownership status of the Hard-to-Reach Lighting Program participants. Ninety-five percent of participants own their homes, with 4% renting their home¹.

	% of Participants
Own	95%
Rent	4%
Other	1%

Table 19: Home Ownership Status

Table 20 shows the distribution of the number of people per household among program participants. Over 60% of participating households are occupied by only one or two people. Another 30% of participating households contain either three or four people.

	% of Participants
1	18%
2	42%
3	17%
4	14%
5	4%
6	2%
Refused	2%

Table 20: Number of People in Household

Table 21 summarizes the distribution of the primary language spoken in participating households. Over 90% of participating households primarily speak English. About 3% of participating households speak Spanish, with another 3% speaking Tagalog. To be more effective at meeting hard-to-reach goals, the program should strive to reach a more ethnically diverse population of customers.

	% of Participants
English	91%
Spanish	3%
Tagalog	3%
Chinese	1%
Other	1%

Table 21: Primary Language of Household

¹ The 1% shown as neither renting nor owning their home is a building appearing to function in a commercial capacity. The survey data shows that this participant site is a Homeowners Association building. This respondent has been omitted from the remaining demographic tables.

All respondents were asked the highest level of education they have completed. As shown in Table 22, just under 10% of participants have completed high school or less, about 35% have completed some college, another 30% have a 4-year college degree, and approximately 20% have an advanced degree.

	% of Participants
High School Graduate or Less	8%
Some College	34%
4-Year College Degree	29%
Advanced Degree	18%
Refused	10%

Table 22: Level of Education Completed

Table 23 presents the distribution of 2003 household income. Over 50% of participants had a 2003 household income of \$43,501 or more. Approximately 10% of participants had a 2003 household income of less than \$23,000. Nearly 20% of participants refused to provide their 2003 household income.

	% of Participants
Less than \$23,000	9%
\$23,001 - \$27,000	3%
\$27,001 - \$32,500	3%
\$32,501 - \$38,000	8%
\$38,001 - \$43,500	4%
\$43,501 or more	52%
Don't Know	4%
Refused	17%

Table 23: 2003 Household Income

Table 24 summarizes the distribution of the age of participants of the Residential In-Home Audit Program. Participants of the program range in age from 31 years old to 91 years old. Participants are 58 years old on average with a standard deviation of 18 years. These summary statistics suggest the distribution of the age of participants of the Residential In-Home Audit Program may be slightly skewed to the right.

	Mean	Standard Deviation	Minimum	Maximum	% Refused
Age of Respondent	58	18	31	91	15.2%

Table 24: Age of Respondent

Observations and Recommendations

This chapter presents observations made about the 2003 Local Residential In-Home Audits Program through the course of conducting this evaluation. Recommendations to improve the program are also presented.

Audit Recommendations Are Being Implemented

Just over two-thirds of participants report they have made at least one physical change in their home as a result of their audit. Additionally, about two-thirds of participants state they have made at least one behavioral modification based on the results of their energy audit. This suggests that for the most part participants found the audit recommendations reasonable and that they believed the recommendations could result in energy savings.

Program Tracking Data Excludes Participant Specific Recommendations

The specific physical and behavioral recommendations resulting from each participant's audit are not electronically recorded. So, the current evaluation of the program could only ask participants about what, if any, physical or behavioral changes they recall making as a result of their audit. Asking participants specifically about the actions recommended in their report would allow for a more accurate evaluation of program effectiveness. Therefore, we recommend electronically recording participant-specific recommendations based on the participant-specific energy reports.

Participants Do Not Recall Information on Other SDG&E Energy Efficiency Programs

When asked to rate their satisfaction on the clarity of the information on how to participate in other SDG&E energy efficiency information, nearly 40% of participants cannot do so. Approximately 75% of participants have not participated in other SDG&E energy efficiency programs. When asked why not, nearly 40% of such participants (28% of all participants) state they were not aware of the other SDG&E programs. These three findings indicate that the program needs to better emphasize the information provided during the audit about how to participate in other SDG&E programs, as this component of the energy audit appears to be the least memorable for participants of the Residential In-Home Audits program. Participants for the most part remember, understand, and believe the recommended physical and behavioral modifications resulting from the audit. However, a sizable portion of participants do not appear to recall the information on other SDG&E programs or to be aware of the other SDG&E energy efficiency programs.

