research/into/action inc

Final Report

Low Income Energy Efficiency Program 2009-2010 Process Evaluation

Prepared For:

California Public Utilities Commission

PG&E

SOUTHERN CALIFORNIA EDISON
An EDISON INTERNATIONAL® Company

Southern California Gas Company
A Sempra Energy utility

SDGE
A Sempra Energy utility

Prepared By:

research/into/action inc

Jane S. Peters, Ph.D.
Kara Crohn, Ph.D.
April Armstrong
Ned Harris
Jun Suzuki
Joe Van Clock

Research Into Action, Inc.

June 10, 2011

ACKNOWLEDGEMENTS

Many people supported the evaluation team by contributing to this process evaluation and report. They include: the investor-owned utilities' (IOU) staffs, who responded to requests for information, data, interviews, and a focus group; the managers, field crew, and office staffs of the contractor organizations who responded to our requests to participate in interviews and a focus group, and to allow us to ride along on visits to customers' homes; and to the many customers who took the time to respond to our phone surveys and graciously welcomed us into their homes during site visits. We appreciate the time and thoughtful response each person offered.

In particular, we would like to acknowledge the assistance of Mary O'Drain at Pacific Gas & Electric Company, who served as our evaluation project manager, and Tory Francisco, who served as our advisor at the California Public Utilities Commission. We also thank: Carol Edwards of Southern California Edison for her insightful feedback throughout the evaluation; Brenda Gettig of San Diego Gas & Electric and Delia Meraz of Southern California Gas Company for their leadership; and Greg Buchler of Southern California Edison and Kevin Cudd of Pacific Gas & Electric Company for their invaluable support.

We are grateful for the high-quality work completed by our partners in this evaluation. APPRISE conducted interviews of private contractors and provided advice on the development of the customer survey. Abt SRBI conducted surveys of the IOUs' customers and helped refine customer survey questions.

TABLE OF CONTENTS

EXECUTIVE SUMMARY ..... **I**

INTRODUCTION AND PROJECT BACKGROUND I

EVALUATION APPROACH I

FINDINGS II

Marketing, Enrollment, and Assessment II

Installation and Inspection III

CONCLUSIONS AND RECOMMENDATIONS III

Outreach and Marketing III

Conclusions III

Recommendations IV

Enrollment and Assessment IV

Customer Preparation for Enrollment Visits V

Paperwork Reduction and Database Upgrades V

Home Assessment VI

Customer Education VII

Installation and Inspection VII

Conclusions VII

Recommendations VIII

1. INTRODUCTION **1**

PROGRAM OVERVIEW 1

REPORT OBJECTIVES AND STRUCTURE 2

2. METHODS **6**

PROGRAM DOCUMENTS 7

STAFF 7

CONTRACTORS 7

Contractor Sample Population 8

Contractor and Inspection Staff Focus Groups 9

Contractor Field Crew Ride-Along Observations 10

Telephone Interviews with Key Staff at Contractor Organizations 10

CUSTOMERS 12

3. LIEE PROGRAM OVERVIEW 15

ORGANIZATIONAL STRUCTURES SUPPORTING THE LIEE PROGRAM 15

PG&E 15

SCE 16

SCG 17

SDG&E 18

THE LIEE PROCESS 19

Work Flow and Data Management 19

Marketing and Outreach 20

Enrollment, Assessment, and Education 21

Installation of Measures and Safety Checks 24

Inspection 25

Post-Assessment / Pre-Installation Inspections 25

Post-Installation 26

4. STAFF 27

CONTRACTOR MANAGEMENT AND COMMUNICATION 27

MARKETING AND OUTREACH 29

Centralized Marketing Strategies 29

Removing Barriers to Enrollment and Partnering with Community Groups 30

Leveraging State and Federal Programs 31

Whole Neighborhood Approach (WNA) 32

Description of List Development and Customer Tracking Practices 32

ENROLLMENT AND ASSESSMENT 33

Paperwork Reduction 33

Customer Education 34

Barriers to Enrollment 35

INSTALLATION AND INSPECTION 36

Installation of Measures 36

Inspection 37

5. CONTRACTORS 39

CONTRACTOR FIRM CHARACTERISTICS 39

Third-Party For-Profit Contractors and Community-Based Organizations (CBOs) 39

Financial Capacity and Size of Firms 40

Contractor Employment and Incentive Structures 40

MARKETING AND OUTREACH 42

Firms' Outreach Methods 42

List Development and Customer Tracking Practices 42

IOU-Provided Contact Lists 42

IOU Referrals 43
Identification of Effective Outreach Strategies 43
Leveraging State and Federal Programs 44
ENROLLMENT AND ASSESSMENT 46
Education Delivery 46
Description of Participation Processes 49
PROGRAM PAPERWORK AND DOCUMENTATION 50
Opportunities for Paperwork Reduction 50
Customer Documentation Requirements 51
Rental Property Owner Permission 53
CONTRACTOR INTERFACE WITH UTILITIES 55
Data Transfer to Utilities 55
Opportunities to Facilitate Data Entry 56
Communication and Coordination with Utility Staff 56
APPROACHES TO SCHEDULING AND WORKING WITH CUSTOMERS 58
Scheduling Program Visits 58
Efforts to Minimize the Number of Visits Customers Receive 59
Whole Neighborhood Approach 60
SAFETY CHECKS AND INSPECTIONS 61
Gas Appliance Safety Checks 61
Coordination of Inspections and Safety Checks with Measure Installation 63
Training and Knowledge Transfer 64

6. CUSTOMERS 67

CHARACTERISTICS OF PARTICIPANTS AND NONPARTICIPANTS 67
PARTICIPANTS 68
Measures Installed 68
Marketing and Outreach 71
Energy Education 72
Number of Visits 74
Customer Satisfaction 74
Program Factors 74
Measures and Services 75
Installation Factors 76
Overall Satisfaction 77
Bill Reduction Effect 77
NONPARTICIPANTS 78
Program Awareness 79
Reasons for Nonparticipation 80
Other Services 81

Service Needs....81
Satisfaction with the Utility....82

7. FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS....84

FINDINGS....84
Overall Process....84
Marketing, Enrollment, and Assessment....84
Installation and Inspection....85

CONCLUSIONS AND RECOMMENDATIONS....86
Outreach and Marketing....86
Conclusions....86
Recommendations....86
Enrollment and Assessment....87
Customer Preparation for Enrollment Visits....87
Paperwork Reduction and Database Upgrades....88
Home Assessment....89
Customer Education....89
Installation and Inspection....90
Conclusions....90
Recommendations....90

APPENDICES

APPENDIX A: PARTICIPANT CUSTOMER SURVEY FREQUENCY TABLES....A-1
APPENDIX B: NONPARTICIPANT CUSTOMER SURVEY FREQUENCY TABLES....B-1
APPENDIX C: MAPS OF SAMPLE PARTICIPANTS....C-1

ES EXECUTIVE SUMMARY

INTRODUCTION AND PROJECT BACKGROUND

This document constitutes the final report for the 2009-2010 process evaluation of the Low Income Energy Efficiency (LIEE) program operated by the four investor-owned utilities (IOU) of California for the California Public Utilities Commission (CPUC). The IOUs include: Pacific Gas and Electric Company (PG&E), Southern California Edison (SCE), Southern California Gas (SCG), and San Diego Gas and Electric (SDG&E). Although the program is now referred to as Energy Savings Assistance Program (ESAP), this report will employ the nomenclature used for the 2009-2010 program cycle.

At its most basic, the LIEE program was structured to provide services and efficiency measures to help low-income households conserve energy and reduce their gas and/or electricity costs. LIEE offered a variety of measures, such as lighting retrofits, HVAC repairs or replacements, refrigerators, pool pump replacements, duct testing and sealing, central air conditioner maintenance, evaporative cooler installation and maintenance, attic insulation, water heating measures, weatherization, minor home repairs, and furnace repairs/replacements. The kinds of measures available to customers varied by IOU and other factors, such as climate zone. All measures were installed at no cost to eligible customers.

The LIEE program was funded with ratepayer funds. The CPUC, as the "owner" of the program, set its policy and procedure guidelines. Each of the IOUs administered the program in their respective service territories and were responsible for the installation of measures and providing quality assurance to the CPUC. The IOUs had the option of either contracting the administration of the program out to a primary program implementation contractor and conducting in-house inspections of the program measures internally, or working directly with implementation contractors and hiring independent contractors to inspect the installations[1]. While PG&E did the former, the rest of the IOUs chose the latter arrangement during this program cycle. Contractors played a critical role in the implementation of the program at all stages.

EVALUATION APPROACH

The purpose of process evaluation is to document and provide feedback on program processes in order to guide enhancements of program administration and operation. The two key objectives of this process evaluation are to:

[1] Per Section 8.2 of the *Statewide Low Income Energy Efficiency Program Policy and Procedures Manual*, 2010 working draft dated February 9, 2010.

1. Assess outreach approaches and recommend strategies for improving enrollment opportunities.
2. Document program processes and identify opportunities to improve the efficiency of program delivery and implementation.

To address the evaluation objectives, the Research into Action team reviewed program documents, and gathered and analyzed several sources of primary data. We conducted eight semi-structured, in-depth phone interviews with managerial-level program staff (two per IOU) between October 8 and November 15, 2010, and four follow-up phone interviews (one per IOU) between January 27 and February 4, 2011. Two focus groups conducted in November 2010 provided feedback from PG&E inspectors (first focus group) and SCE and SCG contractors (second focus group) about program processes. We conducted ride-along observations of enrollment and assessment visits, installations, and inspections with 15 contractors from November 16 to November 23, 2010. In conjunction with APPRISE, we interviewed 62 contractors by phone between November 19 and December 14, 2010. Under our direction, Abt SRBI conducted 268 phone surveys with IOU customers participating in the LIEE program and 268 phone surveys with nonparticipants between December 28, 2010, and January 10, 2011. The results of this primary and secondary research are contained in this document.

FINDINGS

The LIEE programs at each of the IOUs evolved into a mature program with protocols at each step of the process: marketing and outreach, enrollment and assessment, installation, and inspection. There were established lines of communication among IOUs and between IOUs. The IOUs' networks of contractors, supported by online databases that managed workflow and held contractors and staff accountable for specific process steps, appeared largely effective.

Marketing, Enrollment, and Assessment

The IOUs and their contractors used various marketing and outreach techniques to generate interest in the program, including conducting targeted campaigns geared to locate and enroll customers for whom the common and more frequently used outreach methods might be less effective.

Nonetheless, identification of eligible customers continued to challenge some IOU program staff and contractors.[2] To simplify the enrollment process, contractors interviewed for this evaluation suggested reducing redundant paperwork where possible. Although enrollment and assessment contractors reported that self-certification of income documents helped reduce enrollment time,

[2] SCG noted that they are more challenged by enrolling customers in the program than identifying potential customers.

some IOU staff were concerned that while this might reduce paperwork, it also could result in enrollment of a higher percentage of customers who normally would not qualify for the program and therefore would increase program costs. Some IOUs and individual contractor firms were providing tablet PCs to contractors or inspectors to reduce data entry time and cost; this strategy may prove cost-effective for all IOUs.

Enrollment and assessment contractors provided customers with a brief educational presentation on energy savings; the amount of time spent on education and materials differed among IOUs. Customer survey results indicate that the amount of time spent on education may influence customer's satisfaction with the energy-saving information provided during the enrollment and assessment visits.

Installation and Inspection

Following the enrollment and assessment visit, in PG&E, SCG and SDG&E service territories, installation contractors completed a more detailed assessment to identify all of the feasible measures for which a customer qualified. In SCE territory, the enrollment and assessment contractor conducted this assessment. Contractors indicated that combustion appliance problems were the most common issue that prevented projects from moving beyond an assessment or limited the measures installed.

There are two times when IOUs inspected contractors' work: post-assessment / pre-installation checks of the enrollment contractor's recommendations; and post-installation checks for proper repairs and installation of measures.

CONCLUSIONS AND RECOMMENDATIONS

While each of the IOUs demonstrated strengths in their program operations, there remain opportunities for improvement.

Outreach and Marketing

Conclusions

IOUs and contractors used a variety of methods to reach customers, from bill inserts to canvassing, telethons, and community events. IOU staff found that some methods, such as community events and mass media campaigns, were better at generating awareness of the program than producing immediate enrollments, but made subsequent direct contacts (e.g., phone calls and canvassing) more effective at convincing customers to enroll. We also found that an approach that worked well in one area or population might not work as well in another. That said, contacts at all IOUs said that automated outbound calling was a cost-effective way of reaching customers. Across the IOUs, surveyed customers remembered hearing about the program most often through word-of-mouth, bill inserts, canvassing, or a phone call.

As contractors worked through lists of potential customers developed by the IOUs and implemented their outreach campaigns, the IOUs were preparing to focus more attention on reaching and enrolling customers for whom the more frequently used outreach methods might be less effective. These included customers who: 1) were located in rural locations; 2) used only cell phones and therefore could not be called using automated dialers; 3) were reluctant to join the program; or 4) rented their homes and needed property owner permission. Contractors and IOU staff feedback suggest that a combination of mass marketing to help raise awareness and use of targeted messages to key populations could help reduce reluctance among property owners and skeptical customers. Customer survey results for this evaluation further suggest that beyond not being aware of the program, nonparticipants did not have a good perception of how much time it took to participate or the potential for energy savings in their home. Program participants, on the other hand, believed the program helped lower their bill and felt that participating in the program did not take much of their time.

Recommendations

- **Use customer testimonials** to help show nonparticipants how easy it is to participate in the program, and that they likely will save money, even if they think they have done as much as they can to save energy.
- **Research and establish a cell phone protocol** that allows IOU staff and contractors to contact customers on their mobile phone, such as the protocol used for conducting surveys with cell phone users. SCG staff noted that they may not be able to do this with their organization's current cell phone policy (based on the Telephone Consumer Protection Act of 1991, which disallows telemarketing to cell phones or numbers on the National Do Not Call Registry).
- To **reach property owners and gain access to more renters**: 1) work with contractors and property owners that already participate in the program to revise and clarify language about co-payments on property owner waiver forms to address property owners' concerns and to create Property Owner Waiver (POW) forms in Spanish and other languages; 2) develop a separate marketing strategy for property owners of single-family units using messages that show the benefits for property owners, not just renters; and 3) for properties with large numbers of potentially eligible customers, encourage WNA-types of approaches. For example, SCE and its contractors found it most cost-effective to meet with property managers to develop refined targeted customer lists and to gain their approval to treat large groups of homes.

Enrollment and Assessment

With the exception of differing approaches to customer energy education, the IOUs approached the overarching enrollment and assessment process similarly and appropriately allowed

contractors to customize their approaches according to what worked best for their firm and customers. We identify the following four opportunities that could facilitate the process.

Customer Preparation for Enrollment Visits

Conclusions

Contractors frequently encountered customers who could not locate proper documentation despite IOU and contractor efforts to mail customers lists of the types of documents needed to enroll, and contractors' staffs' efforts to tell customers which documentation they needed to provide when they scheduled the appointment over the phone.

Recommendation

- ➡ In addition to mailing customers lists of required program enrollment documents in advance of the enrollment and assessment appointment, **contractors can give their office staff better pre-screening scripts to use when scheduling appointments**. This could help reduce the number of rescheduled appointments. For example, staff could help customers select the most relevant documents they will need to qualify for the program and tell them to post the list and the documents (and back-ups) on their refrigerator or other visible location, plus the appointment time and date, and who needs to attend the appointment. Contractors who call right before the appointment also may have a better chance of arriving to a prepared customer and therefore have a shorter and more effective visit.

Paperwork Reduction and Database Upgrades

Conclusions

The documentation process was becoming less cumbersome, as IOUs shifted from paper to online enrollment, but some steps still required effort, such as making physical copies of documents, having office staff dedicated to data entry, and, in PG&E territory, waiting to speak with PG&E staff to enroll customers who were not recognized by the IVR system.

Recommendations

- ➡ **IOUs should work with contractors to determine cost-effective ways to use tablet PCs** that enable quick in-home data entry, electronic signatures, and scanning or uploading of digital photos of customer documents to the online database. Using the same kind of tablet PC across utilities would make the enrollment and assessment process smoother for contractors working in multiple territories. When scanning documents is infeasible, taking digital photos of customer documents can be a reliable, quick alternative to making a physical copy or asking customers to mail or fax their documents. Contractors should take the same precautions to protect customer identity when taking

digital photos as they do with scanning or copying documents, including: covering sensitive information, such as account and Social Security numbers, prior to photographing the document. Also, the IOUs may want to re-examine the need for contractors to both electronically enter data and provide paper copies of enrollment and assessment forms. Similarly, a review of forms could reduce the redundancy of customer and contractor data requested on multiple application forms.

- ➡ As mentioned earlier (and below), the **IOUs should look into creating forms and updating databases to allow for more robust descriptions of customer homes**, either with check boxes or comment fields, or encouraging enrollment and assessment contractors to take and upload digital photos of customer's homes to provide installation contractors with better insight into the tools, materials, and crews needed to service a customer's home.

- ➡ **IOUs should consider further upgrades to their databases** to potentially allow contractors to edit information after uploading it. Additionally, scheduling and routing software upgrades to the IOU databases could help reduce the number of service visits by allowing enrollment and assessment contractors to schedule installation visits at the time of enrollment.

- ➡ **IOUs that share territories should look into using single intake forms and list the same requirements for proof of income**.

Home Assessment

Conclusion

For all of the IOUs, installation contractors were responsible for determining the feasibility of installing the recommended or approved measures for a home. Nonetheless, enrollment and assessment contractors in all of the service territories had the opportunity to better prepare installation contractors for special situations.

Recommendation

- ➡ **Enrollment and assessment contractors could better document special circumstances or potential problems in a home** in order to better prepare installation contractors for their initial visit and reduce the chance for a second visit. This may require IOUs to create forms that allow for more robust descriptions, with check boxes or comment fields, or encouraging enrollment and assessment contractors to take and upload digital photos of customers' homes to provide installation contractors with better insight into the tools, materials, and crews needed to service a customer's home.

Customer Education

Conclusions

More time spent on customer education may positively influence customer satisfaction with the energy-saving information received from the IOUs. Also, investing more time into the customer education process may increase energy savings and therefore warrant further study. Although customer education primarily was delivered during the enrollment and assessment visit, installation contractors and inspectors had the opportunity to reinforce important energy-saving practices and answer customer questions. As demonstrated by LIEE participants' responses to questions about their satisfaction with installers, customers were less satisfied with installers' explanations of how to use equipment and save energy than with other aspects of installers' work.

Recommendations

- **IOUs should collaboratively investigate the extent to which various customer education approaches are effective in increasing customer knowledge of energy-saving practices and actual behavior change**.
- In order to increase the chances of capturing meaningful effects, **the CPUC and IOUs should consider comparing educational practices across IOUs** rather than conducting smaller studies with dissimilar data.
- In the meantime, **reinforcing enrollment and assessment contractor training on the value and purpose of and specific approaches to customer education may be warranted**.
- IOUs also should **remind installation contractors and inspectors of their roles in continuing customer education** by reinforcing key energy-saving practices and instructing customers on safe operation of equipment and warranty processes when the contractors are in customers' homes.
- The IOUs also should **investigate the creation and dissemination of energy education DVDs** to augment the current customer education strategy.

Installation and Inspection

Conclusions

There are two times when IOUs inspected work: post-assessment / pre-installation checks of enrollment contractor's recommendations; and post-installation checks for proper repairs and installation of measures. PG&E, SCG, and SDG&E primarily emphasized mandated post-installation inspections which coordinated well with post-installation NGAT testing requirements. In addition to mandated post-installation inspections, SCE found post-assessment

checks helpful in ensuring all feasible measures were identified prior to the installation contractor's initial visit and anticipated that these checks would improve communication between enrollment and assessment contractors and installation contractors, and therefore increase the likelihood that installation contractors would have what they need when they arrive at the customer's home.

While it is beyond the scope of this evaluation to determine the full efficacy of the installation and inspection processes, issues concerning program limitations on the installation and repair of gas appliances indicate that customers' health and safety could be compromised if they did not qualify for repair, replacement, or installation of new heating equipment and water heaters. This evaluation could not confirm the frequency of such events, but observations and discussions with contractors and IOU staff indicate that there may be opportunities to better assist customers in need.

Recommendations

- ➡ IOUs should investigate opportunities to: 1) **improve communication with customers about the extent to which LIEE can assist them**; and 2) when their needs surpass the limitations of LIEE policies, **ensure contractors provide customers with referrals to other program services in their area**.
- ➡ To **reduce the number of visits**, the IOUs could consider, when feasible, having inspectors arrive while installation contractors are at the customer's home or immediately after the installation work is completed.
- ➡ IOUs should **investigate the possibility of establishing discretionary funds or pursuing partnerships with other agencies to provide customers at risk of not having sufficient heat and hot water with stop-gap or durable equipment**. Also, in exceptional instances where contractors find a gas leak and repairs are beyond the scope of the LIEE program, instead of expecting the customer to get the repairs done, the IOU should contact the landlord (for renters) or (for owner-occupants) have the IOU guide the homeowner to appropriate IOU or federal programs.

1 INTRODUCTION

This document constitutes the final report for the 2009-2010 process evaluation of the Low Income Energy Efficiency (LIEE) program operated by the four investor-owned utilities (IOU) of California for the California Public Utilities Commission (CPUC). The IOUs include: Pacific Gas and Electric Company (PG&E), Southern California Edison (SCE), Southern California Gas (SCG), and San Diego Gas and Electric (SDG&E). Until December 31, 2010, the statewide program name was called LIEE and each of the utilities branded the program individually. At PG&E, the program was called Energy Partners. At SCE, it was called Energy Management Assistance (EMA). SCG referred to the program as the Direct Assistance Program (DAP). SDG&E called it Energy Team. Although the overall program now is referred to as the Energy Savings Assistance Program (ESAP), this report will employ the nomenclature used during the 2009-2010 time period.

The LIEE program provided no-cost energy-related services to low-income households in California. The complementary objectives of the LIEE program were to provide an energy resource for California through energy savings, while reducing low-income customers' energy bills. Some of the energy-related services included home weatherization, refrigerator replacement, repair and replacement of heating and air conditioning equipment, and distribution of compact fluorescent light (CFL) bulbs. In addition, the program provided information and education that promoted energy efficiency practices.

The LIEE program was mature, having been in operation for many years. The last process evaluation was conducted in 2002-2003 for the 2001 program year. This 2009-2010 process evaluation was requested by the CPUC to focus on issues of enrollment and expansion, as the ESAP seeks to serve all eligible and willing low-income households by 2020, a goal set forth in the *California Energy Efficiency Strategic Plan* (CEESP). A team led by Research Into Action, Inc., in association with APPRISE, Inc. and Abt SRBI, Inc., conducted the evaluation.

PROGRAM OVERVIEW

At its most basic, the LIEE program was structured to provide no-cost services and efficiency measures to help low-income households in California: conserve energy; reduce their energy costs; and improve their health, comfort, and safety – while also providing energy savings to serve as an energy resource for California. LIEE measures offered varied by IOU territory and other factors, such as climate zone. Measures included: lighting retrofits; heating, ventilation, and air conditioning (HVAC) repair and replacement; refrigerator replacement; pool pump replacements; duct testing and sealing; central air conditioner maintenance; evaporative cooler installation and maintenance; attic insulation; water heating measures; weatherization; minor

home repairs; and furnace repairs/replacements. In addition, the program provided information and education that promoted energy-efficient practices.

The LIEE program was funded with ratepayer funds. The CPUC, as "owner" of the program, set its policy and procedure guidelines. Each of the IOUs administered the program in their respective service territories and were responsible for the installation of measures and providing quality assurance to the CPUC. The IOUs had the option of either contracting administration of the program out to a primary program implementation contractor and conducting in-house inspections of the program measures internally, or working directly with implementation contractors and hiring independent contractors to inspect the installations.[3] While PG&E did the former, the rest of the IOUs chose the latter arrangement during this program cycle. Contractors played a critical role in the implementation of the program at all stages.

REPORT OBJECTIVES AND STRUCTURE

The purpose of process evaluation is to document and provide feedback on program processes in order to guide enhancements of program administration and operation. The two key objectives of this process evaluation are to:

1. Assess outreach approaches and recommend strategies for improving enrollment opportunities.
2. Document program processes and identify opportunities to improve the efficiency of program delivery and implementation.

To address the key objective of assessing recruitment and improving enrollment, we sought to discover methods that were working well or better than others across the four IOUs and their contractors, and to assess if some methods should be added to the program's overall marketing and outreach efforts. We also explored why some prospective customers whom an IOU attempted to contact through several outreach efforts (door hangers, direct mail, and telephone calls) chose not to participate in the program. By exploring how each IOU and contractor tracked and managed its outreach, marketing, and enrollment processes, we identified potential best practices that might work across the IOUs.

We also explored how the program can more effectively coordinate with: the federal Low Income Home Energy Assistance Program (LIHEAP) and Weatherization Assistance Program (WAP), both administered by the California Department of Community Services and Development (DCSD); the Energy Efficiency and Conservation Block Grant (EECBG) program, administered by the California Energy Commission (CEC); and other programs in which the IOUs' low-income customers participate without realizing that they also could take part in LIEE.

---

[3] Per Section 8.2 of the *Statewide Low Income Energy Efficiency Program Policy and Procedures Manual*, 2010 working draft dated February 9, 2010.

Through interviews with contractors and IOU contacts, we discovered and subsequently documented instances where these overlaps created potential opportunities or problems. Our evaluation identifies and prioritizes key issues the IOUs and CPUC might be able to address. (Note, our proposal did not include discussions with non-IOU organizations about policy issues that were outside of the scope of the process evaluation.) The other key objective was to identify additional opportunities to improve the efficiency of program delivery and implementation. The CPUC sought process flow maps for each IOU program. To do this effectively, we interviewed program staff and contractors, and reviewed existing IOU process charts. We then examined differences across the four IOUs' programs.

In addition, participants in the project initiation meeting identified the following questions the evaluation team should explore: challenges in implementing the three-measure minimum rule for gas homes in SCG territory; gaining landlord approval for installation of measures that are improvements to the dwelling; and the effect of the Combustion Ventilation Air assessment (CVA) and Natural Gas Appliance Test (NGAT) on program eligibility. To address these issues, we incorporated questions regarding the effects of the assessments, and the usefulness of and ability to adhere to the Statewide LIEE Policy and Procedures Manual (P&P Manual) [4] into our interviews with contractors and IOU representatives.

This process evaluation draws on multiple sources of data, including document reviews, interviews, onsite observations, and focus group discussions to describe the program, and compare and contrast the IOUs' approaches. We draw conclusions and make recommendations about best practices and areas for improvement in order to inform the IOUs' process improvement efforts as the ESAP program moves forward.

The next section of this report describes the methods used to gather and analyze data collected for the evaluation. Section 3 describes overall program processes. Sections 4 through 6 address the key evaluation questions and issues of concern to the IOUs by data source. Section 7 then summarizes conclusions and recommendations. Frequency tables describing customer responses to survey questions are displayed in Appendices A and B. Process maps will be provided in a separate document.

[4] In this report, the *P&P Manual* refers to the *Statewide Low Income Energy Efficiency Program Policy and Procedures Manual*, 2010 working draft, dated February 9, 2010.

2 METHODS

The primary sources of data gathered and analyzed for this evaluation were program documents, staff, contractors, and customers. Specific efforts included: review of program documents; interviews with program staff and contractors; focus groups with contractors and PG&E inspectors; ride-along observations with contractors; and interviews of contractors and IOU customers. Multiple methods of data collection were used to triangulate findings (see Table 2.1).

Table 2.1: Data Sources and Topics Discussed

Data Source	Contact Type	Number of Contacts	Data Collection Dates	Topics Discussed
Utility and prime contractor staff	In-depth Interview	8	October 8 to November 15, 2010	• Program process and administration • IOU LIEE staff organization • Customer education • Data management • Communication within IOU and with contractors
PG&E inspection staff	Focus group	5	November 23, 2010	• Program process and administration • Communication within IOU and with contractors
Contractor staff [1]	Focus group	7	November 29, 2010	• Program process and administration • Communication with IOU
Supervisory-level contractor staff [1]	Phone interview	62	November 19 to December 14, 2010	• Services provided and organizational structure • Contractor training • Customer education • Data management • Communication with IOU • Feedback on program process
Enrollment and assessment contractors	Ride-along	10	November 16 to November 23, 2010	• E&A process • Customer education • Paperwork management • Communication with customer, office, IOU
Inspection contractors	Ride-along	4	November 16 to November 23, 2010	• Inspection process • Paperwork management • Communication with Customer, office, IOU

Continued

Data Source	Contact Type	Number of Contacts	Data Collection Dates	Topics Discussed
Participating customers	Phone survey	268	January 6 to January 10, 2011	• Program awareness, reasons for participation • Satisfaction with measures installed • Satisfaction with IOU, contractor • Communication with IOU, contractor • Feedback on program • Demographics, need for measures
Nonparticipating customers	Phone survey	268	December 28, 2010 to January 5, 2011	• Program awareness, reasons for non-participation • Awareness of, participation in other programs • Satisfaction with IOU • Demographics, need for measures

[1] Contractor focus groups and interviews included contractors who performed enrollment and assessment, installation, and inspection work.

PROGRAM DOCUMENTS

To develop the research plan, we reviewed: 73 documents provided by the CPUC and the four IOUs; marketing collateral materials from each IOU; 39 annual reports for the IOUs, from 2002 to 2009; and monthly reports for each IOU, from January 2009 to January 2011. The documents provided an overview of the program's design and evolution, and a baseline for understanding each IOU's unique approach to specific process steps. We reviewed and analyzed the documents when preparing the research plan and referenced them throughout the evaluation.

STAFF

We conducted eight semi-structured, in-depth, two-hour taped phone interviews with managerial-level program staff (two per IOU) between October 8 and November 15, 2010, to understand their perspectives on program administration and operations. One-hour follow-up interviews were conducted with four of the same staff (one per IOU) between January 27 and February 4, 2011, to gain clarity on issues raised in preliminary findings. Staff graciously responded to multiple requests for data and clarification of program procedures. In addition, we conducted one focus group on November 23, 2010, with PG&E internal inspection staff who conduct inspections for the LIEE program.

CONTRACTORS

We completed one focus group on November 29, 2010, with staff from contractor organizations that had substantial reach within the SCE and SCG territories. We conducted ride-along field

observations of multiple field crews for each IOU and completed semi-structured interviews with key staff at a representative sample of contractor organizations.

Contractor Sample Population

The IOUs provided us with lists of contractors working in their territories. While many companies worked in multiple IOU territories, the lists we received included information about 109 unique companies. Based on correspondence with PG&E and SCE staffs, we removed 13 contractors from the list because of their limited program involvement.[5] The 97 remaining contractors included 29 community-based organizations (CBOs) and 68 for-profit firms (Table 2.2).

