FINAL REPORT
Energy Savings Assistance (ESA) Program
Energy Education Research
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DNV KEMA took a lead role in the secondary research review. HINER & Partners, Inc. took a lead role in the contractor and the customer research.

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EXECUTIVE SUMMARY

This report summarizes research completed to for the assessment of Energy Education provided by the Energy Savings Assistance (ESA) Program.

Introduction and Background

The California Public Utilities Commission's Decision 12-08-044, Ordering Paragraph 110 authorized a Joint Utility[1] Study of ESA-provided Energy Education to identify ways to optimize and/or improve the educational component of the ESA Program and examine the current and potential value of this energy education. In addition, the Decision directed the study to test whether and how the current energy education program could be improved to yield actual energy and bill savings and how to effectively deliver the energy education toward the lasting behavioral change in the low income household. The energy education study should aim to explore how to measure success of such education[2].

Energy Education is one of the services provided to customers by the ESA program, and is the only service received by all qualified ESA participants. The "Energy Education" provided by the ESA contractors can occur at several points during a customer's interactions with the program staff, though in practice it is provided during two main touchpoints: (1) during the initial assessment/enrollment visit by an assessor (in the form of general and specific education that includes information about energy efficiency practices and programs, safety, and information about other low income assistance programs), and (2) as part of the installation visit by an installer (as specific information about measure-related use and maintenance when measures such as appliances are installed).

The overall purpose of this Energy Education Study was to identify ways to optimize and/or improve the educational component of the program. Due to time and budget limitations, this study focused primarily on the initial assessment/enrollment visit. Comprehensive information regarding the education or information provided during the installation visits is not included in this report. In particular, this study examines both current and potential practices related to the delivery mechanisms, educational materials, and content and relative value associated with the educational component of the Energy Savings Assistance Program. It further examines best practices across the IOUs and comparable efforts done elsewhere to inform potential improvements to this component of the program.

[1] The Joint Utilities are: Southern California Edison Company (SCE) Pacific Gas and Electric Company (PG&E), Southern California Gas Company (SCG), and San Diego Gas and Electric Company (SDG&E).
[2] The Joint Utilities' July 26, 2013 request for an Extension of Time to Comply with D.12-08-044 and authorization to complete the Energy Education Study in two distinct phases was granted by the Assigned Administrative Law Judge and Commissioner on August 9, 2013. The revised deadline for Phase I addressing delivery practices and educational content is October 31, 2013. The revised deadline for Phase II which will address energy and bill savings addressing is December 14, 2014. The August 9 ruling further directed the IOUs to file a Petition to Modify to defer this phase of the study until the next program cycle.

Along these lines, the two primary objectives of the Energy Education Study were to find improvement opportunities concerning: (1) how energy education is provided, and (2) what materials and content are provided.

As noted above, this research originally included a third objective to describe a method to determine whether Energy Education offerings result (or could result) in realized energy or bill savings for program participants. However, this objective has been postponed and therefore is not included in as part of this report[3].

Methodology

To achieve the ESA Energy Education research objectives, the research team followed a three-phase approach that included: (1) a secondary research review, (2) contractor in-depth interviews and Internet survey, and (3) customer in-home interviews, focus groups, and telephone survey (Table 1). Each phase of the data collection and analyses provided a different type of information that informed the final results presented in this report. Additional details on each of these phases of data collection and analyses are described below in the Methodology section of the report.

Table 1: Data Sources and Overall Purpose

Data Source	Type	Number	Dates	Overall Purpose
Secondary Research	Materials Review	--	February-April 2013	Background; IOU Perspective; Other En Ed programs (outside CA)
Contractor Research	In-Depth Telephone Interviews	12	May-June 2013	Contractor Perspective: (1) How En Ed is delivered; (2) What is delivered
	Online Survey	171	July-August 2013	
Customer Research	In-Home Interviews	30	June 2013	Customer Perspective: (1) How En Ed is delivered; (2) What is delivered
	Focus Groups	6	July 2013	
	Telephone Survey	505	August 2013	

In brief, the three phases included:

(1) Secondary Research Review. The secondary research review included our own evaluation of assessor training materials, quality control and assurance, program materials, program protocols for energy education, and best practices from a literature review, along with interviews with program staff concerning the administration of energy education. This provided a foundational understanding of the energy education component of the ESA program, and a comparative perspective to similar programs in other jurisdictions outside California.

(2) Contractor Research. The contractor in-depth interviews and Internet survey provided the viewpoints of assessors. They were included because they are closest to the in-home energy education experience (in addition to the customers themselves). Topic areas

[3] A petition to modify D.12-08-044 to ensure that Phase II Final Report due date is properly postponed to the next cycle is pending submission.

included assessor background, recruitment and retention, language barrier issues, assessor training, in-home energy education practices, in-home education materials, and contractor ideas for energy education improvements.

(3) Customer Research. The customer in-home interviews and focus groups provided the customer's perspective regarding their motivations about saving energy and the program, their in-home educational experiences, their takeaway from the energy education in terms of what they recalled and how they benefitted, their feedback on the energy education materials, and their ideas for program improvements. The customer telephone survey covered most of these same topics in order to measure the prevalence of ESA participant perceptions and beliefs about their energy education experiences.

The HINER/KEMA research team also went into the field for a day each with an experienced energy assessor at each IOU to observe firsthand their interactions with customers.

Table 2. Data Source Objectives

Data Source	Type	Objectives
Secondary Research	Materials review	What training was provided to contractors? What materials are used for training and with customers? What guidelines determine contractor activities? How is performance and compliance monitored? What practices and materials are used by other en ed programs outside CA? How is en ed delivered in other comparable programs?
Contractor Research	In-Depth Telephone Interviews	What background do assessors have? What training was received? How is en ed delivered? How do customers respond? What content or materials stand out? What issues interfere with delivery? What additional training or materials could be provided?
	Online Survey	How many or what percent of assessors? Validation of findings across contractors and IOU service territories
Customer Research	In-Home Interviews	How has education been provided? What content and/or delivery methods or materials stand out? What learnings have been put into practice? What interferes with delivery and/or implementation in the home? How the information learned is passed on to other household members?
	Focus Groups	What do customers think about current methods for delivering en ed? What do customers think about current content and materials? What do customers think about potential new methods/materials/content? What would resonate most with customers?
	Telephone Survey	How many or what percent of customers? Validation of findings across service territories

Summary findings, conclusions, and recommendations are described next. The recommendations do not imply that the Investor Owned Utilities have not been or are not currently addressing these issues, but rather that these recommendations may be considered when developing future plans. All recommendations need to be considered within the context of feasibility, cost effectiveness, and any other relevant criteria.

Summary Findings and Conclusions

Findings from the three phases of research are summarized below to address the two main research objectives: (1) how energy education is, and should be, delivered, and (2) what materials and content are, and should be, provided to encourage behavioral change in the low income household.

Overall, energy education did assist participants by providing information that could help them save money on their energy bill and addressing their barriers to reducing energy consumption in their homes. Although participants in the in-home interviews primarily attributed energy savings to new lighting, appliances, and hot water shut-off devices, a majority also agreed that it affected their behavior regarding how they used energy and half said it affected the attitudes or behavior of someone else in the home. Most said the information raised their awareness of things they can do and prompted them to change their behaviors.

Participant-reported outcomes from energy education in the quantitative survey were quite positive as well. 82%[4] said they learned something that made them more aware of things they could do to save energy, and 81% said they learned something that led them to pay more attention to how they were using energy. 76% said they learned something that resulted in changes to how they did things in order to save energy. Just as many (74%) think they have also saved money on their energy bill since they participated in the program[5].

Delivery of Energy Education

In terms of overall delivery of energy education, we found:

(1) Assessor recruitment, selection, and retention processes have been effective;
(2) Assessor performance regarding delivering energy education has been excellent overall, but a small minority of customer experiences and/or assessors need improvement;
(3) Assessor training appears to be preparing assessors to provide effective energy education, although we did identify aspects for improvement so that all assessors across all IOUs provide similarly high quality energy education;
(4) Language barrier problems are minimal among the English and Spanish speaking customer populations due to the prevalence of bi-lingual assessors[6];
(5) In-home delivery methods are also generally on target, but the practice of not providing education until *after* qualification on measures has been determined is likely to reduce its effectiveness;

[4] Unless otherwise noted, percentages are based to the total surveyed sample, and response percentages can be independent from each other.
[5] Based on self-reported survey data. Actual savings were not determined as part of this research. If authorized, a second phase will address this issue.
[6] Although contractors referenced communications with non-English and non-Spanish speaking customers, this study included data from English and Spanish speaking customers only, the two most commonly used languages in California. It did not investigate language barrier issues among customers who are dependent on languages other than English or Spanish, nor did it investigate communication barriers for those with visual, auditory, or cognitive impairment. Due to these constraints, these findings are limited to English and Spanish speaking populations.

(6) Customer retention of information is a problem for some customers that should be addressed; and
(7) Households with multiple adults and/or children in the home face challenges with gaining everyone's cooperation in reducing the household's energy consumption, so more could be done to assist these households.

Content and Materials Provided for Energy Education

In terms of overall content and materials that are provided as part of energy education, we found:

(1) The guidebooks used by each of the IOUs are key tools, yet all have room for improvement regarding both layout and content;
(2) Additional materials could be developed that provide appliance cost of use information (similar to the "energy wheel" used by PG&E contractors) and that can help overcome the issues of customers forgetting and of the challenges faced by multi-person households; and
(3) Educational content is relatively comprehensive, but information that customers consider "new" is more memorable.

Recommendations

Overall, there is considerable evidence from the energy education research to suggest that providing energy-related educational information verbally to ESA participants at the time of the initial assessment visit is well-founded. The assessors who provide the education are out-going, motivated, and knowledgeable enough to provide high quality education. Recent ESA participants believe that they benefitted from the information they received, and said the ESA energy education prompted them to change behaviors in ways that have led to lower energy consumption and lower energy bills.

This interactive, action-oriented delivery process follows best practices identified through a review of the energy education literature. Client-specific messages with an action focus delivered in an interactive atmosphere with hands on learning opportunities reinforce the basic elements provided through the ESA energy education. Ideas and recommendations regarding possible improvements are described in greater detail below. Suggestions regarding to best practices and potential improvements are offered to help overcome some of the limitations and shortcomings identified as a part of this research and to improve the delivery of the program.

Key Recommendations

1. **Standardize More of the Training Across IOUs**. While it is important to maintain some flexibility in the training practices, across IOUs and contracting agencies, this research suggests that more standardization and consistency across the IOUs would encourage more of the best practices to be adopted as well as enhance the overall knowledge base of all assessors concerning the energy saving tips and information they pass on to ESA participants. We recommend that the IOU's establish:

    (1) Consistent and rigorous training for new assessors provided by or overseen by the IOU,

(2) Consistent and rigorous refresher training also provided by or overseen by the IOU, and
(3) Consistent and rigorous standards for field training provided by the contracting organizations.

Based on assessor comments and our own review of IOU training programs and field observations, we suggest that training include much of what is already being done though promulgated across IOUs and contractors. For initial training, we suggest:

- Formal classroom instruction focused on informing assessors about as many ways to save energy in the home as is collectively known across the IOUs;
- Classroom role-playing to ensure assessors are able to adapt their education delivery to a wide variety of household situations likely to be encountered (e.g., household size, age of household members, etc.); and
- Field training (conducted by more experienced contractor personnel) where new assessors first observe a more experienced assessor during actual in-home visits and then progress to conducting visits under the tutorage of a more experienced assessor.

Some contractor organizations have trained their assessors to write in the guidebook by underlining and circling key pieces of information, and writing their name and contact information on the back or inside the cover. Writing in the books serves two purposes: it draws the customer's attention to information in the book, and it can remind customers about the information that was conveyed verbally by the assessor if they open and review the guidebook in the future. We recommend that this practice be adopted, and therefore included in training.

For refresher training, we suggest that IOU's establish specific annual standards whereby each active assessor receives periodic additional instruction. Refresher training may focus on content to provide assessors with a large number of energy saving practices and tips which they can, in turn, pass on to customers. Our observations on the few ride-alongs we attended along with customer survey results suggest the assessors sometimes do not provide many of these energy saving tips during energy education, and that they may only provide the most common ones. For this reason, assessors may benefit from reminders or refreshers regarding what the tips are, and how and when to communicate them to customers. To keep the information fresh, the IOU's should seek to provide new education content as well as reminder content for refresher training.

2. **Provide Follow Up.** This research also provided data supporting the benefit of following up with customers after the initial assessment. Follow up may include two-way communication from the IOU (or contractor) mitigating two issues that were identified: (1) some participants are left with a belief that their participation in the program was not completed, so follow-up would allow the customer to describe any unresolved aspects of their participation, and (2) customers tend to forget what they've learned from energy education so follow-up would also provide them with periodic reminders. We offer two types of follow-up for possible consideration:

- First, the ESA program could provide all participants with a mail-back or web-based survey form that would include questions about: (1) what did you learn, (2) what do you plan to put into practice, and (3) what, if anything, was not completed.
- Second, the ESA program could provide participants with periodic communications, such as a quarterly emailed "newsletter" that could include new or reminder energy savings tips, weather-related tips or information, new programs, MyAccount/MyEnergy tie-ins, etc. Communications could also include text or twitter "opt-in" messaging.

3. **Consider Modified and Additional Education Materials.** We recommend some specific revisions to the existing materials, primarily the resource guidebooks. While these materials currently provide a considerable amount of useful information we recommend some modification to increase the appeal and subsequent use. The materials may also benefit from additional content to further motivate and facilitate energy conservation behaviors, particularly for large households with multiple adults or with children. These homes may appreciate more, tips and techniques for engaging other members of the household as well as age-appropriate materials. Specific recommendations regarding these modifications are included in the key findings and detailed results sections of this report. Given that, saving money is the main motivation for participating in ESA (and for following the energy-saving advice provided by energy education) finding ways to call out and highlight the costs associated with using specific appliances or electronics or taking certain actions will make energy education materials more appealing and relevant to the low income customers served by this program.

   We further recommend additional educational materials that would serve as reminders to customers about things they can do to save energy, and more directly enhance the education that is provided. In particular, our research data supports the value of one of the tools currently used only by PG&E. The "energy wheel" provides relevant information (e.g., the costs associated with using different appliances and equipment) in an easy-to-use and somewhat novel format. We suggest that all of the IOUs consider adopting the "energy wheel" or developing a similar tool that can be left with customers.

4. **Consider More Customized Information for Customers.** We recommend that ESA energy education include more information that is customized for the household. Customers voiced interest in new materials that would be more specific to their home and situation. For example, the item of greatest interest to customers in the telephone survey was a list of the Top 5 tips for the household. Implementation of this idea might be as simple as the assessor selecting 5 tips that would apply to the home from a list of 10-12 tips known to be most impactful. Customization would also apply to the need for some households to gain cooperation from other adults or children living in the home. Assessors currently collect information about household members during the qualification process, so this information could be used to "trigger" a situation-specific module, for example, targeted toward homes with children in given age groups or toward homes with other adults (e.g., senior parents, roommates, etc.) living there.

5. **Provide Energy Education Throughout the Visit.** Our research supports the value of a more interactive and holistic approach to the education as part of the assessment visit. Any approach to providing education that does not encourage assessors to deliver information and education throughout the visit reduces the potential benefit of this service for customers.

While many assessors already embed their education throughout the assessment process, we recommend that the training more explicitly teach this approach.

6. **Revise the Protocol of Not Providing Education Until After Qualification on Measures**. This practice appears to be limiting the energy education provided for single-fuel, electric-only visits to the time period following the walkthrough, which is not ideal. Also, our research supports providing energy education to all households that are income qualified regardless of their qualification on measures. The education should include both the verbal walkthrough tips and the review of the guidebook information. Both the customer and the assessor begin the assessment visit motivated to teach and to learn, and both have invested time and effort into the meeting, so not providing education at this point seems like a missed opportunity.

7. **Consider Augmenting the Existing IOU Compliance Surveys and In-Home Inspections**. Currently, the IOU compliance surveys and inspections focus on whether or not education was completed, but not how it was completed nor what the customer gained from it. Existing surveys and inspections can be augmented to capture the "quality" of the education in addition to the current measurement of whether or not energy education was conducted. Additional survey questions could ask the customer, at a minimum, what they did differently as a result of the education.

I. INTRODUCTION AND BACKGROUND

The Energy Savings Assistance (ESA) program provides no-cost services and energy efficiency measures including lighting retrofits, Heating, Ventilation, and Air Conditioning (HVAC) retrofits, 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. In addition, the program provides information and education that promotes energy efficiency practices. The program is intended to provide low-income households with an energy resource that can produce energy savings and reduce low-income customer bills. The program is delivered to qualifying households by contractors hired on behalf of Pacific Gas & Electric Company (PG&E), Southern California Edison (SCE), Southern California Gas Company (SCG), and San Diego Gas & Electric (SDG&E).

Energy Education is one of the services provided to customers by the ESA program, and is the only service received by all ESA participants. The "Energy Education" provided by the ESA contractors can occur at several points during a customer's interactions with the program staff, though in practice it is provided during two main touchpoints: (1) the initial assessment/enrollment visit (by an assessor in the form of general and specific education that includes information about energy efficiency practices and programs, safety, and information about other low income assistance programs), and (2) the installation visit by an installer (as specific information about measure-related use and maintenance when measures such as appliances are installed).

The California Public Utilities Commission's Decision 12-08-044, Ordering Paragraph 110 authorized a Joint Utility[7] Study of ESA-provided Energy Education to identify ways to optimize and/or improve the educational component of the ESA Program and examine the current and potential value of this energy education. To achieve these objectives, the Energy Education Study examines both current and potential practices related to the delivery mechanisms (duration and frequency), educational materials, and content and relative value associated with the educational component of the Energy Savings Assistance Program. Due to time and budget limitations, this study focused primarily on the initial assessment/ enrollment visit. Comprehensive information regarding the education or information provided during the installation visits is not included in this report.

An objective to describe a method to determine whether Energy Education offerings result (or could result) in realized energy or bill savings for program participants was originally part of this research, but this objective has been postponed from this phase of the project. After the initial work plan for addressing this issue was developed pursuant to the original proposal, further investigation and discussion led IOU program staff to consider increasing the scope and rigor of this component. Since the first two objectives of the Energy Education Study were to be completed in October 2013 (following an extension request from the original due date of August 2013), it was determined that the energy savings estimation would no longer fit the timeline or budget. This led to the decision to seek relief from the energy saving estimation component

[7] The Joint Utilities are: Southern California Edison Company (SCE) Pacific Gas and Electric Company (PG&E), Southern California Gas Company (SCG), and San Diego Gas and Electric Company (SDG&E).

from this phase of the research plan, with the intent of creating a separate research project for the next cycle.

As specified in the objectives of the RFP, there are two main issues that are addressed: (1) delivery practices, and (2) educational materials and content. Further, ESA education covers safety and other resources that are available for income qualified households in addition to general information about energy efficient practices and programs that reduce energy usage. A third issue, determining a method for measuring current and potential energy savings, was originally part of this research, but this component has been postponed until the next program cycle.

To better understand and improve delivery practices (i.e., ***how*** education is delivered), the following questions were considered in the research:

- To what extent are the ways that the education is delivered meeting the needs of the customers? (e.g., time, language[8], logistics, technical capabilities, etc.)
- How can energy education be delivered to this population in a way that facilitates lasting behavioral changes in the low income household?
- Are there other ways to deliver the information to the customers or sub groups of customers that may be more effective and efficient – from either the contractor or customer point of view?
- What are some of the key issues the contractors face with respect to delivering the education to the low income customers?
- Are the contractors delivering the information as per training? If not, why?
- Is the contractor training on this area of the program implementation sufficient or lacking? What can be improved?
- How, when, why, and to what extent is the education customized or varied – within and across households, utilities, etc.? Which methods are most effective?
- What is the average amount of time spent on delivering energy education, and what is the appropriate amount of time to maintain customers' attention and retention?

To better understand and improve educational materials and content (i.e., ***what*** is offered to customers) the following activities were also included in the research:

- A review of existing (and/or proposed) IOU materials, content and curriculum as well as comparison materials from other sources (Appendix I) such as comparable local or national energy efficiency programs and/or relevant educational materials, content and curriculum from non-Energy Efficiency programs (that may be similar in concept, delivery or market to the ESA program).

There are three primary strategies we have identified to address the objectives. Our research includes the relevant data sources for each of the three main objectives as per these guiding strategies:

[8] This issue of a potential language barrier was raised by parties during the initial public workshop and investigated more fully in the contractor quantitative and customer research.

1) Determine what ESA contractors provide regarding energy education and how they do it, including content, time spent, instruction methods, incentive structures and supervisory oversight, training received, and related details. Also, determine the range of differences between existing ESA contractors on these same criteria, and best practices.

2) Determine what ESA participants who have received energy education retain and put into practice, including information related to energy efficiency, safety, and additional resources.

3) Identify opportunities to improve the content and delivery of energy education, including the identification of potential new topics (e.g., self help tools on each IOU's website to enable customers to reduce their energy usage, other customer programs such as emailed bill reminders to help customers avoid late payments, etc.) and recommendations regarding what practices or content should be continued "as is," modified, or discontinued.

In our methodology section, we describe the plan of research that was completed to meet each of the three main objectives. To this end, our research focused on exploring the extent to which the program's content, materials, and delivery were currently meeting the needs of different segments, identifying best practices for possible replication and conversely finding areas for improvement, and investigating new content, materials, and delivery that have the potential to further enhance the success of the program.

Also, the research provides specific recommendations so that the Energy Education will effectively: (1) inform ESA participants about ways that the household can save more energy and be safer concerning electricity and/or gas, and (2) affect their behavior so that the household has the potential to achieve additional incremental energy savings as a result of energy education.

II. METHODOLOGY

Numerous strategies were employed to address the main objectives of the research. These included: (1) Secondary Research Review of Programs and Program Materials; (2) Contractor Research which included primarily (a) in-depth interviews with a small sample of contractors, and (b) a larger scale internet survey with contractors; and (3) Customer Research which included (a) In-Home Visits, (b) Focus Groups, and (c) a Customer Telephone Survey with a larger number of respondents. In addition to these core sources of data, we conducted one full day of ride-alongs with contractors at each IOU and discussions with program managers and other stakeholders to help understand key issues and to inform the development of the primary data collection tools described below. The purpose and details of each of the primary data collection methods used are described below.

Table 3: Data Sources and Purpose

Data Source	Type	Number	Dates	Purpose
Secondary Research	Materials Review	--	February-April; 2013	Background; IOU Perspective; Other En Ed programs (outside CA)
Contractor Research	In-Depth Telephone Interviews	12	May 2013	Contractor Perspective: (1) how En Ed delivered; (2) what is delivered
	Online Survey	171	July-August 2013	
Customer Research	In-Home Interviews	30	May 2013	Customer Perspective: (1) how En Ed delivered; (2) what is delivered
	Focus Groups	6	July 2013	
	Telephone Survey	505	August 2013	

The tables below describe how the objectives are served by each of these data components, with examples of the types of questions answered by each component.

Table 4: Understand and Improve Delivery Practices (i.e., *how* education is delivered)

Data Component	Types of Research Questions Answered
1a. Interviews with Program Staff	• What training has been provided to contractors? • What guides the training? • How do IOUs assess or monitor performance of energy education?
1b. Review of Program Materials	• How are contractors trained to deliver energy education? • How are specific materials used when informing or educating customers?
1c. Review of Other Utility Programs & Resources	• What methods of information delivery are employed by the CA IOU's? • Are there benefits to some practices over others in terms of delivery (among IOUs and across other similar programs? • Are there materials used elsewhere that can be employed by ESA?
1d. Review of Other Low Income	• What are other programs doing (e.g., methods of delivery)

Programs	that may/may not be considered for ESA? • (SAME as previous 1c?)
2a and b. Contractor Interviews: In-Depth and Internet Survey	• How is education delivered? • What differences in delivery exist in the field? • How do customers respond to delivery methods? • What issues can interfere with effective delivery?
3a. Customer In-Home Visits	• How has education been provided? • What delivery method stands out? • What has led to putting learning into practice? • What issues within the home interfere with delivery? • Are there other effective methods of delivery?
3b. Customer Focus Groups	• What do customers think about current methods/strategies for providing energy education? • What do customers think about potential new methods by which education could be provided? • Which would be most beneficial? • What is missing or lacking?
3c. Customer Telephone Survey	• How many or what percent of customers …(for each of the qualitative delivery issues above) • Are there demographic or other factors that influence effectiveness of delivery?

Table 5: Understand and Improve Education Materials and Content (i.e., what is offered to customers)

Data Component	Types of Research Questions Answered
1a. Interviews with Program Staff	• What education materials are provided to (1) contractors, and (2) customers? • How was the content developed?
1b. Review of Program Materials	• What is included in the various education materials? • Is there potential new content, not currently included, that could be added?
1c. Review of Other Utility Programs & Resources	• Is there an opportunity to add existing IOU programs to the content? • What is provided through ESA's energy education?
1d. Review of Energy Education in Other Low Income Programs	• What materials and content do other programs have?
2. Contractor Interviews	• What types of information or content resonate with customers? • What do customers respond to? • What are customers uninterested or uninvolved with? • What do customers ask about that is not included?
3a. Customer Qualitative: In-Home Visit	• What information was most useful or practical? • What content did not seem to apply? • What issues within the home prevent adoption of a particular energy efficient practice? • What are the perceived benefits of these practices?

	• Do they motivate?
3b. Customer Qualitative: Focus Groups	• What do customers think about potential new content? • What would be most beneficial? • What is missing or lacking?
4. Customer Quantitative	• How many or what percent of customers …(for each of the qualitative content issues above) • Are there demographic or other factors that influence perceived value or usefulness of content?

Each of the four phases is described in more detail below:

Secondary Research Review

This included a review of the existing reports, education materials, contractor training materials, contractor implementation and supervisory practices, and third party studies and education materials. This also included interviews with key IOU program managers and staff, a review of existing and planned utility programs and technologies, and ride-alongs with several experienced assessors. The ride-alongs involved HINER and KEMA project managers spending one full day with an assessor for PG&E, SCE/SCG, and SDG&E to experience the in-home visits first-hand[9].

The objective of this task was to obtain a thorough understanding of all of the relevant material provided to the low income customer and to the contractor that educates the customer on energy saving opportunities and behaviors. This provided a starting point from which to assess customer takeaway, and prior to the customer and contractor interviews, to identify materials and/or best practices that could benefit the program. The review of existing and planned programs and technologies (e.g., from the IOU's or from outside of CA) was intended to identify any that have potential to be leveraged by ESA Energy Education.

This task, along with the contractor interviews in the second component of the study, documented what contractors currently provide regarding energy education. It also provided a resource for the project team to identify potential new content or delivery methods that were tested with consumers in research components 3 and 4 regarding concept appeal.