Participants are Highly Satisfied with the In-Home Audits Program

All areas evaluated for participant satisfaction scored extremely high. This finding reveals that the program is meeting the expectations of the program participants. For the eight areas of program satisfaction studied, average satisfaction scores ranged between 4.4 and 4.7 on a scale of 1 to 5, where 1 meant very unsatisfied, and 5 meant very satisfied.

EM&V Methodology

To estimate the proportion of participants that have made physical modifications, behavioral modifications, or have participated in another SDG&E efficiency program since their audit, RLW utilized telephone surveys with a statistically representative sample of program participants. We used the program tracking data to design a sample statistically representative of the program. For each program participant in the sample, we ascertained if they have made any physical or behavioral modifications or have participated in another SDG&E energy efficiency program since participating in the 2003 In-Home Audits program. The phone surveys also explored how participants first became aware of the program, reasons for participation, reasons for not making any physical or behavioral changes, reasons for not participating in other SDG&E energy efficiency programs, as well as participant satisfaction with various aspects of the program.

Sample Design

At the planning stage of the M&V evaluation for the 2003 Residential In-Home Audits Program, we proposed a sample of 100 participants for the telephone survey effort. The program tracking data basically consisted of the participant name, account number, and contact data. Therefore, we decided to use conventional simple random sampling to select the sample of 100 participants. In other words, each of the 1,414 program participants was equally likely to be included in the sample.

Our final sample consists of 100 participants. Since simple random sampling was utilized, the case weight of each participant is calculated as the population size divided by the sample size, or $1,414/100 = 14.14$.

Telephone Survey Instrument Design

We developed a questionnaire for the evaluation that obtained a variety of information including:

- How participants heard of the in-home audit program,
- The reasons for program participation,
- Whether the participant has attempted to implement any of the energy efficient measures or ideas suggested by the auditor during the in-home visit,
- If so, which measures or ideas have they implemented,
- Reasons for not implementing recommended measures or ideas,
- Whether the participant has been convinced to participate in other energy efficiency programs offered by SDG&E,
- If so, which programs they have participated in,
- Reasons for not participating in other energy efficiency programs offered by SDG&E, and
- Program satisfaction and recommended improvements.

The survey investigates how participants learned of the 2003 Residential In-Home Audits program and what their specific motivations were for participating. The survey also determines whether or not the participant has made any behavioral changes such as turning off lights in

unoccupied rooms or lowering thermostat settings, or if they have made any physical changes such as replacing appliances or lights as a result of the audit. The survey also determines if the participant has participated in any other SDG&E rebate or incentive programs.

RLW submitted the survey instrument to the SDG&E project manager and other interested parties for a final review and ultimately approval.

Telephone Survey Data Collection

Using the survey instrument described above, telephone surveys were conducted from RLW's CA office. All telephone surveyors were provided instruction on program operation, proper etiquette for contacting participants, and how to interpret participant responses.

All survey calls were tracked and any refusals or incomplete responses were recorded. Upon completing each interview, the telephone survey manager reviewed the survey for accuracy and completeness and then entered the data into an electronic database designed specifically for this survey by the project analyst.

Data were validated automatically using imbedded database functionality. The entered data were also continuously reviewed by the telephone survey manager. Prior to analysis, the project analyst thoroughly performed a quality control check on the data, identifying and correcting any illogical or unreasonable responses.

Table 25 presents the dispositions of the telephone survey data collection effort. We attempted to contact a total of 158 participants. Of these 158 participants, 100 completed a telephone survey, corresponding to conversion rate of 63.3%².

	# of Participants
Total	158
Left Message	19
Cannot remember program.	8
Refusal	8
Claims no participation in program.	4
Disconnected	4
Termination	4
Callback	3
Wrong Number	3
No Answer	2
Participant recently passed away.	2
No phone number/cannot locate #	1
Completed	100
Conversion Rate	63.3%

Table 25: Telephone Survey Dispositions

² The conversion rate is defined as the ratio of successfully completed surveys to all attempted contacts.

Data Analysis

Estimating the proportion of participants that have taken certain actions as a result of their audit is one of the primary objectives of this study. This is a straightforward application of estimating the parameter p in a Bernoulli probability distribution. Since there was no variable available for the entire population that might be related to whether the participant has taken the actions of interest, ratio estimation techniques are not possible. Therefore, conventional mean-per-unit estimation was used instead.