Table 2.2: Active Contractors in Each IOU Service Territory

IOU	CBO	For-Profit	All Contractors
PG&E	11 (3 work in multiple territories)	44 (7 work in multiple territories)	55 (10 work in multiple territories)
SCE	11 (9 work in multiple territories)	11 (8 work in multiple territories)	22 (17 work in multiple territories)
SCG	18 (11 work in multiple territories)	21 (12 work in multiple territories)	39 (23 work in multiple territories)
SDG&E	3 (2 work in multiple territories)	10 (3 work in multiple territories)	13 (5 work in multiple territories)
Total	**29 (11 work in multiple territories)**	**68 (12 work in multiple territories)**	**97 (23 work in multiple territories)**

[1] Does not include the prime contractor for PG&E: RHA. Does include PG&E Repair & Replacement contractors that do HVAC installation and repair work.

Table 2.3 displays the number of each type of organization providing various services. These services range from customer enrollment and assessment, and energy education, to appliance installation, HVAC maintenance, and weatherization. Many contractors provided more than one type of program service.

[5] PG&E's LIHEAP leveraging of contractors' involvement in the LIEE program was limited to providing refrigerators to customers these firms already were serving under state and federal low-income programs. Similarly, the program involvement of SCE's appliance suppliers was limited to delivery and installation of large appliances. Installation contractors interviewed for this evaluation did a broader range of work and had more exposure to the LIEE processes.

Table 2.3: Distribution of Contracted Organization Services

Role	CBO	For-Profit	All Contractors
Enrollment and assessment	3 (2 have multiple roles)	11 (9 have multiple roles)	14 (11 have multiple roles)
Weatherization	26 (3 have multiple roles)	27 (9 have multiple roles)	53 (12 have multiple roles)
HVAC installation and repair	3 (2 have multiple roles)	36 (3 have multiple roles)	39 (5 have multiple roles)
Appliance installation	0	6 (2 have multiple roles)	6 (2 have multiple roles)
Inspection	1 (Has multiple roles)	3 (All have multiple roles)	4 (All have multiple roles)
Unknown	1	1	2
Total	**29**	**68**	**97**

Contractor and Inspection Staff Focus Groups

Research Into Action staff conducted two focus groups.[6] The first, involving PG&E's inspection staff, took place on November 23, 2010 at the PG&E training facility in San Ramon, California, and lasted two hours. The second focus group, involving the program implementation contractor staff who administer SCE's and SCG's programs, took place on November 29, 2010 at SCE's training facility in Irwindale, California, and lasted two and a half hours. Both focus groups were audio recorded, and written notes were captured in a Word document. Table 2.4 provides additional detail about focus group participants.

Table 2.4: Focus Group Participant Roles in Program Delivery

Focus Group	Participants' Program Role	Number of Participants
Focus Group I: PG&E Inspection Staff	Inspection	5
Focus Group II: SCE and SCG Contractor Staff	Administrative	5
	Measure Installation	1
	Inspection	1

[6] The work plan originally called for five focus groups across all IOU territories. This number of focus groups proved infeasible to organize within the evaluation budget and timeline. As such, the evaluation staff consulted with primary contacts at the IOUs and CPUC to revisit allocation of evaluation resources. The group agreed on one focus group with inspection staff in Northern California and one focus group with contractors in Southern California. A focus group in SCE and SCG territory was considered more likely to attract contractors servicing multiple utilities than a focus group in the SDG&E territory.

Contractor Field Crew Ride-Along Observations

Research Into Action staff conducted 67 ride-along observations between November 16 and November 23, 2010: 42 observations of ten enrollment and assessment contractors, and 25 observations of four contractors conducting compliance or NGAT inspections (Table 2.5).[7] Research Into Action staff coordinated with contractors to schedule ride-along observations with contractor crews. Each observer used a standard guide for recording the observations and contractors' responses to questions providing context to the ride-along visits.

Table 2.5: Ride-Along Observation Disposition

Service Territory	Number of Contractors Observed [1]	Number of Customer Visits Observed [2]
	ENROLLMENT AND ASSESSMENT	
PG&E	3	11
SCE	2 (2 joint utility)	10 (9 shared with SCG)
SCG	5 (2 joint utility)	20 (9 shared with SCE, 2 shared with SDG&E)
SDG&E	3 (1 joint utility)	11 (2 shared with SCG)
Total [2]	**10** **(2 joint utility, 8 individual utility)**	**42** **(12 joint utility, 30 individual utility)**
	COMPLIANCE INSPECTIONS	
SCE	1	6
SCG	2	15
	NGAT CHECKS	
SDG&E	1	4

[1] Excludes visits in which the customer was not home. As in the *Customer Visits Observed* column, IOU totals reflect contractors conducting enrollment and assessment for each IOU, regardless of whether they also worked in other IOU territories. The *Total* row lists the number of unique contractors observed.

[2] Totals reflect the number of visits in which enrollment and assessment took place for each IOU. Dual-utility customers (SCE/SCG, and SCG/SDG&E) who were enrolled in both programs are included in the IOU counts for both IOUs in which they were enrolled. The *Total* row lists the number of unique contractors and customers observed across all four IOUs.

Telephone Interviews with Key Staff at Contractor Organizations

Three of the contractor firms that provided services in multiple IOU territories maintained distinct offices in different territories. One of these firms, Richard Heath and Associates (RHA), is included in staff interviews because of its role as a prime contractor in PG&E territory. RHA

[7] Does not include visits to homes where the customer was not available to allow assessment or inspection.

also works in SCE, SCG, and SDG&E territories, but a single contact was able to provide us with information about the firm's work in all three territories. In the case of the two remaining firms, Synergy Companies and the Maravilla Foundation, we sought to contact staff members in each office, effectively increasing the population of 97 contractor *firms* to 99 contractor *offices*.

APPRISE and Research Into Action staffs completed 42 interviews with for-profit firms and 20 interviews with CBO firms between November 19 and December 14, 2010 (Table 2.6). Our preliminary analysis of contractor interview data revealed additional data needs. Therefore, we completed follow-up interviews with six staff from the contractor organizations.[8]

Table 2.6: Contractor Sample Characteristics

Target Group [1]	Population	Sample	Confidence & Precision
	COMMUNITY-BASED ORGANIZATIONS		
PG&E	11 (3 work in multiple territories)	9 (3 work in multiple territories)	
SCE	12 (9 work in multiple territories)	9 (7 work in multiple territories)	
SCG	18 (11 work in multiple territories)	12 (9 work in multiple territories)	
SDG&E	3 (2 work in multiple territories)	1 (1 works in multiple territories)	
Total	**30** **(11 work in multiple territories)**	**20** **(9 work in multiple territories)**	**Exceeds 90/10** [2]
	FOR-PROFIT CONTRACTORS		
PG&E	44 (7 work in multiple territories)	26 (6 work in multiple territories)	
SCE	12 (8 work in multiple territories)	12 (8 work in multiple territories)	
SCG	21 (12 work in multiple territories)	13 (11 work in multiple territories)	
SDG&E	10 (3 work in multiple territories)	8 (3 work in multiple territories)	
Total	**69** **(12 work in multiple territories)**	**42** **(11 work in multiple territories)**	**Exceeds 90/10** [2]

[1] Figures listed for each IOU represent the number of contractors working in that IOU's territory. Contractors who work in multiple IOU territories are counted in cells for multiple IOUs. *Total* rows list the number of unique contractors interviewed.

[2] Assumes absolute precision, proportional sampling, 2-tailed test, finite population correction.

[8] Two of the six reported working in SDG&E service territory, two reported working in PG&E service territory, and two reported working in both SCG and SCE service territories.

APPRISE and Research Into Action staffs made multiple attempts to contact those contractor firms that were not interviewed. Table 2.7 provides details of the dispositions of contractor interview calls.

Table 2.7: Contractor Interview Disposition

Disposition	CBO	Private
Completed interviews	20	42
Bad/duplicate number	1	7
Did not pass screening	1	1
Contact refused interview	0	5
Eligible contact not reached	8	14
Total	**30**	**69**

CUSTOMERS

We worked with Abt SRBI to conduct surveys of participants and nonparticipants of the LIEE program. A unique list of participants was identified in each IOU's LIEE customer database; we included records in the periods between January 2009 and September 2010. We excluded participants who appeared to be master-metered customers because the contact information was for the property owner, not the customer. Nonparticipants were interviewed between December 29, 2010, and January 5, 2011. Participants were interviewed between January 6 and January 10, 2011.

Nonparticipants were customers of the four IOUs who met the basic income requirements for the CARE (California Alternative Rate for Energy) program, but had not participated in LIEE since 2003.

From call lists of a random sample of contacts, we completed 268 participant surveys and 268 nonparticipant surveys; each survey set consists of the same number of completed surveys for each of the four IOUs. The overall response rates were 28% for the participants' survey and 39% for the nonparticipants' survey. Table 2.8 summarizes the sampling frame. Additionally, maps in Appendix C show the distribution of the participant and nonparticipant samples in Northern and Southern California.

Table 2.8: Summary of Sampling Frame

Characteristic	PG&E	SCE	SDG&E	SCG	Total
		PARTICIPANTS			
Participant Completed Surveys	67	67	67	67	268
Response Rate	27%	29%	28%	26%	28%
		NONPARTICIPANTS			
Nonparticipant Completed Surveys	67	67	67	67	268
Response Rate	38%	35%	44%	40%	39%

3 LIEE PROGRAM OVERVIEW

This chapter describes the overall organizational structures and roles supporting the LIEE program at each of the IOUs, program staffs' relationships with the contractors, and a general outline of the processes involved in administering the program. Differences in approaches are noted. Process maps will be included in the final report to help visualize key aspects of the program processes and distinctions in processes among the IOUs.

ORGANIZATIONAL STRUCTURES SUPPORTING THE LIEE PROGRAM

Each of the IOUs organized staff differently to support the LIEE program. Some staff were dedicated solely to LIEE, while others helped the program as part of their role in groups, such as marketing or finance, that support multiple efforts within the company. Across all of the IOUs, contractors enrolled customers in the program, assessed customers' homes for all feasible measures, and installed the measures. PG&E and SDG&E also used staff to inspect contractors' work, while SCE and SCG hired contractors to perform inspections.

PG&E

PG&E oversaw the Energy Partners program and employed Richard Heath & Associates (RHA) to manage the day-to-day program administration.

There were eleven staff within PG&E who worked in the Energy Partners group, seven of whom were full time. In addition to guidance from a Senior Compliance Analyst in the Policy and Regulatory group, and oversight provided by the Manager of Low Income Residential Energy Solutions and Service, there were two people who oversaw the HVAC part of the program and an administrative assistant who was a consultant.

Two people in the Solutions and Marketing team worked solely on outreach and marketing for Energy Partners. Their role included: meeting with cities and counties to put together partnerships, designing direct mail campaigns, and working to provide in-language services to communities such as the Hmong. Within the utility's call center, six to seven people were dedicated to Energy Partners. Planning staff in the Financial team created monthly reports for the CPUC about the program's progress towards goals and indicators, such as the number of homes completed. A few people in the Data group helped the program with the database, one of whom worked with the program full time.

There was also a team of 40 inspectors in the field; 80% of their time was spent on Energy Partners. This team also conducted inspections for PG&E's energy efficiency rebate programs.

PG&E also was responsible for training the contractors RHA hired. Contractors went to a central training center in Stockton to learn about the program, how to do their work within program guidelines, and how to interact with RHA and PG&E.

In addition to the contractors hired by RHA, PG&E directly managed contracts with 27 Repair and Replacement (R&R) contractors who mostly serviced gas appliances (such as gas furnaces and water heaters) and often addressed NGAT failures. Whereas the enrollment and assessment and weatherization contractors managed by RHA worked primarily (if not exclusively) on LIEE projects, the R&R contractors worked for multiple programs.

RHA has worked with PG&E's Energy Partners program for over 20 years. RHA competitively bids for the Administrative Contractor contract, and has won the contract consistently over the duration of the program, with the exception of one three-year period. RHA helped develop the main database supporting the program: Energy Partners Online (EPO). RHA's responsibilities included writing contracts with individual contractors, managing training in the field, handling administrative functions, and using Energy Partners Online. RHA customer call center staff conducted quality assurance via phone calls to customers and inspections of customers' homes and managed a program customer call center. RHA had a staff of four in Fresno in accounting and billing, five to six in general administration, eight to nine people in the call center, and 25 people in the field. They managed 32 weatherization contractors and two appliance contractors who delivered approximately 22,000 refrigerators a year. A RHA manager explained the assignment of contractor areas this way:

- *"In PG&E's service area [weatherization] subcontractors are assigned and limited to specific geographic areas we call 'project areas'. In some areas, more than one contractor is assigned to it. This is done for production reasons and in some cases to facilitate contractors working other programs, such SoCal Gas or LIHEAP."*

SCE

At SCE, the Energy Management Assistance (EMA) program resided under the Income Qualified Programs within the Residential Programs group of the Residential Portfolio in Customer Programs and Services. There were two program managers. The Manager of Program Operations oversaw a group in charge of monitoring, tracking, directing contractors, marketing, outreach, managing inventory for contractors, revising contractor training curricula, and ensuring that assessors and installation contractors were qualified. The Manager of Administration and Compliance oversaw twelve program administration staff, including one business analyst position that was vacant at the time of this evaluation.

One supervisor and four staff were in the field conducting post-assessment verifications to ensure that the work contractors proposed was appropriate, and to inspect the work of individual inspectors and inspection agencies. Another supervisor and four staff did similar work in the office, such as auditing contractors' submissions and creating scorecards on a contractor's work quality, timeliness, service of customers, and paperwork timelines.

In addition, EMA contracted internally with the Processing Services Organization (PSO), to review LIEE forms and invoices. This group also processed rebates for other non-LIEE programs. When a customer called to enroll in the program, the calls were received by the SCE call center, the call center representative asked some basic screening questions, created a lead in EMAPS (the program database), and EMAPS assigned a contractor to follow up with the customer. EMA worked with the marketing department to coordinate events, media, and telethons.

EMA maintained external contracts with approximately 35 service providers who performed one or more program services for SCE. This mix of service providers included six appliance vendors and two organizations who conducted inspections. Among the service contractors, 16 were dedicated to outreach, enrollment, and assessment. The remaining 13 service providers performed outreach, enrollment, and assessment, and also installed electric appliances and weatherization measures. Three of the 13 service providers performed HVAC installations. The two inspection organizations performed preliminary inspections of installation contractors' work. SCE staff conducted additional inspections of the inspectors' and contractors' work to ensure that SCE levels of quality were met and to provide additional training as need.

SCE staff explained the assignment of contractor territories in this way:

- *"SCE's ESA [LIEE] contractors are nominally assigned to geographic areas by ZIP code, but are explicitly not guaranteed sole right to work in those areas. In the relatively few ZIP codes in which more than one contractor is assigned, the system (EMAPS) uses a 'round robin' algorithm to assign batches of neighborhoods to alternating contractors authorized for that ZIP, as long as the contractor has not exceeded its maximum amount of unfinished work in its queue. Exceptions to this rule include: agencies are sometimes allowed to perform Outreach and Enrollment in any area convenient to their staff (e.g., staff members sometimes work areas close to their homes, but outside of the agency's nominally assigned ZIP codes). Also, one contractor outreaches and enrolls only mobile homes territory-wide for ESA in conjunction with their contract with SCE's Comprehensive Mobile Home EE program, so that they represent both programs in one visit. [This contractor also has a contract with SCG.] All other agencies are not restricted by housing type. Finally, SCE ESA management may authorize at any time the reassignment of ZIP codes or batches of jobs away from one contractor and to another for a variety of reasons, including minimizing customer wait times, and giving work to the contractor best able to complete it in a timely and effective manner."*

SCG

SCG administered the Direct Assistance Program (DAP). Reporting to the Customer Assistance Director were the Program Leveraging Manager and the LIEE Manager. The Program Leveraging group was responsible for Marketing, Education, and Outreach, including various program-related campaigns and collateral material. The LIEE Manager oversaw staff in the areas of program implementation, field operations, customer enrollment support, a customer service

center, and invoice and documentation processing. Inspections were outsourced, but contractors did not inspect their own firm's work.

SCG worked with approximately 40 contractors.[9] There were contractors who provide turnkey services (enrollment, assessment, weatherization, inspections, and/or gas appliance services) and some who provided mixed services, which might have been one, two, or three of the services. In addition to private contractors, some contractors were CBOs and partnered with other community groups to deliver DAP services. Eleven of the CBOs were also LIHEAP agencies, working with groups such as Community Block Grants. To the best of program staff's knowledge, the DAP program had partnerships with all known LIHEAP agencies in their territory except for Kern County.

One SCG staff person explained contractor territory assignments this way:

- *"SoCalGas [SCG] LIEE contractors have assigned geographic areas based on ZIP codes and can overlap with other LIEE contractors. Due to SoCalGas's vast service territory, it is not common for a contractor to have access to the entire service area. SoCalGas maintains a call center, and a contractor's radius of service must be able to provide service to all lead sources, including customers who call the ESAP 1-800 line. The call center lead source is in addition to marketing campaigns (direct mails, automated voice messaging [AVM]) and contractor outreach and canvassing efforts."*

SDG&E

In 2009, SDG&E changed their Energy Team program management strategy from working with RHA as a primary contractor to managing the contracts in-house. At SDG&E, the program was managed by the Energy Programs Supervisor who reported to the manager of the CARE and Energy Team programs. The Energy Program Manager oversaw nine full-time staff. Four program managers had specific responsibilities and were cross-trained to fill in for each other in the areas of: 1) contractual and database management, budgets, and collateral for contractors; 2) outreach and bill payment in the SAP system; 3) contractor liaison and contractor issue resolution; and 4) customer assistance programs and back-up to contractor liaison. There were also three clerical staff who processed invoices as they come in and two quality assurance field staff who made sure the P&P Manual was followed. Inspections were conducted by the same group of eight to ten inspectors who conducted inspections for SDG&E's energy efficiency programs.[10] The Energy Programs Supervisor also coordinated with three lead processors, two Quality Assurance staff, and one business analyst who could create queries from the data warehouse to help answer questions about the program.

---

9 SCG anticipates adding four contractors in 2012, bringing the total up to 45 contractors.

10 NGAT inspections were conducted by contractors.

The Energy Team program hired a variety of contractors to implement the program. One contractor only did outreach, serving approximately 20,000 homes annually. Two contractors did outreach and full services (enrollment and assessment, and installation work), serving approximately 15,000 homes each; one of them also coordinated with SDG&E's energy-efficient mobile home program. SDG&E's service territory is divided into eight geographic areas, with three contractors who served exclusive territories. One SDG&E staff member explained how the territories are assigned:

- *"In order to reduce contractors' carbon footprint and reduce their drive time, SDG&E assigns jobs to contractors in their respective geographic areas. Generally, work is assigned based on these areas. However, an evaluation is performed at the end of each day and jobs can be reassigned based on contractor work load, available crews, and contractor's backlog."*

Energy Team also is starting to coordinate with the CARE capitation contractors to begin the Energy Team enrollment process by calling SDG&E while at the customer's home to schedule the customer for an Energy Team enrollment visit. For installation of measures, Energy Team worked with six weatherization contractors, four HVAC contractors, and one appliance contractor who installed refrigerators and high-efficiency clothes washers.

THE LIEE PROCESS

The overarching guidelines set forth in the P&P Manual established the criteria and general steps for the program: marketing and outreach, enrollment and assessment, installation of measures, and inspection. The CPUC mandated that the program be available in every county during the entire program year and set the number of homes each utility was tasked with completing each program year. Each of the IOUs worked slightly differently to accomplish the steps, as did each contractor. In a given day, contractors were expected to service as many homes as possible, while maintaining quality and completeness standards. This section describes overall workflow management and the high-level process steps, indicating the general areas in which the IOUs approached the processes differently.

Work Flow and Data Management

For all of the IOUs, all contractors and staff used central databases to manage workflow within and between process steps, data entry, invoicing, and communication. For PG&E, the database interacted with other internal databases at certain stages to refer customers out for gas service repairs or to R&R programs before work could continue with the LIEE program. For SCE, SCG, and SDG&E, the program databases did not need to engage other databases to complete the process.

In some cases, voice recognition systems, live telephone conversations, and in-person meetings between staff and contractors supported certain workflow steps. For example, PG&E asked enrollment contractors to use an interactive voice recognition system to complete enrollments.

When a name did not match what was on record in the system, then the contractor waited to speak with a PG&E staff member to have the enrollment approved while at the customer's home. In addition, all IOUs had field representatives (RHA field representatives, in the case of PG&E), who were available to talk by phone or meet in-person to help contractors decide how to handle non-standard situations at a customer's home.

Marketing and Outreach

The IOUs employed a variety of marketing and outreach tactics to locate potentially eligible customers and encourage them to enroll in the program. Common approaches included outbound calling and/or automated voice message campaigns, email, direct mail, canvassing, and working with municipalities to host or attend community events in areas with low-income populations. All have tried various forms of mass media, such as TV and advertisements on public transportation, as well as campaigns targeted at particular populations, such as the SCE and SCG Univision telethon, PG&E's language services for the Hmong population, and SDG&E's Hispanic radio station campaigns. The IOUs view mass media as an effective way to generate awareness and credibility so that when the customer next encounters the program – whether through outbound calling, a mailer, or someone knocking on their door – they will be more receptive to enrolling.

The IOUs differed in their approach to marketing and outreach, specifically the extent to which: 1) the IOU provided the marketing materials or the contractor created their own materials; 2) the IOU provided lead lists or the contractor generated their own leads; and 3) the amount of canvassing the contractor did or the number of appointments they scheduled ahead of time.

For example, PG&E contractors received some marketing materials and budgets, as well as lists of potentially eligible customers via RHA, but ultimately were responsible for creating their own marketing materials and generating their own leads. PG&E felt that the contractors knew the populations in their territories well and understood what resonates with their customers; therefore, they were in the best position to create their own materials and determine their own outreach strategies. As such, many of the enrollment contractors canvassed neighborhoods to generate leads.

On the other hand, SCE, SCG, and SDG&E retained tighter control over marketing materials, partly due to their concerns about the consistency and accuracy of the message customers received. SCG contractors were allowed to create their own materials, but were required to have the materials approved by SCG and were not allowed to co-brand. Contractors in the SDG&E and SCG territories used a mix of canvassing and preset appointments. Some SCG contractors exclusively canvassed for their leads, while others exclusively called customers and arranged appointments. SCE contractors tended to receive leads from SCE directly and many contractors set up appointments ahead of time.

With a few exceptions, the Whole Neighborhood Approach (WNA) rarely was efficient as designed, and therefore the IOUs did not pursue the strategy as a primary means of enrolling

customers. Some of the IOUs found the approach helpful when working with large multifamily complexes because, even if the enrollment contractors found that half of the customers were not home or were ineligible for the program, the installation crews still had a full day's work installing measures for those customers who were home. Some IOUs also found the WNA approach appropriate in some rural areas, because the travel time and costs were so high that spending all day in a town and having only a few customers was less costly than making multiple trips. However, the IOUs all used aspects of the approach to efficiently target and enroll customers in the program. For example, all IOUs used ZIP-7 lists to target areas in which there were high concentrations of low-income families.

Enrollment, Assessment, and Education

When a customer was interested in participating in the program, the enrollment contractor worked through the enrollment and assessment process with them. If the customer was approached by an enrollment contractor canvassing the neighborhood, the contractor would complete the enrollment and assessment right away. If the customer learned about the program any other way, the enrollment contractor (likely office staff) called the customer to schedule an appointment, inform the customer about the process, and ask the customer to have two kinds of documents ready to complete the enrollment: proof of income and proof of home ownership.

When the enrollment and assessment contractor arrived at the customer's home for the appointment, they accomplished three tasks: 1) documenting customer eligibility and verifying home ownership; 2) assessing the home or collecting data to allow the IOU to determine if the home needed at least three qualified measures or ensuring that "energy savings of at least 125 kWh/annually or 25 therms/annually must be achieved in homes where only one or two measures are to be installed";[11] and 3) educating the customer on energy-savings tips and the purpose of the program.

The enrollment and assessment contractor was not required to do the tasks in this order. If the enrollment and assessment contractor did not think the customer's home would meet the program requirements, the contractor (depending on the IOU) either informed the customer that their home did not qualify or told the customer that the IOU would contact them about their eligibility and next steps. In SCE territory, for example, enrollment and assessment contractors were instructed not to tell customers the measures for which they might or might not be eligible, because the installation contractor made the final determination about the feasibility of installing the measures the contractor was there to install.

The one measure enrollment and assessment contractors could install was CFLs. In SCE territory, if the customer met program income requirements and had not previously received

[11] See Section 2.9 of the *Statewide Low Income Energy Efficiency Program Policy and Procedures Manual*, 2010 working draft dated February 9, 2010.

CFLs, the enrollment and assessment contractor could install CFLs and replace halogen torchieres with new pin-based CFL torchieres during the assessment visit rather than waiting until the customer received other measures. Contractors were asked to inform customers who did not qualify for LIEE program measures about other programs, such as WAP.

Proof of income is described in the P&P Manual.[12] The enrollment contractor was required to make a copy of at least one of the following types of documents demonstrating proof of income for the income-earning adults in the household: 1) a document indicating the IOU verified CARE eligibility after the customer enrolled in CARE; 2) documents that showed actual income (e.g., copies of all W-2 *and* 1099 forms, a signed affidavit from an employer who paid the applicant cash wages, a signed affidavit of self-employment cash wages); 3) documentation of categorical eligibility (e.g., Medi-Cal, Food Stamps, Temporary Assistance to Needy Families, Women, Infants Children Program, LIHEAP); or 4) a self-certification statement signed by the customer *only* for those customers living in geographic areas where 80% of the customers are at or below 200% of the federal poverty line.

The enrollment contractor also was required to verify home ownership. The contractor could make a copy of one proof-of-home-ownership document, such as a mortgage statement or property title.[13] In the case of customers who rented their home, the property owner was required to sign a property-owner waiver form allowing work to be done, agreeing to co-payments of certain measures if needed, and providing documentation of ownership. Contractors tried to obtain these waivers prior to scheduling an appointment. Many contractors approached the property owner directly to sign the waiver, instead of going through the customer. Although not mandated by the P&P Manual, some IOUs required contractors to work directly with property owners.

Education delivered to the customer varied across the four IOUs. Each IOU expected contractors to cover topics listed in the P&P Manual, including: general levels of energy use associated with specific appliances or behaviors; the impact of LIEE measures on energy usage; practices that reduce the potential savings for energy-efficient measures; behavioral changes that reduce energy use; information on CARE, Medical Baseline, and other programs; appliance safety; how to read a utility bill; greenhouse gas emissions; water conservation; CFL disposal/recycling; and NGAT testing procedures, if applicable. SCG and SCE used the same Energy Education guide. SDG&E and PG&E had their own customer education guides.

---

12 All forms of acceptable proof of income are found in Table 2-3 of the 2010 Policy and Procedures Manual Working Draft.

13 SCG did not require contractors to submit proof of home ownership with their invoices. Contractor agencies may have required their contractors to submit proof of home ownership or property owner waivers because, should a Power of Attorney become involved, the contractor agency needed to provide supporting documentation. However, according to one staff, this situation “is less common.”

PG&E emphasized the role of customer education in the enrollment and assessment visit more heavily than did the other IOUs. PG&E expected enrollment contractors to spend 20 to 30 minutes educating the customer by both "walking the wall" with the customers – discussing energy-saving tips as they walked around the home to assess energy-saving potentials – and sitting down with the customer to discuss those tips and the energy savings educational materials. These materials included a demonstration of how to use the energy wheel when making energy-consuming product purchases or trying to estimate how much energy various appliances or tasks use in their home.

While customers ultimately decided how much and how long to pay attention to the customer education component, PG&E's multi-pronged approach had the potential to engage customers through different learning methods: 1) listening to advice; 2) seeing the physical places where energy savings could be gained or lost and possibly seeing a demonstration of proper operation of measures; 3) reading printed materials; and (4) active calculation of energy use and problem-solving with the energy wheel. The other IOUs expected customer education to take 15 to 20 minutes and to occur primarily while sitting down to discuss the educational materials. If customers asked questions during the home assessment, the IOUs expected enrollment contractors to take time to address them.

All IOUs expected the majority of customer education to occur during the enrollment and assessment process because the enrollment and assessment contractors were skilled in communicating with customers and it made sense to discuss how customers can save energy when the home is being assessed for potential energy-saving measures. As needed, the IOUs also expected installation contractors and inspectors to educate customers on how to effectively and safely operate measures installed in their homes and the reasons why customers should not remove or alter certain measures. These conversations were not guided by IOU educational materials.

Once enrollment was complete, paperwork was submitted to trigger the installation contractor assignment and scheduling process. Enrollment and assessment field contractors who did not automatically upload information to their office database or directly into the IOU databases submitted paperwork to their contractor firm's office staff to input the data into the IOU databases. Paperwork processing sometimes was done in batches, which took from a few days to a week to complete.[14]

[14] SCE encouraged contractors to invoice and process their paperwork daily.

Installation of Measures and Safety Checks

Once the customer was enrolled in the program, the IOUs' databases triggered a workflow step alerting installation contractors to schedule appointments with customers.[15] The IOUs required contractors to install measures within a particular number of days. For example, in PG&E territory, installation contractors had 15 days from the date of enrollment to install measures. If the initial installation date extended beyond 21 days, RHA penalized contractors. If the installation was done before 21 days from the date of enrollment, contractors received a bonus.

The installation contractors were responsible for finalizing lists of measures to install in customers' homes.[16] They had the skills necessary to verify the feasibility of installing recommended measures and to ensure that electric and gas measures suggested by enrollment assessment contractors were appropriate. The weatherization contractors sometimes coordinated customer visits with HVAC contractors and glass contractors if needed. Contractors had the option of sub-contracting work, such as glass installation.

The installation and inspection of gas measures involved safety checks not required of electric measures. The weatherization or HVAC contractors ensured that Combustion Ventilation and Airflow (CVA) requirements could be met before installing or repairing gas appliances. If the installation contractors found that repairs could not be made within program guidelines, they may have contacted the IOU program manager to approve the needed work or referred the customer to another program for the measures they were not able to complete.

For gas appliances, the NGAT was performed either immediately following repair and installation during the same visit by either the same contractor or a different inspector, or during a separate inspection visit following the repair and installation work. The P&P Manual dictated that the NGAT must be performed within five working days from the date that infiltration measures[17] were installed. If it was a PG&E or SCG job, the weatherization or HVAC contractor performed the NGAT test. SDG&E, on the other hand, required their NGAT inspectors, usually RHA contractors, to perform the NGAT test. The inspectors often were dispatched to the customer's home on the same day, either at the same time or shortly after the installation work was done. SCE did not perform NGAT tests.

If PG&E, SCG, or SDG&E contractors found a gas leak, they turned off the gas to the appliance, informed the customer of the situation, and called the IOU. If the gas service staff member *red*

---

15 For PG&E, SCG, and SDG&E, the first installation contractor to visit customers was often a contractor that installed weatherization measures. SCE did less weatherization work, partly because most homes are heated by gas and the heat source is the primary determinant of which IOU does weatherization work.

16 A list of approved installation measures and repairs is found in the P&P Manual, Chapter 7.

17 Most IOU staff and contractors used the terms *infiltration measures* and *non-infiltration measures* or *NIM*. Some used the term *air sealing*. In the P&P Manual, the term *infiltration and space conditioning* includes the sub-categories *envelope and air sealing measures,* as well as *duct sealing* and *attic insulation*.

tagged or *capped* the gas line to the appliance, then PG&E homeowner's appliances could be treated by the Energy Partners R&R contractors. In SDG&E and SCG territories, the HVAC contractors were called to fix the customer's appliance, if possible. If the cost was prohibitive, homeowners were referred to other programs to help reduce the cost. Renters in all territories were informed that their property owner must fix or replace the appliance.