Contractor Research

Contractor interviews included both in-depth, qualitative interviews with a small number of contractors and Internet-based surveys with a larger number of contractors across the service territories. The qualitative interviews were completed by telephone among front line supervisors or managers and in-home assessment technicians, while the quantitative Internet surveys were completed among the assessors only. Managers provided information about education standards and expectations of field technicians, training provided to assessors, materials provided, expectations of the in-home assessors, and other related topics. Assessors provided

[9] These ride-alongs were not considered a source of primary data collection since only one was conducted per IOU. These were intended to assist the research team in better understanding, in a general sense, how the educational process occurs. More such ride-alongs would be required for this information to be considered more generalizable to a larger number of treatments.

information about training actually provided in homes, barriers or problems that interfere with the training in the home, feedback on their own training and education received from their employer and/or IOU, feedback on the effectiveness of materials, and other related topics.

The objectives of contractor interviews were two-fold: (1) understand the current practices, knowledge, and overall "quality" of the assessors who provide this component to ESA participants, and (2) solicit ideas for improving the practices and materials from those who are closest to the activity.

Qualitative interviews provided insight and information to create the online quantitative survey, as well as provided a greater depth of understanding that a quantitative survey alone could not achieve. However, the small sample of the qualitative research means that the results might not be representative of the population. The quantitative survey included questions similar to the qualitative interviews among the larger population of contractor employees.

There were approximately 80 contracting agencies statewide for the ESA program, which vary widely in size and quantity of installations. Current employees of these contractors participated in the research. Specifically:

- In-Depth Interviews: This phase included in-depth telephone interviews among 3 supervisors/managers and 9 assessment/education technicians. Each interview was approximately 30 to 60 minutes. Respondents were selected from different contractors, and from different geographic areas. These interviews also solicited ideas for improving the education.

- Internet Survey: This phase consisted of an online survey hosted on HINER & Partners web server. Managers from each contractor were contacted by telephone to alert them to the upcoming survey and to solicit an estimate of the number of employees who would be eligible to complete the survey. Each manager was then sent an email with a list of unique survey links to be distributed to their employees. Additional emails and phone calls were used to follow up with non-responding contractors. Although the study initially intended to obtain data from at least 200 assessors, despite numerous follow ups and reminders, the final sample included responses from 171 assessors across the four IOU's from an initial estimated population of about 400 assessors for a response rate of about 43%. There is no reason to believe that the data provided do not represent the larger assessor population. Sample sizes for some of the IOU subgroups are relatively small (primarily because the population of assessors is small, but secondarily the response rate among SDG&E assessors was lower than for the other IOUs), so IOU specific results should be considered directional rather than definitive.

Table 6. Contractor Interviews by IOU

Contractor Data Source	Number of Completed Interviews					
	Total	PG&E	SCE-Only	SCG-Only	SCE & SCG	SDG&E
In-Depth Interviews	12	3	2	2	2	3
Internet Survey	171	70	18	34	46	7

In brief, the Internet survey provided information from front-line assessor technicians regarding: (1) assessor background and job responsibilities, (2) aspects of delivery, including time spent, content areas covered, method of delivery (e.g., walking around/demonstration, sitting at table, etc.), and recipients (e.g., homeowner, other household members), (3) feedback on training received, (4) frequency of language barriers (from the assessor's point of view), (5) perceived obstacles or barriers to effective education, and (5) ideas for educational materials or delivery improvements. The in-depth interview guide and Internet survey questionnaire are included in Appendix A and B, respectively.

This component, along with the Secondary Research Review, documented what contractors currently provide regarding energy education, and to a lesser extent determined the range of differences between contractors. It also identified barriers to effective education and ideas for improvements from the contractors' perspective. These improvement ideas, along with ideas generated from the Secondary Research Review, were tested with customers in the in-home interviews, focus groups, and telephone survey.

Customer Research

Many of the study objectives required feedback and input from customers, including understanding how existing training practices meet the needs of different types of households, what motivates customers to pay attention to the educational aspect, how delivery can be improved, what information has been retained and put into practice, how have household Energy Education experiences differed across contractors and technicians, what customers think about potential new education materials or content, and others. Also, the qualitative research guided development of a larger sample quantitative survey.

The customer qualitative research included two components: in-home interviews with 30 recent participants, and (2) 6 focus groups, divided equally between recent participants and higher usage CARE non-participants. The relatively small sample sizes of the qualitative research mean that results are not projectable to the population. The quantitative telephone survey was completed among 505 recent ESA participants. This larger sample size allows the survey results to be considered representative of the full population of recent ESA participants.

Table 7. Customer Interviews and Focus Groups By IOU

Customer Data Source	Language	Number of Completed Interviews & Focus Groups			
		Total	PG&E	SCE & SCG	SDG&E
In-Home Interviews	English	24	12	9	3
	Spanish	6	-	3	3
Focus Groups	English	5	1	2	2
	Spanish	1	1	-	-

Customer In-Home Interviews.

Conducting initial qualitative interviews in the customer's home allowed us to understand the environment as well as customer experiences and preferences. For example, should the energy education be conducted during the walkthrough or at the kitchen table? Is there value in demonstrating what the customer should do to reduce energy use? Is it possible to bring

together all household members? Are there household "conditions" that might make the energy education more or less successful? Are there observed circumstances or conditions that "could" be addressed as possible energy education material or delivery improvements?

The objectives of the in-home customer interviews were to understand, explore, and document (1) motivations about participating in ESA and specifically regarding energy education, (2) energy-related needs, met and unmet, (3) the range of educational experiences, (4) the retention of content, and (5) the adoption of new, energy efficient behaviors. The full interview and observational guide developed for these interviews is provided in Appendix D.

The 30 in-home interviews with recent program participants were stratified in ten clusters throughout the IOU territories. Interviews were 60 minutes each. 20% (2 clusters) were completed in Spanish. The interviews were pre-scheduled among recent ESA participants who had completed the program within the previous 3 months (i.e., early 2013). The interviews were conducted in clusters of three selected to provide a variety of climate zones. Four clusters each were completed in PG&E and SCE/SCG service territories, and two clusters were completed in SDG&E service territory. Interviews in one of the SDG&E and one of the SCE/SCG clusters were completed entirely in Spanish. All other in-home interviews were completed in English.

Interestingly, while the in home visits gathered some systematic data via asking customers to provide scaled numerical ratings, customers recognized that they were often difficult to answer. In some cases, they noted that they didn't have a numbers orientation, and others explained they had "memory problems." These methodological observations support the need to examine data from multiple vantage points to understand the issues.

Customer Focus Groups.

Focus groups brought customers together for qualitative discussions about topics similar to the in-home interviews, however, this forum also allowed us to review multiple IOU materials and brainstorm ways to improve content and delivery, and to review and provide feedback on new content, materials, and delivery ideas (developed jointly by the IOU's and the HINER/KEMA team prior to the groups). Focus groups are one of the best ways to solicit descriptive feedback on new ways of doing things.

The objectives of the customer focus groups were to understand, explore, and document (1) motivations about energy education (e.g., energy efficiency, safety, income qualified assistance), (2) energy education and related needs (including unmet needs among recent participants), and (3) customer reactions to new content, materials, and delivery approaches. See Appendix E for the focus group discussion guide.

Each of the 6 focus groups included 7 to 10 customers. The groups were about 2 hours each. Locations were selected to provide a variety of climate zones, including Fresno (PG&E territory), Orange (SCE/SCG territory), and downtown San Diego (SDG&E territory). One group at each location was conducted among recent ESA participants and the second group was conducted among high usage CARE customers who had not participated in ESA. The ESA participant group in Fresno was conducted in Spanish, while all other focus groups were conducted in English. The table below provides the dates, locations, and group composition.

Table 8. Focus Group Composition

Location	Date	IOU	Group 1	Group 2
Orange	July 23, 2013	SCE/SCG	CARE Non-ESA Participants	ESA Participants
San Diego	July 25, 2013	SDG&E	CARE Non-ESA Participants	ESA Participants
Fresno	July 30, 2013	PG&E	CARE Non-ESA Participants	ESA Participants (Spanish)

HINER & Partners' Steve Westberg moderated the English language groups and Elida Avila moderated the Spanish language group.

This customer qualitative component of research accomplished five tasks: (1) compared the contractor-provided information to what customers said about the education they received, (2) provided additional information about the "quality" of contractor-provided education, (3) determined what customers have retained and put into action concerning energy efficiency, safety, and additional resources, (4) identified gaps by comparing what customers said they need and what they have received, and (5) identified additional opportunities for potential new topics or methods of delivery of energy education.

Customer Telephone Survey

The research objectives of the customer telephone survey were similar to the objectives of the qualitative methods noted above, except the telephone survey was used to gather more quantitative data to *validate* and *measure* the prevalence of experiences, knowledge, and behaviors across the population of recent ESA participants. It also provided estimates of customer interest in new ideas for content and delivery. Additionally, ESA participants' survey responses on key metrics concerning attitudes and barriers toward reducing energy use were compared to non-ESA participants from the CARE population (from the LIEE Segmentation/HUNA research) to identify if ESA participation has overcome some of the perceived barriers to reducing usage.

A telephone survey was completed among 505 recent ESA participants, stratified across IOU territories. 94 interviews, or 19%, were completed in Spanish. The average length of the interviews was 24 minutes.

The statewide "total" results were weighted so that customers from each utility contributed sample sizes that are proportional to the statewide distribution of ESA participants in 2012. Weighting was applied to the data so that statewide "total" results would more accurately represent the statewide population of recent ESA participants.

Table 9. Customer Telephone Surveys By IOU

Customer Data Source	Language	Number of Completed Interviews				
		Total	PG&E	SCE	SCG	SDG&E
Telephone Interviews (Unweighted)	English	411	162	83	84	82
	Spanish	94	23	24	23	24
	Total	505	185	107	107	106
Telephone Interviews (Weighted)		505	197	63	205	39

Specifically, the survey included questions concerning: (1) general energy related perceptions and motivations, (2) recall of the components of energy education, (3) implementation or actions taken as a result of energy education, and (4) interest in new content and delivery ideas. This information served the same project objectives as the Customer Qualitative Research. The telephone survey instrument is available in Appendix F. Data tables of the survey results are in Appendix G.

Lessons Learned

The research identified lessons learned that can be applied to future research efforts. First, forgetting can be a problem not only for the customer, but for research purposes. In this research, we purposely measured the gap between assessor responses to questions about what they provided and customer responses regarding what they received. Without both perspectives, we would have had a less clear understanding of what was actually provided and retained. Second, multiple sources of information such as field observations, program manager interviews, customer in-home interviews, and others are invaluable for understanding how a program is actually implemented. For example, we identified gaps between what assessors said they provided and what we observed in the field. Assessors are familiar with a range of energy information and across multiple homes they likely provide most of it, but in any given home only a subset of this information is covered (due to a variety of reasons but not for a lack of assessor intent in most cases).

III. ANALYSES AND RESULTS

A. Secondary Research Review

This chapter provides our review and assessment of program materials for the Energy Savings Assistance (ESA) Program Education Component, also referred to as Energy Education or EnEd. For this review, we obtained via data requests to the IOUs, several documents that describe the Energy Education process for ESA. These documents covered: (1) the training provided to the contractor employee (referred to as the assessor throughout this report) who conducts the EnEd; (2) program materials that contain the essential content for educating customers; and (3) the ESA Policies and Procedures (P&P) Manual that documents the regulatory requirements the program must meet in regards to educating low income customers on energy efficiency and behavior practices that can help them save money.

Since each IOU is responsible for training their own assessors and has developed training separately from the other IOUs, the documentation received differed between the IOUs.

Our assessment was also informed by information from ride-alongs with assessors from PG&E, SCE/SCG, and SDG&E where we were able to observe their delivery and customer responses. We also used information gathered from interviews with IOU program staff to help provide context on operational practices when it comes to managing the contractors who employ the assessors; that is, what metrics they require, feedback channels, and quality assurance.

For the literature review, our objective was to identify the practices other jurisdictions may have or are currently employing for delivering EnEd to low income customers. The desired outcome for this effort was to identify potential practices that the California Low Income Program teams may consider implementing. For this effort, we searched multiple sites that house energy efficiency studies in search of relevant reports and documents on how other jurisdictions have implemented EnEd for their low income customers. A bibliography of sites visited and reports identified are in Appendix I. As one would anticipate, the degree of specific information on EnEd practices was limited since the studies available were written to address a specific scope, which was for most cases, measurement of energy impacts from the installation of weatherization and energy efficient measures. We did identify six studies that appeared to cover a wider range of topics on their low income programs. We conducted a deeper dive into the content of these studies but still only found cursory references to their EnEd efforts as well as some mention of their materials (although no evaluation of these materials[10]). However, what we did discover was that most Low Income programs operate using the same basic approach of: (1) conducting an initial assessment or audit to identify the potential for more comprehensive measures; and (2) conducting a second visit where comprehensive measures are installed. There were small degrees of differentiation in how they delivered the assessment as noted in Section 4.

The remaining sections of this chapter are as follows:

[10] Although the content of these materials may have been examined, the materials were difficult to obtain and would have been difficult to evaluate outside the studies we examined since this would not provide context regarding how they perform (i.e., whether or not they are effective with customers).

Section 1: Review of ESA Materials. We provide summaries and matrices comparing the various components of assessor training across IOUs and also compare and assess how each IOU address the key EnEd topics required in the P&P manual.

Section 2: Literature Review Summary. We collected evaluation reports from major digital libraries of energy efficiency research. Of those report, we ranked 28 articles according to usefulness for the ESA evaluation and reviewed in detail the top six articles identified based on how well they matched the topic of a low income energy education assessment.

Section 1: Review of ESA Materials

The objective of the review of ESA materials was to obtain a thorough understanding of all of the relevant material and training provided by each IOU to the contractor assessors that allows them to educate customers on energy saving opportunities and behaviors associated with the Energy Savings Assistance (ESA) Program. This is intended to document and assess what the assessors currently provide customers regarding energy education, including the use of energy-consuming devices, programs and technologies available through their utility, and other resources, during the stages of enrollment and walkthrough assessment. In particular, we examined assessor practices across IOUs related to the delivery mechanisms, educational materials, content, and relative value associated with the educational component of the Energy Savings Assistance Program.

The information is based on a review of training and customer materials provided to the HINER/DNV KEMA team as well as from interviews conducted with IOU program managers. A full list of materials examined may be found in the Appendix I. We structured our review using the educational topics provided in the Statewide Low Income Energy Efficiency Program Policy and Procedures (P&P) Manual as the benchmark for what each IOU's assessors should address in order to satisfy the education requirements. These include:

- The general levels of usage associated with specific end uses and appliances
- The impacts on usage of individual energy efficiency measures offered through the ESA Program or other programs offered to low-income customers by the utility
- Practices that diminish the savings from individual energy efficiency measures, as well as the potential cost of such practices
- Ways of decreasing usage through changes in practices
- Information on CARE, the Medical Baseline Program, and other available programs,
- Appliance safety information
- The way to read a utility bill
- Greenhouse gas emissions
- Water conservation
- CFL disposal and recycling

The remaining areas in this section include:

Training**.** The IOU's training materials are examined within the context of what is expected to be covered by the assessor during the initial assessment and walkthrough. The materials are examined to ascertain the extent to which they address the rules for qualification and whether to

continue to the next level. Finally, we review the IOU's Quality Control/Assurance (QC/QA) practices regarding monitoring the assessor's work.

Materials**.** In this section, we reviewed materials provided to customers as part of the educational process. These materials are usually brochures or collateral that the assessor will leave with the customer. It may also be information available on the IOU website. We examined how closely the material aligns and educates on the key topics required via the P&P Manual.

Energy Education Training Approach

The table below provides an overview of program delivery across the IOUs. As shown, the training procedures and on-site mechanisms vary by utility.

Table 10. Education Training Approach				
	PG&E	**SCE**	**SCG**	**SDG&E**
Number of days	8 day outreach training	4 days	5 days	Varies according to contractor. One contractor has 1 day in-house training followed by 1 day ride-along.
Energy Education Training	Includes income qualifications, assessing the home.	Training on first day on communication/time management; 4 hours on 2nd day on Energy Education	30-45 min on Energy Education; have procedures on training and outreach.	Training is conducted by the contracting agencies.
Conducted By	PGE	SCE	SCG	Contractor
Training Manuals Used	1. Weatherization Specialist Training Manual 2. Energy Specialist Training Manual 3. NGAT Tech Manual 4. Duct Testing and Sealing Manual 5. California Installation Standards	Energy Education Workshop Presentation (PowerPoints)	PowerPoints	SDGE does not develop training materials for EnEd. Outreach and Assessment contractors use the ESA Program Guide to Managing Costs for reference and train from this guidebook.
Materials Available for Customer[11]	1. Energy wheel 2. PGE Breathe Easy Solutions brochure 3. ESA Program Guide	1. SCE/SCG Customer Energy Education and Resource Guide 2. Smart Energy Choices brochure 3. SmartConnect Enrollment form	1. SCE/SCG Customer Energy Education and Resource Guide 2. Various marketing materials for homeowners/landlords	1. ESA Program Guide to Managing Costs
On Site	Assessor conducts qualification assessment, then does a walk-thru assessment for measures and education at the same time.	Starts with the income qualification, then assessment to see if the customer is eligible for measures, then education. Assessor's mix education with assessment.	First, assessment checks to see if the customer meets income requirements; then provide energy education. Finally, measure eligibility.	Assessor conducts qualification assessment, then does a walk-thru assessment for measures and education at the same time.
On-site Energy Education	At the same time as walkthrough assessment	At the same time as walkthrough assessment	Before walkthrough assessment	At the same time as walkthrough assessment

[11] Although program materials are available, our research noted instances where materials available from the IOU are not always available for use by assessors and/or delivery to customers.

Table 10. Education Training Approach				
	PG&E	**SCE**	**SCG**	**SDG&E**
Education specifics	No education if not qualified or enrolled.	No education if not qualified or enrolled. Education includes safety, water, and 211. Assessors try to include all household members during education. Assessors required to spend 20 minutes on energy education.	No education if not qualified or enrolled. Developing a DVD. Assessor required to spend a minimum of 15 minutes going over energy education.	No education if not qualified or enrolled.
Leave with Customer	Energy Education Guide, provided to customer at time of enrollment. They are not expected to leave the guide with the customer if not qualified and enrolled, but some do in practice.	Same as PG&E.	Same as PG&E.	Same as PG&E.
Compliance & Follow up	Monitor compliance via phone survey. RHA does another follow-up, and Central Inspection Program (CIP) does installation inspection.	Conducts compliance follow-up inspections including whether education was provided, but no formal survey is administered.	Monitor compliance via a phone survey quarterly asking customer if they remember and are using the guide	Compliance survey similar to SCG.
Payment	Contractors paid a set price for education completed, and are not paid for education unless home is eligible for measures.	Payment is incremental with assessment, then eligibility, and then education. Contractors not paid for education unless home is eligible for measures.	Contractors paid a set price for education completed, and are not paid for education unless home is eligible for measures.	Contractors paid a set price for education completed, and are not paid for education unless home is eligible for measures.

Assessor Energy Education Training

HINER/DNV KEMA received training materials from PG&E, SCE and SCG in the form of manuals and PowerPoints. SDG&E is the only IOU that does not conduct their own trainings, which are the responsibility of the contractor organizations. We did receive the materials used by the SDG&E contractors, which is the guidebook that is also provided to customers. According to interviews with ESA program managers, the IOUs dedicated a portion of their overall contractor training to energy education, ranging from 30 minutes at SCG to four hours at SCE. SCE has more recently revised its training so that now a full day is devoted to energy education. It was not clear from the program manager interviews or from the materials reviewed how much specified time is dedicated to training assessors on energy education at PG&E because energy education occurs throughout PG&E's eight day training. As part of each section of training, there is information about energy saving tips and how to convey this to the customer. We also do not know how much time is devoted to training by SDG&E contractors since they tend to train one new assessor at a time through a combination of information review and field experiences without a formal, defined training program.

PG&E's training materials cover each topic as directed in the P&P manual as a separate module. Learning principles are covered in the objectives of each module with a test at the end to reinforce the lessons. PG&E training manuals were developed in conjunction with RHA (the contractor). These manuals are updated from time-to-time based on feedback from the field as well as when the program itself is updated. PG&E also uses a training video [12] to help the assessor visualize what a visit looks like. The training focuses on the science of energy and its delivery to the customer, the properties of human comfort and how a home's condition affects that comfort. Analysis of a home's energy use and educating the customer on ways to reduce use is a major component of the training. The assessor is then required to perform a minimum of three ride-a-longs with an RHA field trainer. Additionally, the assessor has the opportunity to request a field badge to gain some field experience prior to attending the 8-day training class.

By contrast, SCE's and SCG's training protocols seem less defined based on their PowerPoint presentations, which cover at a high level what is also available in the guidebook and on the IOU websites the customer can access. Topics included: energy education resources; low income resources; home energy use; water conservation; tips to save energy; multi-language assistance; appliance, lead, and earthquake safety; and CFL disposal and recycling.

Materials for Customers

Each utility provides a program guide ranging from 10-20 pages for customers that includes energy education as well as information on the ESA program and other resources. A comparison of these guides is offered in the following section. In addition to the program guides, PG&E also provides their customers with an Energy Cost Calculator interactive wheel which shows the monthly cost to run various appliances in their homes. This wheel requires customers to first determine their cost of electricity or natural gas usage rate by reading their utility bill.

Although anecdotal, there is some evidence via the ride-alongs and in-depth interviews with assessors that the assessors do not always have all of the materials. Although program guides or the "guidebooks" are always (or nearly always) available for assessors to provide

[12] This video was not reviewed as part of the evaluation.

to customers, additional supplemental materials are sometimes in short supply or not available. For example, one PG&E assessor mentioned that copies of the wheel had not been available recently so the assessor showed a wheel to ESA participants but did not leave it with the customer. Likewise, an SDG&E assessor said that the assessors previously had handouts describing how to read the energy bill but these handouts were no longer available, and as such, this was often not covered with customers during Energy Education. While it is not clear via these data the magnitude of this issue, it is worth noting that the program may want to attend to the processes and logistics involved in requisitioning and supplying the educational materials intended to be provided to customers during these assessments. Understanding and monitoring these processes may limit the frequency that these resources are not available in the field.

In-Home Protocols

The assessor's initial in-home visits begin with an eligibility assessment to determine customer income and home qualification. The assessor first establishes income qualification and then conducts a walkthrough assessment to determine if the home is likely to meet the kWh/therm or three measure minimum qualifications for the program. During the walkthrough, the assessor typically provides energy education pertaining to the appliances, lighting, water use, and other energy aspects of the home.

ESA program protocols dictate assessors can only be paid for delivering the education if the household is eligible for measures. Despite this, program managers and the assessors acknowledge that they do provide education during the walkthrough and they sometimes provide the guidebook at that time as well. Because SCE assessors have a lower incidence of qualifying households based on electric-only measures and being more directly affected by the 3Measure Minimum rule, they are less likely to provide energy education during the walkthrough.

Since the contractors and IOU's have some flexibility in *how* the energy education is delivered in the home, we examined some of these differences as part of this overview. SCE tends to emphasize the importance of including all members of the household during the education component, if possible, and expects assessors to spend a minimum of 20 minutes on education. SCG reiterates the value of spending a minimum of 15 minutes educating and, in the near future, will use a DVD to help[13]. SCG also encourages assessors to provide energy education prior to the walkthrough assessment, although assessors from all utilities described providing education before, during, and after the walkthrough (but less so among SCE assessors).

Regarding language compatibility, the IOUs expect their contractors to assign an assessor who speaks the customer's language, which is usually identified prior to the visit. However, each IOU approaches this somewhat differently. SCE sends language preference information to contractors along with the customers contact information. PG&E contractors call customers prior to the visit to confirm information, including language preference. SDG&E implemented and trained contractors on a language-line service in February 2013, which provides assessors with an interpreter by telephone when they encounter a customer who does not speak the assessor's language. SCG also offers assessors a language line to use if assessors encounter a customer who speaks another language. While these efforts are likely to work for the majority of customers (and perhaps for all when a language line is employed by SDG&E and SCG), it is possible that some customers do not receive energy education in their preferred language.

[13] The DVD is under development and was not available for review.

Compliance & Follow Up

Contractor compliance is monitored in different ways by the IOUs. With respect to understanding whether the energy education is being delivered, SCG, SDG&E, and PG&E implement follow-up phone surveys with customers by a live representative to see if customers remember what they were taught, are using the guide, and have been enacting behavioral changes. SCG and SDG&E conduct these phone surveys quarterly, while PG&E conducts monthly surveys with quarterly review of results. SCE does not do follow-up customer surveys as part of their quality assurance, but they employ random site visits[14] (in addition to state-wide mandated inspections) to monitor contractor practices during the assessment visit.

PG&E conducts compliance and follow-up visits through RHA as well as the Central Inspection Program (CIP). The CIP team inspects between 10-16% of the homes per assessor every month, and RHA performs quality assurance (QA) ride-alongs with every assessor per quarter.

For all IOUs, compliance monitoring is to determine whether or not energy education was provided. It does not measure details about what was provided nor does it measure the effectiveness of energy education.

Contractor Compensation for Energy Education

The IOUs do not compensate contractors for energy education if the customer is not qualified for measures.

ESA Customer Energy Information and Resource Guide Review

As mentioned, each IOU offers a program guide, or "guidebook," each ranging from 10 to 20 pages. The guides were intended to provide energy education and information on the ESA program. The table below shows a breakdown of the ESA program topics by each IOU according to the P&P manual topics. SCE and SCG provided the same guide to their customers, and as such are evaluated as one here.

[14] During the period of this research, SCE discontinued this practice. It is not known what the impact will be.

Table 11. IOU CUSTOMER ENERGY EDUCATION AND RESOURCE PROGRAM GUIDE (GUIDEBOOK) REVIEW				
Policy and Procedure Areas	**PGE**	**SCE/SCG**	**SDG&E**	**Comparison**
Program Steps	"Simple 5 Steps" - outlines each step of the ESA program	Not included.	Not included.	Only PGE outlines the steps of the Program
Technical/Measures covered by ESA	Not included.	"Some weatherization program measures"	"Services provided by ESAP"	PGE does not explicitly mention possible measures
Appliance Energy Usage	Home Energy Costs - $/month, $ and energy/year for common appliances	Percentage of dollars spent on end-use/water heating; appliance $/month; appliance energy use/year	Graphs that show percentage of dollars spent on appliances; cents/hour and $/month for certain appliances	PGE and SCE/SCG give most data; provide appliances' energy cost room by room. PGE also provides an energy wheel.
Reading Bill	"Understanding Your Bill" - shows a sample utility bill and provides details	Advises customer to learn how to read their bill but doesn't provide details. Gives utility phone numbers to call for information.	Two pages of information regarding the SDG&E bill were added mid-2013 in a n update. Previously there was a separate collateral piece titled Understanding Your Bill.	PGE and SDG&E include information about how to read the bill in the guidebook
Conservation and Behavioral Tips[15]	"Simple Tips for Saving Energy"	"Things you can do to save energy and money"	"Things you can do to cut costs"	All guides provide similar comprehensive tips.
Appliance Safety	Not included.	Gas safety, electrical safety, and earthquake safety	Not included.	Only SCE/SCG gives safety info
Other Low Income and Energy Efficiency Programs	Provided in separate brochure	List and explanation of other Assistance programs	List of other programs and phone numbers	Not included.
GHG & Water Conservation	“Climate Change and Energy Use”	Not included.	Mentioned throughout	Not included.
CFL Disposal and Recycling	CFL Recycling and Cleanup; Understanding Mercury (products that contain, and	Not included.	CFL disposal; lighting comparison chart; Recycling resources	Not included.