Under mean-per-unit estimation, the parameter p is estimated as $\hat{p} = \frac{1}{N} \sum_{i=1}^n w_i * y_i$, where N is

the population size, w_i is the case weight of sample participant i , and y_i is an indicator variable with a value of one if the participant has taken the action of interest and a value of zero otherwise. Taking into account the finite population correction factor, the associated error

bound at the 90% confidence level is then calculated as $eb = 1.645 * \frac{\sqrt{\hat{p} * (1 - \hat{p})}}{\sqrt{n}} * \sqrt{1 - \frac{n}{N}}$,

where n is the sample size. The relative precision at the 90% confidence level is simply the error bound, eb divided by \hat{p} .

The project analyst also analyzed the remaining results of the telephone survey. The quantitative process survey analysis was carried out using SPSS, a commonly used statistical software package. RLW calculated weighted frequencies, and means of data, where appropriate, to provide unbiased estimates of population characteristics.

Telephone Survey Instrument

SDG&E 2003 Local Residential In-Home Audits Program

M&V Survey Instrument

Surveyor _____

Date _____ Time _____

RLW_ID: «RLW_ID» Sample Designation: «Sample»

Participant Name: «Name» Customer Acct#: «Account_»

Address: «Street_Address» City: «City» Zip: «Zip»

Program Phone: «Phone» Own/Rent: «OwnRent»

Billing Name: «NM_CUST»

Billing Phone: («CUST_HOME_PHN_AREACD») «CUST_HOME_PHN_NBR»

Call Log

Codes:

Surveyor _____ Date _____ Time _____

RLW_ID: «RLW_ID» Sample Designation: «Sample»

Participant Name: «Name» Customer Acct#: «Account_»

Address: «Street_Address» City: «City» Zip: «Zip»

Program Phone: «Phone» Own/Rent: «OwnRent»

Billing Name: «NM_CUST»

Billing Phone: («CUST_HOME_PHN_AREACD») «CUST_HOME_PHN_NBR»

Call Log

Codes:

- 1=Completed 2=Callback 3=Left Message 4=Busy
- 5=No Answer 6=Refusal 7=Termination 8=Wrong Number
- 9=Disconnected Number 10=Language Barrier

	Date:	Time:	Code	Initials	Outcome	Notes
Call 1	_____ / _____	_____ : _____	AM PM			
Call 2	_____ / _____	_____ : _____	AM PM			
Call 3	_____ / _____	_____ : _____	AM PM			
Call 4	_____ / _____	_____ : _____	AM PM			
Call 5	_____ / _____	_____ : _____	AM PM			
Call 6	_____ / _____	_____ : _____	AM PM			
Call 7	_____ / _____	_____ : _____	AM PM			

Concerned Customers: Customers may call the SDG&E Call Center to validate our study. 800-411-SDGE (7343)

Introduction

Hello, may I speak with «Name»,.

Hello, my name is <<interviewer>>. I am calling on behalf of SDG&E regarding their residential in-home audits program. We are conducting an evaluation study of the program on their behalf. We received your name and contact information from SDG&E's residential in-home audits program records in order to conduct the evaluation.

Q1. I have a few brief questions that will take only a couple of minutes to complete. May I ask you these questions now?

- 1) Yes
- 2) No Call back date and time: _____

Q2. Our information shows that you participated in the SDG&E residential in-home audits program on «Date_Comp», is this correct?

- 1) Yes
- 2) No. Probe for someone who would know, if not Thank and Terminate
- 98) DK. Is there someone else in your home who would know?
Record Name _____
- 99) Refused -Thank and Terminate

If respondent initially does not recall program, read the following program description:

This program was provided through SDG&E at no cost to you. In this program, you arranged for an energy expert to inspect your home and recommend ways to reduce your energy consumption. They also left an energy audit report with you describing how your home uses energy and listing recommendations of what you can do to save energy and reduce your utility bills. Do you remember this program?

Satisfaction/Process Questions

Q3. How did you first become aware of SDG&E's Residential In-Home Audits Program? Do Not Read List. Only One Response.

- 1) Letter or Mailing (Other Than Bill Insert)
- 2) Friend/colleague
- 3) SDG&E Web site
- 4) Bill Insert
- 5) Cold Call
- 6) Community Group or Organization
- 7) Light Bulb Turn-in Event
- 8) Other: _____
- 98) Don't Know/Can't remember

Q4. What is the primary reason you chose to participate in the In-Home Audits program? (Do Not Read List, Only One Response.)