In SCE territory, the contractors were not trained to respond to gas issues, but if they noted an obvious problem, they suggested that the customer contact their gas company. SCE weatherized homes with electric heat. However, SCE contractors were not allowed to install infiltration measures in homes with electric heat if there was a gas appliance, such as a gas furnace, gas logs, or a gas water heater, in the living space. This also applied to appliances fueled by other combustion fuels, such as propane or oil. SCE contractors referred such customers to SCG or SDG&E for weatherization or, if a customer did not receive gas service from SCG or SDG&E, the contractor referred the customer to the LIHEAP program for weatherization work.

If repairs or replacement had to be done by another program or by the customer, the customer could call the IOU back to reinstate the work and receive the recommended infiltration measures.

Inspection

As mentioned above, SDG&E and PG&E had inspectors on staff and SCE and SCG contracted for inspections. There were two times when the IOUs could choose to inspect work: non-mandatory *post-assessment/pre-installation* of measures; and mandatory *post-installation* of measures.[18]

Post-Assessment / Pre-Installation Inspections

The IOUs were allowed to inspect a portion of the post-assessment / pre-installation assessments to determine if the assessments were appropriately identifying all feasible measures. SCE had four staff in the field conducting post-assessment verifications, which were called Post-Assessment Checks (PACs). SCE choose to conduct PACs because staff had found the practice improved assessment quality and reduced the number of necessary installation visits. When SCE selected a home for PAC, the installation workflow steps for that home were not referred out to a contractor until the PAC was completed and SCE staff resolved any differences between the initial assessment and the PAC findings.

The other IOUs sometimes conducted pre-installation inspections if they were concerned about a trend a particular contractor was displaying. Before the NGAT procedure was followed, PG&E used pre-installation inspections for quality assurance. However, the NGAT procedure required

[18] See P&P Manual, Chapter 8 for a full description of the policy.

post-installation tests and therefore PG&E decided to shift most inspection resources to post-installation inspections.

Post-Installation

All IOUs weare required to conduct post-installation inspections of all homes where attic insulation or a furnace was installed. Beyond those jobs, the IOUs inspected a minimum number of jobs by contractor, depending on the contractor's pass/fail rate.[19] For example, if an installation contractor had a high pass rate of 95% for its 1,000 homes serviced, then a minimum of 54 of those homes would be randomly selected for inspection. A contractor with a low pass rate of 70% for its 1,000 homes would have a minimum of 317 of those homes randomly selected for inspection. The inspection rates were intended to encourage compliance and offer feedback to guide contractors' improvement. Mandatory inspections had to be scheduled within 30 days of the installation.

All the IOUs except SDG&E scheduled inspections, once the installation work was complete, as a separate visit on a different day. When feasible, SDG&E prefered that their inspectors arrive while the installation contractors were at the customer's home or immediately after the installation work was completed. The P&P manual states that if the customer is non-responsive after three attempts by the inspector to schedule an appointment, the inspector mails a letter to the customer requesting the inspection. If after two weeks the customer still is not responsive, the inspector may make final approval of payment to the contractor for the weatherization work.[20]

According to the P&P Manual, there are two main types of post-installation inspection failures: 1) hazardous fails must be addressed within 24 hours; and 2) correction fails indicate a failure on the part of the installation contractor to install all feasible measures, to install the measures correctly, or to properly invoice the measure. Correction fails must be corrected within 10 days. The IOUs could assess fees to contractors that failed to comply with standards or lose an arbitrated contest of an inspection failure. Likewise, inspectors could be assessed fees should the results of arbitration of an inspection failure favor the contractor. PG&E and SCE required that hazardous fails be corrected within 24 hours, and non-hazardous fails within 10 days.

---

[19] Inspection frequency based on contractors' pass/fail rate is explained in the P&P Manual.

[20] SCE did not hold payment to an installation contractor pending inspection results. If there was a chargeback as a result of an inspection (or any other reason), SCE deducted that charge from a future invoice.

4 STAFF

This chapter describes key findings from interviews with IOU program staff. The interviews focused on understanding best practices, challenges, and examples of which approaches to program implementation work best under certain circumstances.

CONTRACTOR MANAGEMENT AND COMMUNICATION

Program staff at each of the IOUs was satisfied with their approach to contract management: either working with a prime contractor to manage contractor relationships, or working directly with all contractors.

PG&E staff found that working with RHA as a prime contractor allowed them to focus on the bigger picture while RHA managed the day-to-day decisions. They also said RHA was more nimble and could adapt day-to-day program management more quickly than PG&E staff could in-house.

The other IOUs preferred to have a more direct relationship with the contractors. SCE staff thought they could maintain a lower administrative budget by managing the program directly, as opposed to using a prime contractor. Having a direct relationship with vendors and contractors helped them negotiate bulk purchases for appliances and ensure that contractors did not have to invoice for such expensive purchases. SCG and SDG&E staff reported feeling better connected to day-to-day issues than they would if they worked through a prime contractor. SDG&E staff attributed some of their increased customer satisfaction to changing from working with a prime contractor to managing contractors directly. SDG&E staff said they discussed customer satisfaction with contractors at each meeting and provided contractors with monthly reports on year-to-date customer satisfaction scores.

All IOU staffs said they sent new program contractors through IOU-led training programs that covered IOU policies, safety procedures, and statewide and IOU LIEE program guidelines. In addition to teaching contractors how to follow P&P guidelines, staffs said they supplied contractors with additional materials and training guides. PG&E and SCE required contractors to pass exams, including a lab test for installation contractors and inspectors,[21] before they were allowed to conduct LIEE work. SCG tested outreach contractors for basic reading and math skills. SDG&E did not test their contractors, but they worked with contractors to provide contractor-led training on the program and to make certain all new contractors understood all LIEE program guidelines.

[21] SCG did not have a lab test for its installation contractors and inspectors.

IOU staffs reported that contractors often are paired with field service representatives or experienced contractors or inspectors for the first few weeks on the job for hands-on training. All of the IOUs relied heavily on their online databases to communicate and expedite LIEE workflow steps. Overall, staff said these databases had vastly improved the quality, response time, and accuracy of tracking jobs. In addition to these automated systems, all IOU staffs said they sought to maintain consistent communication with contractors in the field to resolve issues and offer advice. Overall, IOU program staffs felt that communication between them and contractors was strong and consistent.

PG&E enrollment and assessment and weatherization contractors primarily worked with RHA to solve problems and deal with day-to-day issues that arose in the field, but contractors interacted more directly with PG&E when they enrolled customers through the interactive voice recognition (IVR) phone line and when they sought permission to spend more on a customer's home than the general guidelines allow. When the IVR system did not allow the contractor to continue enrolling the customer in the program (e.g., the IVR system did not recognize the customer name), then the contractor had to speak with a PG&E Energy Partners staff member. One staff member felt there were sufficient staff to handle the volume of enrollment approval calls, but another staff member who was more directly involved in program management, felt that two more staff members were needed to handle those calls.

A few manager-level RHA contractors supported the need for additional enrollment approval call staff. For instance, during peak times in the fall of 2010, PG&E contractors often waited 30 to 45 minutes to speak with a PG&E representative while at the customer's home to complete the enrollment process. In early 2011, PG&E hired two additional staff. IOU staff reported that the average wait time shrank to less than two minutes. R&R contractors work directly with PG&E program staff and inspectors to resolve questions about HVAC or water heater repairs.

At SCE, contractors said they communicated most often with customer service representatives and client representatives. Client representatives were dedicated to specific contractors and worked on day-to-day issues, visited contractors on location, and made sure contractors were up to speed on issues and policies. Centralized communication was used for distributing updates to policy and procedures. Mass messages were sent via email and posted to the database so that all staff had access to that information. In addition to posting statewide policy and procedure guidelines, EMA staff provided electronic and print copies of how-to guides and quick-start guides for contractors. The Manager of Program Operations met with the contractors' project managers to ensure that the contractors had what they need to do the work. EMA program staff had regular weekly or monthly communications with contractors.

SCG staff said they tried to reduce paper communications by emphasizing use of their HEAT online database to manage workflow. Through on-site trainings and phone support, SCG staff trained contractors on administration tasks and working with the database. They had two staff for contractor support – one who was on the phone and one backup person. Their response time was a couple of days or less. Contractors reported problems by phone. They could call either their field reps or have the customers call the 800 number. They also input issues into the HEAT

database. SCG hosted bimonthly meetings with contractors. To further reduce paperwork processing, staff said a small group of contractors will pilot tablet computers in 2011; training will be built into the five-day training for enrollment and outreach processes.

SDG&E also used the HEAT database to communicate workflow steps. In 2009, SDG&E decided to change their relationship with RHA, from using them as a primary contractor to employing them as one of 15 contractors that SDG&E managed directly. SDG&E staff were satisfied with the change and believed that contractors felt more respected once they dealt with SDG&E directly. In addition to quarterly meetings attended by all contractors, SDG&E staff said they held biweekly meetings with RHA to discuss day-to-day matters and communicate with the other 14 contractors individually.

MARKETING AND OUTREACH

As mentioned in the previous chapter, all of the IOUs managed some amount of campaign-wide marketing and outreach efforts, but the extent to which contractors managed their own marketing materials differed by IOU. This section describes program staff's marketing efforts and their perspective on best practices and challenges in effectively reaching qualified customers.

Centralized Marketing Strategies

To locate potential program participants, staff at all of the IOUs said their utility used various kinds of market segmentation techniques (such as ZIP-7, CARE, disabled groups, Medical Baseline, and PRIZM codes) to develop segmented marketing campaigns and identify potential customers by neighborhood for contractors. They reported common barriers to outreach, such as high numbers of customers who used only a cell phone. This can affect the outreach efforts related to some marketing strategies since *cell-phone only* customers may not be contacted via automated dialers often used in the cost-effective outbound calling and AVM strategy.[22]

In 2009-2010, each of the utilities employed overarching marketing campaigns for their LIEE programs that involved developing community relationships to raise awareness and generate leads by working with, for example, city governments, CBOs, and community college financial aid departments, and by hosting or participating in community events.

Staff at PG&E and others also noted that organizing community events as a neighborhood or community-based outreach effort proved helpful in building goodwill, trust, credibility, awareness, and cooperation with city agencies and customers, and potentially breaking down enrollment barriers. They believed the events facilitated future enrollment in those communities. However, they added that the events rarely were a cost-effective way to generate a large number

[22] At the time of this report, SDG&E was working on a solution to the limitations on using automated dialers to reach customers who are cell phone users.

of leads or enrollments that could be attributed to that particular event. SCE staff offered an example of how to reduce the number of steps – and cost – involved in recruiting from these events by staffing their events with local service providers. This, in turn, allowed the contractors to actually pre-screen customers and set up appointments at the event, instead of just generating a list of leads they would need to contact to set up enrollment appointments.

Staff with all of the IOUs except SCG were decreasing direct mail campaigns. SCG staff reported that they were increasing direct mail as part of an effort to work with CBOs and local communities to generate awareness.

All program staff contacts found outbound calling and AVM to be cost-effective recruiting methods. In addition to outbound calling, SCE staff said a telethon had proven an effective strategy for enrollment and appointment-setting. While the Univision telethon effectively generated leads, there was no control over the demand or service area those leads came from, which made it more difficult to concentrate service.

SDG&E staff also mentioned culture-specific marketing strategies, noting that Hispanic radio spots had been effective. However, efforts to market the program through African-American churches had not worked as well, even though the pastors supported the approach. In addition to segment-specific marketing, SDG&E staff said their program also worked with social media to find customers in online social spaces and they were considering using Craig's List's ad space to reach people. Mostly, SDG&E program staff said they viewed mass marketing strategies as ways to build general awareness to help secure enrollments when they conduct outbound calls, ask CBOs to talk about the program with their clients, or knock on customers' doors.

Removing Barriers to Enrollment and Partnering with Community Groups

Staffs at the four IOUs indicated their programs encountered barriers in finding potential participants and described options to address them. A staff member at SDG&E said the barrier was not necessarily identifying customers, but actually enrolling them in the program. While staffs at the other IOUs said they found it hard to identify potential LIEE participants, they acknowledged general enrollment barriers they were working to alleviate. Staff members across the four utilities cited a variety of approaches to marketing and enrollment to encourage participation, from honing messages to specific communities, to choosing motivated community partners to gain their community's trust, and improving scheduling.

When attempting to refine the marketing messages, SCE staff said some customers were uncomfortable with the idea of enrolling in a "handout" program, but were more willing to enroll in a program that helps everyone benefit from lower costs associated with saving energy. SDG&E staff said they were attempting to shift the message away from just "the guy screwing in a showerhead" to one of "making a home safer and more secure." As a general practice, PG&E staff reported they supported their contractors in tailoring marketing messages to the communities they work in.

In addition to crafting the message, the IOUs worked to establish relationships with cities and CBOs as a way to gain trust and entrée in communities. SCE partnered with cities before starting outbound calling campaigns, so city staff would be prepared to reassure customers that the program was legitimate. SCG found that word-of-mouth and grassroots campaigns broke through trust barriers, which makes partnering with CBOs important. Staff at all utilities also reported that working with some CBOs and churches had helped them gain customers' trust. However, as noted in the example of African-American churches described above, engaged and committed leaders cannot guarantee that their members will share their enthusiasm for a program, so other barriers also must be considered.

In terms of gaining efficiency, SCE staff found they could remove an enrollment barrier by connecting customers directly with enrollment contractors at events and through their call center. As a result, when SCE calleda customer and the customer was interested in the program, the customer was immediately connected with the contractor to schedule an appointment with the contractor.

Leveraging State and Federal Programs

The IOUs coordinated with LIHEAP contractors and agencies where possible, and sometimes worked with cities to market services to customers. IOU staff found many LIHEAP providers were willing to work with them to coordinate services for customers, in some cases agreeing to split measure installations. SCE added a place in their database for service providers to note which measures customers received in LIHEAP, since LIHEAP agencies are not willing to provide that information.

In some locations, however, staff noted instances when some LIHEAP providers were unwilling to coordinate their efforts and the LIEE contractors ended up competing for customers. PG&E program staff explained that leveraging LIHEAP was good and could help with outreach, but it also could be challenging because rules sometimes differed or competed. Further, the staff contact said that leveraging the LIHEAP program worked well if one program could do something the other could not, but it could be frustrating if the two programs offered the same measures. If LIHEAP installs measures first in a customer's home, Energy Partners contractors may arrive and not have enough measures to meet the three-measure minimum, which means Energy Partners cannot provide the service, savings are left on the table, and the customer loses out. Contacts said it was frustrating to lose those savings. Program staff also said some LIHEAP agencies had been unwilling to take LIEE referrals for unknown reasons.

Whole Neighborhood Approach (WNA)

As mentioned in the previous chapter, under the WNA[23] all IOUs used ZIP-7 marketing strategies to identify neighborhoods with high concentrations of likely eligible customers and organized their visits by proximity when possible. However, all IOU staffs agreed that attempting to identify, enroll, install, and inspect large groups of customers' homes within a few days' time proved infeasible. It was particularly difficult to ensure that more individualized measures such as appliances, doors, and window or glass replacement could be readily available. In addition to requiring time to place orders and schedule delivery, these kinds of measures sometimes required different kinds of crews.

SCE staff described one example when the WNA approach did not work. Staff sent postcards announcing when teams would be in a specific neighborhood to do energy-efficiency projects. They received little response to the cards, but when the contractor groups arrived in the neighborhood, few customers were home. Of those who were home, many heads of household were not available to make the decision to allow the work or the occupants were unable to gather the documents needed. Many asked the outreach workers to come back. Staff said that SCE contractors usually enrolled six to seven households per day, but on the WNA days, they typically tried to call on 30 to 40 customers, but would enroll just one household. Therefore, SCE started letting customers schedule the appointments.

Description of List Development and Customer Tracking Practices

The IOUs had a variety of ways to develop lists[24] and track customers. All staff said they attempted to engage customers who were difficult to contact or were reluctant to participate in the program by reaching out to them through the community members or organizations they were most likely to trust, such as their clergy person and members of the community who may not have held an official post, but were well-known and had credibility. The IOUs seem to have used similar list development practices. This section highlights a few of the practices and issues IOU staffs felt were most important.

PG&E broke down targeted customer lists by county. Each county was offered program services each year, based on the percent of eligible customers in the county. To develop this list, PG&E used the CPUC-approved formula for estimating CARE eligibility from census data. They gave those county lists to RHA, which broke down the counties into project areas based on population size and the size of the county. Some big areas, such as San Francisco, may have had one to four

---

23 The WNA was developed by the Energy Division staff during the 2009-2011 Low Income Application proceeding (A. 08-050022, et al.) and adopted by the Commission in D. 08-11-031. The IOUs were directed to incorporate WNA into their 2009-2011 programs.

24 The provision of customer lists to contractors is subject to confidentiality agreements between the IOUs and their contractors, as directed by the Commission in D. 00-07-020.

active contractors, while other, smaller areas may have needed only one contractor per county. Each project area was broken out by ZIP code.

SCE analyzed available data to identify low-income populations by ZIP code and compare them against previous enrollments in order to create new lists of locations with low LIEE penetration rates. A SCE staff member said they first located customers enrolled in CARE because they were likely to qualify for LIEE, and noted that it was difficult to find customers who likely would qualify and were not enrolled in CARE. The internal marketing group helped identify those customers. The LIEE program staff also looked at other customer information, such as those who were enrolled in Medical Baseline, considered themselves disabled, had a high disconnection rate, or had a high energy consumption rate.

Once the list was developed, staff sent mailers to all who were likely to qualify. The SCE staff member said they discussed their needs (such as reaching out to the disabled or people living in multifamily units) with internal marketing department staff, who gave the LIEE staff plans and ideas for reaching those markets, and negotiated and jointly decided how to allocate money to the various campaigns. SCE used a marketing tool they added to their database to track their marketing efforts. They were looking into ways to increase the conversion rate from lead to enrollment because, as one staff member noted, about 40% of the leads dropped out before enrolling in the program. As a result, they had to target up to an additional 40% more leads to reach the enrollment goals. SCE staff said that securing the property owner's permission for rental customers to participate was a primary contributing factor to low enrollment.

SCG staff said they were able to track their marketing efforts in the HEAT database at a campaign level, including costs, response rates, and individual customers' response to campaigns. For example, they were able to identify which customers called in after receiving a mailer that was part of a mail campaign targeted at a particular customer group. However, they were not able to track every contact a customer received from the program, as SDG&E does, but they liked SDG&E's approach and were expanding their tracking capabilities. In addition, they said they were looking for ways to track customers who sign up for LIEE when or after visiting a CBO office.

To track potential program participants, SDG&E said they place a source code (e.g., letter, automated voice message, knock on the door) on every lead in order to track lead conversion rates. They indicated that the effectiveness of some marketing efforts (e.g., website click-throughs, an email blast, or notes from canvassing campaigns) were more easily traced than others. They added that, in a perfect world, a customer should have heard of the program before a program representative knocks on the door to ask them to enroll.

ENROLLMENT AND ASSESSMENT

Paperwork Reduction

There are a few ways in which the IOUs are able to reduce paperwork for contractors and customers. All IOUs were using or were planning to use pilot tablet computers with groups of

contractors or inspectors to enter customer documentation, information, and signatures, as well as the home assessment data. PG&E inspectors interviewed for this evaluation said they used tablets and the staff said they were encouraging contractors to consider purchasing tablets, although one staff member felt the tablets were too expensive for PG&E to provide. SCE staff said the tablets and document scanners worked well and hoped that they would reduce: certain types of data-entry errors that can be immediately identified by automated error checks; time for copying documents; and the amount of paper used. Some contractor firms already used tablet computers in the field. SCG planned to move their enrollment and assessment process to tablets to reduce the amount of triplicate forms customers and contractors must fill out, scan instead of copy documents, and acquire customer signatures electronically. SDG&E had tried tablets once for an auditing function, but once the ruling of pursuing all feasible measures was enforced, they had stopped plans to implement an auditing function. SDG&E staff said that if tablets were less expensive, they would consider moving their enrollment and assessment process to them.

Contacts said that using self-certification of income documents also helped reduce the amount of paperwork and enrollment time. Two IOU staff said they preferred to have actual income documents or categorical qualifications rather than a self-certification document because the former ensures the program is delivered to those who need it most. IOU staffs were concerned that the trade-off between allowing more self-certification (and therefore a reduction in paperwork) might result in enrolling a greater percentage of customers who normally would not qualify, which likely would increase the program costs. However, they said they wanted to ease the enrollment burden for both contractors and customers where possible and saw the self-certification as a good option.

Program staff said that enrollment contractors who worked in multiple IOU territories, such as SCE and SCG, coordinated their work so that customers would need just one appointment to enroll in both programs and another for the installation of measures for both IOU programs. However, a few contractors still worked with just one IOU, because they preferred to or because they could not administer two programs. In these situations, a customer might need to have multiple visits to participate in both IOU programs.

Customer Education

The customer education component, as defined by staff, is discussed in the previous chapter. Educational conversations with customers occurred at various stages of the process. Therefore, evaluators asked staff where they thought customer education should take place and what content should be covered, and by whom. All IOU staffs agreed that the basic education component of the program belonged with the enrollment and assessment contractors because customer education fit well with the people- and sales-oriented skill sets and personalities these contractors tend to have. They found that installation contractors and inspectors tend to be technically skilled and, while capable of explaining the measures that were installed and how they related to energy savings, they were not necessarily trained or inclined to educate customers; some were better with their hands than their words.

That said, the IOU staffs encouraged informal education to occur during the installation contractors' visits; they wanted installers and inspectors to convey the purpose of their visit, to explain how to use the equipment installed and why it was important to keep it in place, and before they left, to tell the customer what they had done. The CPUC and IOUs likely considered this content part of a good communication strategy, more so than customer education. Nevertheless, it is important to recognize that these conversations accomplish the goal of reinforcing messages about how to save energy with the measures installed and how to use those measures safely. As one IOU staff member noted, the ability of installers to appropriately communicate with and educate customers about how to properly use equipment they just had installed is important to the potential benefit and savings of the program.

Barriers to Enrollment

IOU staffs faced some key barriers to enrolling customers that revolve around documentation issues, customer perception problems, and the burden on customers to take time off of work. Documentation issues primarily concerned income verification and working with property owners. Customers who earned cash wages and might not have proper tax documentation had difficulty providing documentation of income. They might hold jobs like lawn care and babysitting that pay $40 to $50. One IOU staff reported that these customers might not be able to afford to pay Social Security and taxes, and therefore likely were unwilling to report their income to the state and federal government. While some of these customers might be allowed to self-certify, this staff member recommended allowing cash-only customers to be allowed to sign an affidavit noting how much they make; SCG allowed this form of documentation.

PG&E experienced another documentation issue, when customers' names did not match the name on the utility bill, which prevented them from enrolling in the program. For example, widows sometimes do not take their spouse's name off the bills, and college students or children living independently from their parents may have their parent's name on the utility bill.

Customer perceptions about the program also impeded enrollment. Staff mentioned that some groups of customers viewed it as a matter of pride to refuse the assistance, while others found the process intrusive, questioned its legitimacy, or did not believe it truly was free.

Communicating with some customers also involved overcoming language and cultural hurdles. In addition, customers might have had difficulty taking time off of work for the visits. Staff felt that some policymakers think low-income customers do not work when, in fact, they often work multiple jobs or jobs that are under the radar. One staff member discussed the possibility of asking contractors to work some evening hours to better accommodate customers' work schedules. This may be feasible only in spring through fall, when it is light in the evening, since contractors must be able to see clearly and walk around the exterior of the house safely.

INSTALLATION AND INSPECTION

The IOU staffs said they had worked with most of their installation contractors and inspectors for a long time and felt they had good working relationships with them and that the overall process was relatively smooth. This section discusses some remaining issues of concern to the staffs.

Installation of Measures

Overall, the IOU staffs found that measure installation processes were tracked well in the database and special situations were dealt with as described in the previous chapter.

The IOU staffs also mentioned a few concerns related to the impact of installation requirements on the kinds of measures that are installed and the extent to which contractors can service customers' homes. Namely, they reported that the restrictions on certain minor home repairs and reimbursement rates for some measures limited what contractors were willing or able to do for a customer. A few IOU staff noted that some inexpensive minor home repairs not covered by the program could prevent customers from receiving gas appliances or infiltration measures. They noted that contractors sometimes paid for these repairs out-of-pocket, but that the repairs should be covered by the program.

On a related note, staff had heard from contractors that some measures were not reimbursed at a high enough rate to make it worth the contractor's time. As such, some IOU staff were concerned that contractors did not offer these measures to customers. Of particular concern to one contact who works with PG&E is the fact that contractors tended to lose money on performing the NGAT. The test can take 45 minutes, yet the contractors receive approximately $34 for their time. Furthermore, if the contractor makes a mistake, they could incur a charge-back.

The implication we draw from these comments is that contractors might have been tempted to avoid installing certain measures or take shortcuts on measures and tasks for which they were not adequately paid. The IOU staff described how they dealt with this issue. SCG included adjustments in its fee schedule for water measures in order to discourage this behavior. Several IOU staff also found that the inspections helped avoid such problems. An upper management RHA contact saw little evidence that contractors avoided installing measures in order to avoid conducting the NGAT for two reasons: 1) homes that received only non-infiltration measures received about $200 less in measures than homes eligible for all measures; and 2) both PG&E and RHA inspected for installation of all feasible measures.

Several IOU staff explained that they had to keep program costs down to be able to install all feasible measures all year without over- or under-spending.[25] While a full discussion of measure costs is beyond the scope of this evaluation, a few key points provide an understanding of the

[25] According to staff, CPUC mandates that the LIEE programs must continue to operate, even if the IOU spends all of its funding.

IOU perspective. As one IOU staff member explained, increasing the cost for one measure usually meant decreasing another measure cost. Both the program portfolio and all the measures individually had to pass cost-effectiveness tests when the IOUs proposed budgets at the beginning of the cycle. Even with a low threshold, many measures did not pass.

Inspection

The inspection staffing and processes defined in the previous chapter describe each IOU's overarching approach to inspection. Like other contractors, inspectors in all territories except SCG attended training and had to pass exams held by the IOU before they were allowed to conduct LIEE inspections. In PG&E's training, inspectors had only one chance to pass the exam; if they failed, they might never work on LIEE inspections. The inspectors had to know how the enrollment and installation contractors did their work, the required levels of quality and completeness, and the proper procedure for handling failures to meet those levels of quality.

Beyond IOU training for inspectors, the IOU staff expected inspection contractors or in-house inspection groups to foster their own mentoring relationships between new and more experienced inspectors so that new inspectors could learn how to handle the "grey areas," such as when to fix a small mistake made by a contractor rather than calling the contractor back to the customer's house and requiring the customer to take another day off of work.

A few contractors and inspectors in PG&E, SDG&E, and SCG territories raised concerns about customers who had no heat or hot water for more than 30 days following an NGAT failure. IOU staff were not aware of any situations in which a repair or replacement that would have been possible to make under program guidelines was not completed. They stated that customers who had their heat or hot water shut off were moved to the top of the list for repairs. The staff person acknowledged that it was possible that customers who could not have their appliances serviced by the program could have their water heater or furnace "red-tagged." They noted that those customers should have been referred to other programs within the utility or to others, such as LIHEAP, for assistance. However, the evaluators did not identify a mechanism that tracked if these customers who had to leave the LIEE program for service ever received help. We were able to gain some insight from follow-up contractor interviews about these issues. Those findings are discussed in the next chapter.

It is important to note here, however, that incidents occurring in the PG&E territory likely resulted from either the R&R contractors experiencing a backlog of work or a database communication failure that occurred between the summer and early fall of 2010. One contact clarified how these two processes could result in customers going without heat or hot water for long periods. When a customer's appliance – typically furnaces – needed repair or replacement beyond the scope of the Energy Partners program, the customer's job was referred to the R&R contractors (this is called the R&R program internally). When this happened, the customer's job remained viewable in the EPO database with a File Identification Number (FIN), sign-up date and program notes, but the workflow step disappeared from the weatherization contractor's view. As soon as the R&R contractor job was entered in the EPO database as *complete*, the workflow

steps again were visible to the weatherization contractor and were listed on the weatherization contractor's to-do list in EPO. Only at that point did the installation contractor know the repair or replacement was complete and that they could install the infiltration measures. The status of jobs sent to the R&R contractor were not updated in EPO, only the completion.

In the other situation, approximately 10% of jobs were stalled in EPO between July 2010 and December 2010, because the jobs required Gas Service Representatives (GSRs) to service the customer before installation contractors could continue with repairs and infiltration measures. While the GSRs likely responded in a timely fashion, their comments entered into the GSR database describing the status of their visit and issuing permission to continue with installation of measures were not visible in EPO. The installation contractors were not able to continue their work until the GSR permission was entered into EPO. One PG&E staff member explained that the process for manually transferring a batch file of comments from the GSR database to EPO on a daily basis has been in place for many years. Once comments are matched with the FINs, each comment is reviewed to determine next steps and manually dispositioned based on the comments.

Once the GSR workflow step is closed, the next step is triggered (e.g., assigning an R&R visit). According to several PG&E staff members, the reason for the backlog was a lack of staff. RHA helped the Energy Partners program resolve the issue and Energy Partners hired two additional staff members to download the GSR comments daily and communicate the comments to the installation contractors. The backlog has not been an issue since December 2010, but as of this report, there is still no way for the comments to be automatically transferred from the GSR database to EPO.

5 CONTRACTORS

This chapter summarizes findings from: 62 semi-structured interviews with key staff from a sample population of 97 contractor organizations; 67 field observations of 14 contractors; and one focus group with staff from contractor organizations that have substantial reach within the SCE and SCG territories, and perform assessment and enrollment, installation, and inspection work.

CONTRACTOR FIRM CHARACTERISTICS

This section discusses characteristics of the third-party contractors that implemented aspects of the LIEE program.

Third-Party For-Profit Contractors and Community-Based Organizations (CBOs)

The IOUs used third-party contractors to implement many aspects of the program, including: direct outreach to potential customers, enrollment and assessment, measure installation, and in some cases, inspections. These contractors included both for-profit firms and community-based organizations (CBOs). Contractor contacts noted that their firms' status as a CBO or for-profit business could present both advantages and disadvantages when implementing the program. Ride-along observations and contractor interviews suggested that contractor employment and incentive structures might result in service limitations among both CBOs and for-profit firms. This is discussed further in the *Contractor Employment and Incentive Structures* section below.

Some CBO contacts noted that their firms could implement state and federal programs like LIHEAP and WAP, whereas for-profit firms were not eligible to implement these programs directly. While not all CBO contractors also implemented state and federal programs, contacts that did so stated that their involvement in those programs provided them access to information useful in their marketing efforts. This is discussed further in the *Leveraging* section below.

With the possible exception of SCE CBO contractors, CBO contractor contacts that implemented the state and federal programs reported frequently leveraging those programs to offer customers a broader array of measures and services, and to address issues that might otherwise have disqualified customers from certain services through LIEE. However, contractors pointed out that customers might not be aware that the additional services they received were made available through programs other than LIEE.