[15] See Appendix H for a more detailed list of tips in each IOUs guidebook.

	devices that contain more than CFL)			
NGAT	Not included.	Gas Safety and Program Measures	Included on Page 7	Explained by the assessor when necessary
Potential ways to diminish savings, and costs	Not included.	Not included.	Not included.	Delivery and observations specific to the home by the assessor
Multi-language?	Available in Spanish	Multi-language telephone directory. Guidebook includes both English and Spanish.	Available in Spanish	PGE and SDG&E have separate Spanish language books. SCE/SCG is combined.

Each "Policy and Procedure Area" is an educational topic that the ESA program must cover, as required by CPUC protocols. As shown above, each guidebook does not uniformly address all topics. Many topics are not expounded on in the guidebooks. Based on our ride-alongs with assessors and in-home interviews with customers, there is some evidence to suggest that the information topics that are not in the guidebook may not get covered during the in-home visit., Since each visit is different based on the circumstances within the home, the assessors education-oriented observations and advice are specific to the home. For example, explanation of NGAT is only essential when the customer qualifies for natural gas measures that require testing. However, across the board, each program guidebook provided comprehensive conservation and behavioral tips for reducing energy usage. Each guidebook provided several pages of advice for common home energy end uses.

Each utility's program guidebook also placed high importance specifically on appliance energy usage. Several pages in each guide were dedicated to graphs, charts, and, in the case of PG&E, an energy wheel explaining the monthly costs (both monetary and energy) of common household appliances.

There remained some disparities between the topics presented by each utility's program guidebook.

- Reading your utility bill. PG&E and SDG&E instruct customers how to read their utility bills in the guidebook using a graphic of a sample bill. This topic is addressed in the guide provided by SCE/SCG in a section entitled "Reading Your Utility Bill Can Provide Answers" which directs customers to call SCE or SCG using provided phone numbers. SDG&E previously used separate collateral materials.
- Appliance safety. SCE/SCG's guidebook includes this information, which covers gas, electrical, and earthquake safety. PG&E and SDG&E guidebooks do not cover this.
- CFL Disposal and Recycling. PG&E and SDG&E both broadly cover CFL tips, disposal, and resources for recycling. PG&E also includes a section on understanding mercury, including charts showing the relative amounts of mercury in other products. The other IOU's guidebooks do not cover this.
- Program Steps. PG&E's program guide provides a checklist of steps for participation in the ESA program. The other IOU's guidebooks do not cover this.

Overall Assessment and Gaps in Education

Despite the fact that assessors are not expected to provide education and educational materials unless a home qualifies and is eligible, the internet survey with contractors suggested that assessors do, on occasion, provide the guidebook to non-eligible households. The customers we observed were appreciative of having the guidebook to refer to later since it contained relevant phone numbers that were pointed out by the assessor. We also observed that for customers that did not qualify, having the guide did help soften their disappointment.

In the field, the level of education provided to the customer is inconsistent because the education delivery and observations tend to be specific to the particular circumstances of each home, and because each utility has developed its training separately from the others. SCG assessors likely will provide the most uniform "formal"[16] education to customers in the future

[16] Since each visit is "customized" based on the household's needs, all visits will be unique to some extent.

when they begin using an educational DVD, which we were unable to evaluate because it is under development.

As discussed above, education on topics such as how to read a utility bill and general appliance safety varied between the utility program guidebooks. Additionally, the IOU materials tended to provide little information on some topics, such as greenhouse gas (GHG) and water conservation education, which were only explicitly mentioned in PG&E's book. While it is possible that other topics and tips not covered in the guidebooks are still expounded on in person during the walkthrough assessment (in addition to safety and tips given at the time of equipment install), it is unlikely that education on GHG and water conservation would occur during a walkthrough that tends to focus on specific appliances and energy and money saving opportunities.

Summary of Findings: ESA Materials Review

Summary findings and conclusions are categorized below.

Assessor Training.

Our review of the materials used to train assessors indicates that there are relatively wide differences between the IOUs. Based on these materials, PG&E's training and educational materials appear comprehensive with energy education information embedded throughout the 8 days of training. PG&E's training is also the longest of the IOUs, and likely includes the most time on energy education-related information. SCE and SCG have energy education training modules of 4 hours (more recently updated to 1 day) and 30 minutes, respectively. SDG&E contractors provided the SDG&E guidebook (that is also provided to customers) as their only materials used for assessor energy education training and with no defined criteria or training plans. Some of the technical topics and information related to measure specific usage and education for the other IOUs may also be offered as embedded parts of the overall assessor training, but these materials and practices were not reviewed in the context of our examination of the educational materials.

In addition some of the training is done verbally from training classes and the on-the-job training, which is not limited exclusively to what is printed in the materials. It is likely, however, that differences in the amount of time devoted to energy education training, and differences in the printed training materials invariably do translate into differing types and levels of knowledge among assessors who have graduated from each IOUs training program. However, these differences are likely mitigated by several other factors all of which are subject to wide variation, including: (1) assessor self-education after completion of IOU training, (2) contractor-provided field training, and (3) periodic "refresher" training.

Customers themselves evaluated the knowledge of SCE and SCG assessors as somewhat lower than that of SDG&E and PG&E assessors, but the training materials do not fully explain these differences since SDG&E and PG&E assessors were evaluated as equally knowledgeable but PG&E seems to have among the most comprehensive of training materials while SDG&E has the least.

We recommend that the IOU's consider more uniform training for contractors. This evaluation did not include attending the full training sessions for contractors and as such it is not possible to recommend specific elements would represent a "best practice" that should be adopted by all IOU's. At the same time, our data do suggest that some consistent standards (e.g., time

spent on energy education training) and topics (e.g., create a comprehensive set of "tips" that assessors state-wide would have at their disposal) would be useful, as would.more uniform training presentation materials that could be employed regardless of which contracting agency or utility conducts the training.

Quality Control & Assurance.

The existing survey-based and inspection-based compliance monitoring approaches appear to be effective in determining whether or not energy education was completed in a household. The surveys and the inspections are known to the assessors, and are completed "randomly," which increases the likelihood that assessors won't claim credit for an assessment that was not done. Also, there is little incentive for an assessor not to provide energy education in order to save time, since most visits (except for SCE) incorporate education throughout the visit from first introductions through the walkthrough, and finally through the wrap-up stage of the visit.

However, existing compliance monitoring methods do not do much to ensure consistent high quality energy education. This is better controlled through consistent training, since assessors have a strong inclination to do what they are trained to do. Inspections might also be expanded to dig into the behavioral impacts of energy education in the home – for example, ask customers what they are doing differently now than before the assessment and energy education visit. The in-home visits conducted for this research did identify a few instances where the assessor likely did not provide a full 20 minutes of quality education, so random inspections with similar in-depth probing to determine what customers recalled and put into practice would help inform program management regarding the quality of the education that is provided.

Program Materials.

The primary educational tool and leave-behind is the resource guidebook. The guidebook is also the de facto training standard for SDG&E, and it plays a prominent role in shaping what the assessor covers during their visit. We evaluated each guidebook's content against the Policy and Procedure standards determined by the CPUC. Each of the three guidebooks (PG&E, SDG&E, and SCE/SCG) was developed independently from the others, so as expected, each guidebook has a different "look and feel," different graphics, and different organization of information, which we evaluated in our customer focus groups (and from which we developed specific recommendations concerning these guidebook aspects). However, we also found that none of the guidebooks includes all of the information required by the program P&P guidelines. Since the guidebook plays a central role in energy education, it needs to contain all the content that program managers want assessors to include in energy education. We recommend that all three guidebooks undergo redesign to ensure that the content is complete (in addition to updating the guidebooks layout, formatting, graphics display, and other factors identified in the focus groups).

One other program leave-behind worth mentioning is the PG&E "wheel." The "wheel" is a tool that allows customer to "calculate" (or more specifically to look up) the costs of running certain appliances or energy consuming items in the home. Assessors in PG&E's territory felt the wheel was useful and popular with program participants, and customers themselves evaluated the type of information provided by the wheel as highly desired. The "wheel" is a "best practice" that we believe should be adopted by the other IOUs.

Other than the "wheel," we did identify any other materials that stood out as particularly effective for energy education. Brochures with enrollment forms for signing up for other utility programs

could still be provided, but these are ancillary to saving energy so are likely a very low priority for both the assessor and the customer at the time of the in-home visit.

Section 2: Literature Review of Other (Non-CA IOU) Programs

The literature review collected evaluation reports from major digital libraries of energy efficiency research (including the Consortium for Energy Efficiency, CALMAC, Northwest Energy Efficiency Alliance, Northeast Energy Efficiency Partnerships, the Department of Energy, and the Low Income Oversight Board). Initially the review found 28 documents that potentially related to low income energy efficiency education. DNV KEMA ranked the documents according to usefulness for the Energy Savings and Assistance (ESA) Program evaluation and reviewed the top seven documents in detail. These are described below.

Quantec Energy Efficiency Meta Evaluation Summary and Best Practices 2007

Quantec (acquired by Cadmus in 2006) reviewed a number of their recent evaluations and summarized advantages and disadvantages of different methods for measuring energy efficiency education. Quantec also summarized best practices for education strategies.

Program Education

Although the evaluation summary did not focus solely on low income customers, it did create a list of energy efficiency best practices that may also apply to low income populations: most effective energy education includes client-specific messages, an action focus, a highly interactive atmosphere with hands-on learning opportunities, the translation of energy impacts to dollars saved, written commitments from clients, and follow-up with participants.

Savings Measured

The Quantec Meta evaluation of evaluation programs in seven states in 2007 found that energy education can help the participant access significant energy savings at both the household and program level. Households have reported savings of $8 to $45 per month from a combination of installing energy efficiency measures and instituting simple energy-saving behaviors in their homes.

Best Practices and Lessons Learned

- Educate participants on the energy using equipment in their homes. Many people do not always make a connection between energy-using equipment in their homes, their overall energy use, and their energy bills.
- Appeal to different learning styles. Some people learn visually, thinking and learning best with pictures and visual displays. Others learn best using their auditory senses, talking things through and listening to others. Some people learn best kinesthetically, through the activity of engaging in energy efficient behaviors.
- Connect energy to money.
- Provide low-cost, energy-efficiency measures for free to incentivize learning.
- Engage children in energy efficiency. Some of the most highly successful and widely supported programs Quantec have evaluated are energy education programs in schools.
- Schedule energy education in coordination with state or federal programs offering a one-stop shop of energy efficiency opportunities.

- Hold sessions in coordination with other agency activities or in conjunction with community events. Agencies recruited participants through other activities held at their agencies, such as Head Start and Share the Warmth.

Connecticut Weatherization Assistance and Helps Program 2007-08

This study evaluated the 2007-2008 impacts of the Helps and Weatherization Assistance Partnership (WRAP) Programs operated by United Illuminating (UI) and Connecticut Light and Power Company (CL&P), respectively (the Companies). The WRAP and Helps Programs were designed to reduce total energy use and electric system peak demand in homes by direct measure installation, especially weatherization measures. These programs provided weatherization measures to help both renters and homeowners reduce their energy bills by making their homes more energy efficient. Services were provided to all customers that qualify regardless of heating fuel (including oil and propane). Each program's free services were provided to customers who have an income level that is at or below 60% of the state median income, spend a high fraction of their annual income on energy, have not received any energy conservation services within the past 18 months, and/or reside within Community Reinvestment Act areas.

Program Education

During the initial on-site visit which was also an audit, participants received direct installation of CFL bulbs and fixtures, weatherization measures, low-flow showerheads and faucet aerators. Water heater thermostats were set to conserve energy during the visit. Following the measure installation during the initial audit visit, participants were provided with other ways to save energy and information via other efficiency programs and online audit tools. After installation, the contractor conducted a "kitchen table wrap-up", which includes a review of what was done. Services provided to qualifying customers in follow-up visits may include; wall insulation, ceiling insulation, appliances, efficient windows and/or heating system repair or replacement (if heated with natural gas).

Savings Measured

A total of 27,799 accounts participated in the WRAP and Helps Programs in the 2007 and 2008 program years. Lighting represents over six tenths of the total estimated electrical energy savings across years (62%), followed by refrigeration savings at 17%. The tracking annual heating savings of 2,785 MWh represents nearly 10% of the overall annual program kWh savings, of which 755,459 kWh was due to insulation measures. According to the tracking systems, the programs were estimated to have achieved 29,384 MWh of annual electric savings overall. Overall, the program was realizing 69.3% (±7.8% precision at the 80% confidence interval) of the electric energy savings in the tracking system. The summer and winter seasonal demand realization rates were 96.8% (±15.3%) and 57.4% (±10.1%), respectively. Savings estimates do not separate out education from installed measures, perhaps because the measures were installed and education was provided at the same time during the walkthrough.

Best Practices and Lessons Learned

- The study recommended that the companies begin to formally track all recommendations that are made, including those not subsequently implemented. To the extent possible, this should include the reasons why certain measures are refused or not otherwise installed. This would provide a foundation to assess what barriers are

preventing recommended measures from being installed, and if additional assessor training might be needed.

- It also recommended reinforcing the need for comprehensive direct measure installation to audit staff/vendors, especially with respect to lighting and DHW measures. Apparently, such measures are usually installed during the audit and observations during the evaluation onsite visits indicated there were missed opportunities, which is another indication that assessors need comprehensive training to maximize opportunities in a home.

Connecticut Weatherization Assistance and Helps Program 2005 Best Practices and Lessons Learned

Prior to the 2007-08 Impact Evaluation discussed above, UL and Connecticut Utilities conducted a process evaluation in 2005. Based on the results in the above study, it appeared that UL and CT may have implemented some or all of the below practices during the course of the 2-3 years when this study was released. Some of the lessons learned/recommendation from this older evaluation include:

- Neither program represented "best practice" among low-income weatherization programs. While some participants in both programs received comprehensive services (e.g., insulation, refrigerators) that have a large impact on their energy use and bills, most participants received measures with relatively minor impacts (e.g., compact fluorescent lights and portable fixtures, faucet aerators, and showerheads).
- Along with rising energy costs and overly optimistic customer expectations, the relatively small impact of most measures on energy use reduced levels of participant satisfaction with energy savings.
- In order to minimize participant dissatisfaction in both programs due to lackluster program-induced energy savings, program staff should direct the implementation vendors to provide customers with realistic expectations of the impact the services will have on their bills. This would involve teaching customers how to read the energy-use sections of their bills, explaining the impact that rate increases will have on energy bills even if the customers are using less energy, and helping participants understand how much energy other products in their homes use (e.g., big screen televisions). Together, this would help the customer to develop a realistic expectation of the impact of the program on their energy bills.

Massachusetts Residential Retrofit and Low Income Program 2010

The Low Income Program is funded by eight Massachusetts gas and electric utilities and has been in operation for over a decade. Statewide coordination occurs via a stakeholder organization called Low Income Energy Affordability Network (LEAN) and has a Best Practices Working Group. The program was implemented by Community Action Programs (CAPs) via a network of twenty community agencies and by the eight Program Administrators (PAs). Early in 2010, the PAs launched Mass Save® a state-wide initiative promoting all energy efficiency programs, including income eligible offerings.

<u>Program Education</u>

The Massachusetts Residential Low Income Programs (the programs) offered free audits and energy efficiency measures to income-qualified residential customers of participating utilities. I n most cases, Community Action Program agencies (CAP agencies) reached out directly to

eligible, high-priority, low income clients receiving fuel assistance, and inform them of the opportunity to sign up for the program. In 2010, the program launched Mass Save website (www.masssave.com) in a state wide online community outreach initiative. The website promotes all available energy efficiency programs including programs with income requirements.

The program application process has been well received by program participants, with 86 percent claiming it was easy to sign up for the program. The agency walked them through potential available services, provides necessary application forms, and verifies income and eligibility. When an applicant was verified as eligible for the program, they are prioritized according to the federal priority system, and placed on a list with other customers waiting to receive services. For multifamily dwellings, two-thirds of building tenants must agree to participate and be eligible for fuel assistance. The length of time to receive an audit depended on a home's priority. During the audits, participating technicians identified savings opportunities such as refrigerator replacement, air sealing, increased insulation, heating system repair and replacements, and installation of programmable thermostats, among others. Technicians also installed a number of instant savings measures such as compact fluorescent lamps (CFLs), faucet aerators, and showerheads. Measures were provided through the programs free of charge.

The CAP agencies leveraged dollars from multiple sources for each home to ensure installation of the best mix of measures. As such, more than two funding sources (state, federal and program) for each job are typical. According to CAP agency staff, the maximum program budget allocated through the program to any one home is $4,500; therefore, a home could have insulation blown in the walls and ceiling with ARRA funding, window sealing with state funds, and a new refrigerator installed with program funds.

Before participating, contractors must complete energy "boot camp" training to qualify for program participation. "Boot camps" were provided by the program administrators and the state to cover insulation and air sealing education. Both auditors and contractors also completed in-field and classroom continuing education training for the Building Performance Institute (BPI) certification training, and were certified by the state after written and in-field testing. The CAPs typically employed auditors directly versus contracting out.

According to the evaluation, 64 percent of participants recalled specific energy-saving tips they learned throughout the program's process. Common tips participants remembered included:

- Turn off the lights when you are not using them;
- Take shorter showers;
- Conserve while doing the laundry (use the cold water cycle, hang clothes to dry, etc.);
- Close windows and doors when the heat or air conditioning is running; and
- Unplug or turn off any devices not in use.

When asked about their behavioral changes since participating in the program process, more than half (57 percent) of respondents acknowledged they changed some of their habits to follow through with tips they discussed with auditors.

Savings Measured

The most critical program metrics currently tracked were total savings and budget expended to date. Collectively, these metrics helped identify any gaps in actual program results versus established goals. Savings values were not available from this report.

Best Practices and Lessons Learned

This report provided best practices tailored to the program and most were not generalizable. Below is a summary of general best practices and lessons learned, primarily about the program overall, but from an energy education perspective, having more information on what was recommended will allow for following up to assess whether educating the customer on actions they can take is having an impact. Also, having such tracking information on recommendations can also inform a billing analysis to determine impacts for energy education.

- The CAPs noted that by employing their own staff as auditors versus contractors they had better quality control.
- Multiple quality control visits, which can occur at a home from various funding sources, can be cumbersome for CAP agency staff and, potentially, for participants.
- Cross program marketing was common but the current reliance on marketing only to customers on fuel assistance programs may miss eligible customers who are unaffiliated with this program (i.e., newly unemployed or non-English speaking customers).
- There was a need for establishing a minimum set of critical data collection and data fields in tracking systems across CAPs and PAs to support evaluation work. This was especially true for data from audits since there was a tremendous amount of data that could be leveraged to assist with evaluation studies, potential studies and program planning efforts that was currently not shared with the PAs.
- The PAs should explore using electronic hardware during audits such as a PDA or laptop to collect and enter data onsite. This can help reduce errors related to manual entry and reduce program administrator costs (i.e., improve data quality by having unique keys, foreign key constraints, lookup tables, and other database design best practices).
- There was a potential disconnect with differing goals of contributing program agencies. Specifically, the CAPs stated its main goal was to improve the quality of life for its low income clients. The PA has a legislative mandate to increase the energy efficiency of low income constituents, and express pride in having been charged with this task.
- The extensive training and education required of contractors extends to their work: the vast majority of surveyed participants (85 percent) rated contractors' work as excellent or good. Further, 86 percent of participants noted their contractors were courteous and respectful towards them and their homes.

New Jersey Low Income Weatherization Assistance Program/ Comfort Partners 2004

This 2004 study evaluated the Federal Low Income Weatherization Assistance Program (LIWAP) impacts as well as the coordination with the statewide Comfort Partners ratepayer program (the two main low income weatherization programs in the state of New Jersey). Comfort Partners replaced individual utility programs with a single statewide program model that could offer comprehensive services to a household. However, while the program model was consistent across individual utilities, each utility retained responsibility for meeting goals in terms of the number households served and for managing program expenditures.

LIWAP provided funds for low-income weatherization with priority given to low-income households with children under 6, with members aged 60 or older, with disabled or terminally ill members, and with high energy burdens. Comfort Partners had the goal of 6,500 income eligible houses in 2004; often priority was given to households with high energy burdens. Both programs used private contractors to deliver services. LIWAP used an audit to determine which measures should be installed and Comfort Partners used a priority list of measures.

Program Education

Both programs stated that they provided client education. The Comfort Partners program provided education training, a tabletop energy education notebook, and conservation conversation cards for use with the customer. An energy education training video was being created at the time of the report. Auditors can charge up to two hours to the energy education portion of the visit. Information on LIWAP client education was not available.

Savings Measured

Gas and electric usage data were estimated to calculate the weatherization installation savings. The net savings for LIWAP was 611 kWh or eight percent. This compares to an average gross savings of nine percent and net savings of 12 percent for the Comfort Partners evaluation. The gross gas savings for LIWAP was 91 ccf, or nine percent, and the net savings was 37 ccf, or four percent. This compares to a gross savings of eight percent and a net savings of seven percent for the Comfort Partners program.

Best Practices and Lessons Learned

The evaluators recommended investing in coordination planning between the two programs. Investing time to consider the potential roles for various program partners would be beneficial. Additionally, there were some potential benefits from two separate but coordinated low-income weatherization programs in New Jersey:

- Different qualifying criteria between programs may mean that more potential households can qualify for service. The two programs can meet the diverse needs of low-income households.
- Leveraging resources between the programs, such as similar educational documents, may reduce costs of providing services.

New York Energy Smart: Low Income Affordability Program 2001

The New York Energy $mart Low-Income Energy Affordability Program began July 1, 1998 and operated through June 30, 2001 with a budget of $16.2 million. The program's goals were to foster energy-efficient building design and installation of efficient lighting and appliances in low-income housing.

Program Education

The program conducted a Low-Income Forum on Energy to coordinate low income activities with related agencies and operating a related Public Awareness campaign; and aggregated low-income customers to secure lower prices for electricity and fossil fuels. The low income aggregate program provided education on energy efficiency services, referrals to available programs, and energy management education to low-income customers in an effort to reduce

electric demand. The Energy Smart program provided education on a variety of topics related to energy use, including financial literacy and budget counseling in order to increase financial stability.

According to the program evaluation, the Low-Income Awareness Program made over 16,500 referrals to other related low-income energy assistance programs. Over 25% of the referrals were made to electric and gas utility-run programs across the State. Referrals were also made to community-based organizations and other statewide entities that sponsor energy assistance programs. The program also coordinated service with the Low-Income Forum on Energy (LIFE), an organization that convenes key energy organizations in support of low-income New Yorkers. At the time of the report, the LIFE website was under development (it now supports events, webinars, newsletters, research, links and resources: http://www.nyserda.ny.gov/life). Outreach and education activities, which included referrals, were provided by a subcontractor advocacy group, program coordinators, and a customer service phone center[17].

The direct installation program also provided 222 building owners and 10,236 low-income residents with education on reducing electric energy use. One challenge for the program was apathy from building owners and managers who did not want to put in the extra time and effort to learn about the program.

Savings Measured

The direct installation component of the program achieved an average 25% reduction in electric energy costs for participating households, although the report was not clear if savings were attributable to energy education or to installations only. Post-installation audits of completed units indicate total electric savings of over 11,492,318 kWh per year, which equates to an annual cost savings of $2,126,078 (assuming electric rates of $0.185 per kWh) for these households.

Best Practices and Lessons Learned

There were a number of lessons learned through the Energy Smart program that many low income programs have adapted but may also still be applicable today. First, the research indicated that low income populations generally lack awareness of energy assistance programs and face a number of barriers in accessing services (such as language and literacy). In order to address the lack of awareness and other low income barriers, the program engaged in significant market research and tailored, multi-lingual marketing to targeted low-income populations. The report generated lessons learned from the education and call center:

- Some low-income consumers were more educated on energy assistance programs available to them than originally believed.
- Some low-income consumers were hoping for more information than the call center was providing. They were disappointed with receiving referrals, especially when the referrals are to agencies they were already enrolled in.
- NYSERDA needed to have a stronger outreach to program administrators, especially since the program and even the concept of the program was new.

[17] This indicates the effectiveness of making referrals. The ESA program includes referring customers to IOU program and other community resources that can help income qualified customers with bill payment and other needs.

- Many callers were expecting the operators to be more knowledgeable about the programs, and were looking to the operators for more than just verbal referrals.
- The database needed constant quality control to ensure that accurate numbers were being released to callers, and that program administrators were aware of any changes to the programs.
- The 1-866-HELP-4-NY telephone operators were enthusiastic about the low-income public awareness campaign and were open to additional training.
- Meals on Wheels was not a viable distribution method.
- Of all mediums, television proved to be extremely effective, leading to 80% of all incoming calls to the call center.
- Call centers can provide callers with referrals and quality customer service, but cannot guarantee that callers will contact the referred programs, or that callers will receive the same type of quality customer service at the next level when speaking with the program administrators.

Summary of Findings: Literature Review

Available reports focused mostly on the weatherization installation practices and savings results. While it appears that programs generally included an education component, either with contractors or homeowners, this aspect of the programs was rarely reported on, making a review of offerings and practices difficult. However, we did note that a few programs provided some details regarding their educational component. We highlight a few of these findings below:

The **Quantec Meta Evaluation** of their evaluations of energy efficient programs in seven states in 2007 found that energy education can help the participant access significant energy savings at both the household and program level. Households have reported savings of $8 to $45 per month from a combination of installing energy efficiency measures and instituting simple energy-saving behaviors in their homes. Although the evaluation summary did not focus solely on low income customers, it did create a list of energy efficiency best practices that may also apply to low income populations. A few practices highlighted in the study for education include: education should include client-specific messages; should have an action focus; delivered in an interactive atmosphere with hands-on learning opportunities; include translation of energy impacts to dollars saved; have written commitments and follow-up with participants.

The **Massachusetts Residential Low Income Program** study provided limited information on the type of tips auditors provided during the audit. Of course, these topics are pretty generic and are covered in the educational component of the ESA program. Topics covered in Massachusetts included:

- Turn off the lights when you are not using them;
- Take shorter showers;
- Conserve while doing the laundry (use the cold water cycle, hang clothes to dry, etc.);
- Close windows and doors when the heat or air conditioning is running; and
- Unplug or turn off any devices not in use.

We did note a subtle difference between the **Connecticut's WRAP** program and ESA. It appears that the WRAP program includes installation of small measures such as CFLs and low-flow shower aerators during the assessment stage (the CA IOUs only provide CFLs during the assessment). The auditors also conduct post-installation education on what they installed,

identified ways to save energy, and informed the customer on energy efficiency programs and online audit tools in the form of a "kitchen table wrap up." Also, the WRAP program auditors must undergo continuing educational training for Building Performance Institute certification. The WRAP study found that the training resulted in increased technical knowledge for auditors which they conveyed via a higher sense of professionalism that the customers recognized and appreciated.