- 1) Reduce Energy Bill / Save Money
- 2) Save Energy
- 3) Learn More About Energy Characteristics of My Home
- 4) Evaluate the efficiency of my home
- 5) Friend/Relative Advised Me To
- 6) Environmental Concerns
- 7) Other: _____

- 98) Don't Know
- 99) Refused

Q5. How would you rate your overall satisfaction with SDG&E's Residential In-Home Audits Program, using a scale of 1 to 5, where a 1 means very unsatisfied and a 5 means very satisfied?

- 1) Very Unsatisfied, why?
- 2) Somewhat Unsatisfied, why?
- 3) Neither Satisfied nor Unsatisfied
- 4) Somewhat Satisfied
- 5) Very Satisfied

Why:

Q6. Now, I am going to read a list of items about the program. Please rate your level of satisfaction for each item I read, using a scale of 1 to 5, where 1 means very dissatisfied and 5 means very satisfied. How satisfied are you with the:

- 1) Convenience of Scheduling the Audit_____
- 2) Quality and Completeness of Energy Inspection_____
- 3) Review and Discussion of Audit Recommendations_____
- 4) Expertise level of the Energy Specialist who Conducted the Audit and Your Energy Report_____
- 5) Clarity and Ease of Understanding the Energy Report_____
- 6) Completeness of the Energy Report_____
- 7) Practicality and Usefulness of the Audit Recommendations_____
- 8) Clarity of Information Regarding How To Participate in Other SDG&E Energy Efficiency Programs_____

Q7. Since the audit, about how many times have you looked at or referred to your energy audit report?

_____ times.

Q8. As a result of the energy audit, would you say that you now know much less, somewhat less, about the same, somewhat more, or much more about how to save energy and manage your energy bill?

- 1) I Know Much Less
- 2) I Know Somewhat Less
- 3) I Know About the Same
- 4) I Know Somewhat More
- 5) I Know Much More
- 98) Don't know

99) Refused

Q9. What recommendations would you have to improve this program for future program participants like yourself?

Participant Action Questions

Now, I would like to ask you about the recommendations contained in your audit report.

Q10. Have you installed any new appliances or equipment or made any other physical changes as a result of your energy audit?

- 1) Yes
- 2) No (Go to Q12)

Q11. Which appliances or equipment did you install? Record Verbatim Response. Prompt For Specifics.

New Appliances or Equipment

- | | |
|------------------------------|--|
| 1. Ceiling Fan | 12. Oven |
| 2. Dishwasher | 13. Washer |
| 3. Dryer | 14. Weather stripping |
| 4. Compact fluorescents | 15. Energy Efficient Lighting (other than CFL) |
| 6. Increased insulation | 15. Whole house fan |
| 7. Low-flush toilets | 16. Windows |
| 8. Pool pump | 17. Other _____ |
| 9. Refrigerator | 18. None |
| 10. Removed/replaced freezer | 19. Air Conditioner |
| 11. Programmable Thermostat | 20. Heat Pump |
| | 21. Central Furnace |

Go To Q13.

Q12. What is the primary reason you have not installed any new appliances or equipment or made any other physical changes as a result of your energy audit? Do Not Read List. Only One Response.

- 1) Financial Considerations / No Money
- 2) No Time
- 3) Participant is a renter (did not want to invest in someone else's property)
- 4) I don't believe the recommended physical changes would result in energy savings
- 5) My audit report didn't contain any recommended physical changes
- 6) Other _____

98) Don't Know

99) Refused

Q13. Do you plan on installing any new appliances or equipment or making any other physical changes in the near future?

1) Yes

2) No (Go to Q15)

98) Don't Know

99) Refused

Q14. Which appliances or equipment do you plan to install? Record Verbatim Response. Prompt For Specifics.

Q15. Have you made any behavioral changes or no-cost changes in an effort to lower your bill as a result of the audit?

1) Yes

2) No (Go to Q17)

Q16. Which behavioral changes have you made? Record Verbatim Response. Prompt For Specifics.

Behavioral/ No-Cost Changes

- | | |
|---|---------------------------------------|
| 1. Turn off unnecessary lights. | 10. Unplug unused appliances |
| 2. Turn off unnecessary electronic equipment. | 11. Adjust pool/hot tub pump settings |
| 3. Using laundry/dishwasher only when full. | 12. Line-dry clothes when possible |
| 4. Adjust thermostat settings | 13. Close blinds & curtains |
| 5. Turn off heater/AC in evenings | 14. Dress in layers |
| 6. Use fan instead of air conditioner | 15. Using timers to control usage |
| 7. Limit Shower time | 16. Other |

Go To Q18

Q17. What is the primary reason you have not made any behavioral changes? Record Verbatim Response. Prompt For Specifics.