Contractor contacts said that CBOs might experience financial challenges that for-profit firms did not. Contractor contacts explained that CBO staffing levels were contingent upon CBOs securing adequate grant funding for each grant cycle. Therefore, the contacts explained that CBO firms typically experienced periods of uncertainty concerning their ability to offer their staff

members continued employment near the end of grant cycles. While for-profit firm staffing levels also were affected by funding levels and program cycles, one contractor respondent representing a for-profit firm noted his firm's ability to "expand at will." In response to this, one SCG staff member noted that the majority of SCG's private contractors could not "expand at will" and experienced financial stress, finding it difficult to obtain additional lines of credit.

Financial Capacity and Size of Firms

IOU staff reported that, regardless of their financial designation, contractor firms that were successful in the program had to have a sufficiently sized staff and adequate financial resources. Regarding staff size, both CBO and for-profit contractor respondents noted that small firms might be overwhelmed by the requirements of implementing the program. Additionally, responses from contractors representing smaller firms suggest that they might be less responsive to small firms' requests for support than they were to requests from larger firms.

Regarding firms' financial resources, staff explained that contractor firms must be capable of maintaining the required insurance policies, withstanding the waiting period between funding the up-front cost of measures and receiving reimbursement for program work, and paying financial penalties for non-compliance with program rules. Contractor interview findings indicate that the waiting period between funding the upfront cost of measures and receiving reimbursement for program work was particularly challenging for small firms, specifically, when reimbursement payments were delayed. The previous process evaluation of the program, covering program year 2001, noted that small firms experienced similar financial challenges.[26]

Contractor Employment and Incentive Structures

Ride-along observations indicate that enrollment and assessment contractors' employment structures influenced the way they approached their work. Enrollment and assessment contractors typically were paid on commission or worked as independent contractors. In either case, the contractors' compensation was based on the number of homes they enrolled. Even when contractors received an hourly wage, the number of homes they enrolled might impact their job performance ratings and bonuses. Given this pressure to enroll the largest number of homes possible, it appeared in ride-along observations that contractors made an effort to work quickly. While ride-along data are not sufficient to determine whether these efforts to work quickly impacted the quality of enrollment and assessment contractors' work, the time pressure enrollment and assessment contractors faced provides important context in considering their role in program delivery.

---

[26] The LIEE program's 2001 process evaluation found that payment delays in PG&E's service territory forced some small firms to increase lines of credit and delay paying their own vendors, while subsequently experiencing a decline in their credit rating. Kema-Xenergy, 2003. *Process Evaluation of the 2001 Statewide Low-Income Energy Efficiency (LIEE) Program*.

Interviews and focus group findings suggest that incentive structures also may impact how installation contractors approached their work. Inspectors in PG&E territory stated that they had observed a difference between the quality of work performed by installation contractors paid by the job and those who earned hourly wages. These inspectors found that contractors paid by the job, in order to complete more jobs and therefore earn more money, tended to install inappropriate measures and did not install measures with high enough quality. By contrast, the inspectors found that contractors who earned hourly wages tended to take "the time to install it right." On the other hand, an upper-management RHA contact asserted that, based on increasingly better inspection results, "The quality of the weatherization quality assurance process and the number and quality of post inspections drives quality, not pay methods."

Contractor focus group participants who worked for SCE and SCG also noted that the quality of work installation contractors perform differed. According to focus group participants, installation contractors varied in the number of jobs they completed in a day. Some contractors completed three or four installations per day, while others might schedule as many as six. According to the focus group participants, the contractors who completed jobs more quickly typically took a less thorough approach to their work by, for example, cutting corners on the quality of the installation.

Interview findings are consistent with these focus group observations. Interviewed contractors stated that piecework incentive structures, coupled with firm directives to focus on profitable measures, may encourage installation contractors to focus their time on installation of measures that the program reimburses at a higher rate. Contractor contacts reported that firms that paid contractors on a piecework basis encouraged contractors to move through LIEE processes quickly. While inspections help ensure all feasible measures are installed, one contractor noted that her agency discouraged contractors from installing certain LIEE measures because the reimbursement potential of the measures was low. As a result, this contact stated that customers might not receive some measures for which they were eligible through LIEE.

In a focus group, one PG&E inspector reported that the results from NGAT tests completed by contractors frequently were inaccurate. The inspector expressed concern that the relatively small payment contractors received for NGAT testing might result in the contractors taking a less thorough approach to NGAT testing than is warranted. In contrast, one management-level RHA contractor said that, although contractors typically lost money performing NGATs, NGAT contractors took the time to complete the tests properly, because they were held responsible for repair or replacement of gas appliances if test results were faulty. The RHA contractor attributed some of the contractors' inaccurate NGAT results to the recently issued "air-free meters," which, according to the contact, should yield less erroneous readings than the "as found meters." Yet, this manager found that moving the meter a half-inch down a vent could produce readings indicating CO levels that were too high, although the previous reading found satisfactory CO levels.

MARKETING AND OUTREACH

This section addresses contractor outreach approaches and identifies strategies for improving enrollment opportunities.

Firms' Outreach Methods

Enrollment and assessment contractors reported using a wide range of methods to identify and enroll LIEE customers, including: responding to IOU referrals; completing scheduled appointments with customers; using IOU-provided data to conduct door-to-door marketing; holding community meetings describing the program; and implementing direct mail, outbound calling, and television advertising.

List Development and Customer Tracking Practices

In Decision 08-11-031, the Commission described a Whole Neighborhood Approach (WNA) to LIEE implementation, under which the IOUs were to use relevant information, including demographic data, CARE customer information, customer address, energy usage data, and income verification status to identify promising neighborhoods. After the IOUs identified the neighborhoods, they delivered this data to LIEE contractors, enabling the contractors to conduct outreach to customers.[27]

IOU-Provided Contact Lists

As previously mentioned, customer lists provided by the IOUs were developed from a variety of sources, including lists of CARE customers, ZIP-7 areas, and market segmentation tools. While research on the effectiveness of these tools and data sources was outside the scope of this study, contractors did provide some insights on the usefulness of these lists. The majority of contractor interview respondents who reported conducting outreach for the program said that at least 75% of the customers provided by the IOU contact lists were eligible for the program. However, the findings suggest that PG&E and SCG screening was not yet fully effective in identifying likely participants. For example, two of the nine respondents who reported conducting outreach in the PG&E service territory said that 70% or less of the contacts listed on the PG&E-provided contact lists were eligible for the program, and three of the seven contractor respondents conducting outreach in SCG service territory said that 60% or less of the contacts listed on the SCG-provided contact lists were eligible.

CARE participants must meet the same income eligibility requirements as participants in the LIEE program and interview findings suggest that contractors looked to CARE to identify

[27] California Public Utilities Commission (CPUC), 2009. *Whole Neighborhood Approach – White Paper Energy Division Low Income Energy Efficiency (LIEE) Programs*.

potentially eligible customers. For example, one PG&E contractor said that 95% of his contacts came from calling CARE lists. However, as noted in the 2001 process evaluation of the program, CARE participants were authorized to self-certify their income, while LIEE program participants must produce income documentation. As a result, LIEE contractors found that some CARE participants were not eligible for LIEE because their income could not be verified or was too high.[28]

IOU Referrals

The majority of the interviewed contractors said that IOUs provided their firms with the names and addresses of potential participants that had contacted the IOU and wanted to schedule an enrollment and assessment visit (Table 5.1).

Table 5.1: Proportion of IOU-Provided Customer Referrals

Did IOUs Provide Contact Information?	Responses (n=39)[1]
Yes	28
Sometimes	5
No	6

[1] Contractor respondents from 39 of the 62 firms reported that they conducted marketing for the program. These 39 were asked whether the IOUs provided their firms with lists, spreadsheets, or databases of names and addresses of potential participants they could use to build contact lists.

Identification of Effective Outreach Strategies

Most of these contractors said that customer-initiated referrals from the IOUs represented a relatively small proportion of their customer leads, although a small number of contractor contacts in the PG&E service territory said that PG&E referrals represented a large proportion of their customer leads. Multiple contractors said their firms received fewer IOU referrals than other firms; these contractors appeared confused about the methods the IOUs used to delegate the customer referrals.

Contractor firms reported using IOU list data for a variety of purposes. Most firms reported that door-to-door canvassing was a major component of their outreach strategy. However, one contractor respondent distinguished his firm's canvassing approach from the canvassing approach prescribed by the WNA, in that his firm used the list data to identify promising "block radiuses," as opposed to identifying entire neighborhoods for targeted outreach. Additionally,

[28] Kema-Xenergy, 2003. *Process Evaluation of the 2001 Statewide Low-Income Energy Efficiency (LIEE) Program*.

several firms reported success using the list information to conduct outbound calling. In response to that success, one contractor respondent said his firm would initiate automated outbound calling in 2011.

Contractors frequently stated that a primary challenge in enrolling customers is convincing them that the program is legitimate. Contractors noted that the most effective strategy they had used to address customers' concerns about the program's legitimacy was to prove that they were approved, direct contractors for the IOUs. We noticed this first-hand during ride-along observations. For example, contractors in SDG&E territory typically introduced themselves as part of "SDG&E's Energy Team," and those serving the PG&E territory mentioned PG&E's name and the Energy Partners program in their greeting. These observations are consistent with research conducted by Nadel, Pye, and Jordan in 1994, which suggests that contractors are able to reduce customer skepticism by co-branding their services with utilities.[29]

Contractors said that outreach to multifamily properties can be a highly effective strategy once they have received permission from the property owner (see the *Rental Property Owner Permission* section below). One contact described in detail a particularly successful approach to engaging multifamily customers. First, the contractor distributed door hangers advertising the program. Next, the firm set up tents in which tenants present qualifying documentation to enroll in the program. In a single day, qualifying individuals received energy education in groups of 10; assessment crews identified measures for installation, and installation crews completed measure installation. The respondent further noted that such events were particularly successful when combined with customer giveaways or raffles.

Leveraging State and Federal Programs

The contractor contacts explained that a key aspect of engaging property owners involved leveraging state and federal programs; the potential for big-ticket items available through the state and federal programs, such as new furnaces, was attractive to the property owners and could be presented to the owners as an overall package that included LIEE enrollment.

Similarly, CBO contacts noted that leveraging other low-income programs was an effective strategy for direct outreach to individual customers. For example, one CBO contact said that his firm's LIEE enrollment strategy began with enrolling customers into LIHEAP. The contact explained that his firm distributed press releases and disseminated information to community and faith-based organizations to raise awareness of monthly LIHEAP enrollment events that the firm held. The contact said the events drew large attendance and that, because LIHEAP also requires customers to provide income-qualifying documentation, it was easy to simultaneously enroll customers in LIEE.

---

[29] Nadel, S., Pye, M., & Jordan, J. 1994. *Achieving High Participation Rates: Lessons Taught by Successful DSM Programs*. Berkley, CA: American Council for an Energy Efficient Economy.

Interview findings revealed that enrolling customers in LIHEAP also was a key element of contractors' efforts to reach rural customers. One CBO contractor said it was effective to work with other CBOs, housing authorities, code enforcement agencies, community and faith-based organizations, and senior centers to obtain help identifying low-income customers. LIHEAP and LIEE then were presented to the customers as a single package. In addition, contractor interviews indicated that CBO contractors that implement state and federal programs may have an advantage in rural markets. Their involvement with multiple programs provided them access to customer information, including customers' history of participation in other low-income programs, which was not available to firms that did not implement state and federal programs.

Contractors noted that, with the recent increases in DOE and ARRA funds, the state and federal programs were more prevalent and accessible. However, some contractors expressed a desire for additional information on how to leverage the various programs. In addition, some contractors said it was challenging to differentiate for customers the many state, federal, and IOU low-income programs available. One contractor suggested that it was difficult to promote the different programs simultaneously without first considering how to coordinate them efficiently. However, multiple contractor contacts recognized that the IOUs were working to improve coordination between the various low-income programs.

Consistent with the limited awareness expressed by contractors who did not directly implement state and federal programs, enrollment and assessment contractors in Southern California IOUs rarely discussed state and federal weatherization programs with customers in ride-along observations. In SDG&E territory, for example, contractors typically directed customers to a general social services hotline, but rarely referred directly to federal weatherization programs. PG&E appeared to be the exception; contractors included a discussion of state and federal programs in their education delivery in all of the observed visits. Inspectors in PG&E territory also reported directing customers to state and federal programs when they observed a need for measures not covered under LIEE (Table 5.2).

Table 5.2: Ride-Along Observations in Which Contractors Mentioned Low-Income Programs by Name

Low Income Program	Mentions (n=48)[1]	Percent of Ride-Alongs
CARE	34	71%
Level Pay program	5	10%
Medical Baseline	3	6%
HEES[2]	0	0%
LIHEAP	13	27%
WAP	11	23%

[1] Totals reflect the number of observed visits in which contractors conducted enrollment and assessment for each IOU. The activities of contractors that performed outreach in multiple service territories are included in the counts above.

[2] Home Energy Efficiency Survey Program. Does not exclusively serve low-income populations.

ENROLLMENT AND ASSESSMENT

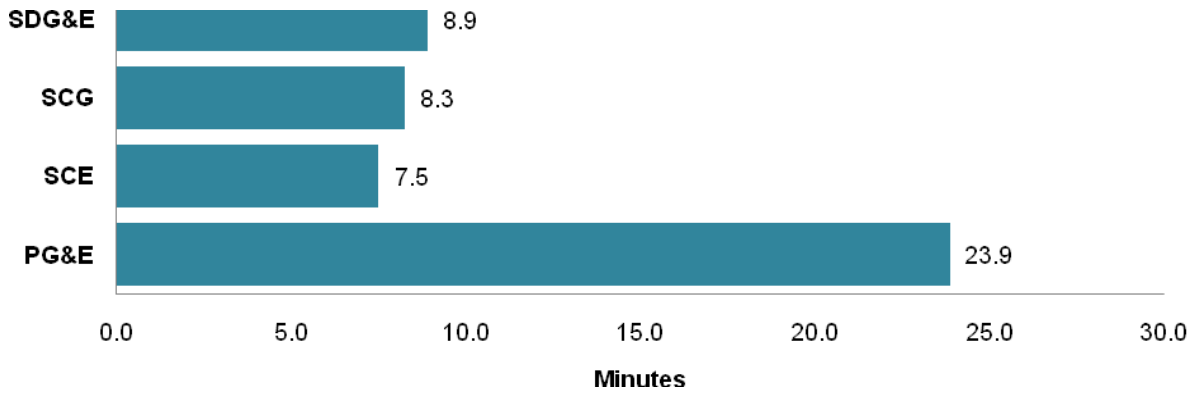
As described in Chapter 3, the enrollment and assessment visit typically was the first visit a customer received as a participant in the LIEE program. In most cases, the contractor staff members who conducted enrollment and assessment were distinct from those who installed measures and conducted safety checks. The enrollment and assessment visit typically included certifying customers' income eligibility, enrolling eligible customers in CARE, referring participants to other energy and non-energy low-income programs, and providing energy education. During the enrollment and assessment visit, contractors also ensured that the potential existed to install three qualifying measures in the customer's homes or that qualifying measures would achieve minimum savings requirements. Following the enrollment and assessment visit, in PG&E, SCG, and SDG&E service territories, installation contractors completed a more detailed assessment to identify all of the feasible measures for which a customer qualified. In SCE territory, the enrollment and assessment contractor conducted this more detailed assessment.

Education Delivery

While focus group and contractor interview data indicate that installation contractors and inspectors informed customers about energy use and the measures installed through the program, enrollment and assessment contractors were tasked with and carried out the majority of the program's education delivery.

Ride-along observations and contractor interviews indicated that a discrepancy exists between PG&E and the other utilities in the amount of time enrollment and assessment contractors devoted to delivering energy education. In ride-along observations, contractors in SCE, SCG, and SDG&E territories spent, on average, less than 10 minutes providing energy education during enrollment and assessment visits, while those in PG&E territory spent about twice as much time, averaging more than 20 minutes (Figure 5.1).

Figure 5.1: Time Spent on Energy Education by Service Territory from Ride-along Observations



Data omit 9 observations in SCE and SCG territories from one contractor who delivered very little energy education. This contractor is considered an outlier.

It is worth noting that customer recollection of energy education was higher in SDG&E and SCE territories than in PG&E or SCG territories. While the difference was not statistically significant, it reinforces the need to better understand which education efforts are most effective.

Despite the increased time that contractors in PG&E territory spent delivering energy education, ride-along observations revealed few notable differences between utilities in the topics contractors covered. In the large majority of cases, contractors informed customers about energy use associated with various behaviors and advised customers of ways they could reduce their energy use (Table 5.3). In contrast, contractors rarely discussed greenhouse gas emissions as part of the energy education they delivered.

Table 5.3: Topics Covered in Education Delivery, from Ride-Along Observations

Topic Mentioned or Discussed	Proportion of Observations Mentioning				
	PG&E (N=11)	SCE (N=2)	SCG (N=12)	SDG&E (N=11)	ALL (N=32)
Usage associated with appliances	91%	100%	55%	73%	69%
High-use culprits	73%	100%	55%	73%	63%
Usage associated with behaviors	100%	100%	55%	100%	84%
Way to reduce usage	100%	100%	64%	100%	88%
Water conservation	0%	50%	45%	45%	25%
Greenhouse gas emissions	0%	0%	9%	0%	3%
Reading the utility bill	64%	0%	0%	64%	44%
Appliance safety	82%	100%	55%	45%	59%

Note: Data omit 9 observations in SCE and SCG territories from one contractor who delivered very little energy education. This contractor is considered an outlier. It is important to note that the sample size is very small and care should be exercised in the interpretation of these findings.

The differences in education content that emerged between utilities largely focused on discussions related to the reading of the utility bill and water conservation. The contractors whose customer visits we observed in SCE and SCG territory rarely provided information on reading the utility bill, while contractors in PG&E and SDG&E territories did so in the majority of observations. While contractors in each territory mentioned water conservation in no more than half of the observations, we did not observe contractors in PG&E territory mention water conservation in any of our ride-along visits.

Interview findings suggest some differences existed in the way contractors in various utility territories approached education delivery. Contacts in SCE and SCG territories were more likely than contacts in PG&E territory to reference printed materials in describing the energy education they provided (Table 5.4). In a typical comment, one contractor said, “DAP provides us with a folder that has pamphlets and we review [them]. I think they try to tailor it to the customer.” In contrast, two contacts in PG&E territory mentioned utility-provided training on energy

education, while none of the contacts in the other utility territories did so. According to one PG&E contractor, "There is a set protocol that [we] are trained to do, and we follow it."

Table 5.4: Resources Referenced in Description of Education Delivery, from Contractor Interviews

Resource	Proportion of Enrollment and Assessment Contractor Respondents Mentioning				
	PG&E (N=14)	SCE (N=8)	SCG (N=16)	SDG&E (N=1)	ALL (N=39)[1]
Printed materials	14%	50%	56%	0	38%
Utility-provided training	14%	0	0	0	5%

[1] Contractor respondents from 39 of the 62 firms reported that they conducted marketing for the program. Evaluating the effectiveness of contractor training on delivering customer education was outside the scope of work for this evaluation. An assessment of contractor training is worthy of future study.

Interviewed contractors typically reported supplementing their discussion of printed materials with specific advice on saving energy. However, ride-along observations suggest that some contractors might benefit from additional guidance on education delivery. While some of the observed contractors provided energy-saving tips to customers, others did not. Furthermore, several observed contractors spent minimal time ensuring that the customers understood the information they provided. One contractor who works in SDG&E territory acknowledged that the utility would like him to spend more time providing education, but believed the program's education materials did not support a discussion longer than the approximately 10 minutes he typically devoted to the topic.

The interviewed enrollment and assessment contractors most commonly suggested that incorporating electronic resources like DVDs or automated PowerPoint presentations could improve the energy education process (Table 5.5). According to contacts, these types of electronic resources might better engage customers. In addition, interviewed contractors said that contractors could leave a DVD with customers to view again or show family members who did not attend the enrollment and assessment visit. Contractors also suggested a desire for more targeted education materials that might address seasonal energy-saving opportunities or the customer's circumstances.

In a related suggestion, contractors stated that tools that would allow for a basic analysis of the customer's energy use might allow them to better engage customers and target the education they provide. According to one contractor who works in SCE territory, "[By] putting [advice] into dollars and cents, you can see [the customers'] minds turning." PG&E teaches customers how to use an energy wheel to estimate their energy costs by appliance or behavior. Customers can then use this wheel to guide decisions about household energy use.

Table 5.5: Enrollment and Assessment Contractors' Suggestions for Improving Education Delivery (Multiple Responses Allowed)

Resource	Mentions (n=39)[1]
Incorporation of electronic resources	5
Materials targeted to homeowner circumstances	4
Increased advertising and mass outreach	3
Analysis of customer energy use	2
Other	7
No suggestions offered	22

[1] Contractor respondents from 39 of the 62 firms reported that they conducted marketing for the program.

Description of Participation Processes

According to the P&P Manual, "In the course of the initial home visit, the outreach worker shall provide a thorough description of the program services available to the low-income household."[30] While ride-along and focus group findings suggest that contractors typically provided a basic description of the program visits a customer could expect to receive, there may be an opportunity to better educate customers about the full participation process, their eligibility for specific measures, and what the program required of the customer at each step of the process.

Enrollment and assessment contractors informed customers about the enrollment, assessment, and installation steps of the participation process in at least 85% of ride-along observations, and contractors mentioned inspections in 8% of observed visits.

In a focus group, inspectors in PG&E territory stated that installation contractors typically informed customers to expect an inspection, particularly in cases in which an inspection was mandatory. While these findings indicate that customers typically received a general description of the participation process, focus group participants noted a variety of areas in which better informing customers about program processes might facilitate those processes and increase customer satisfaction.

According to the inspectors, in the later stages of the participation process, customers might be unsure which contractors had been to their home and which services each contractor provided. Similarly, an interviewed contractor stated that customers often appeared confused about why a contractor had come to their home. One PG&E inspector noted that, even if the enrollment and assessment contractor explained the participation process, customers might be confused if an

[30] California Public Utilities Commission (CPUC), 2010. *The Statewide Low Income Energy Efficiency (LIEE) Policy and Procedures Manual*.

installation contractor encountered a problem and did not clearly explain the problem and the steps necessary to resolve it. PG&E inspectors also stated that some customers had the impression the contractors were utility staff members. In particular, the inspectors said that customers might believe gas service representatives or a contractor's quality assurance staff were PG&E inspectors.

In addition to noting some customers' confusion regarding the purpose of program visits, PG&E inspectors stated that customers might not be aware of the reasons they did not receive certain measures. In some cases, the inspectors explained that enrollment and assessment contractors might create unreasonable expectations for customers. For instance, enrollment and assessment contractors might tell the customer that they qualify for measures that an installation contractor later might determine are not feasible. The installation contractor, in turn, might not effectively explain to the customer why the contractor did not install the measure.

PROGRAM PAPERWORK AND DOCUMENTATION

Opportunities for Paperwork Reduction

In interviews and ride-along observations, both program staff and contractors reported that the program required a large amount of paperwork and expressed a desire to reduce it. In ride-along observations, we observed contractors and customers spending, on average, more than 13 minutes completing paperwork during enrollment and assessment visits; dual-utility customers required, on average, approximately three minutes more than single-utility customers (Table 5.6). Given the increased time required to complete paperwork for dual-utility customers, interviewed contractors expressed a desire for the IOUs to create a paperwork system that is uniform across all four territories. Further reflecting the burden program paperwork places on contractors, the majority of contractors interviewed reported their company employed at least one person dedicated to data entry.

Table 5.6: Time Spent on Paperwork during Enrollment Visits

Utility	Number of Ride-along Observations (n=41)[1]	Average Time Spent on Paperwork (minutes)
Single-utility customers	30	12.8
Dual-utility customers	11	15.8
All observations	**41**	**13.6**

[1] In one observed enrollment visit, the contractor did not complete enrollment paperwork because the customer did not qualify for the program.

Aside from a desire to reduce the amount of required paperwork and streamline the process, contractors reported little difficulty completing the required forms. In PG&E, SCE, and SDG&E territories, a majority of the interviewed contractors rated program application and enrollment

paperwork as "not at all difficult" or "not very difficult" (Table 5.7). As an interviewed contractor who works in PG&E territory said, while the paperwork was not very difficult, "even an experienced person can miss things on the form because there is so much information required."

Table 5.7: Contractor Ratings of Program Application and Enrollment Paperwork Difficulty

Rating (n=39)[1]	Not At All or Not Very Difficult	Somewhat or Very Difficult	Other
Application paperwork difficulty	16	14	9

[1] Contractor respondents from 39 of the 62 firms reported that they conduct marketing for the program.

In contrast to the other utilities, a majority of contractors who worked in SCG territory reported that program enrollment and assessment paperwork was "somewhat difficult." In open-ended responses, these contractors provided relatively little additional detail to support their ratings. Three SCG contractors stated that the paperwork was tedious; two of them also noted that the forms required a high level of detailed information.

Only one interviewed contractor identified specific information included on program forms that he felt was not necessary.[31] Other contractors suggested more general opportunities to streamline the paperwork process. Four contractors questioned the need to both electronically enter data and provide paper forms. One contractor also noted that multiple application forms requested the same customer and contractor data.

Customer Documentation Requirements

Ride-along, focus group, and contractor interview findings revealed that customers do have difficulty providing the documentation the program requires to verify eligibility. We observed customers experiencing some problems providing the required documentation in slightly less than half (47%) of our ride-along observations. Table 5.8 summarizes the types of problems customers encountered.

[31] This contractor, who worked in SCE service territory, asserted that it was unnecessary for the utility to require contractors to collect information on air-conditioning equipment in climate zones that did not qualify for air-conditioning measures.

Table 5.8: Customer Documentation Difficulties

Aspect Creating Difficulty	Observations	
	Number (n=40)	Percentage
Proof of income	10	25%
General difficulty locating documents	3	8%
Proof of home ownership	3	8%
Need for landlord approval	2	5%
Other	1	3%
No difficulty observed	21	53%

Based on ride-along observations, customers most often found it difficult to provide proof of income, particularly when they had a source of income other than a regular paycheck. For example, ride-along observations revealed, and staff acknowledged, confusion among some customers who were self-employed, worked informally, or received rental income from others. Consistent with these observations, one interviewed contractor stated that the program "has a real issue with people who don't have any income." According to this contractor, customers who had run out of savings and unemployment benefits might be unable to provide the documentation necessary to participate in the program.

Ride-along observations also indicated that proof of income might be more difficult for participants to provide than proof of home ownership, since contractors might be able to obtain proof of home ownership through a title search if the customer were unable to provide it. Providing documentation may be particularly difficult for customers for whom managing day-to-day functions is challenging, including some elderly and disabled customers. These customers may not be able to locate the required paperwork easily; as one contractor put it, "most of the people we deal with aren't super organized."

Consistent with these ride-along observations, contractors working in SCE and SCG territories reported in a focus group that customers frequently were unaware of which documents they needed to provide or had a hard time finding documents. This confusion may become an issue particularly for dual-utility customers of SCE and SCG. Although SCG staff said income documentation requirements were the same as those for SCE, contractor focus group participants believed the two utilities accepted different documents as proof of income.[32] According to focus group participants, contractors typically rescheduled enrollment and assessment visits if customers could not provide the necessary documentation. As a result, some customers might have received multiple visits during the enrollment and assessment process.

[32] We received copies of the program application forms. The SCG form had check boxes for public assistance programs used to qualify customers. The SCE form did not list specific programs used to qualify customers.

This difficulty obtaining proof of customers' income that the research team observed parallels findings from the LIEE program's 2001 process evaluation. In an effort to ease income verification requirements, the CPUC's 2001 Decision 08-11-031 allows self-certification of income in areas where 80% of the customers are at or below 200% of the federal poverty line. According to one interviewed contractor, "The utility companies have made great efforts to make the proof of income easier" by identifying cases in which customers can self-certify their income.

However, ride-along and interview findings suggest that the areas where customers can self-certify their income in this way were limited. We observed this practice taking place in only two of our 67 enrollment and assessment ride-along observations. Interviewed contractors asserted that some areas that should meet the CPUC's criteria had not been identified for targeted marketing. Moreover, many of the contractors said that their firms encouraged them to obtain income-qualifying documents even in the areas where self-certification was allowed.

In addition to allowing self-certification of income in targeted areas, one interviewed contractor suggested that contractors could alleviate some of the difficulties customers have in providing documents by clearly explaining the documents participants will be asked to provide when scheduling enrollment and assessment visits.

Rental Property Owner Permission

Ride-along observations and interview data indicate that it was hard for enrollment and assessment contractors to obtain permission from rental property owners to provide program services. In open-ended responses, ten of the interviewed contractors reported difficulty obtaining property owner permission. Three contacts stated that this difficulty had prevented customers from moving beyond an assessment, while three additional contacts said that they would not conduct assessments or deliver education until they received property owner permission. Contractors reported that rental property owners might not be motivated to respond to requests from customers and contractors, or might be skeptical of the program's offer to provide services at no cost.

Contractor interviews and focus groups suggest that confusion regarding the forms rental property owners must sign may compounded these owners' reluctance to participate. One contact noted that some utilities required property owners to sign forms stating that a co-payment might be necessary, even if none of the identified measures required a co-payment. According to this contact, if "the owners see any potential of getting a bill, they won't sign [the waiver]." In addition, SCE contractors participating in a focus group stated that some customers might be unsure if they or the property owner were responsible for any copayment. English-only property owner forms may further limit the ability of participants who do not read English well to communicate with their landlords about program recommendations, requirements, and responsibilities.

In addition to rental property owners' confusion related to forms, contractor interviews suggest that uncertainty regarding the role of LIEE in relation to other available programs might be a barrier to rental property owner participation. One interviewed contractor reported that the availability of multiple low-income efficiency programs may confuse property owners. According to this contact, there was little information available to rental property owners explaining program offerings and providing strategies for leveraging programs. In addition, while two contacts noted that contractors were limited in the services they could provide to renters through LIEE, four contacts assumed that state and federal programs had fewer limitations on measures for renters and less-stringent documentation requirements.

Interview and ride-along findings suggest an opportunity to improve program outreach to rental property owners. While many property owners may not be responsible for energy costs in tenant-occupied areas, property owners believe energy efficiency reduces tenant turnover and vacancy rates.[33] As a result, program participation may present a different value proposition to property owners than it does to tenants. Consistent with this, three of the eight contractors contacted in follow-up interviews reported reaching out to property owners directly in their program marketing.

Contractors noted that engaging with property owners and managers can be very beneficial because they may gain approval to provide services to multiple customers. However, the cost of ineffective outreach to rental property owners also can be great. Owners and property management companies may refuse services, denying access to large numbers of potentially eligible customers. In ride-along observations, we observed lists posted in contractors' offices of property management companies that had refused services. Focus group participants in Southern California also reported that many property owners refused program services.

Ride-along observations and focus group findings revealed a variety of strategies contractors pursued to obtain permission from property owners. One contractor reported sending materials to rental property owners explaining the program and including the property owner permission form in the mailing. However, this contact also noted that property management companies may value program services differently than individual rental property owners. According to this contact, property management companies may not be receptive to the program's offer of free services because the property management companies believe they can earn a fee from property owners for providing similar services.