The **New Jersey LIWAP/Comfort** study noted that the Comfort Program provided education training, a tabletop energy education notebook, and conservation cards they reviewed with the customer. Also, auditors were paid for up to two hours for education during a visit.

New York Energy Smart: Low Income Affordability Program, was a short-run aggregator program where low income customers received education and referrals on energy efficiency, energy management, and financial literacy and budget counseling in order to increase financial stability. The Low-Income Aggregation program was designed to overcome barriers and enable better access to affordable rates. An important goal was to provide education on energy efficiency and financial literacy, and referrals to available programs to help reduce energy use overall. According to the program evaluation, the Low-Income Awareness Program made over 16,500 referrals to other related low-income energy assistance programs. The program also coordinated service with the Low-Income Forum on Energy (LIFE), an organization that convenes key energy organizations in support of low-income New Yorkers. At the time of the report the LIFE website was underdevelopment (it now supports events, webinars, newsletters, research, links and resources: http://www.nyserda.ny.gov/life.

Overall, our literature review results indicate that the educational topics, when discussed, covered similar topics covered in the ESA Policy and Procedures (P&P) manual that includes:

- The general levels of usage associated with specific end uses and appliances
- The benefits of individual energy efficiency measures offered through the EE programs or other programs offered to low-income customers by the utility
- Practices that diminish the savings from individual energy efficiency measures as well as the potential cost of such practices and ways of lowering usage through changes in practices
- Information on low income assistance programs (i.e., CARE, the Medical Baseline)
- Appliance safety information
- The way to read the utility bill

However, we did not find any indications in the literature review that the programs provided information or educational tips on any of the below tips (also required in the ESA P&P manual):

- Greenhouse gas emissions
- Water conservation
- CFL disposal and recycling
- The procedures used to conduct natural gas appliance testing (if applicable)

One area where we did find there may be a greater range of variance may be the length of time the auditor (or assessor for ESA) will spend in the home conducting walkthroughs. For instance, the WRAP and New Jersey auditors can spend up to two hours in the home and the WRAP auditor may actually require a secondary visit versus the average of 30 minutes (reported by the assessors) for the ESA program. We also noted a difference for some agency-

led programs where they tended to emphasize referring customers to a broader range of low income services and resources outside of what the utilities offered. Finally, while there was some mention in a couple of the studies of also referring customers to an online audit tool, the studies did not provide any specifics on whether the auditor/assessor actually helped the customer access the tool or walked them through the tool.

Best Practices from the Literature Review

Our literature review identified the "best practices" called out by the evaluations of similar programs in other jurisdictions. What is most striking about these "best practices" is that they reinforce the basic elements of California's ESA program. As summarized by the Quantec Meta Evaluation: education should include client-specific messages; should have an action focus; delivered in an interactive atmosphere with hands-on learning opportunities; include translation of energy impacts to dollars saved; have written commitments and follow-up with participants. With the exception of written commitments, findings from our research support each of these conclusions, and ESA energy education already includes the first four conclusions.

Other suggestions from the literature review, all of which are supported by the research described in this report, include:

- Appeal to different learning styles. Some people learn visually, thinking and learning best with pictures and visual displays. Others learn best using their auditory senses, talking things through and listening to others. Some people learn best kinesthetically, through the activity of engaging in energy efficient behaviors.
- Connect energy to money.
- Engage children in energy efficiency. Some of the most highly successful and widely supported programs Quantec has evaluated are energy education programs in schools.

Also, the review of the **Massachusetts Residential Retrofit and Low Income Program 2010** concluded that: "… the extensive training and education required of contractors extends to their work: the vast majority of surveyed participants (85 percent) rated contractors' work as excellent or good. Further, 86 percent of participants noted their contractors were courteous and respectful towards them and their homes." We found similar support for consistent, high quality contractor training.

B. Contractor Research

Contractor interviews, the second stage of the research, included qualitative interviews and quantitative surveys. The qualitative interviews were completed among front line supervisors or managers and in-home assessment technicians, while the quantitative surveys were completed among the assessors only. Managers provided information about education standards and expectations of field technicians, training provided to assessors, materials provided, expectations of the in-home assessors, and other related topics. Assessors provided information about training actually provided in homes, barriers or problems that interfere with the training in the home, feedback on their own training and education received from their employer and/or IOU, feedback on the effectiveness of materials, and other related topics.

Contractor In-Depth Interview Results

Key findings from the qualitative interviews are described next. A detailed discussion guide created for these interviews is provided in Appendix A.

Hiring Assessors

Among the contractors we interviewed, assessors enter into their positions usually by applying for the position after hearing about it through word of mouth. For example, the new hire most likely heard about the job from another employee they were acquainted with. From this, the new hire likely knows about job responsibilities and requirements prior to getting hired, resulting in some self-selection since those who apply have a sense that the job will be a good fit for them.

The primary characteristic of assessors, mentioned by the supervisors and the assessors themselves, is an out-going personality. Respondents were unanimous in their comments that an effective assessor needs to have good people and communication skills. Additional characteristics of an effective assessor included:

- Desire to help other people
- Enthusiastic
- Enjoys sales jobs
- Friendly

Assessors were also unanimous in their favorable responses regarding their experiences on the job. They enjoyed the varied nature of their day, the flexible schedule (for canvassing), and the gratification from helping low income households to reduce energy use and save money. Most indicated that they *believe* in what they are doing – that they are doing a job they can feel good about. Very few had any negative comments about their job. Those who did mentioned that some of the homes they enter are dirty and they are hesitant to want to touch anything.

Their comments about the characteristics of an effective assessor were reflected in their enthusiasm toward participating in these qualitative interviews, and in the outgoing and well-articulated manner that nearly all displayed during the interviews.

However, it is worth noting that one of the assessor participants in these qualitative interviews was very difficult to understand, likely because he had learned English as a second language, yet he was responsible for assessing and educating homes among which nine in ten (by his

own estimation) were English-only speakers. As such, it is not likely that the homes where he was providing energy education were receiving the full benefit of knowledge transfer. A conclusion is that there is some potential mismatch between assessor and customer language abilities. We discuss this further in reporting on the contractor quantitative survey, and the customer research.

Training Assessors

Managers and assessors alike agreed that training concerning energy education was very important. The training differed across the IOU's, but in all cases it was valued because it gave the assessors the knowledge needed to help people save energy and reduce their bills.

Since all of the assessors selected for the qualitative interviews had been on the job for at least a year, and most had been on the job for 3 or more years, their recall of their initial training was somewhat limited, yet all recalled that the training taught them the basics of what they needed to do regarding the program, and that the training primarily focused on completing the paperwork (for qualifying and enrolling a household), and about the different measures available for installation.

Assessors described differing amounts of training on energy education (possibly due to differences between IOUs, contractor field training, and length of service), with review of information in the guidebook being most prominent, but most felt that more focus on energy education would be beneficial. Nearly all wanted to know more energy saving tips that they can share with customers, beyond what they had already learned about.

Some (assessors and one of the managers) admitted doing their own research on the Internet, including reviewing their utility company's website. They felt they would like to get more tips from the IOU as part of program support. For example, the IOU could provide each contractor with periodic updates on new energy saving practices.

A few mentioned "update" training that covered assessment or program changes, and was *not* inclusive of energy education. This was considered helpful for other aspects of their job but obviously not for energy education.

SCE and SCG assessors mentioned participating in the full, revised training program that these IOU's have implemented, and required that all assessors attend. This training, they felt, was generally a review of information they already knew (probably because they have been doing the job for several years now), but they felt the full day focus on energy education was valuable.

In addition to the IOU-provided training, the assessors and managers described their organizations own, additional training. All of the contractors represented in these interviews had similar approaches to their own new-hire training, although the amount of time devoted to this training ranged from a few days to a few weeks. Training of a new assessor consisted of:

1. Assignment to an experienced assessor and field supervisor
2. Observation of the experienced assessor or supervisor conducting actual in-home assessment and education visits
3. Conducting assessment and education visits under the supervision of the experienced assessor or supervisor, and receiving feedback about their performance

At least one of the contractors also mentioned conducting periodic short training sessions on different topics as a way to continue to improve assessor's skills. These topics, though, rarely covered energy education information or materials – perhaps other topics, such as updates from the program, are considered higher priority.

At least one other contractor said they send supervisors out on periodic ride-a-longs with the assessors in order to give more continuous feedback to the assessors.

One conclusion from the contractor qualitative interviews concerning training is that the assessors who received more lengthy and thorough training tended to be more confident about their energy-related knowledge. Those who received shorter training were less confident and apparently less knowledgeable.

Providing Energy Education During the Visit: Verbal Information

Energy Education, from the assessors' perspective, is an integral part of the assessment visit. Many of the assessors mentioned that education starts right when they arrive at the home and greet the customer. They use the information as an ice-breaker to help develop rapport with the customer. For example, one of the assessors described how she starts evaluating the home immediately by observing whatever she can see when she first enters, so she can start commenting about energy efficient practices right away as well.

Most of the assessors (across IOUs) in these qualitative interviews felt that the most effective education is conducted during the walkthrough when they can *show* as well as *tell*. However, customers do not always accompany them on the walkthrough – primarily because of health or age-related challenges with mobility.

In terms of what assessors cover when providing Energy Education, nearly all mentioned customizing their comments based on what the customer has in their home. For example, a customer without gas service won't be told about gas safety, nor will a customer without air conditioning be told to set their AC thermostat to 78 degrees.

Assessors also commented on the importance of keeping the energy saving tips "fresh and new" by providing tips that customers might not know or are not doing, so that customers don't tune out from hearing about things they already know. Another information aspect that at least one assessor mentioned was providing positive feedback about things the household already appears to be doing to save energy.

Beyond this, assessors are limited in their ability to educate by what they know themselves. Several of the assessors, presumably the more ambitious and motivated ones, mentioned that they sought out more energy-related information than was provided by their IOU, and they have shared some of this information with customers during their assessment and education visits. Conversely, this suggests that those assessors who have not sought out additional information on their own continue to share just what they have learned through their training.

When asked about the topics they try to cover with all customers, nearly all of the assessors mentioned they focus on all of the major appliances: air conditioning, refrigerators, washer and dryers, dishwashers, etc., unless, of course, the customer does not have the appliance. They also said they covered hot water conservation: shorter showers, not running water when not actually using it; and light bulbs: use CFLs, turn them off when leaving the room. Several said they follow the home assessment form for this.

Specific energy saving advice that they provide concerning major appliances included: thermostat set-points, changing filters, unplugging when not in use, keeping water bottles in the refrigerator, and others.

Other topics mentioned as frequently covered by at least one assessor were more diverse, including:

- AC tune-up program
- Close shades
- Keep water bottles in the refrigerator
- Baseline and tiers
- Disposal of CFLs
- Other programs: 211, CARE, medical baseline, California Lifeline, etc.
- How to read the bill

One of the assessors mentioned that he tells customers that it is more efficient to do laundry in the evenings. Some customers in the qualitative in-home interviews and focus groups also believed this to the extent that they believe it saves money. Currently, very few customers can actually see any benefit on their bill from shifting usage, so assessors would benefit from having a greater understanding about the benefits of running major appliances in the evening (e.g., unless customers participate in a TOU rate they will not see direct savings, though forgoing running "heat generating" appliances during the day may, for example, assist in reducing some load generated by a more taxed air conditioner during the hot summer months).

Regarding the way that specific information is conveyed, assessors each develop their own style but several mentioned they try to frame energy saving tips in terms of what the customer is paying for using the appliance or other items (e.g., hourly or monthly cost to run the appliance or electronic item). Assessors seem to believe, rightly, that customers who participate in ESA are primarily motivated to save money, so the assessors try to use saving money and energy in their education delivery. One assessor mentioned using analogies: "Pouring hot water down the drain is like pouring milk down the drain." Another assessor described motivating customers by giving them the "reasons" for doing things.

The issue of not providing energy education to homes that did not qualify for measures was mentioned by one of the SCE territory assessors. He mentioned a new practice where he does not provide any education until after the walkthrough. This particular assessor, along with most of the others, believed that education during the walkthrough was more effective than education after the walkthrough, which typically takes place at the kitchen table with the guidebook in hand. As a result, this new practice might interfere with more effective energy education.

One assessor mentioned that customers used to ask questions about SmartMeters, but no longer do so.

<u>Providing Energy Education During the Visit: Guidebooks and Other Materials</u>

Both assessors and managers commented that the review of the guidebook was typically done at the end of the visit as a wrap-up and review of things discussed during the walkthrough. One assessor commented that he tries to get other household members involved during this part of the visit since everyone can sit around the table. Also, this same assessor mentioned that

customers seem receptive to a "professional" providing information to their children or other household members, which can carry more weight than when the bill payer does it. Customers in the focus groups confirmed this belief – many do want the assessor to educate all household members.

Some assessors circle and highlight information in the guidebook during the review, and write their contact information in a prominent location for the customer. The customer in-home interviews demonstrated that this practice does facilitate customer's recall of the guidebook.

Contractor's Ideas on Education-Related Program Improvements

Nearly all the assessors and their managers primarily wanted more of what they currently have: information about how to save energy in a home that they can pass on.

Additionally, some assessors suggested:

- More handouts. Some assessors mentioned that they used to have more handout materials but some of these are no longer available. This include the Wheel (from PG&E) and handout sheets about how to read their energy bill (from SDG&E). Since assessors seem to "customize" each visit depending on their own knowledge, the home itself, and the customer, it makes sense to arm assessors with more content to enable more customization.
    - This, however, does place more responsibility on program and contractor managers to ensure that materials are always available to the field personnel. More than one assessor commented that they "used to" have certain materials that were not currently available, but which program managers had indicated are currently provided.
    - Others mentioned that more tailored handouts for the household (e.g., something for children, larger households, etc.) would be useful.

- Reminder tools. One of the assessors who primarily worked with seniors requested leave-behinds, such as refrigerator magnets, that could aid customers' memory.

- Teach the "Energy Bank" to families. One of the assessors described a game he calls the "Energy Bank" that he explains to families to encourage the children's involvement in saving energy. The idea is to set a target monthly bill amount, and "bank" any bill savings when the bill is below the target. Periodically, the ""bank" is distributed to family members. Also, any family member who breaks a rule (e.g., leaves light on in an empty room) must pay a fine to the bank.

- Refresher training for assessors. Those who received additional follow-on training said they learned some new things, and that it was helpful to be reminded. Those who did not thought refresher training would be useful, especially to learn new tips.

Language Barriers

Investigating the potential issue of the assessors not being able to clearly communicate with an ESA participant because of a potential language barrier was a topic covered by the contractor quantitative survey and the customer quantitative survey. However, we noted one instance where this could be occurring. One of the assessors (who described his training as watching

another guy do it for a couple days) was not fluent in English, yet he was serving customers who were predominantly older, English-only speakers living in mobile homes. Based on the difficulty that this assessor had in communicating in English during the interview, we surmise that customers have a very difficult time understanding any energy education that he communicates during his in-home visits.

One of the managers mentioned that most of their assessors are bi-lingual, primarily speaking both English and Spanish but a couple other languages are represented as well. Assessors for SDG&E also have access to the Language Line, which can provide a translator for nearly any language encountered in the field.

This issue of a potential language barrier was raised by parties during the initial public workshop and investigated more fully in the contractor quantitative and customer research.

Gas-Only and Electric-Only Assessment

One of the assessors in the SCE and SCG territory mentioned that customers sometimes get confused by gas-only and electric-only assessments. This was also observed in one of the in-home customer interviews where the customer received a gas-only visit so felt that the assessment was left incomplete.

This is an issue that SCE and SCG might investigate further. Ideally, any home with both gas and electric service would receive a joint utility assessment, or further efforts could be made to ensure customers understand the type of visit they have received.

Contractor Internet Survey Results

Following the in depth interviews with a small group of 12 contractor employees, an Internet survey was developed, programmed, and implemented among a much larger group of assessors. Since SCE and SCG assessors work in overlapping service territories, results are shown for SCE-only, SCG-only, and combined SCE and SCG contractors, in addition to PG&E and SDG&E contractors.

Key findings from the Internet survey are described below. See Appendix B for the final implemented survey. See Appendix C for data tables of survey results. Survey question numbers are shown in parentheses following the description of findings that were derived from the data table for the survey question.

Assessors who responded to the survey represented all four utilities: PG&E, SCE, SCG, and SDG&E. A few assessors have done work for more than one IOU, likely because they are located near service territory boundaries. (QS2)

Assessor Tenure, Workload, and Job Responsibilities

Assessors were asked how long they have been working in their current positions. The average tenure as an assessor was 3.8 years and the median was 2.8 years. This suggests that the assessors were, on average, quite experienced and that the position has had little turnover. Interestingly, those in the Southern California area who were single fuel (i.e., work only for SCE or only for SCG) had the lowest tenure, but those who worked for both SCE and SCG had among the highest tenure. (QA1)

Based on hours worked, nearly all assessors have been employed full-time or close to full-time in the position. The mean was 37 hours per week, and the median was 40. Although there were some differences between IOUs, these were not statistically significant. (QA2)

The reported number of homes visited in an average week is consistent with the number of hours worked. The average of 21.5 homes per week suggests they are assessing about 4 homes per day. Considering drive time between homes this would leave about 60-90 minutes per visit – enough time to conduct a thorough assessment and to provide the minimum of 20 minutes of Energy Education. It also suggests that the assessors have been reasonably productive yet not under unreasonable time pressures that could result from a heavier schedule of daily appointments. On average, SCE and SCG assessors appear to be assessing relatively more homes. For SCE only assessors, this may be a function of being able to enroll fewer customers (and therefore spend less time per home) since the eligibility requirements tend to more limiting for SCE than the other IOUs. For SCG only assessors, the assessment of *only* the gas measures may result in less time in the homes, which in turn could enable them to approach more homes per day. (QA3)

Language Fluency and Frequency of Language Barriers

A majority of assessors responding to the survey were multilingual. In addition to English, over half (63%) spoke Spanish and about 13% spoke some other language (with a few speaking two other languages). 30% said they spoke only English. There are some difference across the IOUs which may also reflect both the different customer and workforce markets that are served by each IOU. Assessors in PG&E territory and SCE-only assessors were less likely to speak another language than SCG and SDG&E assessors. (QA7)

Assessors who spoke only English were asked to estimate how many of the homes they recently approached they were not able to speak fluently with the customer. About one in nine of their visits (13%) were situations with some language difficulties, but far fewer (3%) were situations where the assessor reported they were not able to converse because of the language barrier. These percentages suggest that while there are not a large number of assessments that might be hindered by a language barrier, ensuring language compatibility may reduce the frequency of incompatible visits. (QA8)

Those who spoke languages in addition to English were asked what languages they spoke during their more recent in-home visits. Almost half (47%) were conducted in Spanish, while another third (38%) were completed in English. A small fraction of the time (1%) assessors reported that they could not converse with the customer due to a language barrier. This provides further evidence that contractors have done a good job of meeting customer's language needs, although instances do exist where it has been a problem and could be a barrier for achieving 100% participation. (QA9)

Assessor Training

As part of the survey, assessors were asked to evaluate their initial training concerning the education component of the ESA program. First, they indicated the components of which their training was comprised. A substantial majority received classroom training (83%) and materials (84%), which was typically provided by their IOU (or by outreach and assessment contractors in SDG&E territory). Since many of these contractors have been working for a number of years in the field, it is possible that some of the assessors have forgotten about training they have attended, or the initial training practices and protocols have been modified since they were

originally hired. Nonetheless, the program should strive for 100% of assessors recalling their IOU-provided training. (QT1)

In terms of the initial training that assessors received, slightly more than half had role-playing (63%), and ride-along training where they were the observer (60%), and ride-along training where they were observed and critiqued (59%). While individual IOUs use role playing exercises during their training, the majority of this training was typically provided by their employer, the ESA contractor. Given the potential benefit of this type of "on-the-job" training, it would make sense to increase these percentages to as close to 100% as practical as well.

Assessors working for the different IOU ESA programs reported difference in the type of training they received, particularly concerning ride-along training. Our field observations during our own ride-alongs with assessors made it clear that assessors do what they have been trained to do, so the rigor of training has an impact on program delivery, so all IOUs should ensure a comparably high level of rigor.

Six out of ten (60%) said they received additional training concerning Energy Education since their initial training. This is another training aspect for which the program should strive for greater rigor so that a higher percentage could answer "yes." (QT3a)

Among those who received additional training, one in three (34%) said it was conducted in the office to review new materials, while another 20% said they received a refresher class. 13% described their additional training as field training or ride-alongs. (QT3b)

Regardless of their IOU, assessors generally provided high marks for the quality of the training they had received – with one in four (27%) giving it the highest rating (a "10" on a 10-point scale) and just 1% rating in the 1 to 3 range of the scale. This is consistent with the assessor qualitative results and other indicators in this quantitative survey. The training is perceived to be valuable by those implementing the program in the field. (QT4)

Among the aspects of training that assessors found most helpful, energy savings information (e.g., tips to conserve) was at the top of the list, followed by real customer interaction. These two aspects are core to Energy Education – which is essentially the transfer of knowledge from the assessor to the customer in a personal setting. Classroom training and role playing were also top mentions. SCE-only assessors were the most likely to believe that role-playing was most valuable. This may be a reflection of some of the recent enhancements to the education training component of the program that SCE has implemented, which has included more role playing scenarios. PG&E assessors were more likely to cite field training, an aspect that has been emphasized by PG&E's implementation contractor, RHA. (QT5)

When asked how they thought the training could be improved to make energy education more effective, assessors' ideas for improvement included more of the things they found most useful – in-person field training, more energy education, and more role playing. A common theme to these suggestions is that assessors do want *more* training. Only one in four (27%) said "nothing." (QT6)

The value of energy-related knowledge, in the eyes of assessors, is also reflected in the fact that three in four (75%) have also conducted research about energy education topics on their own – such as by going to their utility's website. This is also an indicator that assessors are motivated to provide quality energy education to the point of seeking new information on their

own. It is likely that additional educational information provided by the IOU's will find a receptive audience among the assessors. (QT8)

How Energy Education is Delivered In-Home

The following survey results focus on a key study objective regarding understanding how the assessors currently delver energy education in customers' homes, and what differences, if any, exist among the IOUs.

Regarding when they conduct energy education during the assessment visit, assessors reported conducting energy education at any point – before, during, and/or after the walkthrough. Those in PG&E territory tended to do the education during the walkthrough, while SCE's assessors tended to conduct it after the walkthrough (and presumably after the household has been qualified based on measures they can receive). These tendencies were not strong, since no more than half said they conduct education during the most common time period of "during the walkthrough." (QIH1)

Given that assessors have generally been trained to consider energy education as part of the entire assessment process, it is likely they were considering the more holistic delivery of energy information and not exclusively when they discuss the informational guidebooks or other tools (e.g., the PG&E "wheel").

When asked which time period was most effective for themselves, about half of the assessors (49%) across all utilities indicated that education during the walkthrough as one of the best time periods. This is consistent with the qualitative interviews among contractors, in which nearly all commented about the advantages of being able to *show* rather than *tell* that the walkthrough afforded them. One in three (32%) mentioned that after the walkthrough was best, with the remaining 19% saying before the walkthrough. (QIH2a/2b)

When asked to respond to the same preference for educational information from the customer's perspective, assessors were more evenly divided between the time periods during the walkthrough and after the walkthrough. (QIH3a)

These findings regarding an optimal time to conduct energy education, along with our observations during ride-alongs and customer interviews suggest that energy education is probably most effective when it is conducted during multiple time periods of the visit. This enables repetition, for example during the walkthrough the assessor can explain how to save energy for a particular appliance and then briefly cover this again after the walkthrough while reviewing the resource guidebook. It also enables some flexibility and allows the assessor to adapt to the particular situation – a customer who might be distracted by their children during one time of the visit could be more attentive during another time. Also, some customers who have mobility issues were not able to accompany the assessor during the walkthrough, so by necessity needed to receive energy education either before or after the walkthrough.

Interestingly, the SCE-only assessors were the most likely to report that customers were most attentive after the walkthrough, and they were the most likely to only provide energy education after the walkthrough. Since they are the only group to do so, it's possible that they feel customers are most attentive after the walkthrough since this is their approach.

There was consistency between the IOUs in terms of when they provide the hard-copy materials. Most assessors (77%) said they typically provided the resource guidebook after the

walkthrough, although some handed out the guidebook before or even during the walkthrough. Providing the EE materials after the walk through, makes sense for BOTH those assessors who provide some verbal information during the walkthrough and assessors who do most of their energy education discussion with customers after the walkthrough. For those who discuss more with customers during the walk though, it enables them to review the information discussed as well as point out information not yet discussed such as safety and resource information not related to specific appliances in the customer's home. (QIH4)

Reflecting further on recent visits, assessors were also asked to indicate how often they (1) reviewed all the pages, (2) reviewed some of the pages, (3) not reviewed specific pages but explained the purpose, or (4) not reviewed the materials but left them for customers to review. Assessors said that the majority of the time (59%) they reviewed all the pages, and another 30% of the time they reviewed some of the pages. Only 3% did they not review anything. There was little difference across IOUs. Although these results could be overstated since there's not time during most visits to cover everything in the book, they indicate that assessors are cognizant of the "requirement" to review the guidebook and other materials with customers. (QIH5)

Though not a common practice (41% overall said they provide at least sometimes to non-qualifying households), PG&E, SCG, and SDG&E assessors were more likely than SCE assessors to provide the guidebook in these instances. Anecdotally, assessors what to help customers as much as possible, and providing the books can help avoid some disappointment among those who do not qualify. Given the recent policy direction regarding the provision of energy education ONLY to qualifying households[18], SCE assessors who were most affected by this are less likely to leave the educational materials at a home that does not qualify. (IH8)

Among recent visits, assessors were asked to provide an estimate of the frequency that they conduct energy education with: (1) the customer, (2) another adult in the home, and (3) children present. They were further asked to indicate the frequency that children appeared to live in the home but were not present. Again there were no relevant differences among IOUs. Assessors noted that most visits (75%) were conducted with the customer of record. About one in five (19%) were conducted with another adult present. Since these two categories do not equal 100% or more, assessors apparently have under-reported. Nonetheless, it seems clear that a large majority of visits were with the customer only. Visits where another adult was present or children were also present occurred much less often. (QIH9)

Since about one in three homes were estimated to have children, about half the time children were present during the assessment visit – a frequency that is high enough to warrant consideration for education targeted toward children.

Regarding the amount of time assessors reported that they spent with customers conducting the energy education portion of the ESA visit, most indicated they spent far more than the minimum 20 minutes (specified by SCE) – with an overall mean of 32 minutes and a median of 25 minutes. Results from a similar question asked in the customer interviews support this. (QIH10a)

Assessors doing electric-only (for SCE) reported significantly less time conducting energy education (with a mean of 20 minutes). SCE assessors have been directed not to educate

[18] CPUC response to SCE PFM.

unless the household qualifies, so they are probably doing less informal education before the walkthrough has been completed.