Behavioral/ No-Cost Changes

- | | |
|---|--|
| 1. Already a common practice | 5. Kids won't change their habits |
| 2. I don't believe behavioral modifications are necessary. do to save that we haven't already done. | 6. Not sure of what else we could do to save that we haven't already done. |
| 3. It's too difficult I'm too lazy | 7. Other |
| 4. Don't want to adjust our comfort level. | |

Q18. Do you plan on making any behavioral changes in the near future?

- 1) Yes
- 2) No à Go to 20
- 98) Don't Know
- 99) Refused

Q19. Which behavioral changes do you plan to make? Record Verbatim Response. Prompt For Specifics.

The energy audit also provided with you with information about how you can participate in other SDG&E energy efficiency programs that provide rebates, or financial incentives, for installing certain energy efficient equipment.

Q20. Have you participated in any other SDG&E energy efficiency programs as a result of the information you received through the audit?

- 1) Yes
- 2) No (Go to Q22)

Q21. Which of the following SDG&E energy efficiency programs have you participated in as a result of your in-home audit? Circle All That Apply.

- 1) Single-Family Home Improvement Rebates (Rebates for appliances, ACs, windows, insulation, water heaters, furnaces, etc. in single family homes)
- 2) Multi-Family Home Improvement Rebates (Rebates for ACs, light fixtures, etc. in multi-family structures)
- 3) Smart Thermostat Program (Free digital thermostat, customer allows SDG&E to remotely control AC during energy shortages in exchange for incentive)
- 4) Refrigerator-Freezer Recycling (Recycled an old refrigerator or freezer for incentive)
- 5) Hard-To-Reach Lighting Turn-In Program (Turned-In Inefficient Bulbs/Lamps For Efficient Bulbs/Lamps)
- 6) Low Income Energy Efficiency Program (weatherization measures, furnace repair and replacement, water heating measures, ACs, etc. for low-income customers)
- 7) Other _____
- 98) Don't Know
- 99) Refused

Go To Q24.

Q22. Why have you chosen not to participate in other SDG&E energy efficiency programs?

- 1) No Time

- 2) Not Interested right now
- 3) Too Much Paperwork
- 4) Financial Considerations / No Money
- 5) Incentives not enough
- 6) I Haven't Seen a Program Matching My Needs
- 7) Other _____
- 8) Program ran out of funding _____
- 98) Don't Know
- 99) Refused

Skip to Q24, unless answer to Q22 was #5 "I Haven't Seen a Program Matching My Needs"

Q23. What type of program would match your needs?

Q24. What is the likelihood that you will participate in one of SDG&E's energy efficiency programs in the near future?

- 1) Not at all likely
- 2) Unlikely
- 3) Not sure
- 4) Likely
- 5) Very Likely
- 98) Don't Know
- 99) Refused

DEMOGRAPHIC QUESTIONS

I just have a few final questions for background and classification purposes only.

Q25. Do you own or rent your home?

- 1) Own
- 2) Rent
- 3) Other: Specify _____
- 98) Don't Know
- 99) Refused

Q26. How many people live in the household?

- 1) # _____
- 98) Don't Know

99) Refused

Q27. What is your household's primary language?

- 1) English
- 2) Spanish
- 3) Chinese
- 4) Russian
- 5) Italian
- 6) Vietnamese
- 7) Indian
- 8) Korean
- 9) French
- 10) Other: _____
- 98) Don't Know

Q28. What is the highest level of education you have completed?

- 1) High School Graduate or Less
- 2) Some College
- 3) 4-Year College Degree
- 4) Advanced Degree
- 99) Refused

Q29. Lastly, into which of the following categories did you household income fall for 2003?

- 1) Less Than \$23,000
- 2) \$23,001 - \$27,000
- 3) \$27,001 - \$32,500
- 4) \$32,501 - \$38,000
- 5) \$38,001 - \$43,500
- 6) \$43,501 or more
- 98) Don't Know
- 99) Refused

Q30. Can you tell me your age?

- 1) _____
- 98) Don't Know
- 99) Refused

These are all of my questions. Thank you for your time.