Similarly, in a focus group, SCE and SCG contractors reported that the contractors' scheduling staff called property owners and provided them with forms even before the enrollment and assessment visit took place. In ride-along observations, enrollment and assessment contractors stated that they would personally call property owners to explain the program and ask for

[33] Recent research also supports this assertion, including Rounick, Gustav. 2010. *Energy Efficiency in Multifamily Properties: Drivers and Policies. Dept of Real Estate and Construction Management*, Master of Science Thesis no. 500; and Peters, Jane. 2010. Final Report: *Survey of Multifamily Property Owners.*

permission to provide services. In one ride-along observation, the contractor went to the office of a property owner he was unable to reach by phone. This contractor said it was important for contractors to attempt to obtain the owner's authorization during the visit, instead of presenting the program to owners and then asking them to provide their consent at some unspecified date.

CONTRACTOR INTERFACE WITH UTILITIES

Data Transfer to Utilities

Contractor interview respondents working in all four IOU service territories described their ability to upload data directly into each IOU's database. Contractors working in PG&E, SCE, and SDG&E territories rated the user-friendliness and effectiveness of IOU-provided data management tools highly, while contractors in SCG territory more often provided neutral ratings for that IOU's data management tools (Table 5.9).

Table 5.9: Relative Ease and Effectiveness of IOU-Provided Data Management Tools, Per Contractor Contacts

Rating	Responses (n=62)
RELATIVE EASE OF IOU-PROVIDED DATA MANAGEMENT TOOLS, PER CONTRACTOR CONTACTS	
Very easy	17
Somewhat easy	22
Neither difficult nor easy	12
Somewhat difficult	3
Very difficult	4
Don't know	4
RELATIVE EFFECTIVENESS OF IOU-PROVIDED DATA MANAGEMENT TOOLS, PER CONTRACTOR CONTACTS	
Very effective	16
Somewhat effective	26
Neither effective nor ineffective	9
Somewhat ineffective	5
Not effective	2
Don't know	4

Several contractors considered PG&E's provision of users with administrative (write) privileges to be an advantage because data-entry personnel could edit information after uploading it to PG&E's database. SCE, SCG, and SDG&E databases did not allow contractor data-entry personnel to make edits after uploading. According to one SCG contractor, "We have to wait for administrative action to make changes on the database – and the program staff often takes quite awhile to respond." Additionally, contractor office staff noted that when they enter information

into SCE's and SCG's databases, even prior to uploading, it was difficult to tab back through fields to correct data that had been entered, because when they returned to a previous field, any data already entered in that field had been erased.

Staff members checked enrollment forms and the documentation customers provided before entering the information into the program database. Contractors in SCE and SCG territory also might check the customer's information to determine if they qualified for LIEE services from an IOU that did not perform the initial enrollment and assessment. According to contractors, the data they entered from forms had to match the information in the program database exactly, with even small grammatical differences resulting in system errors.

Opportunities to Facilitate Data Entry

Regarding data management practices, two contractors (one in SCG and one in PG&E territories) noted that the administrative hours required to implement the program have increased as tracking shifted from paper reporting to both paper and electronic reporting. The contractor respondent working in PG&E territory noted that, after entering information from physical forms into the IOU database, contractors had to then scan the forms and send them to PG&E. According to this contractor, that added step doubled the administrative hours required to implement the program.

To streamline reporting processes, contractor contacts from each of the IOU service territories suggested that the IOUs facilitate a paperless enrollment and assessment process by providing electronic mobile devices to contractors. SCE recently provided tablet PCs and portable scanners to a subset of its enrollment and assessment contractors.[34] Ride-along observations indicated that enrollment and assessment contractors typically used digital cameras or other portable devices to collect electronic copies of customer documentation. Contractors' use of this technology appeared more efficient than relying on customers to fax or mail copies of their documents, as one of the observed contractors did.

Communication and Coordination with Utility Staff

Interview findings indicate that contractors communicated with utility staff or the utility's prime contractor frequently. Nearly half (47%) of all contacts reported that they were in email contact with staff members daily and approximately 80% reported at least weekly email contact. However, contacts working in SCE, SCG, and SDG&E territories provided higher ratings for staff members' responsiveness to those emails than did their counterparts in PG&E's service territory (Table 5.10). Two-thirds (67%) of respondents in SCE, SCG, and SDG&E territory reported that utility staff were very responsive to their requests for assistance, while 38% of contractors in PG&E territory reported that the utility's prime contractor was very responsive.

[34] Excerpted from Monthly Report of Southern California Edison Company on Low Income Assistance Programs for December 2010.

Among RHA-managed contractors' ratings, 54% rated RHA as "very responsive." Among R&R contractors, 50% rated PG&E staff's responsiveness as "usually responsive." The interview responses do not indicate a clear reason for this difference in ratings.

Table 5.10: Degree of Responsiveness of Utility/Program Administrator Staff, Per Contractor Respondents

Responsiveness	Contractor Ratings of Program Administrative Staff					
	PG&E (N=26)		SCE (N=8)	SCG (N=20)	SDG&E (N=8)	TOTAL (N=62)
	R&R	RHA-MANAGED				
Very responsive	3	7	6	12	6	34
Usually responsive	6	2	1	4	2	15
Not very responsive	2	1	0	3	0	6
Other	1	4	1	1	0	7

Open-ended responses from RHA-managed contractors in PG&E's service territory suggest that individual contacts with whom the contractors had interacted provided varying levels of service. One contractor noted that RHA was very responsive to issues raised by office staff. In contrast, several contractors noted that RHA was not very responsive to issues raised by field staff. Nonetheless, one contractor noted that RHA was adding staff in order to improve its responsiveness to field issues. Consistent with this assertion, another contractor said he had recently begun working with a new contact who was much more responsive than the staff contact he had worked with previously.

Contractors' lower ratings of PG&E's responsiveness, particularly to field staff, also may reflect the long hold times contractors encountered when they called PG&E from the field. Both contractors and PG&E inspectors reported waiting on hold as long as 45 minutes when calling the Central Inspection Program (CIP) hotline and when calling to schedule gas service (discussed further in the *Gas Appliance Safety Check* section below).[35] Contractors attributed these long waits to a need for additional staffing at PG&E. As mentioned above, one R&R contractor also cited a need for additional staff as the cause of extended reimbursement cycles; he stated that in some cases, it had taken PG&E more than 90 days from the time a job was completed to reimburse the contractor. Other contractors also noted that PG&E's reimbursement cycle could be lengthy. RHA contended that they had paid contractors within 30 days after contractors submitted job completion forms and entered the information into EPO "with almost no

[35] As mentioned previously, PG&E hired two additional staff in early 2011, and PG&E staff report an average wait time of under two minutes.

exceptions in the past four years." There may be differences in the experience of R&R contractors who work directly with PG&E staff and contractors managed by RHA.

APPROACHES TO SCHEDULING AND WORKING WITH CUSTOMERS

The P&P Manual specifies that contractors must provide services to customers "in a reasonable time frame, as determined by the utility." The manual further states "the number of visits to a home shall be kept to a minimum."[36] Ride-along and focus group findings revealed a variety of barriers that contractors faced in meeting these goals, as well as strategies contractors undertook to overcome those barriers.

Scheduling Program Visits

In ride-along observations, contractors reported that it often was difficult to schedule appointments with customers and observations indicated that missed appointments were common. Ride-along and focus group findings indicate that contractors typically called customers before visiting the customer's home to ensure that the customer would be available. Some contractors also contacted customers directly to reschedule appointments if they encountered an unexpected delay or had a cancellation that would allow them to move appointments forward.

In an effort to facilitate scheduling efforts, one contractor we observed in ride-alongs, as well as one interview contact, reported scheduling installation appointments during the enrollment and assessment visit. According to the interview contact, "When you have [the customer] at E&A, they are committed" and may be more receptive to scheduling an installation appointment than they would be at another time. In addition, one interview respondent noted that a large proportion of program participants work during normal business hours, making it difficult to schedule appointments during the day. To address this, the contractor respondent said that he intended to change the hours his staff works.

Focus group findings also suggest there was an opportunity for contractors to better communicate with customers regarding scheduling. Inspectors in PG&E territory stated that contractors' missed appointments were one of the most common sources of participant dissatisfaction the inspectors encountered. In addition, contractors in SCE and SCG territories reported keeping detailed records of any instances in which the customer was not available, in case the customer later called to complain about a missed appointment.

[36] California Public Utilities Commission (CPUC), 2010. *The Statewide Low Income Energy Efficiency (LIEE) Policy and Procedures Manual*.

Efforts to Minimize the Number of Visits Customers Receive

The IOUs and contractors worked to minimize the number of visits to customers to reduce implementation costs and minimize inconvenience to customers. However, a variety of circumstances, such as the need for contractors to return to customers' homes to obtain qualifying documentation and situations that required special parts or crews to complete measure installation, required additional customer visits. While inspectors in PG&E territory stated that their compliance inspections typically were the fifth or sixth visit a customer received, and noted that customers might receive as many as 12 visits, customer survey findings (see Chapter 6) indicate that most customers received between two and three visits; six or more visits were extremely rare. Contractors and inspectors noted situations that might result in additional program visits.

- **Enrollment and assessment:** Contractors reported rescheduling appointments if a customer did not have the required documentation available.
- **Installation:** Contractors and inspectors cited a variety of factors that might increase the number of installation visits a customer received, including:
  - **The need for equipment**, like a specialized door or windowpane that the installation crew did not carry with them. In focus groups, PG&E inspectors noted that some installers carried a more comprehensive range of equipment than others did.
  - **The structure of the contractor's crews**, with some contractors employing insulation crews distinct from those that installed ground weatherization measures. Some installers also might subcontract for services like window installation.
  - **HVAC or gas appliance safety issues** that required service from the utility's gas service representatives or the repair and replacement program.
- **Inspection:** Contractors and PG&E inspector focus group participants reported that measures that failed a compliance inspection required at least two additional program visits: the contractor would return to address the issue and the inspector would return to re-inspect the work.

In focus groups, PG&E inspectors suggested that conducting a more detailed assessment of the measures needed before an installation crew arrived might facilitate the installation process and ultimately reduce the number of visits required. Consistent with the inspectors' assertion, one contractor stated that his installation crews typically determined what a home needed then returned to their warehouse for supplies before completing the installation. According to this contractor, "I definitely have to 'pre-run' to know what I've got…. Someone has to see the job first to get the job together." This contractor suggested that requiring enrollment and assessment contractors to provide digital photographs of the homes they enroll might help installation contractors better prepare for each job.

In addition to this contractor's desire for enrollment and assessment contractors to provide photographs and additional detail with their observations, interviewed contractors expressed dissatisfaction with the more detailed audits (also called *assessments*) conducted after the enrollment and assessment process was complete. According to contacts, the information provided through the detailed audits frequently was inaccurate or incomplete, requiring the contractors to return to the homes with the necessary parts and/or tools. HVAC contractors, in particular, expressed dissatisfaction with the quality of the detailed audits, which weatherization contractors typically conducted. Due to the lack of detail with regards to HVAC audits, one contractor working in PG&E territory said that his firm did not rely on the audits, but instead performed a separate HVAC audit to ensure it had the necessary tools and parts on hand. One HVAC contractor said that it would be helpful for the detailed audits to include information, such as model numbers, serial numbers, and fuel sources for water heaters, furnaces, and vents.

Whole Neighborhood Approach

The Whole Neighborhood Approach to LIEE implementation seeks to both ease scheduling difficulties and reduce the burden program participation places on customers. Under the Whole Neighborhood Approach, contractors conduct outreach, enroll, and treat households in quick succession. However, contractor interview findings suggest that such an approach usually may be incompatible with contractors' workflow. While several contacts suggested that performing the installation on the same day as enrollment and assessments could expedite program processes, eliminating the need for additional appointments, these contractors appeared to have little practical experience with the approach.

In contrast, contractors who had employed this approach reported that scheduling installations on the same day as enrollments and assessment visits often was impractical. Contractors explained that, in general, it was difficult to mesh these two activities in a way that efficiently accomplished both enrollment and assessment and installation. Enrollment and assessment visits typically took less time than installation visits. As a result, installation crews might become backlogged. Conversely, if enrollment and assessment crews had difficulty enrolling customers, installation crews sometimes were idle, which was costly for contractors. Furthermore, contractors noted that because the same-day approach required installation crews to be prepared for a variety of homes, they had to haul more equipment than generally was practical.

Although contractors considered same-day installation impractical when targeting single-family homes, interview findings suggest that a same-day approach can be effective in multifamily complexes or other situations in which customers live in similar types of dwellings. One contractor noted that a same-day approach worked well in apartment buildings in which multiple units frequently qualified for similar measures. Similarly, another contractor noted that the same-day approach also worked well when targeting mobile home parks, because mobile homes often required similar measures and the concentration of mobile homes within a park allowed contractors to reach multiple customers in quick succession.

One respondent also noted that a same-day approach often was practical in rural settings because it reduced travel time, which might offset other inefficiencies the approach involves.

SAFETY CHECKS AND INSPECTIONS

Gas Appliance Safety Checks

Contractor interview findings indicate that combustion appliance problems were the most common issue that prevented projects from moving beyond an assessment or limited the measures installed (Table 5.11). A majority of the interviewed enrollment and assessment contractors from each gas utility cited combustion appliance problems as a barrier they had encountered. In open-ended comments, contractors varied regarding the extent to which these issues impacted the services they provided. According to one contractor, "Providing CVA [-related repairs] isn't compensated by the Gas Company, so we can't do the work, and have to walk away from the home."[37]

Table 5.11: Factors that Prevent Projects from Moving Forward or Limit Measures Installed, from Contractor Interviews (Multiple Responses Allowed)

Limiting Factor	Proportion of Observations (n=39)[1]
Combustion appliance problems [2]	54%
Pests	21%
Unsanitary conditions	13%
Pets	8%
Hoarders	8%
Unsafe (violent) conditions	8%
Mold	5%
Home in bad repair	5%
Other	15%
Rarely encounter issues	18%

[1] Contractor respondents from 39 of the 62 firms reported that they conducted marketing for the program.

[2] Includes CVA issues, gas leaks, high carbon monoxide levels, cracked heat exchangers, problems with combustion appliances and other heating system issues. As an electric-only utility, combustion appliance issues do not impact SCE's program offerings.

[37] The CPUC approves the list of measures and repairs covered by the program.

While the program reimbursed contractors for certain minor home repairs that facilitated installation of infiltration measures, other minor home repairs that had to be completed before the installation of infiltration measures were not reimbursable; contractors were authorized to complete such repairs at their own cost. In contrast, three contractors reported providing only non-infiltration measures when a gas appliance issue was present, and two reported that gas issues might result in installation delays as the program and utility worked to resolve the problem. In addition, three contacts reported leveraging state and federal programs to repair gas appliance issues they encountered.

All of the utilities offered repair and replacement services to address problems with combustion appliances, although these services might be limited for rental properties. Consistent with staffs' remarks concerning the difficulties associated with servicing NGAT failures, focus group findings also suggest that barriers to coordination existed between the LIEE program, utility staff who service gas problems, and R&R services. These coordination barriers could create serious discomfort for customers who might not have had space or water heat from the time a gas service representative or program contractor disconnected an appliance and capped a leaking gas line until they received R&R services.

While contractors in the SCG territory provided less detail regarding the cause of delays than did the PG&E inspectors, focus group participants in SCE and SCG territories also stated that customers might face a long wait for NGAT and CVA issues to be addressed. To facilitate the process, the contractors reported encouraging customers to make repairs themselves when possible. Additionally, the contractors stated that they would at times make simple repairs that would allow them to complete the installation. In particular, two interviewed contractors reported that they might install vents to address CVA issues with water heaters in enclosed spaces. The program did not reimburse the contractors for some of these repairs.

Focus group and interview findings suggest that while some contractors may have viewed the repairs as worthwhile if they eliminated the need to schedule additional installation visits, others may have opted to install only non-infiltration measures when such repairs were required. According to one contractor, if the program were to reimburse more minor repairs to address gas safety issues, "they will open up so many more applications." One weatherization contractor who participated in the focus group suggested allowing weatherization contractors to make more repairs that address gas safety issues during the initial visit in order to install infiltration measures immediately, rather scheduling a separate crew to do the repairs and therefore delaying the work.

Because LIEE is limited in the appliance repair and replacement services it provides to renters, interview findings suggest that the ability to leverage state and federal programs may be particularly important in addressing NGAT issues for customers in rental properties. According to one contractor who works in PG&E territory, "They cap off furnaces or major gas leaks, then those people are without hot water or heat, depending on if it will ever be fixed through the R&R program. Renters don't get fixed, so that's where we have to come in and help those people through another program."

Similarly, another contractor in PG&E territory stated that by referring customers to state and federal programs, they could "move forward" with program services that firms that cannot leverage other programs would not be able to provide. However. one contractor questioned this approach, saying "Low-income ratepayers that rent, pay the same amount into the gas surcharge, so why is it okay for them to subsidize owners' furnaces, but not the other way around?" This contractor noted that, "There is no way to enforce the law [that requires] landlords to provide heat for tenants," and referring customers to LIHEAP would not solve the problem, because LIHEAP "won't be able to handle all the customers." Water heaters, according to this contractor, were not as big of a problem as furnaces and, as such, he had suggested several times that the CPUC and IOUs set aside funds to help renters with their furnace issues.

Ride-along and focus group findings suggest that placing responsibility for NGAT testing on contractors or utility staff members who have the ability to directly address some issues could alleviate some of the problems that PG&E inspectors described. In SDG&E territory, the enrollment and assessment contractor staff members responsible for NGAT carried the tools and parts necessary to perform rudimentary repairs they were likely to encounter. While NGAT inspection contractors' ability to make repairs was limited – they had to "tag and cap" appliances when they encountered a gas leak and refer broken appliances in rental units to the property owner – the contractors could devote as much time as necessary to make authorized repairs. In our focus group, PG&E inspectors cited a pilot initiative in San Jose that took a similar approach, giving gas service representatives the responsibility for NGAT inspections.

Coordination of Inspections and Safety Checks with Measure Installation

Ride-along observations and interview findings reveal that contractors employed a variety of strategies to coordinate safety checks and inspections with measure installation in order to reduce the burden program participation placed on customers. One interview contact in SCG territory whose organization did installations and inspections described efforts to coordinate inspections with measure installation. According to this contact, installation crews called the contractor's central office as they finished a job and the central office dispatched an inspector. This contact stated that because the inspection and installation took place during the same visit, the installation crew could immediately address any issues the inspector identified. In general, SCG weatherization crews performed NGAT at the end of the weatherization installation visit.

Similarly, in ride-alongs, we observed contractors in SDG&E territory working to coordinate NGAT inspections with installation of weatherization measures. The contractor staff members responsible for NGAT inspections used the program database to identify homes scheduled to receive weatherization services on a given day. The NGAT inspectors then communicated with both installation contractors and customers to narrow scheduled installation windows and create a more concrete schedule of inspections. Comments by contractor staff who conducted NGAT inspections suggest that some installation contractors were more receptive to this type of cooperation with the NGAT inspection contractors than were others.

Coordinating NGAT inspection with measure installation – as the observed SDG&E contractors did – facilitated the participation process for customers who did not need to arrange an additional inspection visit. However, to some extent, this increased convenience for the customer came at the expense of contractor efficiency. Because the NGAT inspection contractors must structure their inspections around scheduled installation visits, the contractors sometimes faced downtime between inspections while waiting for installation crews to arrive. In addition, instead of grouping inspections in one area, installation contractor schedules sometimes required NGAT inspectors to travel from one neighborhood to another. Finally, NGAT inspectors' schedules sometimes became backlogged when they encountered problems requiring time-consuming repairs.

While PG&E inspectors did not describe efforts to coordinate their visits with installation contractors, focus group findings suggest the inspectors maintained informal relationships with contractors that allowed them to proactively address issues that arose frequently. According to one inspector, "It's just easier to kill [an issue] at the source when you notice it on a few jobs. If we can stop it, the pattern won't continue and it's less jobs that we have to go re-inspect, less customers that have to deal with the additional visits." The inspectors noted that they nonetheless reported issues they encountered in the program database, but stated that these informal contacts allowed them to more quickly address recurring problems. Contractors also reported maintaining informal relationships with gas service representatives in order to more effectively track program efforts to address any CVA or NGAT issues.

Training and Knowledge Transfer

Focus group and ride-along findings suggest there may be an opportunity to improve internal knowledge transfer, particularly among inspectors. In focus groups, PG&E inspectors stated that they had gained knowledge in two primary areas that could benefit their less experienced colleagues. First, the inspectors said they had learned informal ways to work around inefficiencies in program processes and to effectively coordinate between the actors involved in program delivery. These skills included working with the program database and finding additional homes in the area to fill in any vacancies in their inspection schedules. Second, the inspectors reported they had developed skills in education and customer service to support their role as the customer's final contact with the program.

Similarly, in ride-alongs, inspectors in Southern California noted that, while less experienced inspectors might focus on identifying and penalizing contractors' shortcomings, more experienced inspectors sought to resolve issues most conveniently for the customer. To this end, inspectors might carry out simple repairs or advise the customer to do so rather than calling the contractor back to the home and requiring the customer to schedule additional program visits.

Finally, an interviewed contractor in PG&E territory expressed a desire for more frequent training classes to certify staff members to conduct enrollment and assessment and NGAT. According to this contractor, new employees had been unable to receive utility certification quickly enough to meet the contractor's demand. This contractor suggested the program could

provide training more widely by creating a mechanism to certify contractor staff to administer training.

6 CUSTOMERS

In this chapter, we report the results of the telephone surveys we conducted with 268 customers of the four IOUs participating in the LIEE program, as well as 268 nonparticipants who met the basic income requirements. Abt SRBI fielded the surveys between December 28, 2010, and January 10, 2011. Average completion time was 18 minutes.

We compared results across the four IOUs for: respondents' age, household size, and gender; space- and water-heating fuel type; and measures installed. When appropriate, we analyzed the results by the number of measures installed and the number of visits received. All the results are presented by IOU. We include findings of all other cross-analyses only when we observed statistically significant results, denoted with $p<0.05$.

CHARACTERISTICS OF PARTICIPANTS AND NONPARTICIPANTS

Table 6.1 shows key demographic and housing characteristics of participants and nonparticipants by IOU territory. A large majority of CARE customers (92% to 97%, depending on the IOU) were nonparticipants in LIEE; therefore, characteristics of LIEE nonparticipants resemble those of CARE customers.

Table 6.1: Characteristics of Participants (P) and Nonparticipants (NP)

Characteristic	PG&E		SCE		SDG&E		SCG		Total	
	P (N=67)	NP (N=63)	P (N=46)	NP (N=63)	P (N=67)	NP (N=57)	P (N=67)	NP (N=64)	P (N=247)	NP (N=247)
Age										
18 to 35 years old	7%	8%	10%	11%	14%	13%	7%	10%	10%	10%
36 to 55 years old	31%	35%	31%	40%	41%	34%	39%	37%	36%	37%
56 years or older	61%	56%	58%	49%	45%	54%	54%	52%	55%	52%
Household Size										
1 person	30%	47%	21%	32%	27%	36%	18%	21%	24%*	34%*
2 persons	23%	21%	33%	16%	18%	20%	18%	22%	23%	20%
3 to 4 persons	30%	16%	22%	29%	33%	20%	36%	33%	30%	25%
5 or more persons	17%	16%	24%	24%	22%	24%	28%	24%	23%	22%

Continued

Characteristic	PG&E		SCE		SDG&E		SCG		Total	
	P (N=67)	NP (N=63)	P (N=46)	NP (N=63)	P (N=67)	NP (N=57)	P (N=67)	NP (N=64)	P (N=247)	NP (N=247)
Space Heating Fuel										
Electricity	28%	28%	12%	33%	23%	41%	23%	29%	21%	32%
Natural gas	62%	56%	87%	56%	76%	53%	75%	69%	75%*	59%*
Other	11%	16%	2%	11%	2%	6%	2%	2%	4%	9%
Water Heating Fuel										
Electricity	22%	14%	8%	18%	11%	30%	6%	15%	12%	19%
Natural gas	76%	73%	89%	73%	88%	68%	94%	85%	87%*	75%*
Other	2%	13%	3%	9%	2%	2%	0%	0%	2%	6%

Notes: P = participants and NP = nonparticipants. Total sample size: 247 each for the participant and nonparticipant surveys. See the sections below for explanations of the reduced sample sizes. Asterisk (*) denotes $p<0.05$.

Participants and nonparticipants were relatively older; more than half were 56 or older, while only 10% were 35 or younger. An average of one-third of the nonparticipants throughout all of the IOUs' territories lived alone; the remainder were spread relatively equally among two-person (20%), 3 to 4-person (25%), and larger (5 or more) households. Participants' household sizes were slightly larger; this was consistent across the four IOUs ($p<0.05$).

The type of fuel used for space and water heating seems to have a stronger association with contacts' participation status. Across the four IOUs, participants were more likely to use natural gas for space heating (75%) and water heating (87%) than were nonparticipants (59% and 75% respectively; $p<0.05$).

PARTICIPANTS

After we fielded the survey, we learned that SCE's list of participants included 21 customers (31%) who had received an initial assessment, but were disqualified for measure installations. As a result, we excluded them from the analysis. Therefore, the sample size of participants was 247.

Measures Installed

We analyzed each IOU's LIEE customer databases per measures installed in participants' homes. Table 6.2 shows the percentages of the respondents who received each measure type by IOU.

Overall, measures relating to infiltration and space conditioning (72%), water heating (69%), and lighting (64%) were the most common repairs or installations. There is wide variation in measure type installed per IOU due to the kinds of measures offered by each. Thus, the *NA* entries in Table 6.2 reflect measures not offered by an IOU. SCE and SCG served many of the same customers and offered measures relevant to their fuel type. SCG did not install lighting measures,

refrigerators, or cooling measures fueled by electricity; SCE did. SCE did not install water heating or heating system measures, while SCG did. SCE did not install infiltration and space conditioning measures in homes that used gas, propane, or wood as their primary heat source, which explains the low (7%) installation rate. The distribution of measure types among the sample of participants is similar to the participant populations.

Table 6.2: Types of Measures Received by Participants

Measure	PG&E (n=67)	SCE (n=46)	SCG (n=67)	SDG&E (n=67)	Total (n=247)
Infiltration & space conditioning	81%	7%	94%	88%	72%
Water heating measures	69%	NA	99%	88%	85%
Lighting measures	90%	72%	NA	96%	87%
New measures (microwave, furnace filter, etc.)	76%	0%	13%	22%	30%
Refrigerators	13%	22%	NA	22%	19%
Cooling measures	15%	26%	NA	12%	17%
Heating system	0%	NA	13%	4%	6%
Pool pumps	NA	7%	NA	NA	7%
Programmable thermostat (pilot measure)	NA	7%	NA	NA	7%

Note: Ns for total are adjusted for measures that have NA (not applicable) for one of the IOUs.

The maps in Figure 6.1 and Figure 6.2 show the distribution of these measures across Northern and Southern California. Installations were concentrated in densely populated areas, such as Los Angeles, the Bay Area, and Fresno. Our research indicates there are opportunities to capture additional significant savings in some of the outlying areas.

Figure 6.1: Distribution of PG&E Measure Installations (Sample)

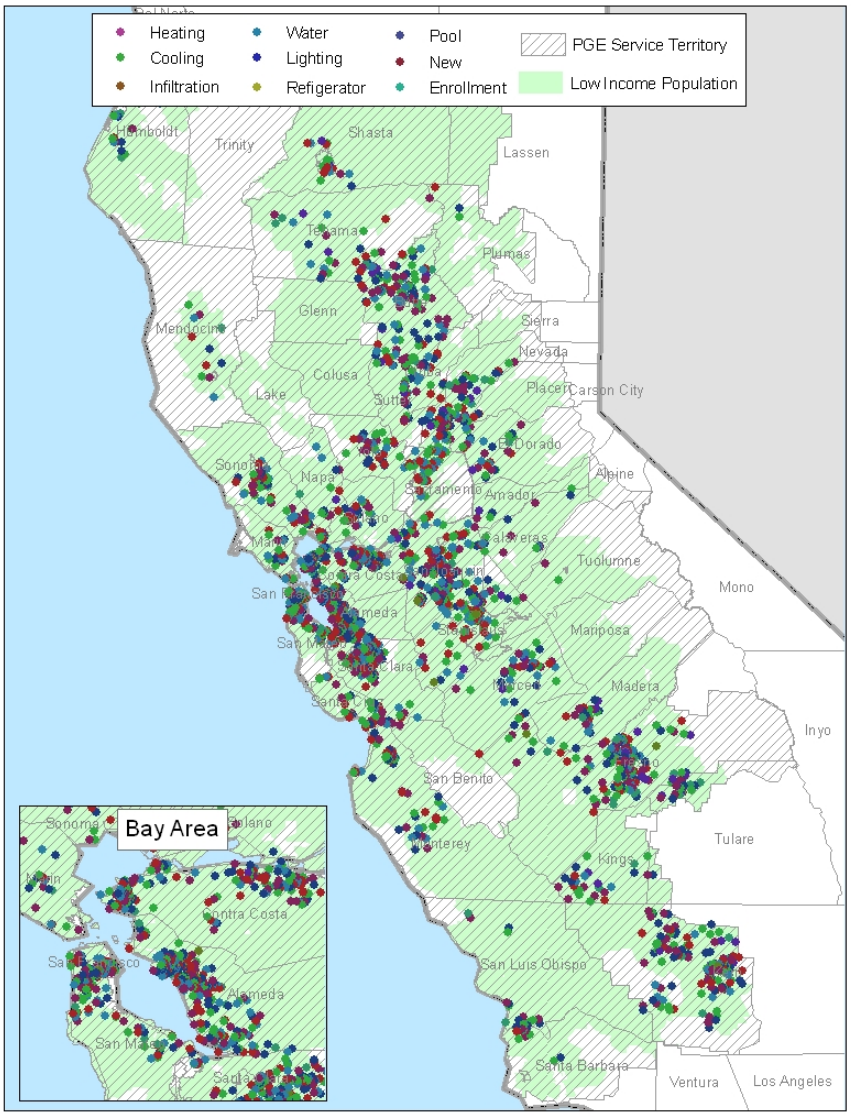
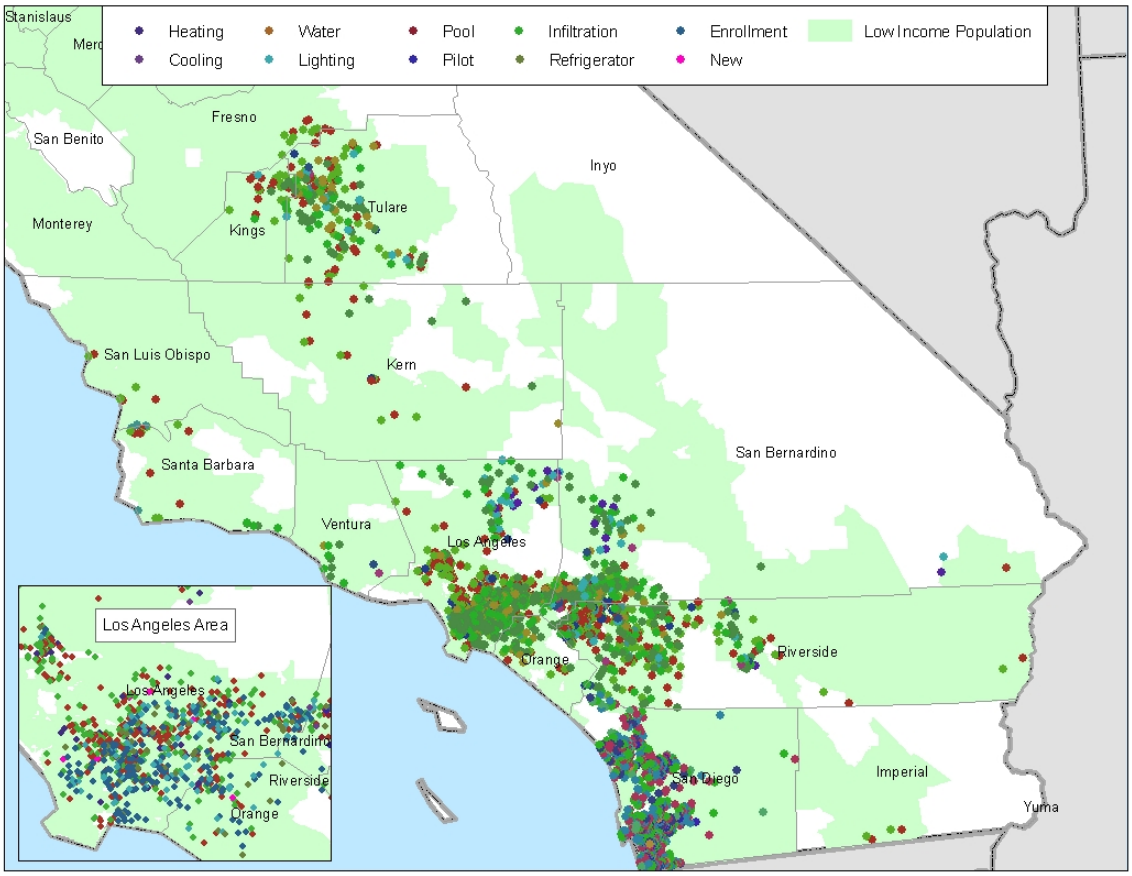


Figure 6.2: Distribution of SCE, SCG & SDG&E Measure Installations (Sample)



Marketing and Outreach

Table 6.3 summarizes the customer contacts' responses to the question about how they first heard about the program. On average, contacts from all four utilities most frequently (27%) reported hearing about the program through word-of-mouth communication – via family members, friends, colleagues, and neighbors. An average of 24% of all contacts said they heard about the program via their utility's bill insert. Smaller percentages of respondents recalled direct outreach activities, such as door-to-door outreach (11%) and telephone marketing (9%), as their first source of program information. Far fewer contacts reported utility websites (5%), media sources (3%), and other programs and organizations (3%) as their first source of LIEE program information.