Average maximum and minimum amount of time spent on energy education varies substantially between customers. The qualitative interviews with both contractors and customers suggest that differing household conditions such as home size and number of appliances, and customer receptivity to energy education contribute to these time differences. Of note, the means across the IOUs were all well above program guidelines, so assessors tend to exceed the 20-minute requirement far more often than they under-achieve it. (QIH10b/c)

When asked what they considered to be the ideal time to spend on education, assessors reported a mean that was very close to the 20-minute guideline (given by SCE), and that was *less* than the average amount of time reportedly spent on education. This suggests that contractors could feel that they are more likely to "over-educate" than "under-educate" or even that they spend more time on energy education than is beneficial for energy savings. This is possibly a result of some customers not being very interested in the education component, so that assessors feel that the customer is not likely to practice energy conserving behaviors. (QIH10d)

Energy Education Content

Assessors were asked to indicate how often they covered specific energy-related information topics. They selected from a predetermined list, and were asked to specify any additional topics they frequently covered with customers. The list of topics was compiled from the resource guidebooks and from observations about what assessors tend to discuss with customers during research team members ride-alongs.

There is wide variation among the assessors in terms of the frequency that different topics were covered during the assessment visits. However, relatively few of these topics were cited as being provided "all the time," and there were differences between assessors from the different IOUs. These results indicate that there have been variations between assessors in terms of their delivery of content, in part driven by their IOU (i.e., differences in training), by climate (i.e., closing drapes or blinds is more effective in more extreme hot or cold areas), and by customer (based on what the customer has).

The topics in the first list that assessors reviewed represented the topics specified in the P&P guidelines, so should be covered with all homes, but the assessors have indicated that they are not doing so for all customers. 94% of assessors indicated that they cover "gas safety" (the topic covered most often) at least some of the time, while 54% said they cover earthquake safety (the topic least likely to be covered) at least some of the time. (QIH11)

The frequency that assessors provide information that applies to specific appliances also varied across appliances, although most of these energy tips are provided at least "sometimes" by more than 90% of assessors. Differences regarding the energy tips that are provided about appliances and other aspects of the home exist between IOUs, which are likely a result of differences in training. For example, PG&E and SDG&E assessors are more likely to tell customers to use a microwave instead of the range or oven more often than SCE or SCG assessors. (IH12a/b/c/d)

Contractor Suggestions Regarding New Ideas for Educational Content and Materials

Assessors were asked to evaluate some new ideas generated by the research team. Overall, assessors preferred the ideas that reflected relatively quick and simple things that the assessor can do for or provide to the customer, including: (1) the ability to sign customers up for other programs by checking a box on the application; (2) refrigerator magnets that would remind about things the assessor taught the customer; (3 tied) the ability to provide a comparison of the customer's recent energy usage against other similar homes, and (3 tied) information for bigger households (5 or more people, multiple generations, etc.); (5) information for children; and (6) the ability to show and enroll customers in new utility services such as email and text alerts. Among the least popular were videos or DVDs. (QSU3)

The most popular new ideas among assessors are consistent with the qualitative finding that assessors were primarily motivated by the opportunity to help others. Videos and DVD's might be less popular because they remove the assessor from the education process.

Assessor Demographics

Assessors are well-educated. Most (82%) have competed at least some college, trade, or technical school, and more than one-third (34%) said they were college graduates. (QD1)

A majority of assessors (83%) have been compensated as contract employees, meaning that they were paid a certain amount for each competed assessment. Most also canvass to find potential new ESA participants, for which they have also been compensated in a similar manner. That retention and longevity have been relatively high suggests that this method of compensation has merit, but changes to the program (e.g., that would increase or reduce the amount of time spent on energy education) might warrant re-evaluation of compensation amounts. For example, increasing the amount of time assessors spend on education without increased compensation might encourage assessors to skip some of the content. (QD2)

Almost every assessor who responded to the survey said they have shared at least some of the information that they provide customers with friends and family. Further, most assessors (70%) said they have told friends and family nearly everything they know – an indicator that a majority of assessors touch more than just treated homes with energy education. They are essentially goodwill ambassadors for the program. (QD3)

Nearly all of the assessors (82%) said their household energy bills were lower now than when they first started this job. This result, along with assessors passing on energy education to their friends and family, is a strong indicator that the assessors are engaged in their work, believe in what they do, and practice what they preach. (QD4)

In sum, assessor characteristics are all strong positives that suggest that any program changes, once incorporated into training, are likely to be successful in the field.

Summary of Findings: Contractor Research

Overall, based on the findings from the contractor in-depth interviews, the Internet survey, and the research team's ride-along observations, the assessors seem well-suited for their role as energy educators within the context of their assessment and education visits. A large majority are well-educated, motivated, and out-going, all of which can facilitate their ability to interact

with and communicate with customers in their homes. Based on the contractor research, key findings are summarized by focus areas below.

Assessor Recruitment, Selection, and Retention. Assessor recruitment and selection processes (job openings have primarily been filled by word-of-mouth among friends and acquaintances of existing assessors) seem to be working well since assessors possess the necessary skills and personal characteristics to be successful. That tenure is quite high suggests that retention (through compensation, working conditions, job satisfaction, and related factors) has been effective as well.

Language Barrier Issues. From the assessor's perspective, situations where they have not been able to communicate with customers due to a language barrier appear to exist but have been relatively infrequent. It is probably not possible to serve all customers in their preferred language given the diversity of California's low income population and the geographic constraints imposed on contractor personnel (they have to physically travel to the customer's home), However, it appears this issue is minimized through: (1) hiring and assignment of appropriately bilingual assessors to cover certain areas and/or customers where non-English languages are prevalent, and (2) making use of a language line when it's not possible to expediently provide an assessor who speaks the customer's language (particularly for languages other than English or Spanish). It also identified the importance of ensuring that all assessors are able to clearly communicate regardless of language. Currently, contractors do seem to be following procedures to do these things, but there have been some lapses.

Assessor Training for Energy Education. Assessors rated the training for energy education that they have received with high marks, yet many still felt that more training would be beneficial. Differences in training between the IOU's and between individual contracting organizations appear to exist as well.

Although the assessors in response to the quantitative survey indicated that they provide most of the energy saving information the vast majority of the time, our observations on ride-alongs suggests the assessors might have overstated the quantity of energy saving tips that they actually provide to a given home. It may be that assessors would benefit from periodic reminders about the benefits and how to communicate the energy saving tips over the course of the assessment visit. To keep the information fresh, the IOU's could seek to provide new education content as well as reminder content for refresher training.

In-Home Education Practices. Most assessors currently provide energy education at different times during their assessment visit, and during moments that seem to fit the situation. For example, some assessors use energy education to develop rapport with customers at the beginning of the visit even before qualification, they provide energy education during the assessment walkthrough in order to *show* as well as to *tell* about ways to save energy, and they provide education near the end of the visit, typically by reviewing information in the guidebook that had been discussed during the walkthrough as well as pointing out new information that the book contains. These practices provide reinforcement and repetition, avoid pedantic lecturing in favor of conversational sharing of information, and allow the education to be tailored to specific household circumstances.

The recently implemented practice (by SCE) whereby customers do not receive any education until the walkthrough has been completed and qualification has been determined seems counter to this recommendation. Even households that do not qualify based on measures could be afforded the opportunity for comprehensive education, and the IOU's and contractors could be

compensated appropriately. This seems to be a missed opportunity since the customer and assessor are together in person at a time when the customer is typically very receptive to reducing their energy costs.

In-Home Education Materials. The current procedure is that assessors provide the energy guidebook to qualifying households, and review at least some of the content with the customer during the visit. Additionally, some contractor organizations have trained their assessors to write in the guidebook. They do this by underlining and circling key pieces of information, and writing their name and contact information on the back or inside the cover (the PG&E guidebook has a specific place for assessors to provide this information, but the others do not). Writing in the books serves two purposes: it draws the customer's attention to information in the book, and it can remind customers about the information that was conveyed verbally by the assessor if they open and review the guidebook in the future. This could be adopted by all contractors for these reasons.

Four out of ten assessors also said they sometimes provide the guidebook to households that did not qualify for the program (this is done more often by PG&E assessors). In qualitative interviews, assessors mentioned that providing the guidebook helps customer even when they have not qualified based on measures or for other reasons. Also, during the customer focus groups, those who did not recall receiving a guidebook requested one that they could review on their own. Since the customer has already indicated interest in saving energy by attempting to participate as well, they are a receptive audience so it would probably be beneficial for them to receive a guidebook.

Contractor Suggestions Regarding New Ideas for Educational Content and Materials. Assessors provided some suggestions for improving energy education in the in-depth interviews, and they were subsequently included and asked about in the Internet survey that was conducted with a larger group of assessors. Top rated ideas reflected relatively quick and simple things that the assessor can do for or provide to the customer, including: (1) the ability to sign customers up for other programs by checking a box on the application; (2) refrigerator magnets that would remind about things the assessor taught the customer; (3 tied) the ability to provide a comparison of the customer's recent energy usage against other similar homes, and (3 tied) information for bigger households (5 or more people, multiple generations, etc.); (5) information for children; and (6) the ability to show and enroll customers in new utility services such as email and text alerts. Lower on the list were additional leave behinds, including DVD's. Subject to cost and feasibility review, some of these suggestions could be implemented.

C. Customer Research

The customer research included both qualitative and quantitative methodologies. The qualitative component of the customer research included 30 in-home interviews among recent ESA participants and 6 focus groups among participants and CARE non-participants. The quantitative component was a telephone survey among 505 recent ESA participants.

In-Home Interviews with Customers Results

As noted above, the research team scheduled 30 visits to ESA program participants' homes to gain a more in-depth understanding and observe various circumstances that may affect how energy education is or could be done in the home. Key findings based on these visits are discussed below. During the in home visits customers were also asked to rate various elements of the program to gauge their responses relative to other sources of data collection. These were followed up with more detailed probes to understand the relevant issues in greater depth. The discussion guide for the customer in-home interviews is in Appendix D.

Program Benefits Identified

Most participants mentioned "saving money" as the chief benefit to their participation. A minority mentioned "saving energy," either alternatively or as a secondary benefit. Only one person initially mentioned "greater safety."

Further probing uncovered some deeper, more personal benefits. For some, "saving money" translated directly into more money for food and other "essentials" that they had minimized. One person said "I eat better. Twenty dollars goes a long way when you cook for yourself…When you're on limited funds, you have to stretch out everything. My primary concern is eating."

Another was concerned about waste in general, and specifically about poor energy use: "It's vital to have a saving program to avoid waste…even among those who can't afford to purchase items, themselves [such as people on CARE and government assistance]." Another believed it was wise for "the city to save more for later." Several participants with young children or grandchildren mentioned that saving energy now translated into more energy and/or relatively less expensive energy later, for future generations.

Others mentioned the stress of living on fixed incomes and that saving money on utility bills relieved stress. Some said they would be more able to pay other important bills. Some said saving money added to their ability to pay other bills on time or without as much sacrifice. One mentioned that saving money on utilities meant there was less chance her Internet service would have to be turned off.

Some also characterized their bill reduction as "helping to have a better family life." A mother said that being able to buy after-school snacks at a fast food restaurant meant more quality time with her kids and that it improved family relationships."

Overall Ratings for Program and Effectiveness

The vast majority of participants gave the highest rating ("10") on their likelihood to recommend the Energy Savings Assistance Program. Some noted that they had, in fact, already

recommended it. The most common reasons for very high ratings included "saves me money," "quick work," and "nice assessor." Lower ratings and reasons were:

- "Was promised a callback [about a new washer] and didn't get one"
- "I didn't think they did a lot"
- "They didn't do much"

The vast majority also gave the highest rating ("10") on effectiveness of the program, and generally cited the reduction in their utility bills as explanation.

Those who gave lower ratings regarding the effectiveness of the program mentioned:

- "I'm always energy-conscious" suggesting that she did not really need the program because she was already doing all she could.
- One customer felt that the actual savings was not really significant noting, "I saw some energy drop, but it wasn't crazy" whereas another said it was hard to tell how much savings would be generated since "It's only been one month since installation".
- In some cases, customers were a bit confused as to why the program was replacing fixtures that were perfectly good, not really having a clear understanding of the energy savings benefits of these replacements. As she noted, "There was nothing wrong with my fixtures. They gave me [one] and some bulbs."

When asked about bill savings as a result of the program, nearly all felt their energy bill(s) had dropped in amounts ranging from about $5 to $30 per month[19].

Participants chiefly attributed their energy savings to higher efficiency lighting, lower water use (e.g., from new shower heads), and improved appliances rather than to new behaviors in their household. Some were keenly aware that drafty doors, windows, and/or electrical outlets were weather-stripped and, in general, they were cooling their homes less. Some who received new refrigerators noted that the new ones didn't seem to be on all the time (they couldn't hear their motors), and they attributed savings to that.

Participants who received swamp coolers attributed significant savings to using them instead of their regular A/C, or in combination with ceiling and portable fans without their regular A/C.

Participants that received low-flow showerheads with the shut-off chains mentioned new showering habits. They talked of the automatic shut-off until hot water became available, and of keeping the showerhead off while they soaped up. One Spanish-speaking participant noted that his two sons took less time in the shower. However, they tended to think of this solely as water savings, rather than also as gas (water heater) savings.

<u>Unaided Recall of Information About Saving Energy and Energy Safety</u>

In general, when asked (on an unaided basis) about the types of information their assessor provided to them about saving energy or energy safety, only a few respondents initially recalled *any* assessor-provided information other than some basic information their new, efficient appliances, lighting, and other devices would save them energy. After additional follow-up

[19] Actual savings estimation was not captured as part of this phase of the project (see footnote 2), but it would be useful to know if customers realized actual savings specifically from the energy education they received.

inquiry, a few mentioned that they recall assessors recommending some behaviors that they could do to save more energy such as

- Unplug items when not in use because they continue to use energy
- Set the thermostat to 78 degrees
- Don't use the "dry" cycle of the dishwasher

With further probing about how their household's energy-using behavior might affect energy use, they repeated similar information about turning off lights and other devices when not in use and setting the thermostats lower in the winter and higher in the summer.

While customers often recognized that the information they received did not seem to particularly new to them, (as one commented, "I don't need someone to tell me the sky is blue"), they also recognized that the information brought some things more into the forefront of their awareness and it did ultimately have an effect on changing some of their behaviors.

Interestingly, despite some customers feeling as though much of the information provided was fairly simplistic, there is also evidence to suggest that customers have a limited understanding of the savings benefits of the program or specific measures that are offered via the program. In some instances, an assessor provided CFLs to the customers and did not install them into the sockets. In one case, the customer noted that the bulbs were still sitting there because she forgot to install them, whereas in another instance a couple noted that they were waiting for the original incandescent bulbs to burn out. There were also instances in which assessors (and installers) installed the new equipment but did not take the old incandescent bulbs and/or showerheads, and participants later switched them back because they weren't happy with the more efficient versions. These examples suggest that assessors may not have been following the program protocols for measure installations. While it was not the intent of this study to evaluate overall assessor performance or compliance and these issues were not systematically examined in this study, these anecdotal findings do suggest that there are lost savings opportunities if measures are not directly installed and other measures not removed. Moreover, it further illustrates that a customer's ultimate interest in savings (which they claim is the most important benefit of the program) may be circumvented by other behavior-based preferences that over-ride benefits that may be derived by energy savings. For the purpose of this study, these data do suggest that if (aesthetically or functionally) customers prefer the non-efficient alternatives unless the educational and informational materials provide a compelling (savings based) reason to adopt behaviors or retain more efficient measures customers may not reap all of the benefits of the ESA program.

<u>Most Important Elements of the ESA Program</u>

When asked which aspect of IOU-provided assistance is most important(between (a) equipment / home improvements, (b) information about energy safety, use and savings, or (c) the discounted rate, participants felt the financial discount provided by CARE was most important, they were split in terms of the importance of physical improvements and information – the two main aspects of ESA.

Those citing the financial discount thought of it as money that went directly to their pockets, usable for other important needs. Those citing physical improvements for energy efficiency generally said improved efficiency was important because it would continue to happen every month, essentially automatically. Those citing information reasoned that they wouldn't know about the program (improved efficiency and the financial discount) unless they had the

information, and that without information they would not know how or what to do to save. Not surprisingly, participants who learned safety hazards specific to their own home such as their water heater wasn't properly vented or was set to produce scalding water tended to value information more. This was particularly true for a young mother, who expressed pride in providing safe environments for her very young children, but who hadn't considered the potential danger if one of them had turned on the hot water. Another participant, a male who was proud of the energy-saving timers and devices he had installed himself, was grateful to learn that he had the potential for a lethal CO build up in his garage, where he spent many hours.

Several participants mentioned that all three components were needed, and that they worked together.

Time Spent Discussing Energy Saving and Safety Information

Customers were also asked how much time they recalled that the assessor spent with them offering information. Based on these discussions with customers, there was no consistent pattern in terms of either when or how much time was spent delivering "information". Most recalled that assessors spent at least some time, typically a total of about 30 minutes divided evenly before, during and after the assessor walkthrough. A few, though, were adamant that the assessor only qualified them and spent no time discussing either information about saving energy or about safety related to energy.

Because some participants lived in studio or one-room apartments with external (shared) water heaters, and had few electronic devices, some of the information that may typically have been discussed did not particularly apply. One single woman was grateful to have received a power strip, not in fact for its energy saving potential, but rather because it actually enabled her to plug in her microwave and a second kitchen appliance at the same time.

Some mothers with toddlers present unique challenges when providing energy information or discussing energy use. They are busy and appear to be overwhelmed by the circumstances around them. For example, during one visit a women held, cared for, rocked or followed her young children around during the in-home visit as we talked The apartment was messy with . clothes strewn in every room and the kitchen sink was full of yesterday's dishes. She had a second child that was one to two years older, whom she had seated in front of a TV hoping it would occupy him. She looked exhausted and appeared unable to concentrate on any discussion topics for more than a moment. It is likely that an assessor's effort to provide this home with energy education would be dictated by the circumstances of this particular situation.

In some cases, participants were rather adamant that they already knew the information that the assessors were providing. In one case, for example, the customer was abrupt, dismissive with the research interviewer during the visit suggesting that it is also likely that he was similarly impatient with the assessor who may have been trying to provide educational information to the household during the assessment visit.

Nearly all said they had accompanied the assessor during his/her walkthrough.

When asked when the assessor delivered his or her most valuable information about saving energy, participants were more opinionated – with the largest group having said they received the most valuable information during the walkthrough, followed by a few who said it was most

valuable after the walkthrough (and a few who mentioned the benefit of what they received before the walkthrough.

Those who got their most valuable information during the walkthrough primarily mentioned that the assessor pointed things out and *showed* them, while those who said the most valuable information was provided after the walkthrough said that they did not get any information before or during the walkthrough, or that the guidebook was a good reminder of what they heard during the walkthrough.

Types of Energy Use and Safety Information Provided

The information that customers recalled that was provided by assessors seems to have been mostly general, rather than room or appliance specific. When customers were specifically asked what assessors mentioned about specific kitchen appliances, entertainment equipment and other energy-using devices during the walkthrough, they typically recalled general information, such as turn off lights and devices when not in use and use the power strip they were provided.

Those that reported receiving information for specific devices and appliances tended to say they already knew it and had been doing it, although a few said the information was new to them. Examples were unplug the toaster, coffee maker and/or microwave; consolidate loads of dish and clothes washing; use major appliances in the evening, if possible; and don't leave the refrigerator door open longer than necessary. Many who received the low-flow showerhead said their assessor suggested that they stop the water while they were soaping, which many said they and other household members were doing.

Overall it appears when the assessor's walkthrough was re-traced, as part of this research, customers reported that assessors generally focus their information and tips on major appliances, lighting, and water use which is consistent with the energy savings information offered in the guidebooks as well.

Use of the ESA Energy Resource Guidebook

According to the participants, some assessors (about one in three) did not leave or review a booklet after their assessment. There is some evidence to suggest that this may not be accurate due to poor participant recall. In one home, for example, the customer was adamant that she did not receive a guidebook, until her husband brought it out. Likewise, this same customer did not recall reviewing the guidebook with the assessor, yet inside the book were the assessor's circles and other marks, along with his contact information.

Just over half said the assessor did leave a booklet. Among these who recalled the booklet, while the majority said the assessor reviewed it with them, it is surprising that more of them did not recall getting the booklet or having had the assessor review it with them given that ALL of them are expected to have received the information.

Based on these discussions, it was common for assessors to have discussed and provided the guidebook after the walkthrough, but nearly as many customers recalled getting the book at the beginning of the visit, before the walkthrough. One participant reported having received the guidebook at the beginning because he specifically asked and wanted something tangible that provided "verification" of the visit.

About a third of those we talked with had saved the guidebook and were able to locate it at the time of the interview. Those who could not produce their booklet were more likely to have said that their assessor did not review specific information in it, suggesting that the assessor's review does aid customer recall of it. As noted earlier, however, given that some customers believed or insisted that there was little that they could learn (that was new) about saving energy, it is also possible that they ignored the educational aspects of the assessor's visit or possibly even refused it (though none admitted doing so). Interestingly, among those who said they did not receive a booklet most were interested in reading it when shown a demonstration copy. One customer asked for his utility's phone number to request a copy.

Among those who said they received a guidebook, about one in four said their assessor wrote in the booklet. This does seem to be a memory jog concerning the guidebook since customers specifically commented that they remembered them writing in it, although it's also likely that some customers who did not remember the book (even though they received one) also did not remember the assessor writing in it.

As part of the discussion, customers were also asked what topic areas from the guidebook they recalled that their assessor reviewed with them. Just about all who recalled the review said their assessor reviewed information about energy savings, while somewhat fewer said they recalled having reviewed information about other programs or safety information.

Roughly a third of the customers said they reviewed the book later on their own[20]. Those who did not said they didn't think about it or noted that they were "too lazy."

Information Passed to Household Members

Again, roughly a third of those we talked to who noted that they had reviewed the guidebook *on their own* following the visit also said they passed on information about saving energy and/or safety to someone else in their household. Many of these customers reviewed the guidebook with others in the household at the same time that they reviewed it on their own.

In terms of "who" the information was passed on to, not surprisingly, it is most often communicated or shared with a spouse or one's children. Among those who passed on information, about half reported that it affected their spouse or children's attitudes about energy, and about a third reported that their spouses actually modified their behavior while, a smaller percentage noted that their children's behavior changed as a result of the information provided. One elderly participant said his wife, who was exhibiting signs of Alzheimer's disease, was remembering to consolidate her clothes washing. Apparently, spouses were easier to influence than children, perhaps because the educational material is geared toward adults rather than children.

Among those who discussed not having passed the information along, we observed there are some scenarios such as retired couples, who tended to have both persons sit in on the assessor review, in which case there would be no one to "pass the information along to". In other cases, such as Households with a parent of a toddler, especially single moms, it does not make sense to pass the information along. There are also situations in which the parent assesses the value and receptiveness of passing the information along. For example, a middle-aged father said that his son was "rebellious" and he just couldn't change his behaviors regarding energy use. Hence, the information gleaned from the in-home visits reinforces the

[20] A more thorough review of the guidebook itself was completed in the customer focus groups.

need and value of the assessor's judgment in determining how and what educational materials can be communicated to these households. It further suggests the value of having some customization and perhaps more content or materials that are suited to some of these scenarios.

Assessor/Contractor Ratings

Customers typically gave very high ratings of their assessor on all dimensions: "knowledge," "interest in participant questions," "information relevance," "communication" and "courtesy." Complaints about an assessor were very rare, and sometimes were related to the perception that repairs/replacements were more limited that the participant expected. One customer was upset that an assessor had red tagged his wall heater, shut it off, and told him it was his (the participant's) responsibility to repair. Later, another inspector examined the heater and said it would be okay to operate after soot was removed. In the mind of the customer these contradictory opinions undermined the credibility of the original assessor and the red tag decreased the participant's satisfaction with the assessor and the overall program.

In another instance, the assessor did not receive favorable reviews because a non-Spanish speaking customer noted that the contractor used a Spanish-speaking crew and directed them in Spanish, which created a situation in which the customer could not follow what was going on. He reported that this extended to their discussions of the appliances and the work they were doing and as such he felt he was missing valuable information about his home's energy use.

Participant Suggestions for Improvement

Most participants' suggestions for improvement were about spending more time on the information or providing more details about how to save. A few had said their assessor did not provide any information, so these participants were clearly interested in what they had missed. One customer noted it would be of value to him to have been given "a savings target" for example. Another customer mentioned the idea that an online graphic comparison of his apartment's energy use compared to other similar units would be helpful.

Several participants claimed their assessor did not ask for or complete a walkthrough. A couple of these apparently involved initial visits from assessors walking the neighborhood and looking to qualify participants. As noted, a few participants claimed that assessors initially said they would do more than was actually done. One participant said he was still waiting to hear if his washer could be replaced. Conceivably, his appliance may not have qualified for an upgrade, yet the customer did not recall being told this. Regardless of the reason in that or other instances, a couple of participants out of the approximately 30 surveyed believed the work in their home was incomplete suggesting that it is even more important for the assessors to clearly explain the process and leave simple and clear information with the customer to manage expectations and ensure greater comfort and confidence in the processes involved in (and benefits of) program participation.

A few said the assessor did not provide much educational information after qualifying them. These participants said they got more energy-related educational information from the installers who came later.

When asked about the most important information provided during the visit, most comments were about the *variety* of helpful tips that applied to their various appliances and other energy-consuming items, and they additionally singled out the information about AC usage (thermostat

settings, changing filters), consolidating laundry loads, and lights (turning them off when not in use, using energy saving bulbs).

Special Situations Affecting Energy Use

The in-home visits identified a few particularly challenging situations where energy education information might not be adopted. As noted, several participants were moms with one or more small children, who seemed overwhelmed by the responsibility. They were using TVs and other entertainment equipment to occupy or pacify their children, whether their children remained in place or not. Energy reduction in those situations would seem to require getting out of the house with their children, perhaps visits to a recreation area or other people's homes, so educational information could include a recommendation to do just this.

Other participants were disabled and/or elderly and appeared home-bound. They were using energy to create comfortable conditions and/or use medical equipment, and were of the opinion that they could not reduce more without affecting their health or well-being. Medically challenged households might benefit from information specifically designed for their needs. This could likely require further investigation into ways they could reduce further without health consequences (Could a smart power strip be used with their medically-necessary equipment? Is there a thermostat set-point that is best for asthma sufferers).

One elderly man on fixed income bluntly stated that it was more likely his inefficient appliances and light bulbs would survive him and that it didn't make financial sense to replace them unless they actually did stop working. For his situation, financial payback information might be helpful.

Summary of Findings: In-Home Interviews with Customers

Summary findings about energy education from the 30 in-home interviews with recent participants include:

Impact of the Program. Participants were primarily motivated to sign up for ESA in order to save money, and felt that the information they received through the program helped them do this. Although participants in the in-home interviews primarily attributed energy savings to new lighting, appliances, and hot water shut-off devices, and initial recall of energy education topics was low, a majority agreed that it did affect their behavior regarding how they used energy and half said it affected the attitudes or behavior of someone else in the home. Most cited that the information raised their awareness of things they can do and prompted them to change their behaviors.

Energy Education Delivery. Most participants recalled receiving, on average, about 30 minutes of education. However, a few (about one in ten from these interviews) did not recall any energy-related information. Also, most participants accompanied the assessor during the walkthrough, and felt that the most valuable information they had received was during this time when the assessor pointed things out and explained what could be done to reduce energy use with that item. A smaller number of customers felt that the most valuable information was provided after the walkthrough and noted that the guidebook provided a good reminder of what they heard during the walkthrough. The top-of-mind information recalled tended to be general, including things such as turning off lights and appliances when not in use and using a power strip to make it easy to "unplug" items when not in use. When probed, they cited more specific practices,

such as unplug the toaster, coffee maker and/or microwave; consolidate loads of dish and clothes washing; use major appliances in the evening, if possible; and don't leave the refrigerator door open longer than necessary. Although most said they knew these things already, for some they were new.

Energy Education Materials. About one in three participants did not recall getting a guidebook. Among the remainder who recalled getting one, about half recalled the assessor reviewing information in the book with them, but the rest did not. Among those who said they received a guidebook, about one in four said their assessor wrote in the booklet. This practice does seem to make the guidebook more memorable for customers. When asked what topic areas they recalled from the guidebooks, there was not a particular area that was consistently recalled. Among those topics recalled, customers pointed to energy saving practices, other utility programs that could help them save energy, general assistance programs, and safety information. Relatively speaking, customers' recall of the guidebook appears to be low considering that all participants should have received it and had the assessor review it with them. Since the contractor surveys suggested that assessors are providing and reviewing these with most participants, it is likely that more limited customer recall of this particular issue may be reflected in these results.

Other Household Members. About half of the participants with other members in their household said they passed on information from the assessor's visit, including reviewing the guidebook with them. Among those who passed on information, about half said it changed their spouse and/or children's attitudes about saving energy and somewhat fewer said it changed behaviors. Where information was not passed on, it could have been a situation where the spouse sat in on the assessor review, or where the children were too young for it to be relevant.

Assessor Evaluations. Participants typically gave very high ratings of their assessor on all dimensions: "knowledge," "interest in participant questions," "information relevance," "communication" and "courtesy." Complaints about an assessor were very rare, and sometimes were related to the perception that repairs/replacements were more limited that the participant expected.

Participants Suggestions for Program Improvements. Most suggestions for improving energy education among the in-home interview participants were about spending more time on the information and providing more details about how to save. Concerning what they did receive, customers liked the extended *variety* of helpful tips, and specifically mentioned tips about AC usage (thermostat settings, change filters) and lights (turning them off when not in use, use energy saving bulbs).

Based on these findings, energy education appears to be on the right track. Customers who recalled it believe that it has had an impact on their attitudes and behaviors concerning energy use. Also, the underlying premise of in-home energy education provided in-person by a trained assessor (and educator) appears sound: customers who have signed up for ESA are motivated to save energy and money, so are a receptive audience for information that can help them save. They want the information.

The way that energy education is currently provided in the home is working, but currently has limitations. Participants (and assessors as well) were most receptive to education provided

during the walkthrough, followed by an educational review with the guidebook after the walkthrough. Some households, though, have particular challenges, especially those with children and those with medical issues.

A major limitation is that recall of specific energy education information is weak, especially among older customers. The program should do more to remind customers about things they can do to save energy.

Participants with other household members already do a relatively good job passing on information within the household, even though energy education information and materials are not currently designed to explicitly enable this type of sharing. This suggests that the program could improve its impact on the approximately 80% of households with two or more residents by developing practices and materials targeted to multi-member households.

Focus Groups with Customers

The six focus groups with customers were completed in three locations at centralized focus group facilities. Summary findings from the focus groups are discussed below.

Focus Group Detailed Findings

Biggest Contributors to Energy Use in the Household

Most low income customers, including both the ESA participants and non-participants, described the biggest contributors regarding their energy use as physical aspects of their home and energy consuming devices. Physical aspects included: lots of windows, vaulted ceilings, lack of insulation, swimming pools (with pool pumps), and drafts under doors. Energy consuming devices included air conditioning, appliances such as refrigerators, lights, electric space heaters, and the abundance of electronic items that are plugged in such as TV's, computers, Wi-Fi routers, and others.

Those with smaller bills were more likely to mention the more common uses such as lights and refrigerators, while those with larger bills were more likely to mention AC, windows, lofted ceilings, and such.

When probed, many also admitted that other family members were irresponsible concerning energy use: mostly teenagers and younger children, but young adult children as well. Respondents were generally in agreement that those who do not pay the bill do not care as much about saving energy.

Some respondents, though, had other household members who were conscientious: children that have had the right habits instilled in them by their parents, or other adults in the household who share with the bills.

Motivations to Actively Conserve Energy

Personal motivation was not cited as much of a problem or reason for higher energy bills – most respondents said they are very conscious of their energy bills and wanted to *save money*. However, this does not mean that they were always minimizing their energy use. One non-

participant described himself, “I am pretty lazy about it sometimes. I usually do not turn off my computer when I am not using it. It just goes on sleep mode. I tell myself it is not using that much electricity.”

For some, *health considerations* are a major driver of higher energy cost especially for heating and cooling, but some mentioned medical-related equipment that runs on electricity, such as air purifiers and humidifiers for asthma. Other motivations, such as a desire to be *green* or *safety*, were of little consequence to most ESA participants, although these were motivators for a small minority. Safety had at least two different meanings: lights provide a sense of security at night, and they make walking up and down stairs safer.

Regarding *environmental* considerations, some had the opinion that it takes money to make improvements that are green, which most ESA participants (and at least some high usage non-participants) don’t have. High usage non-participants were more likely to mention the *environment* as a motivator than were ESA participants – perhaps because their economic situation is typically better than ESA participants, evidenced by their ability to afford larger energy bills.

Habits were also drivers of higher energy costs, but could also be reasons for lower bills. Habits that participants and non-participants believed increased their costs included leaving lights on, sleeping with TV’s or music on, leaving computers on, and similar practices. Habits that reduce the bill were: using more blankets, closing blinds on hot days, unplugging things, hang drying clothes, etc.

Of note, a lack of information was *not* mentioned as a reason for higher usage. One non-ESA participant described, “I think you make a decision, I am not going to change my light bulbs, I am not going to turn off my heat, I am not going to do these things. People make those decisions but I think they are pretty well informed.”

That said, some energy-related information is not commonly known, so is potentially beneficial to many households. Short reminders and feedback can also be important tools to help households reduce their energy use. Also, new information is more attention getting and memorable than information that is already well-known.

<u>ESA Program</u>

When probed about the relative importance of three main pillars of utility company assistance – financial, physical, and information or education – both participants and non-participants had mixed opinions. Most seemed to think that all three were important and worked together.

Physical assistance was important because it provides improvements that they otherwise could not afford to do, or would not have the time to do. Financial help was important because it directly helps them save money day in and day out. Respondents were equally split regarding which of these two types was most important.

Educational or information help was more polarizing than the other two types. Some felt it was least important because they already knew about ways to save energy. Others felt it was most important because it can be applied no matter what your situation, and that knowledge is power. In either case, customers did want information specific to their home and situation.

This implies that the value of the education should be communicated in marketing materials or to new participants (e.g., "making a few changes in how you use energy could save you $xx/month"), and probably should focus on content that most people don't already know.

Reasons to Participate

ESA participants said they participated because: (1) they had a problem with their home that needed to be fixed (e.g., lack of insulation so their home was too hot and/or too cold; drafts; weather stripping around doors missing); (2) their bill seemed too high or had increased recently (which prompted them to call their utility or to agree to the program when a contractor came to their door); or (3) they heard favorable word of mouth about the program (people hear about it from friends and neighbors, so decide to try it out). Of note, none mentioned that they participated in order to learn more or for assistance in changing their behavior.

This suggests that education is not something they are expecting nor are they seeking it, so the content and delivery of energy education needs to be "attention getting" in order to facilitate retention and adoption. Also, program marketing could recognize these three main "prompts" to participation – "fix problems with your home, reduce your bill, lots of your neighbors have done so already."

Those who knew something about the program and sought it out wanted the physical improvements that would correct the main deficiency in their home to reduce their bill. High usage non-participants had comments similar to participants regarding their reasons they might want to participate. They recognize issues with their home they believe the program could correct.

Non-participants also had concerns. One concern was that "programs" can be disguised sales calls by utility contractors. Solar seems to have influenced perceptions that even authorized utility contractors are still trying to sell something, so more utility customers have a guarded response to programs such as ESA. Another concern was regarding quality of the work and appliances – experiences with other similar programs, word-of-mouth (from ESA participants), and then simply doubts that a free program would provide good quality were mentioned by some non-participants. Since some ESA participants did express their dissatisfaction with the quality of the free refrigerators and of the work performed by their contractor, this is probably a valid concern.

Program Experiences

ESA participants were asked about their experiences with the program. Program positives centered around the fact that participants received free assistance that they otherwise would not have received on their own (because of financial and lack of knowledge issues). ESA participants also mentioned the helpfulness of the representatives who came to their home – and the information and explanations that were given. As one participant said, "It was very hands on, very personable, and very comfortable. It was a great experience, not to mention all these little tidbits of information."

Participants who had some type of follow-up also mentioned this as a positive. For example, one customer mentioned that the contractor supervisor came to their home and completed a

thorough inspection of the work, and another mentioned a phone call from their contractor asking if they were satisfied with the work.

Program weaknesses included:

- Some ESA participants experienced lengthy delays in getting the improvements.
- Some participants had complaints about the "quality" of the measures: those who received a refrigerator said the new refrigerator was the cheapest available (replacing an old, but better quality unit).
- Some contractors seemed in a hurry or were not thorough, so that after the measures were done, the customer still felt that their home had significant problems that should have been addressed by the program. Some customers said that the contractor did not walk through their home, but instead asked questions.
- Some felt they did not receive something they should have gotten (like a microwave oven), while others said that their contractor did not complete the work (for example, a participant was told by the contractor that they would return but that the return visit was never completed).
- A few wished that the visit was more comprehensive to include the water company.

In sum, participants reported generally positive but somewhat mixed experiences – some said their assessor was very thorough and that they received improvements that made it all worthwhile, while others felt their visit was hurried and incomplete, leaving them with some improvements but with some issues still uncorrected. Overall, though, the vast majority of participants felt it was worth it to participate.

Perceived Impact of Participation

About half the Orange County ESA participant group believed they were saving energy after their participation, while nearly all of the San Diego and Fresno groups believed they were saving. Since only one focus group was completed among ESA participants in each service territory, it is not possible to draw utility specific conclusions from this, but we can conclude that "most but not all" participants believe they have derived energy savings.

Some participants cited noticeable drops in the bills, while others said their bills remained unchanged but their additional new improvements or energy conservation efforts had to be making a difference, perhaps by keeping their bills from increasing.

Energy Education

Across the three focus groups, a majority but not all of ESA participants recalled receiving information or education during their assessment visit. Those who did recall getting information described a process consistent with program protocol: the assessor gave tips and advice about how to save energy either before, during, or after the walkthrough. However, even participants who recalled receiving information did not recall much specific information, except instances where the information was new to them.

Specific information recalled and mentioned by ESA participants as particularly helpful included: use power strips, unplug items when not in use, set the thermostat at specific temperatures and leave it there (e.g., 68 in winter and 78 in summer), use power strips, keep the refrigerator full,

and others. For example, in one of the focus groups, a respondent mentioned that his Wi-Fi is constantly on, which generated others in the group to say they had never thought about their Wi-Fi in terms of energy consumption before, but that they would now that they were made aware.

Safety information was recalled and mentioned by a few ESA participants, though only those who felt they were saved from an existing safety hazard that their assessor identified and that was subsequently corrected. General safety information was not remembered.

During the discussions about energy saving practices, it was clear that there were some misperceptions among respondents that the program might be able to correct – a few believed that they pay more during peak times and less during off peak (likely because of the new smart meters that nearly all were aware of), and some believed that virtually all small appliances should be unplugged when not in use, including toasters, blenders, etc., even though these items do not contribute to vampire load.

Participants who recalled specific information did feel that the information was helpful and that they put at least some of the information into practice. For example, one customer received the five free CFLs and then purchased another 5 to replace her remaining incandescent bulbs. Another respondent said she now uses their fan more often instead of the AC because she learned that the fan uses less energy. Others mentioned closing the blinds during the day and using the smart power strip.

ESA participants placed higher value on information they did not already know, yet even seemingly common sense actions, when brought up, were mentioned as valuable: run your appliances full (and less often), keep the refrigerator door closed, etc.

A majority of ESA participants also recalled getting the Energy Resource Guide. The participants who recalled receiving energy-related information tended to recall receiving the guide (though not all), and most who recalled getting the guide recalled that the assessor reviewed the guidebook with them (but again, not all). However, those who said they got a guidebook and that the assessor reviewed it with them did not recall many specific details from the book. Some of those who did not recall the guide mentioned receiving a packet of papers, so perhaps they “misplaced” the guidebook among the other paperwork.

Few participants said they reviewed the guidebook on their own after the visit. It’s likely that they would need something to “trigger” a subsequent review of the guide, since once received they typically put it somewhere that was out of sight and hence out of mind. One of the 10 Orange respondents said she reviewed the guidebook after the visit, mainly to “see what was in it.” When probed about what she learned, she admitted to not reading the information but instead skimmed through. The dense content and lack of focus dissuaded her from delving into it.

Regardless of whether or not they recalled receiving information, nearly all of the ESA participants as well as the high usage non-participants said they would want to receive information. They recognized that there were things they did not know, so could benefit from some useful new tips.

A theme during the group discussions about the energy education or information component was customer interest in new information and lack of interest in what they already knew. The in-person visit creates a captive audience so should maximize communicating new information.

Very few ESA participants mentioned that anyone else in their household participated in receiving information, but most who had children or other adults in the home (participants and non-participants alike) wanted them to be encouraged to participate. Respondents felt that their children or other adults living in the home (e.g., adult children, spouses) would be more likely to listen to an outside authority figure (or "expert") than to the bill payer.

Resource Guidebook

Participants and non-participants reviewed the resource guides provided by SCE/SCG, PG&E, and SDG&E during the focus groups. Respondents in each group reviewed all of the guidebooks, so were able to compare between them.

Overall, they liked the concept of a booklet that contains this type of information, plus they responded favorably to most of the existing content. However, the fact that very few participants said they read the guidebooks on their own suggests that the guides need to be extremely user friendly, inviting, and useful.

To this end, most respondents preferred certain elements from all three guides, so suggested a blend of the three. Key findings about the guidebook(s) include:

- Charts and graphs were attention getting and easier to read.
- Full color in the text helped make key information stand out. The book should make the main points stand out so customers can focus their attention on main ideas.
- Dollars assigned to specific appliances and other items was of very high interest. Customers pointed out that kWh without dollars was not useful. Note that this type of information was the most preferred and desired among nearly all customers in all of the focus groups.
    - Customers also wanted a comprehensive list nearly all of the main appliances, equipment, and electronics that people have in their homes. Those with pool pumps were quick to notice whether or not pool pumps were included in the guidebook.
- A title that reflects their desire to save energy to save money was appealing. For this reason, most respondents preferred the SDG&E guide title, "It pays to Save Energy."
- Customers want the guide to "prioritize" information for them. This is a current weakness of the SCE/SCG guide.
    - Saving money was a main motivator so other information (safety, climate change, other resources, etc.) was of secondary importance. The guidebook should take this into account.
- Respondents suggested creating separate guides for English and Spanish (referring to the SCE/SCG guide) to reduce the size and bulk of it.
    - Spanish speakers, though, liked having both English and Spanish so other household members who read English can help them understand the information. Some Spanish-speakers are not literate in Spanish.
- Lighting

        - Participants liked the CFL sheet in the SCE guide that can help them chose the right bulbs. Some suggested this should also include LED's.
        - How to dispose of CFL's in an easy way seemed to be a consideration for quite a few respondents.
    - How to read online energy usage – was of interest to some but not all. What customers currently want most is information about how much energy is used and what it costs to run each of their appliances and electronic devices for a period of time such as an hour or over a year.
        - A few said they have already looked at their online energy use but did not find it useful, perhaps because they did not know what to do with it or could not determine usage of specific appliances from it.
        - A few customers wanted to know how to "read" the new meters when they physically look at them, so it seems clear that more information in general about what the new meters provide could help.
    - How to read the bill – some were interested in this but not all. Mostly, respondents said they were interested in comparing their usage this month this year to the prior year to see if their usage changed.
    - Top 5 List – most felt this would be useful if it would be specific to their home.
    - Most respondents with teens or children in their homes responded favorably to ideas that would involve these household members, including:
        - Refrigerator magnets for kids
        - Versions of the Guide for young people (age appropriate)

<u>New Ideas</u>

Participants and non-participants provided suggestions and reactions to potential new ideas regarding energy education. These included:

- Leave-behind single-page checklist of things to do – this could include a list of appliances in the home, and tips for reducing energy use. While much of this information is in the guidebook, it's not specific to the home, so they requested an easy-to-use single-page format.
- Calendar with Tip of the Month – this would provide a visible and frequent reminder to conserve energy, and would not clutter up their refrigerator like a magnet would do.
- Follow-up – most felt that follow-up would be useful.
    - A few mentioned that they can or do already receive emails on energy saving topics, and that the utility's website or bill inserts also contain this information, indicating that they already pay attention to these informational resources.
    - Email seemed acceptable to most participants.
    - Preferences regarding follow-up frequency varied: from monthly to annually. Most would probably be satisfied with quarterly follow-up, which they suggested could be seasonal.
- Videos
    - Most participants were not too interested in a DVD, but did respond more favorability to online video, such as through YouTube.

        - Spanish-speakers were more favorable about a DVD (and video), possibly because their reading skills makes it difficult to read a booklet even when it is provided in Spanish.
        - One customer suggested a series of DIY videos for people who want to do the work themselves, though since lack of time and money to make improvements is a barrier to saving energy so a DIY option would assist only a small minority of customers.
    - A short online training class (similar to online driver's education classes) with information content and short quizzes to test knowledge also had appeal, if there were an incentive to complete it (such as additional CFL's, LED nightlights, etc.)

Customers in one of the groups mentioned wanting the program to include water conservation in addition to gas and electric, beyond hot water – since water bills for many households can exceed their energy bills.

Some customers were interested in a more detailed in-home assessment where the energy draw of their main appliances would be measured. They suggested that the ESA program could lend out energy measurement devices. For smaller and more commonly used appliances or devices, a standardized list would be sufficient.

Summary of Findings: Focus Groups With Customers

Summary findings and conclusions are categorized below.

Energy Education: Information Needs. Participants and non-participants alike recognized the value of receiving energy efficient appliance and weatherization measures that the program provides, but they were more divided concerning the value of information. Customers mentioned that appliances and weatherization saves energy continuously, while information requires action as well. Based on observations and comments of the focus group respondents, the educational information provided via the ESA program tends to be: (1) not particularly memorable and, (2) not new to the customer. While there is value in reminding customers about energy conservation, the educational information may be more impactful if it provides new things to do as well.

It is also possible that the information is not especially memorable because customers were not seeking it when they signed up. This implies that the content and delivery of energy education needs to be more "attention getting" in order to engage the customer and facilitate retention and adoption. For example, each energy saving tip could be supported with an estimated savings potential (e.g., keeping the refrigerator full could save $XX per year).

Since for most customers, saving money on their bill is the main motivation for participating in ESA (and for following the energy-saving advice provided by energy education) customers unanimously want information that illustrates dollar costs of using specific appliances or electronics for a period of time (such as an hour or over a year). The IOU guidebooks include this, but it appears to get lost among the other information provided via this component of the program. As such, elevating this to be more "front and center", (e.g., highlighted, offered first, more time on this, more emphasized, etc) may help engage customers more in this component of the program. Including some estimated dollar savings from specific energy conservation actions may also be of interest and become included as part of the educational materials discussed.

Energy Education: Materials. Overall, customers liked the concept of a booklet that contains energy-related information, plus they responded favorably to most of the existing content with few, if any, problems understanding the information. However, the fact that relatively few participants said they read the guidebooks on their own suggests that the guides need to be more user friendly, inviting, and useful. To this end, most respondents preferred certain elements from all three guides, so suggested a blend of the three. Key findings about the guidebook(s) include:

- Charts and graphs were attention getting and easier to read.
- Full color in the text helped make key information stand out.
- A title that reflects their desire to save energy to save money was appealing.
- Customers want the guide to "prioritize" information for them.
- Respondents suggested creating separate guides for English and Spanish (referring to the SCE/SCG guide) to reduce the size and bulk of it.
    - Spanish speakers, though, liked having both English and Spanish so other household members who read English can help them understand the information. Some Spanish-speakers are not literate in Spanish.
- How to read online energy usage was of interest to some (but not all).

Customer Suggestions for Improvement. Participants and non-participants provided suggestions and reactions to potential new ideas regarding energy education. Customers were most favorable about:

- Leave-behind single-page checklist of things to do – this could include a list of appliances in the home, and tips for reducing energy use. While much of this information is in the guidebook, it's not specific to the home.
    - A similar idea was a "Top 5 List" specific to the household.
- Calendar with Tip of the Month – this would provide a visible and frequent reminder to conserve energy.
- Follow-up with reminders, new tips, and a check-up on the household's progress in reducing energy use would be useful.
    - Email seemed acceptable to most participants.
    - Most would probably be satisfied with quarterly follow-up, which they suggested could be seasonal.
- Most participants were not too interested in a DVD, but did respond more favorability to online video, such as through YouTube.
    - Spanish-speakers were more favorable about a DVD (and video), possibly because their reading skills makes it difficult to read a booklet even when it is provided in Spanish.
- A short online training class with information content and short quizzes to test knowledge also had appeal, if there were an incentive to complete it (such as additional CFL's, LED nightlights, or even as a requirement to receive the free measures).
- Some customers were interested in a more detailed in-home assessment where the energy draw of their main appliances would be measured. They suggested that the ESA program could lend out energy measurement devices.

Other Household Members. Households with children or even other adults were also very interested in information delivery and content that involved the entire household. For example, the assessment appointment could be scheduled to facilitate participation by more people in the household, and the assessor could request that everyone at home join during the education component. Also, customers responded favorably to an idea for age appropriate resource guide books.

ESA Participants vs. CARE Non-ESA Participants. We did not note any particular differences in needs or preferences between ESA participants and the CARE non-ESA participants, except that the non-ESA participants had more comments about using the Internet as a potential resource. Based on their stated household incomes solicited during recruiting for the groups, the CARE non-participants tended to have somewhat higher education levels and income than the ESA participants (perhaps reflecting ESA program focus on those with greatest need within the population of all low income). Higher income households tend to be more web-enabled, which could explain this observed difference. This suggests that as more homes are treated by the ESA program, the demographics of those remaining will shift, and more web-based education resources could become more popular among ESA participants.

Telephone Survey with Customers

Following the in-home interviews and focus groups, a telephone survey was implemented in order to ascertain more quantitative data on these topics via a larger representative sample of 505 recent ESA participants. The survey sample was stratified by IOU, and results were weighted so that each IOU represented its correct proportion of the statewide total of treated homes in 2012.

Telephone Survey Research Results

Findings from the telephone survey are discussed next.

Attitudes About Energy Efficiency

As an introduction to the survey, recent ESA participants were asked to identify the barriers or obstacles to reducing their energy use in their home. Top barriers included: (1) the need to maintain heating and cooling (mentioned by 62% as a barrier), (2) the age and condition of their home (52%), (3) having too many things that use electricity (50%), (4) the cost of new appliances (49%), (5) age of major appliances (48%), (6) not knowing what else you can do (46%), and (7) cooperation from others in the home (38%). The physical measures provided by ESA directly address items 2, 3 and 5, and in some cases item 1, while energy education is targeted toward item 6, and to a lesser extent items 1, 3, and 7. For example, energy education advises participants to unplug or turn off appliances when not in use, keep refrigerators full and vacuum coils periodically, use a smart powerstrip for electronics and entertainment, and adopt many other energy saving habits all of which minimize consumption across most energy consuming devices found in homes. For most participants, the need to maintain heating and cooling is also targeted by education regarding thermostat set-points, closing drapes or blinds to limit heat gain and lose, and other actions that participants can take. (AT3)

SCE participants were less likely to cite “renting” as a barrier since more of SCE’s recent participants have been homeowners.

Participants also indicated their agreement to statements representing attitudes toward energy conservation. Responses indicate that the majority of participants (78%) feel knowledgeable

about what they can do to reduce energy use around their home, and they monitor their energy bills closely. For comparison, more CARE non-ESA participants (91% PG&E customers, 87% SCE customers) indicated that they know what they can do in the 2009 LIEE (ESA) Segmentation study[21]. Additionally, another two out of three (65%) ESA participants agreed that they are doing all they can to reduce energy use on their home, compared to 80% PG&E and 78% SCE among the general CARE population. While not definitive, these differences may be explained by a participation bias in which those customers who chose to participate in ESA are seeking assistance because they are *more aware* of their own needs. On the other hand, it may also be the case that *actual* needs of the ESA participants and those CARE customers who are not ESA participants are different. While it is not within the purview of this study to resolve this, it is important to recognized that the educational component of the ESA program is intended to provide a resource to increase customers awareness and knowledge of what they can do as well as provide tangible resources and information on potential actions that can help them save more energy. The need for this service is further illustrated by the fact that nearly 20% of those sampled report that they are not so knowledgeable about what they can do. (AT10)

While relatively high percentages "agree" with many of these statements, even the statements with highest agreement leave *at least* one in five who do not agree, which is ample room for continued improvement. Specifically, 22% do not feel knowledgeable and 27% do not monitor their energy bills closely. Also, two in three (65%) said they've already done all they can to save energy, which represents a substantial opportunity for energy education to change this perception that is potentially limiting their future efforts.

Another noteworthy result is that most program participants (67%) believe that technology can help them reduce energy consumption. Technology can include improvements in energy efficiency of new appliances or other energy consuming devices, as well as control and monitoring tools. Given this information, the ESA program may be able to capitalize on technological resources that can assist customers in learning about and reducing their consumption.

While SCE customers were more likely to agree that "I don't often think about how much energy I use in my home," this could be a result of recent participants' demographic or geographic make-up, perhaps related to their higher homeownership.

<u>Experience Regarding the ESA Assessment and Education Visit</u>

The survey included questions to determine participants' experiences with the energy education component of the ESA program. These questions focused on the information received during the initial assessment visit.

First, participants were asked how much time in total the assessor spent providing information about how to reduce energy use and to be safe around energy. Roughly two-thirds (60%) of participants recalled receiving 20 minutes or more of energy education, while about one-third (33%) recalled receiving 19 minutes or less. A small percent (7%) were unsure or did not recall. The amount of time spent on education as reported in the phone survey is less than what the assessors suggested in their survey, and less than what was suggested by participants in the in-home interviews. (EDM1a)

[21] 2009 LIEE (ESA) Segmentation Study, HINER & Partners, Inc., www.CALMAC.org

These differences, however, may reflect that fact that contractors were referring to the more "holistic" delivery of education and information which may be embedded in the walkthrough or other discussions with the customers. When the customers were asked this question, they may be reflecting only on what they recalled as part of the more formal educational component of the program. Moreover, it is likely that since the in-home interviews focused participants on re-enacting that actual visit, what was reported via this source may be more accurate since general recall of details may get more lost in a more simple and quick phone survey inquiry.