Each IOU employed unique outreach strategies ($p<0.05$). Contacts of SCE were significantly more likely to report the utility's bill insert as the first program information source (41%) than those of other IOUs. A significantly higher percentage of participants in the PG&E territory reported they first learned of the program through a phone call (19%) than those in other IOU territories.

Table 6.3: Source of Program Information

Source	PG&E (n=67)	SCE (n=46)	SDG&E (n=67)	SCG (n=67)	Total (n=247)
Word-of-mouth (friends, family, colleague, etc)	33%	22%	31%	21%	27%
Utility's bill insert	13%	41%	19%	27%	24%
Someone stopped by	12%	2%	16%	9%	11%
Phone call	19%	4%	6%	6%	9%
Utility website	1%	4%	4%	9%	5%
Media (TV, radio, paper, etc.)	1%	0%	7%	3%	3%
Other program, organization	3%	4%	0%	4%	3%
Other	10%	4%	6%	4%	6%
Don't know	6%	17%	9%	16%	12%
Total	**100%**	**100%**	**100%**	**100%**	**100%**

As shown in Table 6.4, when asked about their reasons for participating in the program, a majority of the contacts for all utilities reported that "saving energy / reducing [their] utility bill" was their primary reason (68%). Eleven percent of the respondents also reported "sometimes having trouble paying [their] utility bills" as a reason for participation. Twelve percent of contacts reported becoming interested in the program because the utilities provided the services for free. Three percent of respondents also reported deciding to participate in the program because they were concerned about protecting the environment, and 2% said they participated because their property manager asked them to.

Table 6.4: Reason for Participation

Reason	PG&E (n=67)	SCE (n=46)	SDG&E (n=67)	SCG (n=67)	Total (n=247)
To save energy / reduce utility bill	69%	80%	67%	58%	68%
Service was free	6%	9%	15%	16%	12%
Sometimes have trouble paying utility bill	12%	11%	7%	12%	11%
To help the environment	3%	0%	4%	3%	3%
Property manager wanted me to	3%	0%	1%	1%	2%
Other reasons	3%	0%	3%	7%	4%
Don't know	4%	0%	1%	1%	2%
Total	**100%**	**100%**	**100%**	**100%**	**100%**

Question: *"Which of the following best describes why you decided to participate in the <program name>?"*

Energy Education

We also asked participants if they had received any energy education through the program. Table 6.5 shows that 76% of all respondents recalled an energy education component.

Table 6.5: Energy Education Provided

Was Energy Education Provided?	PG&E (n=67)	SCE (n=46)	SDG&E (n=67)	SCG (n=67)	Total (n=247)
Yes	75%	83%	82%	66%	76%
No	25%	17%	18%	34%	24%
Total	**100%**	**100%**	**100%**	**100%**	**100%**

Question: *"Did the program representative tell you how you could save energy?"*

We then asked those who could recall receiving energy education if they could remember specific information they had received (Table 6.6). The three most common mentions related to infiltration and space conditioning (such as adding insulation and reducing drafts around doors and windows – 40%), replacing old light bulbs and fixtures (37%), and changing various energy-using behaviors (such as adjusting heating and cooling temperature settings and turning off lights when not in use – 32%). Nine percent of contacts reported they received suggestions on replacing older appliances with more energy-efficient ones.

Table 6.6: Suggestions Provided during Energy Education (Multiple Responses Allowed)

Measures Suggested	PG&E (n=50)	SCE (n=38)	SDG&E (n=55)	SCG (n=44)	Total (n=187)
Infiltration and space conditioning	46%	32%	44%	36%	40%
Lighting	30%	37%	56%	23%	37%
Behavior change	38%	37%	27%	27%	32%
Appliances	10%	11%	11%	2%	9%
Water conservation	2%	3%	5%	7%	4%
Water heating	0%	3%	5%	7%	4%
Cooling	0%	5%	0%	5%	2%
Other topics	10%	13%	11%	7%	10%

Question: *"What did they suggest?"* The question was asked in an open-ended format and the responses were coded later. Percentages do not total 100% because many respondents provided multiple responses.

Number of Visits

Respondents reported the number of times people, including program representatives and contractors, visited their house to complete the project. As noted in Table 6.7, the average number of visits received was 2.6. SCE customers reported an average of 3.5 visits, which is significantly higher than what the customers of the other IOUs reported ($p<0.05$).

Almost all of the respondents said the program representatives and contractors arranged visits when it was convenient for the customer.

Table 6.7: Number of Visits

Visits	PG&E (n=67)	SCE (n=46)	SDG&E (n=67)	SCG (n=67)	Total (n=247)
1 time	36%	17%	34%	36%	32%
2 times	27%	22%	42%	34%	32%
3 times	18%	33%	12%	16%	19%
4 times or more	19%	28%	12%	13%	17%
Total	**100%**	**100%**	**100%**	**100%**	**100%**
Mean ($p<0.05$)	**2.7**	**3.5**	**2.2**	**2.2**	**2.6**

Question: *"Do you remember how many times people, including the contractor, visited your house to complete the work?"*

Customer Satisfaction

We investigated several measures of contacts' satisfaction with the program. Due to space limitations, tables that show satisfaction ratings present only percentages of *satisfied* responses by IOU.[38]

Program Factors

We asked participating contacts about their satisfaction with all areas of the program process, including: the explanation of the program provided by the program representative during the first contact; courteousness of the program representative throughout the visit; sign-up process for the program; energy-saving information provided; people who visited their home throughout the process; and the amount of time the whole process took (Table 6.8).

[38] All satisfaction rating questions had a 5-point scale, with "1" being *very dissatisfied* and "5" being *very satisfied*. In the tables in this section, we combined the "4" and "5" ratings into one category we have labeled *satisfied*. See appendix A for outputs of all responses.

Overall, contacts reported high satisfaction in all areas. Across the IOUs, the items contacts rated most highly were, in order: the people who were involved in the process, the sign-up process, and the overall project completion time.

Table 6.8: Customer Satisfaction – Program Factors (Percent Satisfied)

Program Factor	PG&E (n=67)	SCE (n=46)	SDG&E (n=67)	SCG (n=67)	Total (n=247)
Courteousness of program rep	92%	98%	98%	97%	96%
Sign-up process	89%	96%	97%	97%	95%
People who came to your home	91%	93%	94%	95%	93%
Time it took to complete the process	91%	84%	94%	95%	92%
Program explanation provided by program rep	89%	96%	89%	89%	90%
Information provided on how to save energy (p<0.05)	92%	83%	94%	80%	88%

Question: *"Using a scale from 1 to 5, where 1="strongly disagree" and 5="strongly agree", please rate the following statements* [expressing a positive opinion of …].

A significance test suggests that satisfaction ratings given by customers of SCE and SCG on "energy-saving information" were significantly lower than ratings given by customers of the other IOUs (p<0.05).[39] Those who received less than two measure types also rated "energy-saving information" lower than those who received more measures (p<0.05).

Measures and Services

For the four primary measure types – CFLs, refrigerators, heating systems, and air conditioning – we investigated participating contacts' satisfaction with and their perceptions of the quality of the items they received.

Table 6.9 shows the percentages of contacts who said they were satisfied with the item they received. A large majority of the respondents were satisfied with the items installed. Satisfaction with CFLs and refrigerators was the highest (91%); satisfaction with heating and cooling system installations was the lowest (82%).

[39] We used nonparametric tests to analyze group differences in satisfaction ratings.. We used Mann-Whitney U for variables with two groups and Kruskal-Wallis for variables with more than two groups.

Table 6.9: Customer Satisfaction – Measures Installed (Percent Satisfied)

Measure	PG&E	SCE	SDG&E	SCG	Total
CFL (n=157)	91%	86%	93%	—	91%
Refrigerator (n=34)	89%	100%	87%	—	91%
Heating system (n=12)	—	—	—	88%	82%
Cooling system (n=30)	—	92%	100%	—	82%

Question: *"On a scale from 1 to 5, where 1 means "not at all satisfied" and 5 means "very satisfied", please rate your satisfaction with . . ."*

Note: "—" denotes insufficient sample size (n=4 or smaller). Denominators of total include installations of all IOUs.

Table 6.10 shows the percentages of customers who rated the item they received as "lower quality than what I had before." None of the contacts who reported receiving a heating system rated their new system as lower in quality than their previous system. A small percentage of CFL recipients (13%) thought the new CFLs they received were lower in quality than lighting they had before. Almost a quarter of those who received a cooling system or refrigerator rated their new system as being of lower quality than their previous system.

Table 6.10: Customer Satisfaction – Measures Installed (Percent Lower Quality than Previous System)

Measure	PG&E	SCE	SDG&E	SCG	Total
Heating system (n=12)	—	—	—	0%	0%
CFL (n=157)	14%	14%	11%	—	13%
Cooling system (n=30)	—	20%	—	—	23%
Refrigerator (n=34)	22%	10%	36%	—	24%

Question: *". . . is higher quality, the same quality, or lower quality than what you had before?"*

Note: "—" denotes insufficient sample size (n=4 or smaller). Denominators of total include installations of all IOUs.

Installation Factors

Respondents also rated their satisfaction with their installer (Table 6.11).[40] Overall, satisfaction was high. The area participant contacts from all utilities ranked lowest was their installer's explanation of how to use the installed measures and how the measures save energy ($p<0.05$).[41]

[40] All satisfaction rating questions had a 5-point scale, with "1" being *very dissatisfied* and "5" being *very satisfied*. In the tables in this section, we combined the "4" and "5" ratings into one category we have labeled *satisfied*. See appendix A for outputs of all responses.

[41] Wilcoxon's two-related samples nonparametric test.

Table 6.11: Customer Satisfaction – Installation Factors (Percent Satisfied)

Installation Factor	PG&E (n=67)	SCE (n=46)	SDG&E (n=67)	SCG (n=67)	Total (n=247)
Carefully installing new items	97%	91%	97%	92%	95%
Carefully removing old items	97%	95%	95%	88%	94%
Courteousness of installers	94%	93%	95%	94%	94%
Installers cleaned up after installation	92%	89%	94%	89%	91%
Installation was done professionally	92%	91%	91%	84%	89%
Explained how to use / how it saves energy (p<0.05)	88%	83%	89%	81%	85%

Question: *"Using the scale 1-5, where 1 means 'strongly disagree' and 5 means 'strongly agree,' please rate your experience with the installation of various things installed in your home, like light bulbs, lighting fixtures, appliances, shower heads, vents, and insulation or weather stripping to seal up areas where heat or air conditioning could be lost".*

Overall Satisfaction

We measured participants' overall satisfaction with the program by asking them whether they would recommend the program to their friends and family members (Table 6.12). A large majority (96%) of the respondents said they would recommend the program to others. The small percentage of those who indicated overall dissatisfaction with the program cited the following reasons: lack of follow-up from the program, the contractor's unprofessionalism, and the lack of reduction in their utility bills.

Table 6.12: Recommend LIEE to Others

Would Recommend Program	PG&E (n=66)	SCE (n=46)	SDG&E (n=67)	SCG (n=67)	Total (n=247)
Yes	97%	98%	96%	96%	96%
No	3%	2%	4%	4%	4%
Total	**100%**	**100%**	**100%**	**100%**	**100%**

Question: *"Would you recommend this program to a friend or family member?"*

Bill Reduction Effect

Finally, we asked participants if they had noticed any reduction in their utility bills after participating in the program (Table 6.13). Two-thirds (67%) of these contacts reported seeing such a reduction. A quarter of the respondents (24%) said they hadn't noticed any decrease in their bills, while 9% reported they didn't know or it was too early to tell if the program-installed measures had reduced their energy bills.

Table 6.13: Bill Reduction Effect

Noticed a Reduction in Bill	PG&E (n=67)	SCE (n=46)	SDG&E (n=67)	SCG (n=67)	Total (n=247)
Yes	64%	70%	72%	63%	67%
No	25%	22%	21%	27%	24%
Don't know/too early	10%	9%	7%	10%	9%
Total	**100%**	**100%**	**100%**	**100%**	**100%**

Question: *"Have you noticed a decrease in your bill since participating in the program?"*

NONPARTICIPANTS

Among the nonparticipant survey respondents, 91% had never participated in LIEE (Table 6.14). Just 1% of the respondents had participated in LIEE before; but, since they had received an assessment before 2003, were eligible to participate in the 2009-2010 program. Twenty-one (8%) of the contacts reported they had participated in the LIEE program before, but had had an assessment after 2003 and, therefore, were not eligible to participate in the 2009-2010 program. We eliminated these 21 contacts from our nonparticipant analysis because we must consider them participants.[42]

Table 6.14: LIEE Participation Status among Nonparticipant Survey Respondents

LIEE Participation	PG&E (n=63)	SCE (n=63)	SDG&E (n=57)	SCG (n=64)	Total (n=247)
Never participated in LIEE	94%	92%	82%	94%	91%
Past participant (assessment before 2003)	0%	2%	3%	2%	1%
Past participant (assessment in 2003-2008)	6%	6%	15%	4%	8%
Total	**100%**	**100%**	**100%**	**100%**	**100%**

[42] The *California Statewide LIEE Policy and Procedures Manual,* section 2.6 states that, with some exceptions, homes participating in the LIEE program within the past 10 years are not eligible to participate. For this evaluation, IOU staff advised the evaluation team to consider homes participating since 2003 as past participants.

Program Awareness

Table 6.15 summarizes responses to questions related to nonparticipants' awareness of the program. Only 16% of contacts were aware of the LIEE program title used by their IOU. However, a majority (66%) recognized the program when we described it briefly.

Table 6.15: Program Awareness among Nonparticipants

Program Awareness	PG&E (n=63)	SCE (n=63)	SDG&E (n=57)	SCG (n=64)	Total (n=247)
Have heard of the name of the program	19%	19%	11%	14%	16%
Recognize the program with a brief program description	62%	70%	61%	72%	66%

Question: *"Have you heard of the <program name> program?"*

Question*: "<Program name> is offered at no cost to qualified customers. It involves getting an assessment of your home and appliances to determine if you are eligible to receive various products and services that can help you reduce your household energy use. Do you think you may have heard of <program name>?"*

Some (16%) of the nonparticipants who had never participated in LIEE reported they had requested an assessment of their home and that someone had come to their home to check various features, such as insulation and the water heater (Table 6.16).

Table 6.16: Assessment Requested among Nonparticipants

Assessment Status	PG&E (n=63)	SCE (n=63)	SDG&E (n=57)	SCG (n=64)	Total (n=247)
Have requested an assessment but never participated	21%	8%	12%	22%	16%

Question: *"Did you have an assessment of your current home done for the <program name> program? In other words, did someone come to your home to check things like your insulation, water heater, windows, heaters, air conditioners, lights, refrigerator?"*

As shown in Table 6.17, nonparticipants most frequently said they learned about energy-saving programs through their utility bill (37%). Twelve percent of nonparticipants also cited each of the following sources of information about energy-saving programs: brochures, media sources such as radio or TV, and word-of-mouth through their neighbors and friends. Small fractions (3% to 6%) of respondents mentioned other sources of this information: sales phone calls, web searches, contractors, and marketing mails.

Table 6.17: Typical Information Source for Energy-Saving Programs (Multiple Responses Allowed)

Information Source	PG&E (n=63)	SCE (n=63)	SDG&E (n=57)	SCG (n=64)	Total (n=247)
Included with my utility bill	29%	38%	32%	48%	37%
Brochure	5%	21%	12%	11%	12%
Media (radio, TV, billboard)	21%	10%	11%	6%	12%
Neighbor or friend	13%	8%	16%	11%	12%
Phone call	8%	3%	9%	5%	6%
Web search	3%	8%	4%	6%	5%
Vendor, distributor, or contractor	2%	5%	4%	3%	3%
Mail	2%	3%	7%	2%	3%
Other	8%	6%	4%	3%	5%

Question: *"How have you typically learned about programs that help you save energy?"*

Note: Percents indicate percentage of those who reported each source of information within each utility. The sum of each column is more than 100% because we recorded multiple responses.

Reasons for Nonparticipation

When we asked nonparticipants why they hadn't applied to participate in the program, the most common reasons[43] were: their lack of program awareness (24%); belief that there was nothing that could be done to help them save energy (15%); no need for the program's services (14%); concerns about the amount of time it would take and extent of their involvement required (12%); and concerns that their property managers would not allow them to participate (10%). Other reasons (see Table 6.18), included: their beliefs that they were not eligible (7%) and that "nothing is free" (5%); their lack of concern about energy use (4%); and the program's non-response to their request for information (3%).

[43] Expressed as an average of nonparticipants from all four IOUs.

Table 6.18: Reasons for Nonparticipation

Reason	PG&E (n=44)	SCE (n=43)	SDG&E (n=37)	SCG (n=46)	Total (n=170)
Unaware of the program	21%	22%	29%	26%	24%
There's nothing that can be done	15%	22%	10%	13%	15%
No need for service	15%	11%	10%	18%	14%
It seems it involves too much time	6%	11%	13%	18%	12%
Property manager won't let me	18%	8%	13%	3%	10%
Perceived ineligible	9%	3%	6%	10%	7%
Nothing is free	3%	3%	6%	8%	5%
Not concerned about energy	3%	8%	0%	5%	4%
Requested service but got no reply	6%	3%	3%	0%	3%
Other	6%	8%	10%	0%	6%
Total	**100%**	**100%**	**100%**	**100%**	**100%**

Question: "*Why haven't you attempted to apply for any programs to help you save energy or weatherize your home to help seal up places where air conditioning or heat could be lost?*"

Note: This question was asked only for the respondents who reported "no" to Q6 (Have you participated in this program or a program like this?). "Other" verbatim responses were further categorized into pre-coded options.

Other Services

Among those who had never participated in LIEE, 12% reported participating in energy-saving programs offered by organizations other than their utility (Table 6.19). They reported various measure types installed through these programs, including: appliances, infiltration-reduction measures, lighting, and water-conservation measures.

Table 6.19: Other Services Received by Nonparticipants

Participation	PG&E (n=63)	SCE (n=63)	SDG&E (n=57)	SCG (n=64)	Total (n=247)
Participated in other energy-saving program	8%	13%	16%	11%	12%

Service Needs

We also asked nonparticipants to gauge the condition of their heating system and refrigerator. Seventeen percent reported their heating system needed to be repaired or replaced (Table 6.20). Households with three or more members, especially those with children, were twice as likely to

report this as those in one- to two-person households ($p<0.05$). Thirteen percent said their refrigerator needed to be repaired or replaced.

Table 6.20: Condition of Nonparticipants' Heating System and Refrigerator

Condition of System	PG&E (n=63)	SCE (n=63)	SDG&E (n=57)	SCG (n=64)	Total (n=247)
HEATING SYSTEM					
Working well	82%	74%	76%	74%	77%
In need of repair or replacement	13%	16%	15%	17%	15%
Don't know	5%	10%	9%	9%	8%
REFRIGERATOR					
Working well	91%	81%	84%	91%	86%
In need of repair or replacement	10%	18%	16%	8%	13%
Don't know	0%	1%	0%	1%	1%

Question: *"Is your heating system / main refrigerator …?"*

Satisfaction with the Utility

Finally, we asked nonparticipants to rate their general satisfaction with their utility. A large majority (89%) reported satisfaction with their utility; just 3% reported dissatisfaction (Table 6.21).

Table 6.21: Nonparticipant's Satisfaction with Their Utility

Satisfaction	PG&E (n=63)	SCE (n=63)	SDG&E (n=57)	SCG (n=64)	Total (n=247)
Satisfied	76%	87%	82%	92%	85%
Neutral	11%	6%	11%	3%	8%
Dissatisfied	5%	3%	2%	2%	3%
Don't know	8%	3%	5%	3%	5%
Total	**100%**	**100%**	**100%**	**100%**	**100%**

Question: *"On a scale from 1 to 5 where 1 means "not at all satisfied "and 5 means "very satisfied", how would you rate your satisfaction with <utility>?"*

Note: Question was on a scale from 1 to 5 where 1 means "not at all satisfied "and 5 means "very satisfied." Ratings "1" and "2" are recoded to *dissatisfied* and ratings "4" and "5" are recoded to *satisfied*.

7 FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

In this section, we review the key findings from the evaluation, draw conclusions about the various process steps across IOUs, and recommend opportunities for further program development.

FINDINGS

The LIEE programs at each of the IOUs evolved into a mature program with protocols at each step of the process: marketing and outreach, enrollment and assessment, installation, and inspection. There were established lines of communication among IOUs and between IOUs. The IOUs' networks of contractors, supported by online databases that managed workflow and held contractors and staff accountable for specific process steps, appeared largely effective.

Overall Process

Each of the IOUs organized staff differently to support the LIEE program. Some staff were dedicated solely to LIEE, while others helped the program as part of their role in groups, such as marketing or finance, that support multiple efforts within the company. Across all of the IOUs, contractors enrolled customers in the program, assessed customers' homes for all feasible measures, and installed the measures. PG&E and SDG&E also used staff to inspect contractors' work, while SCE and SCG hired contractors to perform inspections.

The overarching guidelines set forth in the P&P Manual established the criteria and general steps for the program: marketing and outreach, enrollment and assessment, installation of measures, and inspection. Each of the IOUs worked slightly differently to accomplish the steps, as did each contractor. In general, contractors were expected to service as many homes as possible, while maintaining high quality and completeness standards. For some contractors, like many of those in SCE territory, work was assigned to them on a regular basis. Other contractors managed their workflow more directly. Contractors and IOUs managed workflow, reported problems, and invoiced jobs primarily through online databases with support from in-person conversations and phone calls.

Marketing, Enrollment, and Assessment

The IOUs and their contractors used various marketing and outreach techniques to generate interest in the program, including conducting targeted campaigns for customers who were difficult to locate and those who were difficult to convince to enroll. Nonetheless, identification of eligible customers continued to challenge IOU program staff and contractors. IOU staff found that outbound calling and automated voice messages were both effective in generating interest

and cost-effective. Customers indicated learning about the program most frequently through word-of-mouth and bill inserts, followed by contractors who came to their door and phone calls from contractors or the utilities. Aside from not being aware of the program, nonparticipants reported not enrolling in the program because they believed there was nothing more they could do to save energy, participating in the program would take too much time, or their property manager or owner would not allow it. Contractors also noted difficulty in working with property managers and owners, and cited customer distrust of contractors as a common barrier to enrollment. While the Whole Neighborhood Approach (WNA) did not prove feasible in most situations, some contractors found that kind of approach cost-effective with large multifamily complexes and in rural areas.

To simplify the enrollment process, contractors suggested reducing redundant paperwork where possible. Contractors reported that use of self-certification of income documents helped reduce enrollment time. IOU staff were concerned that, while allowing more self-certification could reduce paperwork, it also could result in enrolling more customers who normally would not qualify and therefore would increase program costs. Some IOUs and individual contractor firms were providing tablet PCs to contractors or inspectors to reduce data entry time and cost; this strategy may prove cost-effective for all IOUs.

Enrollment and assessment contractors provided customers with a brief educational presentation about energy savings; the amount of time spent on education and materials differed among IOUs. Customer survey results indicate that the amount of time spent or the contractor's approach to customer education might influence customer satisfaction with the energy-saving information provided during contractor visits. For instance, SCE and SCG customers' satisfaction with the energy-efficiency information provided was significantly lower than the satisfaction levels reported by PG&E and SDG&E customers. A robust study of customer education is beyond the scope of this study, but further research on effective customer education practices could address this question.

Installation and Inspection

Following the enrollment and assessment visit, in PG&E, SCG, and SDG&E service territories, installation contractors completed a more detailed assessment to identify all of the feasible measures for which a customer qualified. In SCE territory, the enrollment and assessment contractor conducted this assessment. Contractors noted that multiple visits to customers' homes were required if the customers needed materials or services the contractors were not trained or equipped to provide. Additional installation visits also were required if inspectors found problems with the contractors' work.

Contractors indicated that combustion appliance problems were the most common issue that prevented projects from moving beyond an assessment or limited the kinds of measures that could be installed. While some minor home repairs were allowed in order for infiltration measures to be installed, some repairs were not allowed and prevented installation of measures unless contractors did the work themselves, even though it was not covered by the program.

Customers could be left without heat or hot water if the appliance could not be serviced under LIEE or through IOU R&R services. Renters were particularly vulnerable. Leveraging other low-income energy programs could help customers receive needed aid, yet the connections to these programs were limited, other than for CBOs that delivered low-income programs in addition to LIEE.

CONCLUSIONS AND RECOMMENDATIONS

Outreach and Marketing

Conclusions

IOUs and contractors used a variety of methods to reach customers, from bill inserts to canvassing, telethons, and community events. IOU staff found that some methods, such as community events and mass media campaigns, were better at generating awareness of the program than producing immediate enrollments, but made subsequent direct contacts (e.g., phone calls and canvassing) more effective at convincing customers to enroll. We also found that an approach that worked well in one area or population might not work as well in another. That said, contacts at all IOUs said that automated outbound calling was a cost-effective way of reaching customers. Across the IOUs, surveyed customers remembered hearing about the program most often through word-of-mouth, bill inserts, canvassing, or a phone call.

As contractors worked through lists of potential customers developed by the IOUs and implemented their outreach campaigns, the IOUs were preparing to focus more attention on reaching and enrolling customers for whom the more frequently used outreach methods might be less effective. These included customers who: 1) were located in rural locations; 2) used only cell phones and therefore could not be called using automated dialers; 3) were reluctant to join the program; or 4) rented their homes and needed property owner permission. Contractors and IOU staff feedback suggest that a combination of mass marketing to help raise awareness and use of targeted messages to key populations could help reduce reluctance among property owners and skeptical customers. Customer survey results for this evaluation further suggest that beyond not being aware of the program, nonparticipants did not have a good perception of how much time it took to participate or the potential for energy savings in their home. Program participants, on the other hand, believed the program helped lower their bill and felt that participating in the program did not take much of their time.

Recommendations

- ➡ **Use customer testimonials** to help show nonparticipants how easy it is to participate in the program, and that they likely will save money, even if they think they have done as much as they can to save energy.
- ➡ **Research and establish a cell phone protocol** that allows IOU staff and contractors to contact customers on their mobile phone, such as the protocol used for conducting

surveys with cell phone users. SCG staff noted that they may not be able to do this with their organization's current cell phone policy (based on the Telephone Consumer Protection Act of 1991, which disallows telemarketing to cell phones or numbers on the National Do Not Call Registry).

➡ To **reach property owners and gain access to more renters**: 1) work with contractors and property owners that already participate in the program to revise and clarify language about co-payments on property owner waiver forms to address property owners' concerns and to create Property Owner Waiver (POW) forms in Spanish and other languages; 2) develop a separate marketing strategy for property owners of single-family units using messages that show the benefits for property owners, not just renters; and 3) for properties with large numbers of potentially eligible customers, encourage WNA-types of approaches. For example, SCE and its contractors found it most cost-effective to meet with property managers to develop refined targeted customer lists and to gain their approval to treat large groups of homes.

Enrollment and Assessment

With the exception of differing approaches to customer energy education, the IOUs approached the overarching enrollment and assessment process similarly and appropriately allowed contractors to customize their approaches according to what worked best for their firm and customers. We identify the following four opportunities that could facilitate the process.

Customer Preparation for Enrollment Visits

Conclusions

Contractors frequently encountered customers who could not locate proper documentation despite IOU and contractor efforts to mail customers lists of the types of documents needed to enroll, and contractors' staffs' efforts to tell customers which documentation they needed to provide when they scheduled the appointment over the phone.

Recommendation

➡ In addition to mailing customers lists of required program enrollment documents in advance of the enrollment and assessment appointment, **contractors can give their office staff better pre-screening scripts to use when scheduling appointments**. This could help reduce the number of rescheduled appointments. For example, staff could help customers select the most relevant documents they will need to qualify for the program and tell them to post the list and the documents (and back-ups) on their refrigerator or other visible location, plus the appointment time and date, and who needs to attend the appointment. Contractors who call right before the appointment also may have a better chance of arriving to a prepared customer and therefore have a shorter and more effective visit.

Paperwork Reduction and Database Upgrades

Conclusions

The documentation process was becoming less cumbersome, as IOUs shifted from paper to online enrollment, but some steps still required effort, such as making physical copies of documents, having office staff dedicated to data entry, and, in PG&E territory, waiting to speak with PG&E staff to enroll customers who were not recognized by the IVR system.