Interestingly, 7% said their assessor spent 9 or fewer minutes, and it not really possible to provide effective energy education within this time frame.

Nearly all participants (89%) indicated that they accompanied the assessor during the walkthrough. This reflects positively on the educational component of the program since the walkthrough was identified by participants as the part of the assessment visit in which the most effective information was provided, and it was identified by the assessors as the time when customers were most attentive. (EDM2)

Among households with more than one person living there, a little less than half (40%) indicated that someone else from the household was present during at least some part of the visit when information was provided. This is a favorable reflection on the education delivery as it suggests that assessors are also communicating some information to other household members while conducting the assessment. Since cooperation from others has been articulated as a key barrier for almost half of the program participants, this practice of having a "professional" explain some of this information may facilitate cooperation among more members of the household. (EDM4)

The vast majority of participants (86%) also reported receiving the guidebook from their assessor, although this leaves about 15% who said they either did not get a guidebook or they did not recall. This suggests that the guidebooks did not make a lasting impression on some participants. (EDM5a)

Although the vast majority of participants (86%) reported receiving the guidebook from their assessor, just over half (55%) recalled the assessor reviewing the guidebook with them. This suggests that either they do not recall, or the materials were simply left with them and not formally reviewed. Based on the inquiry with the assessors, most (90%) claimed to have formally reviewed these materials with the customers. This gap may be attributed to an overestimation by assessors or underestimation (and forgetfulness) by customers. Based on our observations regarding the assessors' motivation and interest to help customers as much as possible, it is more likely that customers are under estimating the time assessors spent on this activity. This assumption is further supported by interview data gathered as part of the customer in-home interviews conducted as a part of this research. In collecting those data, it became apparent that customers sometimes required multiple prompts before they remembered that the assessor went through the guidebook with them. These inconsistencies in the data, however, are important as they represent a discrepancy of nearly 40% between the assessors' opinions (90%) and the customers' recollection (55%) with respect to whether the materials were reviewed during the visit. (EDM5b)

Since the programs expect that ALL (100%) of the qualified homes receive these materials AND the materials are discussed with the customers, there is some room for improvement to ensure that all qualified homes receive the educational materials AND are walked through the information included in the materials.

When asked if they had saved the booklet they were given, nearly all who recalled receiving the guidebook (94%) said they saved it, which was also consistent with the in-home interviews. About three out of four (78%) who saved it said they referred to the guidebook at least once after the assessment visit. A main benefit of the program providing a guidebook is to allow participants to continue to learn about energy saving practices after the assessor's visit, so this result suggests that the guidebooks are fulfilling this purpose. (EDM8)

Unaided with prompts, participants identified what they recalled learning from the assessor during the visit. More than two-thirds of those surveyed (71%) recalled information related to saving energy in their home, while almost one-third (20% who said they "don't know" plus 9% who said "nothing") reported that they did not recall anything about the information they received. This indicates that some participants have trouble recalling what they actually received. (EDM11)

In terms of the specific details that participants recall having been discussed: (1) upgrading lighting, (2) unplugging appliances when not in use, (3) weather stripping, (4) adjusting the thermostat, and (5) turning lights off were more commonly identified as having been covered. Since these items represent many (possibly most) of the major causes of energy waste in homes, it appears that assessors are covering key ways to minimize energy use.

Participants were subsequently asked if they recalled receiving information about several specific topics that are nearly all part of the program's directive. Half recalled receiving information about other utility assistance programs, and about going to their utility's website for additional information. Fewer, about one in three, recalled information about CFL disposal and recycling, electric or gas safety, how to read their energy bill, and how much it costs to run specific appliances. Though the assessor survey found much higher percentages concerning the frequency that these topics are covered, our ride-along observations as well as the in-home customer interviews suggest that these topics are not consistently covered, and these topics when covered are discussed after the walkthrough typically while reviewing the guidebook. Since recall of these topics here is relatively low, this confirms assessor and participant beliefs that information during the walkthrough is most effective. Conversely, information covered while seated at the kitchen table with a guidebook is apparently less memorable. (SED1)

Consistent with the room-by-room walkthrough where assessors provide information about specific energy consuming appliances or devices in the room, the survey asked customers if they recalled receiving information about how to save energy regarding their appliances and devices in each room (i.e., they were asked if their assessor provided energy saving information about their refrigerator, cooking appliances, and dishwasher, before the survey questions asked about items commonly found in another area of the home).

Depending on the appliance or other item, customers recalled that assessors discussed these items with different frequency, from 79% of the time (lights and light bulbs) to 10% of the time (dishwashers). Also noteworthy is that while participants recall getting information on refrigerators (53% of the time) and hot water heaters (54% of the time), assessors claimed to have provided this information about 90% of the time. This is a significant gap between assessors and participants recall as to what was covered. (EDC_a)

Customers were also asked whether the information that they received on these various appliances was new or redundant to what they already know. According to customers, roughly two-thirds of the information provided was already known and the remaining third was

considered “new” to them. This is a relatively high percentage for new information considering the long history of energy conservation in California and the relatively high percentage of ESA participants who indicated that they were motivated to reduce their energy bills. Even for the ubiquitous light bulb, energy education information was considered new by 26% of participants. (EDC_c)

Appliances and devices associated with the highest percentages of new information included: (1) those used for cooking (microwave oven and oven, range, or cooktop), and (2) those associated with water use (washing machine, hot water heater, and dishwasher).

Note that in the table below, the actual sample size for each item was based on those who recalled getting information about it, so is a subset of the total shown.

Customers did receive a variety of information concerning things they can do, such as vacuuming refrigerator coils, washing only full loads, etc. However, for many appliances, the information that customers most often recalled was that their appliance was old and/or should be replaced. For refrigerators, the program does provide a solution to this problem, but not all customers who are told they should replace an old appliance are provided with one by the program.

Perceptions About Energy Education’s Impact

When asked to identify which information was of most value to them, participants tended to mention the same things that they had recalled when asked without any specific prompting. That no single item was mentioned by more than 11% of participants suggests that the diversity of household situations and customer’s existing knowledge leads to wide variations in the value of information across households. The program’s implicit customization approach whereby assessors enter the customer’s home to determine what they need does accommodate this diversity. (MUI1)

Reasons why this information was valuable were topped by comments that it saves money and that the customer learned what uses energy in their home, which enables them to focus their efforts where they can expect the biggest payback. Learning what uses energy also implies that the customer learned something new – further evidence of the value of new information. (MUI2)

Regardless of what specific information they had recalled, participants were asked if they had learned anything that made them more aware of things they could do to save energy. About four out of five (82%) said they had become more knowledgeable about things they can do. Participants were further asked if they had learned anything that resulted in their paying more attention to how they were using energy. Again, four out of five (81%) said that they had. (SIP1)

Participants were next asked if they learned anything that resulted in their making changes in how they did things in order to save energy. Nearly as many (76%) said that they had.

A fourth outcome question asked participants if they had learned anything that led them to consider the purchase of more efficient appliances or electronics. A majority (65%) said yes, they had. Finally, participants were asked if they had learned anything that resulted in their actually purchasing more efficient appliances or electronics. Over half (54%) said that they had.

In sum, a majority of participants reported that energy education had increased their knowledge, motivation, and behaviors concerning energy efficiency in their homes. From the customers perspective, most did achieve the desired outcomes of energy education.

Changes that participants said they made in their homes in terms of how they used energy as a result of energy education were similar to the aspects of energy education that they were most likely to recall. These included: turning off lights more often, unplugging appliances and chargers when not in use, reducing cooling (and heating) by using their HVAC less often, installing more CFLs, using less water, and doing laundry during off-peak hours. Based on research team observations during ride-alongs, these were many of the same items that assessors tended to mention during their in-home visits so we found consistency between what assessors tell participants, and what participants said they are now doing. (SIP2)

The action of doing laundry during off-peak hours does not, for most participants, directly affect their energy bill, yet some assessors apparently do tell this to customers and some customers do believe that it makes a difference to their bills. This confusion should probably be clarified through assessor training.

Participants were also asked if they think they saved money on their energy bill since they participated in the ESA program. Again, a substantial majority (74%) said they believed that they have saved money. This further supports our conclusion that most ESA participants (although certainly not all) believe they have met a primary goal (i.e., to save money) from the program. (AT8)

Participants with more than one person living in the household (about four out of five respondents) were asked if they had discussed or shared any of the information about energy efficiency or energy-related safety they had learned from the program with anyone else on their household. Over two out of three (69%) said that they had. This is consistent with the in-home qualitative interviews where a majority also said they shared information with others in their home. Exceptions had been those households with really young children who likely would not understand it, or where the other person in the household was present during the assessor's visit. (SIO1)

The information that these participants said they shared within their household was very similar to what they said they had learned (or been reminded of) and had implemented in their home. Turning off lights when not in use and unplugging appliances or chargers when not in use topped the list. Others said they passed on "everything" or generically mentioned sharing information about "saving energy" and "saving water." (SIO4)

Among those who said they passed on information to other household members, four out of five (81%) said that the other member(s) did change their behavior so that they were now doing more to save energy. (SIO6)

Evaluations of Assessors

Participants were asked to evaluate their assessor on five dimensions developed to measure the assessor's effectiveness from the customer's point of view. The five dimensions included: (1) knowledge of the material and subject matter, (2) interest and ability to answer questions, (3) ability to clearly communicate, (4) courtesy and politeness, and (5) sensitivity or awareness of specific needs of the household.

ESA participants gave their assessors high marks across all measures. Almost nine in ten (88%) gave their assessor an 8 to 10 rating (on a 0-to-10 scale) for courtesy and politeness, and they gave only slightly lower marks for the other measures.

According to the customers, the assessors were weaker in their knowledge of the material or subject matter, and sensitivity or awareness of specific needs of the household. In these areas, 78% of the customers rated their assessor between 8 and 10 on a ten-point scale. While these are still respectable high results, they provide some insight into ways that training and educational delivery may be modified or improved. (REP1)

Assessors for SCE and SCG received slightly lower ratings than did assessors for PG&E and SCE. Based on our observations from the in-home interviews and ride-alongs, this could be a result of some customers receiving a "single fuel" assessment visit whereby the assessor's do not typically provide information concerning the other fuel.

Participants were asked a follow-up question about what the representative could have done to improve the way they provided information. Most participants (more than seven in ten) said "nothing" could be done to improve and that they "don't know" how the assessor could improve. Among those who did have a suggestion, participants requested a more thorough walkthrough, a more thorough review of the booklet, be more knowledgeable about the program, follow up (as promised), and provide more information about the entire process. (REP2)

Participants of SCE and SCG had more mentions about follow-up, so this could be a another reason for the lower evaluations given to assessors of these two IOUs,

A final question concerning the assessors' performance asked what stood out about the representative that made them effective. Two characteristics comprised the majority of responses. 40% of participants said that the assessor was courteous and provided good customer service. These comments reflect the assessors' strong interpersonal skills, also evidenced in the interviews with the assessors themselves and their supervisors. (REP3)

Another 29% cited their assessor being knowledgeable and able to answer all questions. Fewer participants for SCE and SCG mentioned this characteristic of their assessor (and more said that "nothing" stood out about the assessor), which again could be a result of "single fuel" assessors or assessment visits. Since customers tend to presume that the ESA program covers both electricity and natural gas, a "single fuel" visit that does not cover both fuels could be perceived as incomplete or the assessor could be perceived as less knowledgeable.

Evaluation of New Energy Education Ideas

Participants were asked to evaluate new ideas identified during the secondary research review, contractor in-depth interviews and Internet surveys, and customer in-home interviews and focus groups that could enhance or augment energy education. For survey length reasons, each participant evaluated nine of the 18 new ideas, selected randomly.

Top new ideas based on participants' interest included: (1) a customized list of the Top 5 things the household could do to save energy (73% rated 8-10 regarding their interest); (2) information specifically for bigger households with 5 or more people residing there (73%); (3) information specifically for children such as age-appropriate booklets (71%); (4) information about new LED lights (70%); (5) a list of how much it costs to run each of their appliances for one hour (65%); (6) refrigerator magnets with reminders about ways to save energy (63%); (7) a checklist or

survey you could complete and send in right after the visit regarding the program, materials, and services you received (62%); and (8) suggestions for making a "game" out of saving energy that could be used to get others in the household to save energy (62%). (NEW1)

Although this list of top ideas represents a diverse set, it includes items that are: (a) more "customized" for the household (items 1, 2, 3, and 5), (b) new technology or not well known (item 4), (c) methods to involve others in the household (items 2, 3, and 8), (d) reminders against forgetting (item 6), and (e) a way for the customer to communicate back to program managers in order to close the loop, for example if the household did not receive a measure that they expected to receive).

Note that "customized" does not mean unique for every individual household, but rather tailored to match some specific conditions in the household (e.g., number and ages of people in the household, type and age of main appliances, etc.)

Participants were further asked which method of communication they would prefer if their IOU were to follow up with them after they had completed the program. Most preferred methods included: (1) a letter or postcard through the mail (preferred by 49%), (2) email (preferred by 27%), and (3) a phone call from a live person (preferred by 15%). (NEW2)

When asked how often they would want follow-up, the top frequency was quarterly or every 3 months (preferred by 34% of participants), followed by twice a year (preferred by 27%) and monthly (preferred by 20%. The option for no follow-up was selected by just 2%. (NEW4)

Appliances Received

Participants were asked if they had received any appliances through the ESA program. Almost half (40%) said they had received one. (ARR1)

Those who did were asked what type of appliance. Refrigerators were most common, received by 39% of all those who got an appliance. Another 16% said they received a washing machine or dryer and 14% said they received a microwave oven. (ARR2)

Participants who had received an appliance were also asked if the installer gave them any information at the time of the appliance delivery, and the type of information. Half who had received an appliance (50%) said they had received information. (ARR3)

Among those who got information with their appliance, about three out of four (73%) said they received written materials, and 42% said they received information verbally. Note that some customers recalled receiving both written and verbal information, but most recalled getting just one type. (ARR4)

Summary of Findings: Telephone Survey With Customers

Summary findings and conclusions are categorized below.

Addressing Customers' Barriers to Saving Energy.

ESA participants were asked to identify barriers to reducing their energy use in their home. Top barriers included: (1) the need to maintain heating and cooling (mentioned by 62% as a barrier), (2) the age and condition of their home (52%), (3) having too many things that use electricity

(50%), (4) the cost of new appliances (49%), (5) age of major appliances (48%), (6) not knowing what else you can do (46%), and (7) cooperation from others in the home (38%). The physical measures provided by ESA directly address the top 3 barriers, but energy education is targeted toward the others. For most participants, the need to maintain heating and cooling is also targeted by education regarding thermostat set-points, closing drapes or blinds to limit heat gain and lose, and other actions that participants can take.

Participants also indicated their agreement to statements representing attitudes toward energy conservation. Responses indicate that a large majority of participants (78%) feel knowledgeable about what they can do to reduce energy use around their home, and 73% monitor their energy bills closely. For comparison, more CARE non-participants (91% PG&E customers, 87% SCE customers) indicated that they know what they can do in the 2009 LIEE (ESA) Segmentation study. Additionally, another two out of three (65%) ESA participants agreed that they are doing all they can to reduce energy use on their home, compared to 80% PG&E and 78% SCE among the general CARE population. While not definitive, these differences suggest that ESA participants have greater awareness of their need for assistance than the general CARE population – which is perhaps why they participated in ESA to begin with, or they have greater awareness about energy and what they can do to manage it after they participated in ESA.

Participants reported outcomes from energy education were overall quite positive. As a measure of knowledge, 82% said they learned something that made them more aware of things they could do to save energy, and 81% said they learned something that led them to pay more attention to how they were using energy. For behavioral measures, 76% said they learned something that resulted in changes to how they did things in order to save energy. Just as many (74%) think they've saved money on their energy bill since they participated in the program, too.

Participants also reported some activity and success in gaining cooperation from others in the household. Two out of three (69%) said they discussed or shared some of the information about energy efficiency or energy-related safety they had learned from the program with someone else on their household, and 81% of these customer felt their other household member did change their behavior regarding energy use. This is consistent with findings from the in-home interviews as well.

While there is the opportunity for the program to adopt new content (specifically, new energy saving "tips," additional tools or materials to further assist larger household or households with children, etc.), it appears that in a broader sense energy education is on target. It's addressing the major needs and most customers perceive that they are getting considerable benefit from it.

<u>In-Home Experiences</u>.

Customer in-home experiences have been quite consistent with program guidelines but with a few exceptions. Customers have reported an average of just over 25 minutes spent on education, above the minimum of 20 minutes used by SCE. SCE and SCG customers had the shortest reported times, perhaps reflecting the homes with single-fuel focus. Nearly all (89%) reported accompanying the assessor on the walk-though, and about half the households with more than one person living there said that someone else from their household joined in for at least part of the education. 86% reported receiving the guidebook, nearly all (94%) who received it said they saved it, and a majority (78%) also said they reviewed the guidebook later

on their own or with someone else in the household. These are all relatively high, positive results.

Inconsistencies with program guidelines appear to be: (1) one in three (33%) reported receiving information for less than 20 minutes, and (2) 39% who recalled getting the guidebook did not recall the assessor reviewing it with them.

An issue contributing at least in part to some participants reporting less than 20 minutes of education and to not receiving a guidebook is that customers appear to have forgotten some of what they learned. When asked on an unaided basis what they recalled learning, almost one in three (30%) said "nothing." When prompted about specific types of information, only half recalled information about other utility or assistance programs or about going to their utility's website for more information, and only about one in three recalled information about how to read their energy bill, safety, CFL disposal and recycling, or how much it costs to run specific appliances. Based on the contractor interviews and our ride-alongs, some of this lack of recall can be attributed to assessors not covering all of these topics, but it is also because participants have forgotten.

One other issue concerns the specific energy saving tips that are provided. Most of the information was already known to customers, but approximately one-third of it was considered new information. This is a relatively high percentage for new information considering the long history of energy conservation in California and the relatively high percentage of ESA participants who indicated that they were motivated to reduce their energy bills. Even for the ubiquitous light bulb, energy education information was considered new by 26% of participants. It is possible that new information stands out so is more memorable.

Assessor Performance.

ESA participants rated their assessors on five dimensions: (1) knowledge of the material and subject matter, (2) interest and ability to answer questions, (3) ability to clearly communicate, (4) courtesy and politeness, and (5) sensitivity or awareness of specific needs of the household. Almost nine in ten (88%) gave their assessor an 8 to 10 rating (on a 10-point scale) for courtesy and politeness, and they gave only slightly lower marks for the other measures. Assessors have the most room for improvement regarding knowledge of the material or subject matter, and sensitivity or awareness of specific needs of the household. 78% of participants rated their assessor in the 8 to 10 range for both of these measures.

Assessors for SCE and SCG received slightly lower ratings than did assessors for PG&E and SCE. Based on our observations from the in-home interviews and ride-alongs, this could be a result of some customers receiving a "single fuel" assessment visit whereby the assessor's do not typically provide information concerning the other fuel.

Participants were asked a follow-up question about what the representative could have done to improve the way they provided information. Most participants (more than seven in ten) said "nothing" could be done to improve, but among those who did have a suggestion, participants requested a more thorough walkthrough, a more thorough review of the booklet, be more knowledgeable about the program, follow up (as promised), and provide more information about the entire process.

These results suggest that the large majority of assessors in the field are doing excellent work regarding energy education. However, we estimate that a small minority of visits (and/or

assessors), probably around 10% to 15%, could use meaningful improvement. This estimate is based on participants' ratings of their assessor in the telephone survey, customer comments during the in-home interviews, and our own observations from ride-alongs and in-depth interviews with assessors themselves.

Customers Response to New Ideas and Improvements.

Participants were asked to evaluate new ideas identified during the secondary research review, contractor in-depth interviews and Internet survey, and customer in-home interviews and focus group research that could enhance or augment energy education. Top new ideas based on participants' interest included: (1) a customized list of the Top 5 things the household could do to save energy (73% rated 8-10 regarding their interest); (2) information specifically for bigger households with 5 or more people residing there (73%); (3) information specifically for children such as age-appropriate booklets (71%); (4) information about new LED lights (70%); (5) a list of how much it costs to run each of their appliances for one hour (65%); (6) refrigerator magnets with reminders about ways to save energy (63%); (7) a checklist or survey you could complete and send in right after the visit regarding the program, materials, and services you received (62%); and (8) suggestions for making a "game" out of saving energy that could be used to get others in the household to save energy (62%).

Although this list of top ideas represents a diverse set, it includes items that are: (a) more "customized" for the household (items 1, 2, 3, and 5), (b) new technology or not well known (item 4), (c) methods to involve others in the household (items 2, 3, and 8), (d) reminders against forgetting (item 6), and (e) a way for the customer to communicate back to program managers in order to close the loop, for example if the household did not receive a measure that they expected to receive).

Note that "customized" does not mean unique for every individual household, but rather tailored to match some specific conditions in the household (e.g., number and ages of people in the household, type and age of main appliances, etc.).

D. Summary of Findings and Conclusions

Findings from the three phases of research are categorized into ten topical areas that focus on: (1) customer motivations and barriers to saving energy, including the challenges of gaining cooperation from others in the household who are not the bill payer, (2) assessor background, training, and in-home experiences with delivering energy education, (3) program protocols, standards, and materials that were developed and used to guide the delivery of energy education, and (4) new ideas for enhancing the effectiveness of energy education. Combined, these topical areas address the two main research objectives: (1) how energy education is, and should be, delivered, and (2) what materials and content are, and should be, provided.

Summary Results

Customer Motivations and Barriers to Saving Energy.

Understanding customer motivations for saving energy, and barriers to their being able to do so, provide the context within which energy education is delivered. Two questions are: Can energy education tap into and reinforce current customer motivations? Does energy education address customers' barriers?

To answer these questions, we refer to consistent findings from several components of the research including the customer qualitative research and quantitative survey. Participants from the in-home interviews said they were primarily motivated to sign up for ESA in order to save money, and felt that the information they received through the program helped them do this. Focus group participants also agreed that saving money on their energy bills was the main motivation for participating in ESA. Further, from the customer quantitative survey, in response to an open-ended question about why information received during the in-home visit was valuable, the top three answers were: (1) it saves money, (2) they learned what uses energy, which allowed them to make better decisions to help save energy and consequently money, and (3) that its generally a good thing to save energy. While other motivations do exist, including the desire to save energy which can reduce one's impact on the environment, the most salient motivation from this research was clearly to save money.

In the customer quantitative survey, ESA participants were asked to identify barriers to reducing their energy use in their home. Top barriers included: (1) the need to maintain heating and cooling (mentioned by 62% as a barrier), (2) the age and condition of their home (52%), (3) having too many things that use electricity (50%), (4) the cost of new appliances (49%), (5) age of major appliances (48%), (6) not knowing what else you can do (46%), and (7) cooperation from others in the home (38%). The physical measures provided by ESA directly address items 2, 3 and 5, and in some cases item 1, while energy education is targeted toward item 6, and to a lesser extent items 1, 3, and 7. For example, the need to maintain heating and cooling is also targeted by education regarding thermostat set-points, closing drapes or blinds to limit heat gain and lose, and other actions that participants can take.

Apparently, energy education did assist participants with achieving their goal(s) and address their barriers, at least from the customers' perspective. Although participants in the in-home interviews primarily attributed energy savings to new lighting, appliances, and hot water shut-off devices, and initial recall of energy education topics was low, a majority agreed that it did affect their behavior regarding how they used energy and half said it affected the attitudes or behavior

of someone else in the home. Most cited that the information raised their awareness of things they can do and prompted them to change their behaviors.

Participant-reported outcomes from energy education in the quantitative survey were overall quite positive as well. As a measure of knowledge, 82% said they learned something that made them more aware of things they could do to save energy, and 81% said they learned something that led them to pay more attention to how they were using energy. For behavioral measures, 76% said they learned something that resulted in changes to how they did things in order to save energy. Just as many (74%) think they have also saved money on their energy bill since they participated in the program[22].

Participants also reported (in the quantitative survey) some activity and success in gaining cooperation from others in the household. Two out of three (69%) said they discussed or shared some of the information about energy efficiency or energy-related safety they had learned from the program with someone else on their household, and 81% of these customer felt their other household member did change their behavior regarding energy use. This is consistent with findings from the in-home interviews as well.

From the focus groups, participants and CARE non-participants almost unanimously recognized the value of the physical improvements that the program provides (by indicating that physical improvements were a more important program component than information or education), while they were more divided concerning the value of information. Delivery of the information (i.e., education) can affect its value, as does the customers' response to the information. In contrast, physical improvements, once installed, are constantly at work saving energy.

Limitations of information (i.e., education) were identified as: (1) it is not memorable and, (2) it is not new to the customer. While it is valuable to remind customers about energy conservation, information is more impactful if it provides new things to do as well. That is, combining an old passive message with new information and relevant actions to take has more impact, making it more memorable.

Information might also be less memorable because customers were not actively seeking it when they signed up. This implies that the content and delivery of energy education needs to be more "attention getting" in order to facilitate retention and adoption. For example, each energy saving tip could be supported with an estimated savings potential (e.g., keeping the refrigerator full could save $XX per year).

While there is the opportunity for the program to adopt new content (specifically, new energy saving "tips," additional tools or materials to further assist larger household or households with children, etc.), it appears that in a broader sense energy education is on target regarding approach and materials. It is addressing the major needs to help overcome the barriers and most customers perceive that they are getting considerable benefit from it.

<u>Assessor Recruitment, Selection, and Retention.</u>

Since energy education is primarily delivered through interpersonal communication between the assessor and the participant, program managers should ensure that assessors have the right personal traits to effectively do this. Again, while this study did not address more

[22] This research did not include energy savings estimations, though it would be useful to know if these same customers realized actual bill savings.

comprehensive issues as may be done in a process evaluation, our inquiry with contractors revealed that assessor positions have been primarily filled by word-of-mouth among friends and acquaintances of existing assessors. Assessors and their supervisors were nearly unanimous in their agreement that the most important characteristics that an assessor should possess are an out-going personality and a desire to help others. It's likely that existing assessors refer open positions to friends that they believe fit these criteria. Hiring managers and supervisors look for these characteristics during the hiring process. As noted below, this appears to be working well since participants gave very high evaluation scores in both the in-home interviews and telephone survey to nearly all of the assessors that conducted their visits.

Tenure is also stable with a mean of 3.8 years, and less than one in four (22%) having been working as assessors for less than a year. This suggests that retention, through compensation, working conditions, job satisfaction, and other conditions has been effective as well. Of note, most assessors are compensated on a "per completed visit" basis, which would tend to reward those who are indeed more out-going. Most assessors also canvas for new enrollments, which again would favor a more out-going personality. With a desire to help others, job satisfaction is high since assessors spend their days helping income qualified households lower their energy bills. This was evidenced by the assessors who participated in the qualitative interviews being unanimous in their liking of the job[23]. They enjoyed the varied nature of their day, the flexible schedule (for canvassing), and the gratification from helping low income households to reduce energy use and save money.