Recommendations

- **IOUs should work with contractors to determine cost-effective ways to use tablet PCs** that enable quick in-home data entry, electronic signatures, and scanning or uploading of digital photos of customer documents to the online database. Using the same kind of tablet PC across utilities would make the enrollment and assessment process smoother for contractors working in multiple territories. When scanning documents is infeasible, taking digital photos of customer documents can be a reliable, quick alternative to making a physical copy or asking customers to mail or fax their documents. Contractors should take the same precautions to protect customer identity when taking digital photos as they do with scanning or copying documents, including: covering sensitive information, such as account and Social Security numbers, prior to photographing the document. Also, the IOUs may want to re-examine the need for contractors to both electronically enter data and provide paper copies of enrollment and assessment forms. Similarly, a review of forms could reduce the redundancy of customer and contractor data requested on multiple application forms.

- As mentioned earlier (and below), the **IOUs should look into creating forms and updating databases to allow for more robust descriptions of customer homes**, either with check boxes or comment fields, or encouraging enrollment and assessment contractors to take and upload digital photos of customer's homes to provide installation contractors with better insight into the tools, materials, and crews needed to service a customer's home.

- **IOUs should consider further upgrades to their databases** to potentially allow contractors to edit information after uploading it. Additionally, scheduling and routing software upgrades to the IOU databases could help reduce the number of service visits by allowing enrollment and assessment contractors to schedule installation visits at the time of enrollment.

- **IOUs that share territories should look into using single intake forms and list the same requirements for proof of income**.

Home Assessment

Conclusion

For all of the IOUs, installation contractors were responsible for determining the feasibility of installing the recommended or approved measures for a home. Nonetheless, enrollment and assessment contractors in all of the service territories had the opportunity to better prepare installation contractors for special situations.

Recommendation

- ➡ **Enrollment and assessment contractors could better document special circumstances or potential problems in a home** in order to better prepare installation contractors for their initial visit and reduce the chance for a second visit. This may require IOUs to create forms that allow for more robust descriptions, with check boxes or comment fields, or encouraging enrollment and assessment contractors to take and upload digital photos of customers' homes to provide installation contractors with better insight into the tools, materials, and crews needed to service a customer's home.

Customer Education

Conclusions

More time spent on customer education may positively influence customer satisfaction with the energy-saving information received from the IOUs. Also, investing more time into the customer education process may increase energy savings and therefore warrant further study. Although customer education primarily was delivered during the enrollment and assessment visit, installation contractors and inspectors had the opportunity to reinforce important energy-saving practices and answer customer questions. As demonstrated by LIEE participants' responses to questions about their satisfaction with installers, customers were less satisfied with installers' explanations of how to use equipment and save energy than with other aspects of installers' work.

Recommendations

- ➡ **IOUs should collaboratively investigate the extent to which various customer education approaches are effective in increasing customer knowledge of energy-saving practices and actual behavior change**.
- ➡ In order to increase the chances of capturing meaningful effects, **the CPUC and IOUs should consider comparing educational practices across IOUs** rather than conducting smaller studies with dissimilar data.

- ➡ In the meantime, **reinforcing enrollment and assessment contractor training on the value and purpose of and specific approaches to customer education may be warranted**.
- ➡ IOUs also should **remind installation contractors and inspectors of their roles in continuing customer education** by reinforcing key energy-saving practices and instructing customers on safe operation of equipment and warranty processes when the contractors are in customers' homes.
- ➡ The IOUs also should **investigate the creation and dissemination of energy education DVDs** to augment the current customer education strategy.

Installation and Inspection

Conclusions

There are two times when IOUs inspected work: post-assessment / pre-installation checks of enrollment contractor's recommendations; and post-installation checks for proper repairs and installation of measures. PG&E, SCG, and SDG&E primarily emphasized mandated post-installation inspections which coordinated well with post-installation NGAT testing requirements. In addition to mandated post-installation inspections, SCE found post-assessment checks helpful in ensuring all feasible measures were identified prior to the installation contractor's initial visit and anticipated that these checks would improve communication between enrollment and assessment contractors and installation contractors, and therefore increase the likelihood that installation contractors would have what they need when they arrive at the customer's home.

While it is beyond the scope of this evaluation to determine the full efficacy of the installation and inspection processes, issues concerning program limitations on the installation and repair of gas appliances indicate that customers' health and safety could be compromised if they did not qualify for repair, replacement, or installation of new heating equipment and water heaters. This evaluation could not confirm the frequency of such events, but observations and discussions with contractors and IOU staff indicate that there may be opportunities to better assist customers in need.

Recommendations

- ➡ IOUs should investigate opportunities to: 1) **improve communication with customers about the extent to which LIEE can assist them**; and 2) when their needs surpass the limitations of LIEE policies, **ensure contractors provide customers with referrals to other program services in their area**.

- To **reduce the number of visits**, the IOUs could consider, when feasible, having inspectors arrive while installation contractors are at the customer's home or immediately after the installation work is completed.

- IOUs should **investigate the possibility of establishing discretionary funds or pursuing partnerships with other agencies to provide customers at risk of not having sufficient heat and hot water with stop-gap or durable equipment**. Also, in exceptional instances where contractors find a gas leak and repairs are beyond the scope of the LIEE program, instead of expecting the customer to get the repairs done, the IOU should contact the landlord (for renters) or (for owner-occupants) have the IOU guide the homeowner to appropriate IOU or federal programs.

APPENDICES

APPENDIX A: PARTICIPANT CUSTOMER SURVEY FREQUENCY TABLES

APPENDIX B: NONPARTICIPANT CUSTOMER SURVEY FREQUENCY TABLES

APPENDIX C: MAPS OF SAMPLE PARTICIPANTS

A PARTICIPANT CUSTOMER SURVEY FREQUENCY TABLES

CUSTOMER RESPONSE TO MARKETING

1. How did you hear about the < Program>?

Response	PG&E	SDG&E	SCE	SCG	Total
A bill insert	9	13	24	18	**64**
An advertisement on your door	1	0	0	0	**1**
A phone call	10	4	3	4	**21**
Someone stopped by house	7	11	4	6	**28**
Utility website (specify SCE, SCG, SDG&E. PG&E)	1	3	2	6	**12**
A friend, family member, or colleague	22	18	16	14	**70**
I learned about it when I signed up for another program	1	0	1	1	**3**
Other (specify)	12	12	4	7	**35**
Don't know / Don't remember	4	6	13	11	**34**
Total	67	67	67	67	**268**

2. Which of the following best describes why you decided to participate in the <Program>?

Response	PG&E	SDG&E	SCE	SCG	Total
To save energy	16	19	17	16	**68**
To reduce your electric or gas bill / pay less	29	24	33	20	**106**
Because services were free of charge	4	9	4	11	**28**
To help the environment	2	3	1	2	**8**
Because you sometimes have trouble paying your electric or gas bill	8	5	8	8	**29**
Property manager wanted you to	2	1	1	1	**5**
Some other reason (not specified)	3	5	3	8	**19**
Don't know / Don't remember	3	1	0	1	**5**
Total	67	67	67	67	**268**

3. Were there other reasons?

Response	PG&E	SDG&E	SCE	SCG	Total
To save energy	13	13	22	16	**64**
To reduce your electric or gas bill / pay less	9	15	11	10	**45**
Because services were offered free of charge	3	4	4	6	**17**
To help the environment	7	6	4	4	**21**
Because you sometimes have trouble paying your electric or gas bill	1	0	4	2	**7**
Property manager wanted you to	0	0	0	1	**1**
Some other reason (not specified above, record)	4	10	2	6	**22**
No other reasons	29	19	20	20	**88**
Don't know / Don't remember	1	0	0	2	**3**
Total	67	67	67	67	**268**

4. Did the program representative tell you how you could save energy?

Response	PG&E	SDG&E	SCE	SCG	Total
Yes	50	55	52	44	**201**
No	11	6	13	13	**43**
Don't remember / NA	6	6	2	10	**24**
Total	67	67	67	67	**268**

5. What did they suggest? (Open ended)

Response	Total
Open ended	**181 responses**

6. Do you remember how many times people, including the contractor, visited your house to complete the work?

Response	PG&E	SDG&E	SCE	SCG	Total
1 time	24	23	16	24	**87**
2 times	18	28	17	23	**86**
3 times	12	8	18	11	**49**
4 times	3	4	4	6	**17**
5 times	1	0	0	1	**2**
6 times	1	1	2	0	**4**
7 times	0	0	0	1	**1**
8 times	1	0	0	0	**1**
Don't know / Don't remember	6	3	10	1	**20**
Refused	1	0	0	0	**1**
Total	67	67	67	67	**268**

7. Did they do the work when it was convenient for you?

Response	PG&E	SDG&E	SCE	SCG	Total
Yes	65	64	59	66	**254**
No	0	2	6	1	**9**
Don't know / Don't remember	1	1	2	0	**4**
Refused	1	0	0	0	**1**
Total	67	67	67	67	**268**

This Section for Customers of SCE & SCG Only

8. Who would you contact…if you had questions about qualifying for certain items or services offered by <Program> program?

Response	SCE	SCG	Total
Southern California Edison (also called 'Edison')	26	15	**41**
Southern California Gas (also called 'the gas company')	12	10	**22**
The contractor who came to your home or another organization (WRITE IN)	1	0	**1**
_____ contact	10	13	**23**
Don't know	5	2	**7**
Refused	1	0	**1**
Total	55	40	**95**

9. Who would you contact …about scheduling an appointment to have work done, like having equipment or insulation installed, or to do recommended repairs?

Response	SCE	SCG	Total
Southern California Edison (also called 'Edison')	17	9	**26**
Southern California Gas (also called 'the gas company')	12	8	**20**
The contractor who came to your home or another organization (WRITE IN)	11	8	**19**
_____ contact	7	9	**16**
Don't know	7	6	**13**
Refused	1	0	**1**
Total	55	40	**95**

10. Who would you contact …if you had a problem with the equipment installed, the work the contractor did, or your general experience with the contractor?

Response	SCE	SCG	Total
Southern California Edison (also called 'Edison')	12	6	**18**
Southern California Gas (also called 'the gas company')	9	13	**22**
The contractor who came to your home or another organization (WRITE IN)	17	9	**26**
_____ contact	9	9	**18**
Don't know	7	3	**10**
Refused	1	0	**1**
Total	55	40	**95**

11. Who would you contact...to ask questions about why certain things were or weren't done as part of the < Program>?

Response	SCE	SCG	Total
Southern California Edison (also called 'Edison')	20	9	**29**
Southern California Gas (also called 'the gas company')	7	11	**18**
The contractor who came to your home or another organization (WRITE IN)	4	3	**7**
_____ contact	15	15	**30**
Don't know	7	2	**9**
Refused	2	0	**2**
Total	55	40	**95**

SATISFACTION WITH THE LIEE PROGRAM

Now I'd like to ask you about the services you received from <program >. Using a scale from 1 to 5, where 1= "strongly disagree" and 5= "strongly agree," please rate the following statements.

12. The representative explained the program clearly during the first contact.

Response	PG&E	SDG&E	SCE	SCG	Total
1 - Strongly Disagree	2	0	5	1	**8**
2	1	1	0	2	**4**
3	4	6	1	4	**15**
4	5	7	14	13	**39**
5 - Strongly Agree	51	49	45	46	**191**
Don't know	2	1	2	0	**5**
Wasn't there	2	3	0	1	**6**
Total	67	67	67	67	**268**

13. The representative was courteous throughout the visit to my home.

Response	PG&E	SDG&E	SCE	SCG	Total
1 - Strongly Disagree	0	0	3	0	**3**
2	3	0	1	1	**5**
3	2	1	0	1	**4**
4	5	3	6	5	**19**
5 - Strongly Agree	55	61	56	58	**230**
Don't know	1	0	1	0	**2**
Wasn't there	1	2	0	2	**5**
Total	67	67	67	67	**268**

14. On a scale from 1 to 5 where 1 means "not at all satisfied" and 5 means "very satisfied", how would you rate your satisfaction with the sign-up process for <Program>?

Response	PG&E	SDG&E	SCE	SCG	Total
1 - Not at All Satisfied	0	0	3	1	**4**
2	2	1	1	0	**4**
3	5	1	2	1	**9**
4	7	14	7	19	**47**
5 - Very Satisfied	51	49	54	45	**199**
Don't know	1	1	0	0	**2**
Wasn't there	1	1	0	1	**3**
Total	67	67	67	67	**268**

15. And, on a scale from 1 to 5 where 1 means "not at all satisfied" and 5 means "very satisfied", how would you rate your satisfaction with the **information provided on how to save energy in your home**?

Response	PG&E	SDG&E	SCE	SCG	Total
1 - Not at All Satisfied	0	1	4	4	**9**
2	0	1	2	2	**5**
3	5	2	6	7	**20**
4	11	14	10	10	**45**
5 - Very Satisfied	48	48	44	43	**183**
Don't know	1	0	1	0	**2**
Wasn't there	2	1	0	1	**4**
Total	67	67	67	67	**268**

16. On a scale from 1 to 5 where 1 means "not at all satisfied" and 5 means "very satisfied", how would you rate your satisfaction with the <Program> **people who came to your home**?

Response	PG&E	SDG&E	SCE	SCG	Total
1 - Not at All Satisfied	0	1	4	0	**5**
2	2	1	0	1	**4**
3	4	2	2	2	**10**
4	5	11	9	15	**40**
5 - Very Satisfied	54	50	51	46	**201**
Don't know	1	0	1	1	**3**
Wasn't there	1	2	0	2	**5**
Total	67	67	67	67	**268**

17. On a scale from 1 to 5 where 1 means "not at all satisfied" and 5 means "very satisfied", how would you rate your satisfaction with the **amount of time** the whole process took?

Response	PG&E	SDG&E	SCE	SCG	Total
1 - Not at All Satisfied	2	1	4	0	**7**
2	2	1	3	1	**7**
3	2	2	2	2	**8**
4	6	9	14	21	**50**
5 - Very Satisfied	52	52	43	39	**186**
Don't know	1	1	1	2	**5**
Wasn't there	2	1	0	2	**5**
Total	67	67	67	67	**268**

17a. You were dissatisfied with the <Program service>. Why? (open ended)

Response	Total
Open ended	21 responses

CUSTOMER RESPONSE TO MEASURES/SERVICES

Now, I'd like to ask you about some of the things that were installed in your home and the services you received.

From our records, it looks like the <Program> program either fixed or installed …

…"Twisty" Bulbs, also known as CFLs

18. Confirm that respondent received measure

Response	PG&E	SDG&E	SCE	Total
Yes	54	55	29	**138**
No	2	8	4	**14**
Don't know / NR	4	1	0	**5**
Total	60	64	33	**157**

19. On a scale from 1 to 5, where 1 means "not at all satisfied" and 5 means "very satisfied," please rate your satisfaction with the CFL.

Response	PG&E	SDG&E	SCE	Total
1 - Not at All Satisfied	2	1	1	**4**
2	1	2	1	**4**
3	2	1	2	**5**
4	5	11	3	**19**
5 - Very Satisfied	44	39	22	**105**
Don't know	0	1	0	**1**
Total	54	55	29	**138**

20. Do you think the CFL is higher quality, the same quality, or lower quality than what you had before?

Response	PG&E	SDG&E	SCE	Total
Higher	27	32	17	**76**
The same	17	14	8	**39**
Lower	7	6	4	**17**
Don't know	3	3	0	**6**
Total	54	55	29	**138**

…New Refrigerator

21. Confirm that respondent received measure

Response	PG&E	SDG&E	SCE	Total
Yes	9	15	10	**34**
Total	9	15	10	**34**

22. On a scale from 1 to 5, where 1 means "not at all satisfied" and 5 means "very satisfied," please rate your satisfaction with the refrigerator.

Response	PG&E	SDG&E	SCE	Total
3	1	2	0	**3**
4	1	0	1	**2**
5 - Very Satisfied	7	13	9	**29**
Total	9	15	10	**34**

23. Do you think the refrigerator is higher quality, the same quality, or lower quality than what you had before?

Response	PG&E	SDG&E	SCE	Total
Higher	6	7	6	**19**
The same	1	2	3	**6**
Lower	2	5	1	**8**
Don't know	0	1	0	**1**
Total	9	15	10	**34**

…New Heating System or Programmable Thermostat

24. Confirm that respondent received measure

Response	SDG&E	SCG	Total
Higher	2	6	**8**
Don't know	1	3	**4**
Total	3	9	**12**

25. On a scale from 1 to 5, where 1 means "not at all satisfied" and 5 means "very satisfied," please rate your satisfaction with the new heating system or programmable thermostat.

Response	SDG&E	SCG	Total
4	0	1	**1**
5 - Very Satisfied	2	5	**7**
Total	2	6	**8**

26. Do you think the new heating system or programmable thermostat is higher quality, the same quality, or lower quality than what you had before?

Response	SDG&E	SCG	Total
Higher	2	5	**7**
The same	0	1	**1**
Total	2	6	**8**

…New Air Conditioning Unit or Swamp Cooler (evaporative cooler)

27. Confirm that respondent received measure

Response	PG&E	SDG&E	SCE	Total
Yes	3	1	12	**16**
No	6	6	0	**12**
Don't know / NR	1	1	0	**2**
Total	10	8	12	**30**

28. On a scale from 1 to 5, where 1 means "not at all satisfied" and 5 means "very satisfied," please rate your satisfaction with the new air conditioning unit or swamp cooler (evaporative cooler).

Response	PG&E	SDG&E	SCE	Total
1 - Not at All Satisfied	0	0	1	**1**
2	1	0	0	**1**
3	1	0	0	**1**
5 - Very Satisfied	1	1	11	**13**
Total	3	1	12	**16**

29. Do you think the new air conditioning unit or swamp cooler (evaporative cooler) is higher quality, the same quality, or lower quality than what you had before?

Response	PG&E	SDG&E	SCE	Total
Higher	0	1	4	**5**
The same	0	0	4	**4**
Lower	1	0	2	**3**
Didn't have one before	2	0	2	**4**
Total	3	1	12	**16**

Using the scale 1-5, where 1 means "strongly disagree" and 5 means "strongly agree," please rate your experience with the installation of various things installed in your home, like light bulbs, lighting fixtures, appliances, shower heads, vents, and insulation or weather stripping to seal up areas where heat or air conditioning could be lost.

30a. The installations were done professionally.

Response	PG&E	SDG&E	SCE	SCG	Total
1 - Strongly Disagree	1	1	5	3	**10**
2	0	0	0	2	**2**
3	4	5	2	5	**16**
4	7	11	5	10	**33**
5 - Strongly Agree	53	47	46	43	**189**
Don't know	1	0	6	1	**8**
Refused	0	0	1	1	**2**
Was not there	1	3	2	2	**8**
Total	67	67	67	67	**268**

30b. The installers were careful when removing the old items.

Response	PG&E	SDG&E	SCE	SCG	Total
1 - Strongly Disagree	0	1	1	3	**5**
2	1	0	2	0	**3**
3	1	2	0	5	**8**
4	2	14	5	6	**27**
5 - Strongly Agree	61	44	48	50	**203**
Don't know	1	3	7	1	**12**
Refused	0	0	1	0	**1**
Was not there	1	3	3	2	**9**
Total	67	67	67	67	**268**

30c. The installers were careful when installing the new items.

Response	PG&E	SDG&E	SCE	SCG	Total
1 - Strongly Disagree	1	1	3	2	**7**
2	0	0	2	0	**2**
3	1	1	1	3	**6**
4	3	12	8	9	**32**
5 - Strongly Agree	61	49	43	50	**203**
Don't know	0	0	8	1	**9**
Refused	0	0	0	1	**1**
Was not there	1	4	2	1	**8**
Total	67	67	67	67	**268**

30d. The installers clearly explained how each item should be used and how it will help save energy.

Response	PG&E	SDG&E	SCE	SCG	Total
1 - Strongly Disagree	0	3	3	8	**14**
2	2	2	2	1	**7**
3	6	2	6	3	**17**
4	10	14	10	8	**42**
5 - Strongly Agree	46	43	37	44	**170**
Don't know	2	0	8	2	**12**
Refused	1	3	1	1	**6**
Was not there	67	67	67	67	**268**
Total	0	3	3	8	**14**

30e. The installers were courteous.

Response	PG&E	SDG&E	SCE	SCG	Total
1 - Strongly Disagree	0	1	1	0	**2**
2	1	0	1	1	**3**
3	3	2	2	3	**10**
4	8	8	6	6	**28**
5 - Strongly Agree	52	53	50	56	**211**
Don't know	0	0	4	0	**4**
Refused	1	0	1	0	**2**
Was not there	2	3	2	1	**8**
Total	67	67	67	67	**268**

30f. The installers cleaned up when they were done.

Response	PG&E	SDG&E	SCE	SCG	Total
1 - Strongly Disagree	0	1	4	2	**7**
2	2	0	1	1	**4**
3	3	3	2	4	**12**
4	4	12	6	14	**36**
5 - Strongly Agree	57	47	47	43	**194**
Don't know	0	0	6	2	**8**
Refused	1	4	1	1	**7**
Was not there	67	67	67	67	**268**
Total	0	1	4	2	**7**

35. Had you known ahead of time what <name of program> program would require of you and what you would get out of it, would you have participated?

Response	PG&E	SDG&E	SCE	SCG	Total
Yes (RECORD REASON)	62	63	60	64	**249**
No (RECORD REASON)	1	1	2	1	**5**
Not sure (RECORD REASON)	4	2	5	2	**13**
Refused	0	1	0	0	**1**
Total	67	67	67	67	**268**

COMPARE SATISFACTION WITH PARTICIPATION IN <PROGRAM> & OTHER PROGRAMS

36. Have you participated in other <utilities> programs to help you save energy? (PROBE: Other rebates for equipment or bill rate reductions, in the past?)

Response	PG&E	SDG&E	SCE	SCG	Total
Yes	12	9	10	4	**35**
No	49	55	56	60	**220**
Don't know / Don't Remember	6	3	1	3	**13**
Total	67	67	67	67	**268**

37. Compared to the other < utility> programs you participated in, how would you rate the <Program>? Was it …

Response	PG&E	SDG&E	SCE	SCG	Total
Better than other programs [SKIP TO Q38]	4	0	4	1	**9**
The same as other programs [SKIP TO Q40]	4	6	4	2	**16**
Worse than other programs [SKIP TO Q39]	2	0	0	0	**2**
Not sure[SKIP TO Q40]	2	3	2	1	**8**
Total	12	9	10	4	**35**

38. Why do you rate the <Program> as better than the other programs?

Response	PG&E	SDG&E	SCE	SCG	Total
Fuel or electric or gas bill payment assistance	10	13	5	15	**43**
Weatherization - refers to attic insulation, door weather stripping, Caulking, new windows/doors to seal up areas	7	7	9	7	**30**
Electric or gas rate reduction	11	11	13	11	**46**
Some other service (not specified)	9	2	6	3	**20**
Don't know	28	31	33	30	**122**
Refused	2	3	1	1	**7**
Total	67	67	67	67	**268**

39. Why did you rate the <Program> as worse than previous programs? (Open ended)

Response	Total
Open ended	2 responses

41. In what year did you have your home weatherized?

Response	Total
Total	32 responses

ASK OF ALL RESPONDENTS

42. What is the main heating source for your home? Is it….

Response	PG&E	SDG&E	SCE	SCG	Total
Electricity	18	15	7	15	**55**
Natural gas	40	50	52	49	**191**
Propane or oil	2	0	1	0	**3**
Some other such as wood, kerosene, or solar (SPECIFY)	5	1	0	1	**7**
Don't know / NA	2	1	7	2	**12**
Total	67	67	67	67	**268**

43. Is your heating system….

Response	PG&E	SDG&E	SCE	SCG	Total
Working well	62	53	47	52	**214**
In need of repair	1	6	9	4	**20**
Not working, in need of replacement	3	3	5	9	**20**
Other (SPECIFY)	0	4	6	1	**11**
Don't know	1	1	0	1	**3**

44. What other heating sources do you use for your home?

Response	PG&E	SDG&E	SCE	SCG	Total
Electricity	13	20	25	19	**77**
Natural gas	2	5	3	9	**19**
Propane or oil	1	1	0	0	**2**
Some other such as wood, kerosene, or solar (SPECIFY)	7	3	4	7	**21**
None	44	36	34	32	**146**
Don't know / NA	0	2	1	0	**3**
Total	67	67	67	67	**268**

45. What is the main source of cooling for your home? Is it…

Response	PG&E	SDG&E	SCE	SCG	Total
Central/Whole house air conditioning	34	25	27	34	**120**
Window air conditioning unit(s)	4	10	16	12	**42**
Swamp cooler	9	0	13	9	**31**
None / no AC/cooling	15	23	10	11	**59**
Other (SPECIFY)	4	8	1	0	**13**
Don't know	1	1	0	1	**3**
Total	67	67	67	67	**268**

46. How many cooling units do you have?

Response	Total
Total	85 responses

47. Do you heat your water with …

Response	PG&E	SDG&E	SCE	SCG	Total
Electricity	14	7	5	4	**30**
Natural gas	48	57	59	60	**224**
Other, such as propane or solar (SPECIFY)	1	1	2	0	**4**
Don't know / NA	4	2	1	3	**10**
Total	67	67	67	67	**268**

48. Is your main refrigerator…

Response	PG&E	SDG&E	SCE	SCG	Total
Working well	62	54	58	55	**229**
In need of repair	2	7	6	3	**18**
Not working, in need of replacement	1	4	2	7	**14**
Other (SPECIFY)	0	1	0	1	**2**
Don't know	2	1	1	1	**5**
Total	67	67	67	67	**268**

49. Do you have any other appliances that are in need of repair or replacement?

Response	PG&E	SDG&E	SCE	SCG	Total
Yes	9	19	17	18	**63**
No	57	47	49	49	**202**
Don't know	1	1	1	0	**3**
Total	67	67	67	67	**268**

50. Have you noticed a decrease in your bill since participating in the program?

Response	PG&E	SDG&E	SCE	SCG	Total
Yes	43	48	39	42	**172**
No	17	14	21	18	**70**
Not sure yet / Don't know	7	5	7	7	**26**
Total	67	67	67	67	**268**

51. Is this what you expected from participating in this program?

Response	PG&E	SDG&E	SCE	SCG	Total
Yes	37	39	36	38	**150**
No	6	9	3	4	**22**
Total	43	48	39	42	**172**

52. Do you have any suggestions for improving any aspect of this program? (Open ended)

Response	Total
Open ended	151 responses

53. Would you recommend this program to a friend or family member?

Response	PG&E	SDG&E	SCE	SCG	Total
Yes	64	64	63	64	**255**
No	2	1	4	1	**8**
Not sure [SKIP TO Q55]	0	2	0	2	**4**
Refused	1	0	0	0	**1**
Total	67	67	67	67	**268**

54. Why would you recommend/not recommend this program? (Open ended)

Response	Total
Open ended	243 responses

DEMOGRAPHICS

Finally, I'd like to ask some questions about you and your home to help us compare across participants

55. Please stop me at your age range.

Response	PG&E	SDG&E	SCE	SCG	Total
18-25 years old	0	5	1	1	**7**
26-35 years old	5	4	6	4	**19**
36-45 years old	11	13	9	9	**42**
46-55 years old	10	14	12	17	**53**
56-65 years old	19	7	14	16	**56**
66 or older	22	23	25	20	**90**
Refused	0	1	0	0	**1**
Total	67	67	67	67	**268**

56. Including yourself, how many people live in your household?

Response	PG&E	SDG&E	SCE	SCG	Total
1	20	18	14	12	**64**
2	15	12	22	12	**61**
3	11	13	4	14	**42**
4	9	9	11	10	**39**
5	4	8	3	8	**23**
6	6	4	9	6	**25**
7	1	3	3	5	**12**
Don't know / Refused	1	0	0	0	**1**
Total	67	67	66	67	**267**

57. How many are adults - aged 18 and older?

Response	PG&E	SDG&E	SCE	SCG	Total
1	23	20	15	15	**73**
2	27	23	36	19	**105**
3	11	14	8	19	**52**
4	5	5	4	9	**23**
5	0	3	3	3	**9**
6	1	1	0	1	**3**
7	0	1	0	1	**2**
Total	67	67	66	67	**267**

58. Has the number of people in your household changed since the <Program>, such as adding a new baby or a new housemate?

Response	PG&E	SDG&E	SCE	SCG	Total
Increased	3	6	5	6	**20**
Decreased	6	7	7	6	**26**
Stayed the same	57	54	55	53	**219**
Refused	1	0	0	2	**3**
Total	67	67	67	67	**268**

59. Please let me know if any of the following have occurred since you signed up for <Program> ….

Response	PG&E	SDG&E	SCE	SCG	Total
None	20	19	23	19	**81**
Changed work shifts	2	2	1	1	**6**
Remodeled house	2	4	4	3	**13**
Installed a new appliance/equipment, including electronics, such as plasma screen TV, video game equipment	7	8	7	8	**30**
People are working outside of the home who weren't before	1	1	3	1	**6**
People are staying home who weren't before (clarify - stay home because not working anymore or working from home)	10	12	8	16	**46**
Use appliance(s) more	4	4	4	6	**18**
Other (no specify)	6	4	4	5	**19**
Don't know	14	11	12	7	**44**
Refused	1	2	1	1	**5**
Total	67	67	67	67	**268**

60. Gender. This is recorded by interviewer.

Response	PG&E	SDG&E	SCE	SCG	Total
Male	29	30	25	22	**106**
Female	38	37	42	45	**162**
Total	67	67	67	67	**268**

61. Instrument Version. This is recorded by interviewer.

Response	PG&E	SDG&E	SCE	SCG	Total
English	61	57	55	54	**227**
Spanish	6	10	12	13	**41**
Total	67	67	67	67	**268**

Thank you for taking time to answer these questions!

B NONPARTICIPANT CUSTOMER SURVEY FREQUENCY TABLES

CUSTOMER RESPONSE TO MARKETING

1. How have you typically learned about programs that help you save energy?

Response	PG&E	SDG&E	SCE	SCG	Total
Email	0	1	0	0	**1**
Brochure	3	8	12	8	**31**
From a vendor, distributor or contractor	1	4	2	2	**9**
Included with my utility bill	14	23	24	31	**92**
Phone call	5	5	2	3	**15**
Media (such as ads on radio or TV or local billboards)	12	6	5	2	**25**
Web search	3	2	5	3	**13**
Neighbor or Friend	9	9	5	7	**30**
Other (Please specify)	6	4	3	3	**16**
Don't know	14	5	9	8	**36**
Total	67	67	67	67	**268**

2. Have you ever heard of the <Program>?

Response	PG&E	SDG&E	SCE	SCG	Total
Yes	15	14	14	10	**53**
No	48	52	48	56	**204**
Don't know	4	1	5	1	**11**
Total	67	67	67	67	**268**

3. How did you hear about the program?

Response	PG&E	SDG&E	SCE	SCG	Total
Phone call about it	1	2	2	1	**6**
Mail	8	9	6	6	**29**
Knock on my door	0	1	0	1	**2**
Community organization or other group	6	2	6	2	**16**
Total	15	14	14	10	**53**

4. Have you been contacted about programs that provide rebates for energy-efficient equipment, like light bulbs, air conditioners, refrigerators, clothes washers, water heaters or even provide the equipment for free?

Response	PG&E	SDG&E	SCE	SCG	Total
Yes	24	21	27	28	**100**
No	28	32	26	29	**115**
Total	52	53	53	57	**215**

5. <Program> is offered at no cost to qualified customers. Do you think you may have heard of <Program>?

Response	PG&E	SDG&E	SCE	SCG	Total
Yes	17	24	22	27	**90**
No	27	25	27	22	**101**
Don't know	8	4	4	8	**24**
Total	52	53	53	57	**215**

6. Have you participated in this program or a program like this? (CLARIFY IF NEEDED: programs that help you save energy by offering rebates for equipment or bill rate reductions)

Response	PG&E	SDG&E	SCE	SCG	Total
Yes, this program	9	15	10	8	**42**
Yes, another program	5	9	8	7	**29**
No	44	37	43	46	**170**
Don't know	9	6	6	6	**27**
Total	67	67	67	67	**268**

7. Did you have an assessment of your current home done for the <Program>? In other words, did someone come to your home to check things like your insulation, water heater, windows, heaters, air conditioners, lights, refrigerator?

Response	PG&E	SDG&E	SCE	SCG	Total
Yes	4	12	5	4	**25**
No	4	2	4	4	**14**
Don't know	1	1	1	0	**3**
Total	9	15	10	8	**42**

8. Do you recall what year you had the assessment?

Response	PG&E	SDG&E	SCE	SCG	Total
2000	0	0	0	1	**1**
2002	0	1	0	0	**1**
2004	0	0	1	0	**1**
2005	0	1	0	0	**1**
2006	0	3	0	0	**3**
2007	0	2	1	0	**3**
2008	0	1	0	0	**1**
2009	0	0	1	0	**1**
2010	1	1	1	1	**4**
Don't know	3	3	1	2	**9**
Total	4	12	5	4	**25**

9. Have you requested another assessment at your current home?

Response	PG&E	SDG&E	SCE	SCG	Total
Yes	0	1	1	2	**4**
No	8	14	9	5	**36**
Don't know	1	0	0	1	**2**
Total	9	15	10	8	**42**

10. Why have you not requested an assessment of your current home?

Response	PG&E	SDG&E	SCE	SCG	Total
I do not want any one in my home	0	2	0	0	**2**
I am not concerned about reducing my electric or gas bill / pay less	0	1	0	1	**2**
I have doubts that anything is really free of charge	1	0	1	0	**2**
Property manager will not let me	0	1	2	0	**3**
I don't think there is anything else that can be done	1	0	2	1	**4**
I do not think it (what they do) will make much difference	0	2	0	0	**2**
It seemed like it involves too much / I can't take time off work, etc.	1	2	0	1	**4**
Some other reason. Specify:	4	4	4	2	**14**
Don't know / Don't remember	2	2	0	1	**5**
Total	9	14	9	6	**38**

OTHER PROGRAMS

11. What was the result of the assessment by the <Program>?

Response	SDG&E	SCE	SCG	Total
Still waiting for assessment to be done	1	1	2	**4**
Total	1	1	2	**4**

12. What type of similar program did you apply for?

Response	PG&E	SDG&E	SCE	SCG	Total
Gave response	5	7	7	5	**24**
Don't know	0	2	1	2	**5**
Total	5	9	8	7	**29**

13. Do you remember the name of the program?

Response	PG&E	SDG&E	SCE	SCG	Total
Yes, specify	2	1	1	1	**5**
No	2	7	7	6	**22**
Don't know	1	1	0	0	**2**
Total	5	9	8	7	**29**

14. Do you remember what you received from the program?

Response	PG&E	SDG&E	SCE	SCG	Total
Yes, specify	5	6	7	6	**24**
No	0	2	1	1	**4**
Don't know	0	1	0	0	**1**
Total	5	9	8	7	**29**

15. Did you have an assessment of your current home done by this other program?

Response	PG&E	SDG&E	SCE	SCG	Total
Yes	3	3	3	3	12
No	2	5	5	4	16
Don't know	0	1	0	0	1
Total	5	9	8	7	29

16. Do you recall what year you had the assessment?

Response	PG&E	SDG&E	SCE	SCG	Total
2001	0	1	0	0	**1**
2005	1	0	0	1	**2**
2008	1	0	1	0	**2**
2009	0	1	1	1	**3**
2010	0	0	1	1	**2**
Don't know	1	1	0	0	**2**
Total	3	3	3	3	**12**

17. Have you received any of the following services from any other programs?

Response	PG&E	SDG&E	SCE	SCG	Total
Fuel or electric or gas bill payment assistance	1	3	1	1	**6**
Weatherization with attic insulation or new windows/doors to seal places where air conditioning/heat could be lost	0	2	2	0	**4**
Electric or gas rate reduction	1	2	2	2	**7**
Some other service (not specified)	1	0	0	1	**2**
Don't know	2	2	3	3	**10**
Total	5	9	8	7	**29**

NON-APPLICANTS

18. Why haven't you attempted to apply for any programs to help you save energy or weatherize your home to help seal up places where air conditioning or heat could be lost?

Response	PG&E	SDG&E	SCE	SCG	Total
I do not want any one in my home	0	1	2	0	**3**
I am not concerned about reducing my electric or gas bill/pay less	0	0	3	2	**5**
I have doubts that anything is really free of charge	1	2	1	3	**7**
Because I was behind in my electric or gas bill payments and don't want to call the company	0	1	0	0	**1**
Property manager will not let me	6	4	3	1	**14**
I don't think there is anything else that can be done	4	1	7	4	**16**
I do not think it (what they do) will make much difference	0	1	1	1	**3**
It seemed like it involves too much / I can't take time off work, etc.	0	4	3	4	**11**
Some other reason (Please Specify):	23	17	16	24	**80**
Don't know/Don't remember	10	6	7	7	**30**
Total	44	37	43	46	**170**

19. Have you ever requested an assessment of your current home? In other words, did someone come to your home to check things like your insulation, water heater, windows, heaters, air conditioners, lights, refrigerator?

Response	PG&E	SDG&E	SCE	SCG	Total
Yes	13	7	5	14	**39**
No	40	35	43	36	**154**
Don't know	0	1	1	2	**4**
Total	53	43	49	52	**197**

20. Why have you not requested an assessment of your current home?

Response	PG&E	SDG&E	SCE	SCG	Total
I do not want any one in my home	1	1	1	2	**5**
I am not concerned about reducing my electric or gas bill / pay less	0	2	1	0	**3**
I have doubts that anything is really free of charge	0	1	0	1	**2**
Because I was behind in my electric or gas bill payments and don't want to call the company	0	0	1	0	**1**
Property manager will not let me	2	6	6	0	**14**
I don't think there is anything else that can be done	4	0	8	3	**15**
I do not think it (what they do) will make much difference.	2	1	3	2	**8**
It seemed like it involves too much / I can't take time off work, etc.	1	5	0	5	**11**
Some other reason (Please Specify):	19	12	17	17	**65**
Don't know/Don't remember	11	8	7	8	**34**
Total	40	36	44	38	**158**

ASK OF ALL RESPONDENTS

21. On a scale from 1 to 5 where 1 means 'not at all satisfied' and 5 means 'very satisfied', how would you rate your satisfaction with <utilities> ?

Response	PG&E	SDG&E	SCE	SCG	Total
1 - Not at All Satisfied	3	1	1	0	**5**
2	0	0	1	1	**2**
3	7	6	4	2	**19**
4	18	18	12	14	**62**
5 - Very Satisfied	34	39	46	48	**167**
9	4	3	3	2	**12**
10	1	0	0	0	**1**
Total	67	67	67	67	**268**

22. Turning now to another subject, is your heating system....

Response	PG&E	SDG&E	SCE	SCG	Total
Working well	54	48	48	45	**195**
In need of repair	6	2	7	2	**17**
Not working, in need of replacements	2	8	3	9	**22**
Other (please specify)	2	3	2	6	**13**
Don't know	3	6	7	5	**21**
Total	67	67	67	67	**268**

23. Are you able to stay comfortably warm in the winter?

Response	PG&E	SDG&E	SCE	SCG	Total
Yes	57	56	52	53	**218**
No	9	11	9	11	**40**
Sometimes/It depends. [ASK TO EXPLAIN]:	1	0	5	3	**9**
Don't know	0	0	1	0	**1**
Total	67	67	67	67	**268**

24. How do you stay warm? Do you... (Mention #1)

Response	PG&E	SDG&E	SCE	SCG	Total
Run the heater	43	32	43	38	**156**
Wear extra clothes instead of running the heater	15	18	18	15	**66**
Do not need to run heater - does not get cold here	1	5	2	3	**11**
Something else (Please specify)	8	12	4	11	**35**
Total	67	67	67	67	**268**

24. How do you stay warm? Do you... (Mention #2)

Response	PG&E	SDG&E	SCE	SCG	Total
Run the heater	6	3	3	4	**16**
Wear extra clothes instead of running the heater	6	4	10	17	**37**
Do not need to run heater - does not get cold here	0	0	0	1	**1**
Something else (Please specify)	7	3	1	2	**13**
Total	19	10	14	24	**67**

25. Is your main refrigerator...

Response	PG&E	SDG&E	SCE	SCG	Total
Working well	61	56	55	61	**233**
In need of repair	3	2	7	3	**15**
Not working, in need of replacement	3	8	4	2	**17**
Other (Please specify)	0	1	0	0	**1**
Don't know	0	0	1	1	**2**
Total	67	67	67	67	**268**

26. Do you have any other appliances that are in need of repair or replacements?

Response	PG&E	SDG&E	SCE	SCG	Total
Yes	15	13	12	10	**50**
No	51	54	53	55	**213**
Don't know	1	0	2	2	**5**
Total	67	67	67	67	**268**

27. About your utility bill, do you...

Response	PG&E	SDG&E	SCE	SCG	Total
Make the payment every month; never have to worry about making the payment	25	23	25	32	**105**
Make the payment every month, but sometimes have to cut back on other expenses	23	24	24	20	**91**
Make the payment most months, but sometimes have to pay for other things instead	16	7	6	6	**35**
Make the payment sometimes, but struggle to keep the gas or electric from being shut off	3	12	9	6	**30**
Other (Please specify)	0	0	0	1	**1**
Don't know	0	1	3	2	**6**
Total	67	67	67	67	**268**

28. Has the CARE rate improved your ability to pay your utility bill? (IF needed, say 'CARE is the program that provides income-qualified customers a discount of 20% or more off their monthly electric and gas bills.')

Response	PG&E	SDG&E	SCE	SCG	Total
Yes	60	64	57	60	**241**
No	7	2	8	6	**23**
Don't know	0	1	2	1	**4**
Total	67	67	67	67	**268**

29. Is this what you expected as a result of participating in this program?

Response	PG&E	SDG&E	SCE	SCG	Total
Yes	57	62	54	56	**229**
No, was not my expectation	2	0	2	3	**7**
Don't know	1	2	1	1	**5**
Total	60	64	57	60	**241**

DEMOGRAPHICS

Multi1: Are you also a customer of SOUTHERN CALIFORNIA GAS?

Response	SCG	Total
Yes	44	**44**
No	19	**19**
Don't know	4	**4**
Total	67	**67**

Multi2: Are you also a customer of SOUTHERN CALIFORNIA EDISON?

Response	SCG	Total
Yes	45	**45**
No	19	**19**
Don't know	3	**3**
Total	67	**67**

30. Who would you contact... if you had questions about qualifying for certain items or services (Mention #1)

Response	SCE	SCG	Total
SCE	30	30	**60**
SCG	2	4	**6**
Other: Please specify	1	3	**4**
Don't know	11	8	**19**
Total	44	45	**89**

30. Who would you contact... if you had questions about qualifying for certain items or services (Mention #2)

Response	SCE	SCG	Total
SCE	0	2	**2**
SCG	16	11	**27**
Other: Please specify	1	0	**1**
Total	17	13	**30**

31. Who would you contact... if you had questions about scheduling an appointment to enroll in the program (Mention #1)

Response	SCE	SCG	Total
SCE	33	29	**62**
SCG	2	6	**8**
Other: Please specify	0	1	**1**
Don't know	9	9	**18**
Total	44	45	**89**

31. Who would you contact... if you had questions about scheduling an appointment to enroll in the program (Mention #2)

Response	SCE	SCG	Total
SCG	15	11	**26**
Total	15	11	**26**

32. What is your primary heating fuel? (Heating fuel is the fuel or energy source that powers the primary heat source.)

Response	PG&E	SDG&E	SCE	SCG	Total
Electricity	17	23	20	18	**78**
Natural Gas	38	33	35	46	**152**
Propane or Oil	4	1	6	0	**11**
Other (wood, kerosene, solar, etc.)	6	4	0	1	**11**
Don't know / NA	1	6	6	2	**15**
Refused	1	0	0	0	**1**
Total	67	67	67	67	**268**

33. What OTHER heating fuel(s) or energy sources are used to heat your home?

Response	PG&E	SDG&E	SCE	SCG	Total
Electricity	13	9	9	11	**42**
Natural Gas	5	4	2	7	**18**
Propane or Oil	2	0	0	0	**2**
Some other such as wood, kerosene, or solar	6	2	4	3	**15**
None	40	49	51	45	**185**
Don't know/NA	0	2	1	1	**4**
Refused	1	1	0	0	**2**
Total	67	67	67	67	**268**

34. What type of fuel or energy source is used to heat the water used in your home?

Response	PG&E	SDG&E	SCE	SCG	Total
Electricity	8	18	11	9	**46**
Natural Gas	45	41	43	56	**185**
Some other such as propane or solar	7	1	5	0	**13**
Don't know / NA	6	6	8	2	**22**
Refused	1	1	0	0	**2**
Total	67	67	67	67	**268**

35. What is the main source of air-conditioning or cooling for your home?

Response	PG&E	SDG&E	SCE	SCG	Total
Central/Whole house air conditioning	31	13	33	28	**105**
Window AC(s)	6	12	9	11	**38**
Swamp cooler	7	2	7	5	**21**
None / no AC/cooling	7	24	12	18	**61**
Other (Please specify)	10	10	4	4	**28**
Don't know	5	5	2	0	**12**
Refused	1	1	0	1	**3**
Total	67	67	67	67	**268**

36. How many units of <main source of air-conditioning> do you have?

Response	PG&E	SDG&E	SCE	SCG	Total
1	16	12	10	14	**52**
2	3	6	5	1	**15**
3	0	1	3	0	**4**
4	0	1	0	1	**2**
5	1	1	1	0	**3**
6	1	1	1	0	**3**
7 or more	0	2	0	0	**2**
Don't know	2	0	0	4	**6**
Total	23	24	20	20	**87**

37. Please stop me when I reach the age range you are in...

Response	PG&E	SDG&E	SCE	SCG	Total
18-25 years old	0	1	0	1	**2**
26-35 years old	5	7	8	5	**25**
36-45 years old	11	12	11	14	**48**
46-55 years old	13	11	15	12	**51**
56-65 years old	13	15	13	13	**54**
66 or older	24	20	20	21	**85**
Refused	1	1	0	1	**3**
Total	67	67	67	67	**268**

38. Including yourself, how many people live in your household?

Response	PG&E	SDG&E	SCE	SCG	Total
1	31	22	22	13	**88**
2	14	14	10	15	**53**
3	5	6	7	9	**27**
4	6	8	12	14	**40**
5	3	6	3	8	**20**
6	3	6	8	6	**23**
7 or more	4	3	5	1	**13**
Refused	1	2	0	1	**4**
Total	67	67	67	67	**268**

39. How many are adults - aged 18 and older?

Response	PG&E	SDG&E	SCE	SCG	Total
1	35	28	25	15	**103**
2	18	23	20	25	**86**
3	9	8	8	14	**39**
4	2	6	10	9	**27**
5	2	0	2	3	**7**
7	0	0	1	0	**1**
Refused	0	0	1	0	**1**
Total	66	65	67	66	**264**

40. Record Respondent's Gender

Response	PG&E	SDG&E	SCE	SCG	Total
Male	21	23	20	23	**87**
Female	46	44	47	44	**181**
Total	67	67	67	67	**268**

41. Record Instrument Version

Response	PG&E	SDG&E	SCE	SCG	Total
English	66	49	59	48	**222**
Spanish	1	18	8	19	**46**
Total	67	67	67	67	**268**

Those are all the questions I have. Thank you for taking the time to answer these questions.

C LOCATION MAPS OF SAMPLE PARTICIPANTS

Figure C.1: Sample of PG&E LIEE Participants

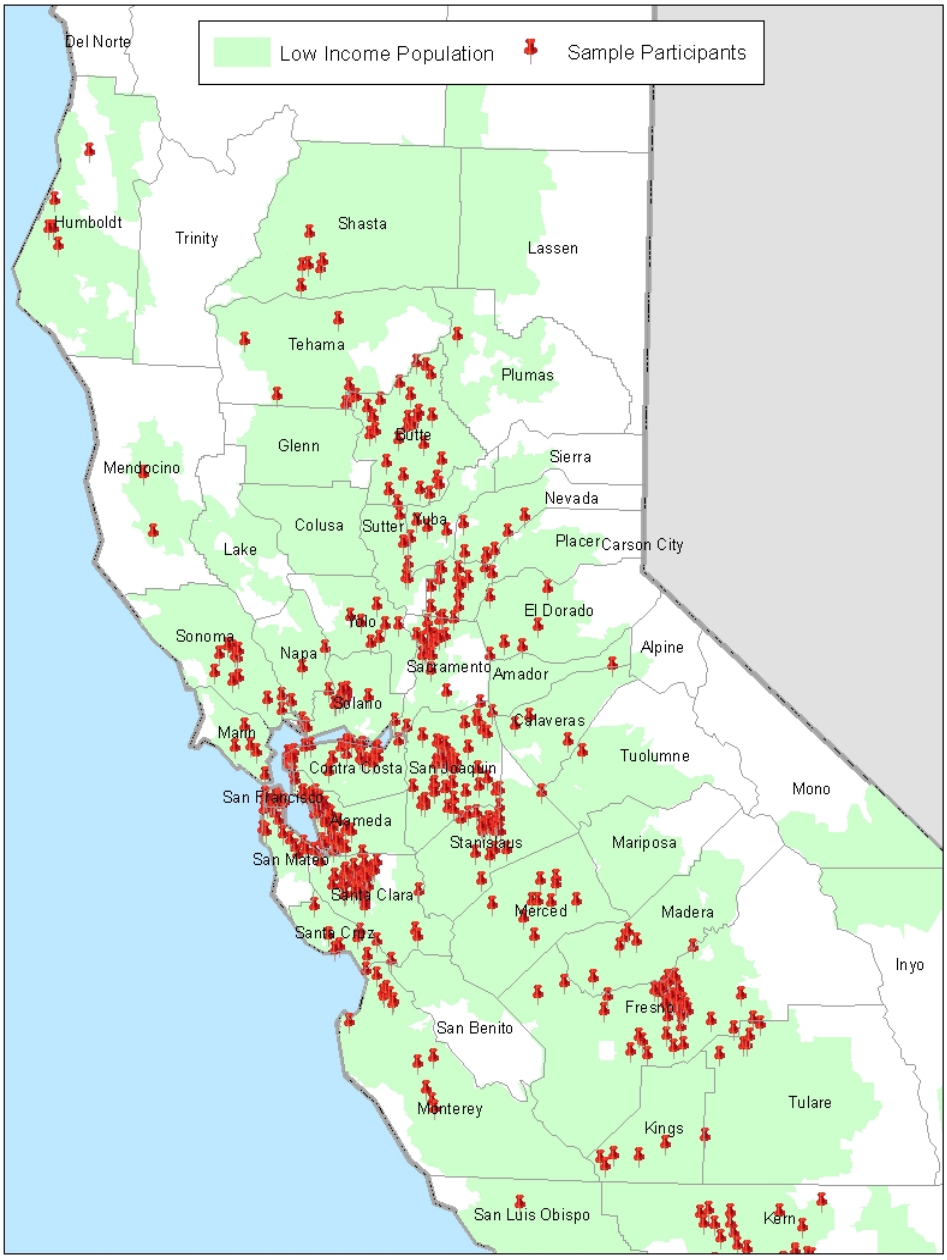


Figure C.2: Sample of PG&E Nonparticipants

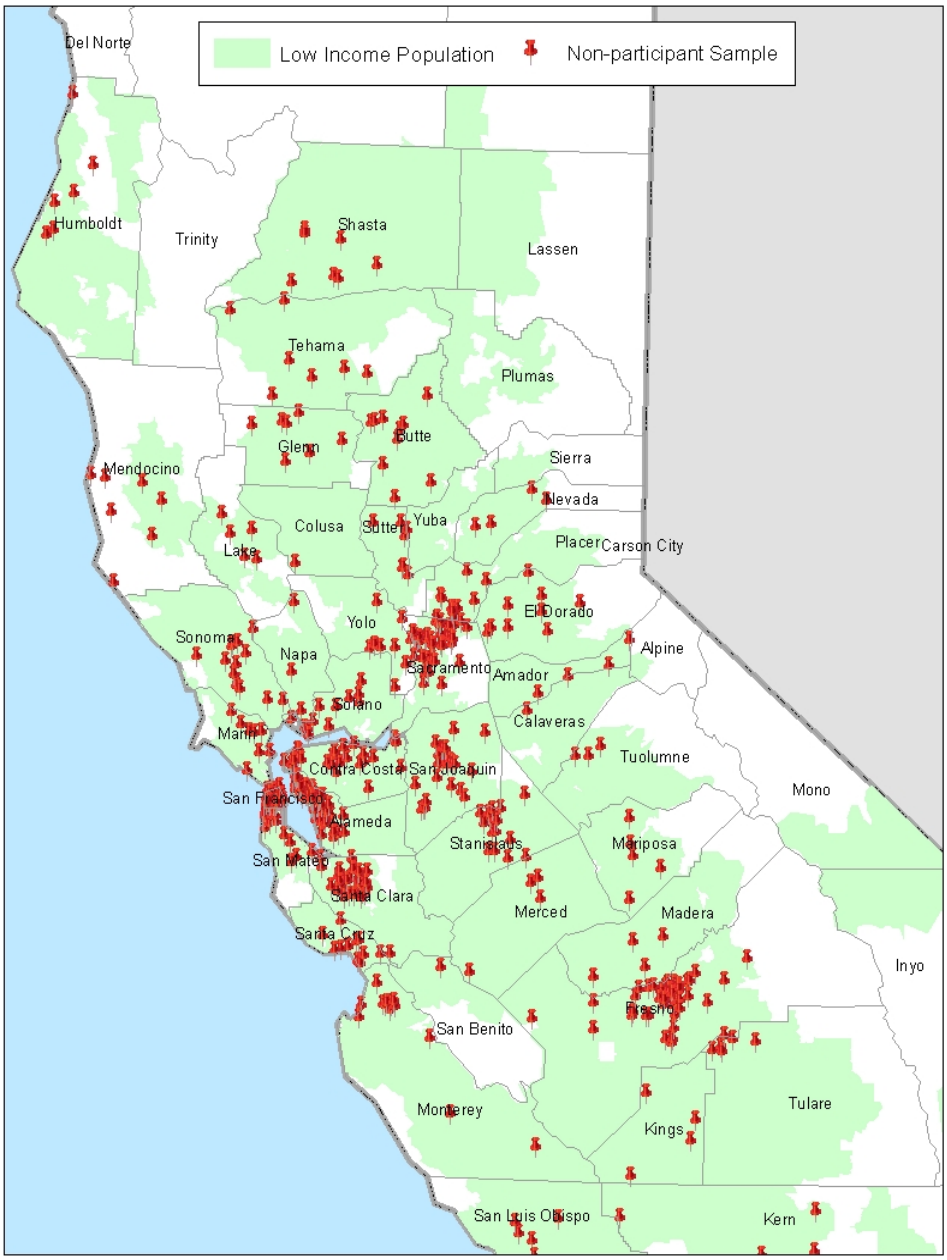


Figure C.3: Sample of SCE, SCG, and SDG&E LIEE Participants

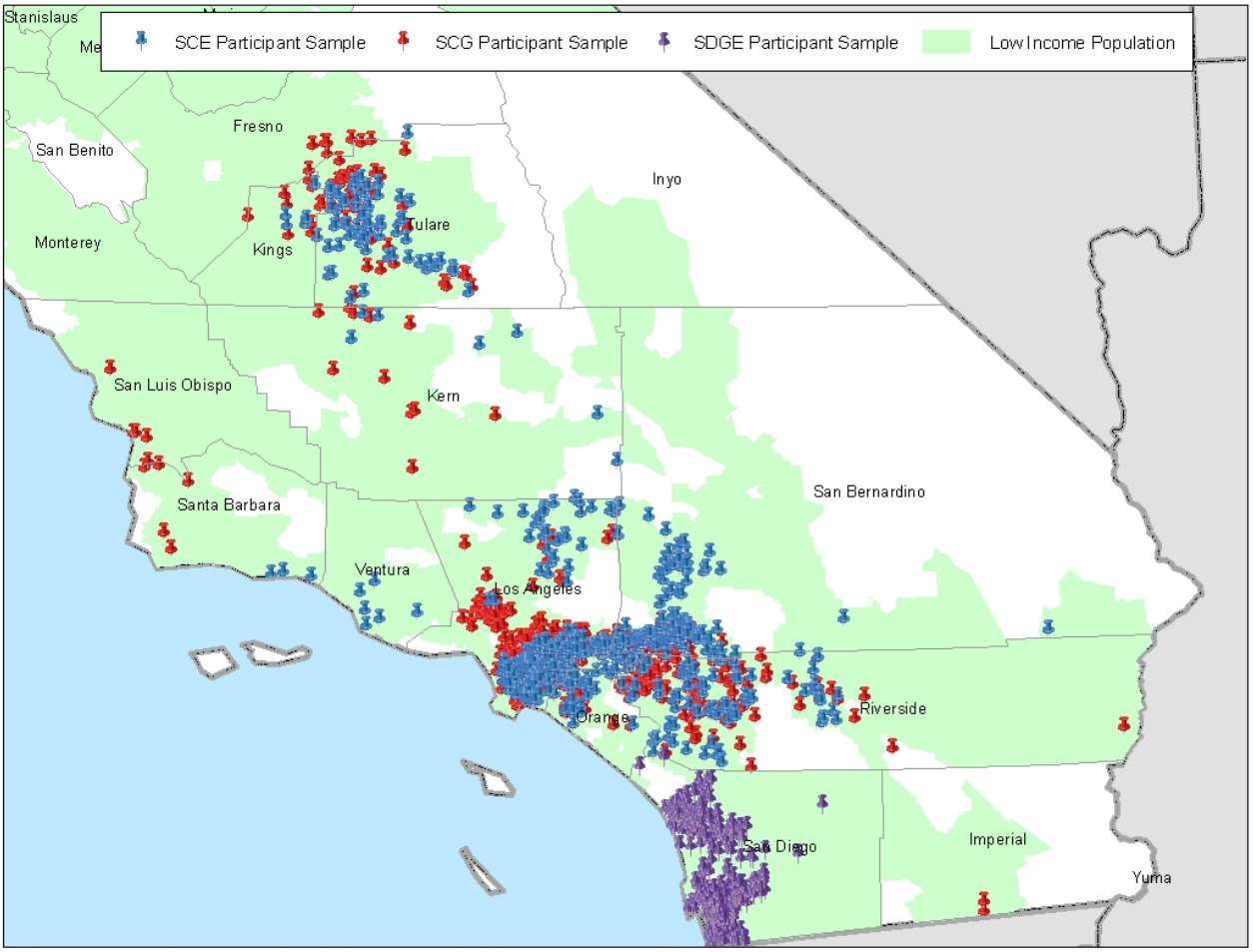
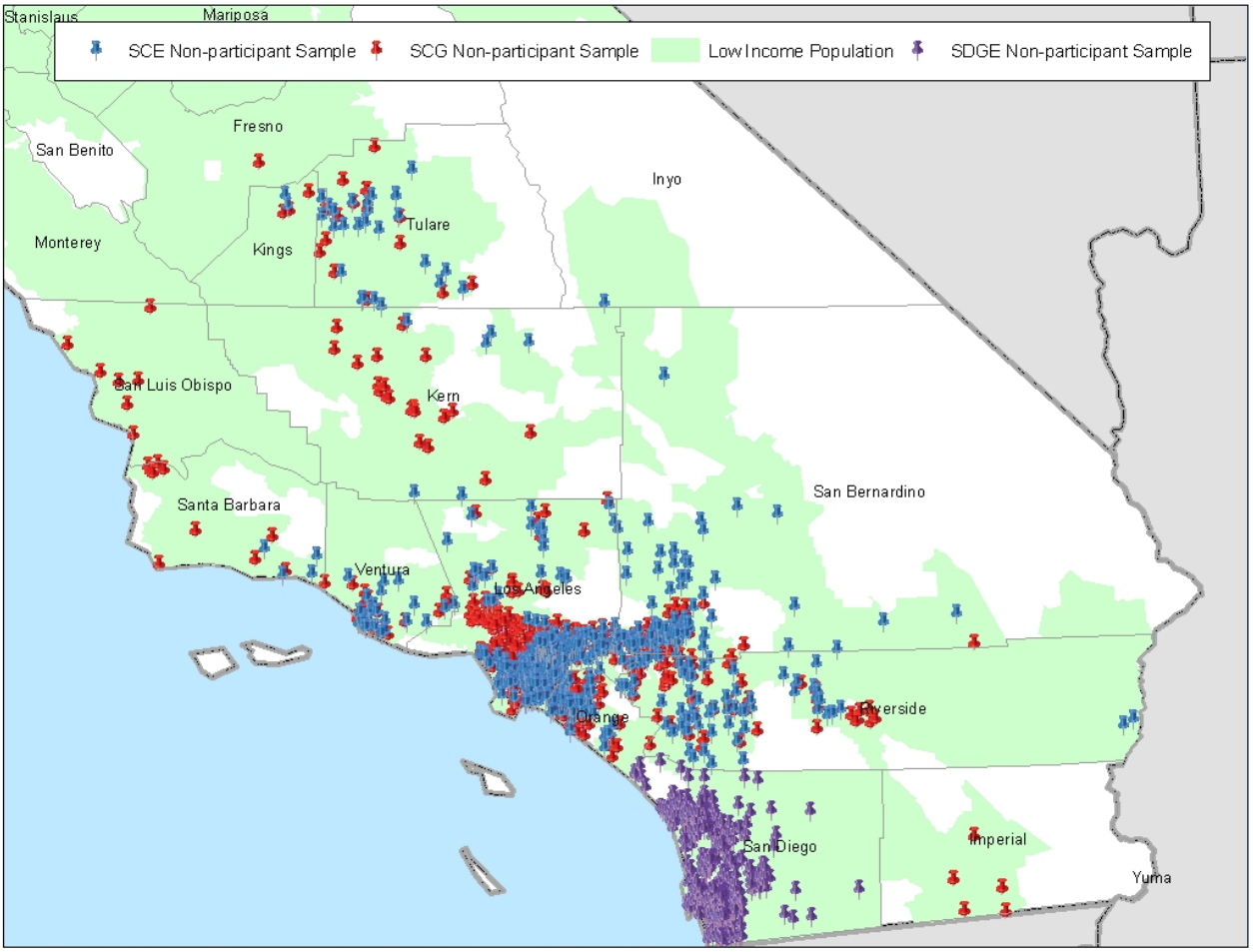



Figure C.4: Sample of SCE, SCG, and SDG&E Nonparticipants