In sum, it appears that assessor recruitment, selection, and retention processes have been effective. The assessors seem very well-suited for their role as energy educators within the context of their assessment and education visits. A large majority are well-educated, motivated, and out-going, all of which can facilitate their ability to interact with and communicate with customers in their homes.

Assessor Performance.

Because effective delivery of energy education requires a competent and communicative assessor, we asked customers in both the in-home qualitative interviews and the quantitative survey to evaluate their assessor on five dimensions developed to measure the assessor's effectiveness from the customer's point of view. The five dimensions included: (1) knowledge of the material and subject matter, (2) interest and ability to answer questions, (3) ability to clearly communicate, (4) courtesy and politeness, and (5) sensitivity or awareness of specific needs of the household.

In the quantitative survey, ESA participants gave their assessors high marks across all measures. Almost nine in ten (88%) gave their assessor an 8 to 10 rating (on a 0-to-10 scale) for "courtesy and politeness," and they gave only slightly lower marks for the other measures: ability to clearly communicate (81% gave an 8-10 rating), interest and ability to answer questions (80%), knowledge of the material and subject matter (78%), and "sensitivity or awareness of specific needs of the household" (78%).

In terms of potential improvements that will benefit the energy education component of the program, assessors would benefit from having more knowledge of the material or subject matter, and increased sensitivity or awareness of specific needs of the household (e.g., it is

[23] There may be some self-selection bias in that those not happy with their job might not have been selected or agreed to participate in the interviews

usually obvious when a household has children but materials do not explicitly address them). Assessors for SCE and SCG received slightly lower ratings than did assessors for PG&E and SDG&E. Based on our observations from the in-home interviews and ride-alongs, this could be a result of some customers receiving a "single fuel" assessment visit whereby the assessor's do not typically provide information concerning the other fuel.

From the in-home interviews, participants gave similarly high evaluations to their assessors, nearly all of their comments were very positive, and negative comments typically referred to the perception that the repairs and other improvements were more limited than the participant expected.

These results provide further evidence that the assessors are providing a high quality energy education experience for a large majority of ESA participants, and that most assessors display the skills and personal characteristics needed for effective delivery of energy education.

However, one additional finding is that not *all* assessors have provided high quality energy education to all customers. At least 3-4% of the visits were considered *below* the standard of "did what they needed to do, no more and no less" and another 7-8% of the visits were evaluated to be right at this minimum standard. Combined, these represent about one in ten of all in-home assessment and education visits.

Language Barrier Issues.

Because many income qualified households are in immigrant communities where languages other than English are primarily spoken, we explored whether there may be language barriers that limit the effectiveness of the energy education[24]. To investigate the extent that this could be a problem, we included questions in the contractor research where the assessors reported what languages they spoke, and the frequency that they encountered customers with whom they had difficulty communicating due to a language barrier.

A majority of assessors responding to the quantitative survey were multilingual. In addition to English, over half (63%) spoke Spanish and about 13% spoke some other language (with a few some speaking Spanish and another language). Assessors in PG&E territory and SCE-only assessors were less likely to speak another language than SCG and SDG&E assessors, though of course the most important characteristic of multi-lingual capabilities is being able to serve the communities in which they are working.

Assessors who spoke only English estimated the percent of in-home visits where they were not able to speak fluently with the customer. They estimated that about one in nine of their visits (13%) were situations with some language difficulties, but far fewer (3%) were situations where the assessor reported they were not able to converse because of the language barrier. These percentages suggest that, for some households, the effectiveness of the education (and the customer experience) may be improved by ensuring language compatibility between the assessor and the customer and perhaps reducing the frequency of incompatible visits.

[24] Due to budget and time limitation, we did not investigate possible issues related to deafness, blindness, or other physical or mental disabilities that could limit communication between assessors and customers. Also, the customer research was conducted in English and Spanish only, so did not include customers who are dependent on a language other than English or Spanish.

Those who spoke languages in addition to English reported the frequency that their in-home visits were conducted in each of the listed languages. Almost half (47%) were conducted in Spanish, while another one in three (38%) were completed in English. Just 1% were situations where the multi-lingual assessor could not converse with the customer due to a language barrier. This provides further evidence that among those contractors surveyed, customer language barriers were not regularly identified as an issue in serving the participants of the ESA program[25].

Along these lines, in a separate effort, customers were asked to evaluate the assessor who came to their home on several characteristics, including the ability to clearly communicate with the customer. Customers gave high marks for this: 81% rated their assessor an 8, 9, or 10 on a zero-to-10 scale, while just 2% rated 0, 1, 2, or 3.

While language barriers are typically viewed as English-speaking providers not communicating in the language of an immigrant population, we noted one instance where the opposite was occurring. One of the assessors (who described his training as watching another guy do it for a couple days) was not fluent in English, yet he was serving customers who were predominantly older, English-only speakers living in mobile homes. Based on the difficulty that this assessor had in communicating in English during the interview, we surmise that customers have a very difficult time understanding any energy education that he communicates during his in-home visits.

From the assessor's perspective, situations where they have not been able to communicate with customers due to a language barrier appear to exist but have been relatively infrequent. It is probably not possible to serve all customers in their preferred language given the diversity of California's low income population and the geographic constraints imposed on contractor personnel (they have to physically travel to the customer's home), However, this is an issue that can be minimized through: (1) hiring and assignment of appropriately bi- or multilingual assessors to cover certain areas and/or customers where non-English languages are prevalent, and (2) making use of a language line when it's not possible to expediently provide an assessor who speaks the customer's language (particularly for languages other than English or Spanish). Based on our examination, contractors seem to be accommodating an identified need via these existing procedures, although there have been instances where they have not met the language need and thereby the program could fall short of its 100% participation goal. To reach the 100% goal, it is likely that additional efforts among the small minority who are not served in-language will be needed.

Assessor Training for Energy Education.

Because assessors learn about the expectations and practices required in providing energy education as part of their overall training, assessors were asked to evaluate their initial training. First, they indicated the components of which their training was comprised. A substantial majority received classroom training (83%) and materials (84%), which was typically provided by their IOU (or by outreach and assessment contractors in SDG&E territory). Slightly more than half had role-playing (63%), and ride-along training where they were the observer (60%), and ride-along training where they were observed and critiqued (59%). This training was typically provided by their employer, the ESA contractor.

[25] Although SDG&E and SCG have a language line, our surveys did not include questions to measure the frequency that it is employed. SDG&E tracks utilization but SCG does not.

It's possible that some of the assessors have forgotten about training they have attended, but nonetheless the program should strive for 100% of assessors recalling their IOU-provided training. Also, while it is commendable that over half of the assessors received "on-the-job" training following their IOU training, given the value of learning directly from more experienced personnel, it would make sense to increase these percentages to as close to 100% as practical as well.

There are differences in the aspects of training reported by assessors from the different IOU's, especially concerning ride-along training. Our field observations during our own ride-alongs with assessors made it clear that assessors do what they have been trained to do, so training content should be consistent in this aspect across IOU's and across contractors.

Six out of ten (60%) said they received additional training concerning Energy Education since their initial training. This is another training aspect for which the program should strive for greater consistency. Among those who received additional training, one in three (34%) said it was conducted in the office to review new materials, while another 20% said they received a refresher class. 13% described their additional training as field training or ride-alongs. Differences between utilities are evident here, though due to the wide variety of training across contractors we were not able to determine which type or combination of elements of follow-up training is ideal. Most assessors, though, did say they would like additional training.

Among the aspects of training that assessors found most helpful, energy savings information (e.g., tips to conserve) was at the top of the list, followed by real customer interaction. These two aspects are core to Energy Education – which is essentially the transfer of knowledge from the assessor to the customer in a personal setting. Classroom training and role playing were also top mentions. SCE-only assessors were the most likely to believe that role-playing was most valuable. Since they are the assessors who are most likely to identify non-qualifying homes, it's possible that role-playing helps them deal with unhappy customers in non-qualification situations. It could also be that SCE's greater emphasis on role playing increased assessor perceptions about its value as well.

Ideas for improvement included more of the things that assessors found most useful – in-person field training, more energy education, and more role playing. A common theme to these suggestions is that assessors do want *more* training – at a minimum to gain additional tips they can provide to customers and to develop more confidence and expertise in dealing with different customer situations.

Our review of the materials used to train assessors indicates that there are relatively wide differences between the IOUs. Based on these materials, PG&E's training and educational materials appear comprehensive with energy education information embedded throughout the full 8 days of ESA program training. PG&E's full program training is also the longest of the IOUs, and likely includes the most time on energy education-related information, although from the materials it was not possible to determine exactly how much time during the 8 days is spent on education. SCE and SCG have energy education training modules of 4 hours (more recently updated to 1 day) and 30 minutes, respectively. SDG&E contractors referred to the SDG&E guidebook (that is also provided to customers) as their only materials used for assessor energy education training and with no defined criteria or training plans.

Clearly, the IOU materials do not include all of the content that assessors receive from energy education training, since much of the training is done verbally from trainer experience, which is not limited strictly to what is printed in the materials. These data do suggest, however, that

differences in the time devoted to energy education training, and differences in the printed training materials is likely to translate into differing levels of knowledge between assessors who have graduated from each IOUs training program. However, these differences are likely mitigated by several other factors all of which are subject to wide variation, including: (1) assessor self-education after completion of IOU training, (2) contractor-provided field training, (3) periodic "refresher" training, and (4)) years on the job. In sum, we did find that there is considerable variation between the IOUs regarding training.

Customers were also asked to evaluate the knowledge of the assessors. Our data indicate that SCE and SCG assessors are considered to be less knowledgeable than SDG&E and PG&E assessors, but the training materials do not fully explain these differences since SDG&E and PG&E assessors were evaluated as equally knowledgeable but PG&E's training materials appeared to be the most extensive while SDG&E's training materials were the least.

Overall, the training appears to prepare assessors to provide effective energy education in participants' homes, since a majority of customers gave their assessor very positive evaluations, and further reported positive outcomes from receiving the education.

Nonetheless, we did find some instances in which assessors provided in-home education that customers felt was not valuable. Since our examination suggests that training is the foundation of assessor effectiveness, we do recommend that the IOU's standardize key aspects of the energy education training (e.g., best practices) they provide to their contractors. Also, the review of the **Massachusetts Residential Retrofit and Low Income Program 2010** concluded that: "… the extensive training and education required of contractors extends to their work: the vast majority of surveyed participants (85 percent) rated contractors' work as excellent or good. Further, 86 percent of participants noted their contractors were courteous and respectful towards them and their homes." This provides further support for consistent, high quality contractor training.

Based on what we reviewed, it is difficult to determine which specific elements would represent a "best practice" that should be adopted by all IOU's. That said, these data do suggest that more consistent standards (e.g., time spent on energy education training) and topics (e.g., create a comprehensive set of "tips" that assessors state-wide would have at their disposal) across IOUs may improve the overall quality of this component of the ESA program. It would also be of value to have a single set of training presentation materials that could be employed regardless of who conducts the training to ensure more continuity across the program. This would accommodate existing organizational and program management differences, for example, the situation where SDG&E contractors are responsible for their own training (so that each contractor does not have to create their own training materials, which could lead to differences in both quality and content) while assessors PG&E, SCE, and SCG contractors are trained by the IOU.

<u>In-Home Energy Education Practices.</u>

Most assessors currently provide energy education at different times during their assessment visit, and during moments that seem to fit the situation. For example, some assessors use energy education to develop rapport with customers at the beginning of the visit even before qualification, they provide energy education during the assessment walkthrough in order to *show* as well as to *tell* about ways to save energy, and they provide education near the end of the visit, typically by reviewing information in the guidebook that had been discussed during the

walkthrough as well as pointing out new information that the book contains. Each of these approaches is also likely to have different benefits and limitations.

Based on what the contractors reported, education appears to be conducted most often during the walkthrough (mentioned by 43% of assessors as their most *frequent* occasion). Assessors reported that the walkthrough is the time that they believe education is most effective with customers. Since nearly all of the ESA participants (89%) reported accompanying the assessor on the walkthrough, this becomes a valuable opportunity and a prime time to disseminate information (or education) to the customer through a "show and tell" activity directly related to the customer's home situation.

The second most frequent occasion was after the walkthrough (mentioned by 34% of assessors), when the assessor has a better idea of the home condition, appliances, and other energy-related features. This is typically done sitting at a table with the resource guidebook as a reference. It was less common to provide the bulk of the energy education (as mentioned by 24% of assessors) before the walkthrough but after completing income qualification.

Although it was most common for assessors to discuss informational and educational material during the walkthrough, and after the walkthrough, based on the data we examined, it is common for assessors to provide energy education throughout the visit during all of these times. This practice provides reinforcement and repetition, avoids pedantic lecturing in favor of conversational sharing of information, and allows the education to be tailored to specific household circumstances.

Assessors were also in agreement that this practice of providing information at different times throughout the visit was best for most households. For example, it enables the assessor to adapt to the situation – a customer who might be distracted by their children during one time of the visit could be more attentive during another time. A conclusion is that this practice of providing information at different times of the visit including before, during, and after the walkthrough is a best practice that should be continued. However, the recent clarifications to program policy that discourage the IOUs from providing education to homes that are not income qualified, or do not pass the three measure minimum (3MM) until after assessment, one could expect the majority of education to shift to after the home is assessed. This policy is likely to degrade the effectiveness of education.

Concerning distribution of the resource guidebook, the current protocol is that assessors provide the energy guidebook to qualifying households, and review at least some of the content with the customer during the visit. Most assessors (77%) said they typically provided the resource guidebook after the walkthrough, although some handed out the guidebook before or even during the walkthrough. This timing probably makes sense for assessors who provide the bulk of the information during the walkthrough since they can then pass out the guidebook and review key information as well as point out safety and resource information that is not related to specific appliances in the customer's home. Due to the direction that IOUs are expected not to provide education unless households are qualified for other measures, the provision of this material after the walk-though also makes sense. Again, this may be more relevant to and common for SCE, who have fewer households that they can immediately assess as "qualified" on account of being a single fuel, electric utility and perhaps more affected by the 3MM rule.

Though not a common practice, some assessors (41%) said they provide the guidebook at least "sometimes" to households that do not qualify for the program. PG&E, SCG, and SDG&E assessors were more likely than SCE assessors to provide the guidebook to non-qualifying

households. Anecdotally, assessors want to help customers as much as possible, and providing the books can help avoid some disappointment among those who do not qualify. It should be noted that contractors are not paid for this (or for providing educational information to a household that is later during the assessment determined not to qualify), so to some degree this is a cost of uncompensated time born by the contractors and/or assessors themselves.

Additionally, some contractor organizations have trained their assessors to write in the guidebook. They do this by underlining and circling key pieces of information, and writing their name and contact information on the back or inside the cover (the PG&E guidebook has a specific place for assessors to provide this information, but the others do not). Writing in the books serves two purposes: it draws the customer's attention to information in the book, and it can remind customers about the information that was conveyed verbally by the assessor if they open and review the guidebook in the future.

In terms of having received the educational materials, 86% of the customers reported receiving the guidebook (in the telephone survey), and nearly all (94%) who received it said they saved it. Most (78%) also said they reviewed the guidebook later on their own or with someone else in the household. While these are all relatively favorable results, these data showed that over a third (39%) of the customers who recalled getting the guidebook did not recall the assessor reviewing it with them. Also, somewhat fewer customers in the in-home interviews recalled receiving or saving the guidebook.

Customer in-home experiences have been quite consistent with program protocols, but with a few exceptions. Customers have reported an average of 26-27 minutes spent on education (above the SCG guideline of a minimum of 15 minutes and the SCE guideline of 20 minutes). SCE and SCG customers had the shortest reported times, perhaps reflecting the homes with single-fuel focus, plus the recent clarification and Commission direction[26] to only provide education after a home is qualified necessitates the provision of the education after the walkthrough assessment has determined that the home will qualify based on measures. Moreover, despite the fact that customers reported that most assessors spend more than 25 minutes with customers, roughly one-third (33%) reported receiving information for less than 20 minutes.

Regarding how much time would be ideal, the variety of in-home circumstances and the range of time currently spent suggests that this varies considerably between households. Assessors, on average, reported that the "ideal" amount of time should be about 25 minutes, which is consistent with customers' reported time spent on energy education. Our ride-along observations confirmed that assessors are thorough when providing tips during the walkthrough, which varies depending on the size of the home so we do not believe that prescribed times are needed if education is provided during the walkthrough. If education is limited to a sit-down after the walkthrough, then a minimum standard of 20 minutes should be maintained. If education materials are augmented per our recommendations, than SCE and SCG assessors should have amply content for this time allotment.

Given what we know about customer recall on such issues, it is possible that some participants reporting less than 20 minutes of education and not receiving a guidebook may have forgotten some of what they experienced. In addition, when asked on an unaided basis what they recalled learning, almost one in three (30%) said "nothing." When prompted about specific types of information, only half recalled information about other utility or assistance programs or

[26] D.12-08-044, p.243

about going to their utility's website for more information, and only about one in three recalled information about how to read their energy bill, safety, CFL disposal and recycling, or how much it costs to run specific appliances. Based on the contractor interviews and our ride-alongs, these results may a combination of limited recall AND the fact that assessors are not covering all of these topics with all participants.

Information might not be very memorable because customers were not seeking it when they signed up. This implies that the content and delivery of energy education needs to be more "attention getting" in order to facilitate retention and adoption. For example, each energy saving tip could be supported with an estimated savings potential (e.g., keeping the refrigerator full could save $XX per year).

Also, saving money on their bill is the main motivation for participating in ESA (and for following the energy-saving advice provided by energy education). Hence, information that customers unanimously want from the program is: dollar costs of using specific appliances or electronics for a period of time (such as an hour or over a year). The guidebooks include this to some extent, but it could be more "front and center" for education. Estimated dollar savings from specific energy conservation actions could also be included.

Clearly, program features can be added that would help remind customers about key aspects of the education: (1) how much it costs to run certain appliances or electronics for a period of time, and (2) specific actions that can be taken to reduce energy use. Based on customer and contractor feedback and our review of PG&E's "energy wheel," this tool provides valuable and easy-to-read information regarding the former. Given this, it may be of value for the other IOUs to consider the use of this tool or something similar with their customers as well. Regarding the latter, the IOUs may consider follow up communications to continue engaging with participants to address relevant actions that may mitigate energy use.

The research also revealed that while most customers were already familiar with many of the "energy saving tips" that are provided by the IOUs, roughly a third of the customers surveyed reported that the information was "new" to them. This is a relatively high percentage for new information considering the long history of energy conservation in California and the relatively high percentage of ESA participants who indicated that they were motivated to reduce their energy bills. Interestingly, even the educational information provided on the ubiquitous light bulb was considered new to 26% of participants suggesting that many of these low income customers continue to benefit from information that we may consider rudimentary given the saturation of CFLs in the market. Given the value of "new information" in an educational program or service, the ESA program would benefit from continuing to monitor the market's knowledge needs and seek out "new" tips to provide assessors to pass on to participants.

Energy Education Materials.

The primary educational tool and leave-behind materials for the customers are the resource guidebooks. The guidebook is also the de facto training standard for SDG&E (since all of SDG&E's assessors are training directly from the guidebook), and it plays a prominent role in shaping what the assessor covers during their visit. While each of the guidebooks incorporate elements from the standardized policy and procedures manual[27], each of the three IOU guidebooks (PG&E, SDG&E, and SCE/SCG) was developed independently from the others, so as expected, each guidebook has a different "look and feel," different graphics, different content,

[27] Statewide Policy & Procedures Manual, section 4.4

and different organization of information. Customers were asked to review and comment on these different materials as part of the focus groups (discussed below).

When reviewing the guidebook's content as per the Commission-approved ESA Program Policy and Procedure Manual (P&P), we found that none of the guidebooks includes all of the information noted by the program P&P guidelines. Since we recognized that the guidebook plays a central role in what is ultimately communicated via the energy education component of the program, it is important that these materials contain all the content program managers want assessors to discuss as part of the energy education. To this end, we recommend that all three guidebooks undergo revision to ensure that the content is complete.

Based on our review, we believe that the topics specified by the P&P manual belong in energy education, with the possible exception of greenhouse gas emissions which few customers identified as a motivation and hence is unlikely to have much impact on their behavior. Most of the other topics are directly targeted at reducing energy consumption, which will reduce greenhouse gas emissions anyway.

The customer focus groups included a review and discussion about the layout, graphics, and informational content of the books. Overall, customers liked the concept of a booklet that contains energy-related information and responded favorably to most of the existing content. However, they also had a number of suggestions that indicate that the guides need to be more user friendly, inviting, and useful. To this end, most respondents preferred certain elements from all three guides, so suggested a blend of the three different IOU materials. Key findings about the structure and formatting of the guidebook(s) include:

- Charts and graphs were attention getting and easier to read than text-heavy descriptive paragraphs
- Full color in the text helped make key information stand out. Main points need to stand out to get customer attention.
- A title that reflects their desire to save energy in order to save money was appealing.
- Customers want the guide to "prioritize" information for them, for example by having the more important "action oriented" information first (e.g., about saving energy) and the less important reference information (e.g., about safety, climate change, etc.) later.
- Respondents suggested creating separate guides for English and Spanish (referring to the SCE/SCG guide) to reduce the size and bulk of it. Spanish speakers, though, liked having both English and Spanish so other household members who read English can help them understand the information. Some Spanish-speakers are not literate in Spanish.

Main findings concerning guidebook information content are:

- Dollars assigned to the energy use of specific appliances and other items was of very high interest. What customers currently want most is information about how much energy is used and what it costs to run each of their appliances and electronic devices for a period of time such as an hour or over a year.
    - Customers pointed out that kWh without dollars was not useful.
    - Customers also wanted a comprehensive energy cost list of nearly all of the main appliances, equipment, and electronics that people have in their homes. Those

with pool pumps were quick to notice whether or not pool pumps were included in the guidebook.

- Tips on how to save energy regarding their main appliances, lighting, electronics, and other energy consuming devices.
    - Customers responded most favorably to "new" information, but even "reminder" information can be useful.
- Lighting
    - Participants liked the CFL sheet in the SCE guide that can help them chose the right bulbs. Some suggested this should also include LED's.
    - How to dispose of CFL's in an easy way seemed to be a consideration for quite a few respondents.
- Information that was of interest to some but not all included:
    - How to read online energy usage
    - How to read the energy bill

One other program leave-behind worth mentioning is the PG&E "energy wheel." The "energy wheel" is a tool that allows customer to "calculate" (or more specifically to look up) the costs of running certain appliances or energy consuming items in the home. Assessors in PG&E's territory felt the wheel was useful and popular with program participants, and customers themselves evaluated the type of information provided by the energy wheel as highly desired. Since the other IOUs do not have a leave-behind that provides this same type of information, we recommend that they develop a tool that provides similar information as the "energy wheel," if not adopting the "energy wheel" itself.

Other than the guidebooks and the "energy wheel," we did not identify any other currently utilized materials that stood out as particularly effective (or ineffective) for energy education. Brochures with enrollment forms for signing up for other utility programs have been provided to some customers, and are undoubtedly beneficial for some of those who received them, but neither assessors nor customers identified these as key materials.

<u>Other Household Members.</u>

Based on the materials reviewed and our observations, both the materials and the delivery of the energy education is typically targeted toward the person who signed up for ESA and available at the time of the initial walk-though assessment. Yet, the demographics of these households, according to our survey show that four out of five households include 2 or more people, and two out of three include 3 or more people. Hence, it is not surprising that customers reported that a barrier to reducing energy use in their homes is tied to gaining the cooperation of others in the home. Moreover, in the focus groups, customers responded favorably to new ideas that involved other household members. Although some assessors make attempts to include other members of the household who are present at the time of the assessment, for a variety of reasons this practice is not consistently employed.

Energy education is not explicitly targeted at multiple household members. Appointments are scheduled with the person who signed up for the program without direct consideration of having others in the home attend the visit. Education content and materials were not designed explicitly for the multi-member household either.

Currently, though, assessors do include other household members who happen to be present. By their estimates, they provide education with another adult in the home being present about one out of five visits, and they provide education with children being present about one out of five visits. This suggests that in households with more than one adult (about 70% of the total), the education is directly provided to at least one other adult to about one in four of these households. For households with children (about 50% of the total), the education is provided with children present to about 40% of them. .

Participants have been doing a pretty good job of passing on the information as well. About half of the participants with other members in their household said they passed on information from the assessor's visit, including reviewing the guidebook with them. Among those who passed on information, about half said it changed their spouse and/or children's attitudes about saving energy and somewhat fewer said it changed behaviors. Where information was not passed on, it could have been a situation where the spouse sat in on the assessor review, or where the children were too young for it to be relevant.

These are relatively high proportions where other household members are being reached considering that the program does not target these other household members directly, but these practices of including others who happen to be present and of passing on information to those who were not present fall short of reaching all household members.

Based on how the program is currently delivering education and supporting data that suggests multi-person households can benefit from an approach and materials that address multiple members of the household, we suggest that the educational component of the ESA program could be modified to better meet the needs of these types of households. For example, the assessment appointment could be scheduled to facilitate participation by more people in the household, and the assessor could make a more conscious effort to request that everyone at home join during the education component. This might even require an additional visit in some cases for a time when more household members can be present than are needed to assess and enroll. Likewise, as appropriate, the IOUs and their implementers (as in the case of SDG&E and PG&E) may bring more attention to this issue during the training sessions with contractors. Program materials, discussed below, can also be augmented to reach more members of a household.

<u>Energy Education Protocols and Compliance Oversight.</u>

According to Commission Decisions, D.08-11-031 and D.12-08-044 , energy education should be provided to households that have completed qualification for the program. In other words, the program provides energy education to income qualified households that have enrolled, been assessed and are determined to be eligible to receive measures through the ESA program. The contractors are not compensated by the IOUs for any energy education provided if the home is not qualified for the program.

According to the P&P manual, the educational component of the visit is expected to cover the following topics: the general levels of usage associated with specific end uses and appliances, the impacts on usage of individual energy efficiency measures offered through the ESA Program or other programs offered to low-income customers by the utility, practices that diminish the savings from individual energy efficiency measures, as well as the potential cost of such practices, ways of decreasing usage through changes in practices, information on CARE, the Medical Baseline Program, and other available programs, appliance safety information, the

way to read a utility bill, greenhouse gas emissions, water conservation, CFL disposal and recycling, and the procedures used to conduct natural gas appliance testing (if applicable).

The IOUs currently monitor the provision of education via a survey among a sample of randomly-selected customers and/or inspections that occur after a home was treated. These methods of monitoring energy education appear to be effective in determining whether or not *some* energy education was completed in a household. The IOU's approaches yield results that suggest there are few instances where energy education has been incorrectly claimed as having been completed. Further, there is little incentive for an assessor not to provide energy education in order to save time, since most visits (except for SCE) incorporate education throughout the visit from first introductions through the walkthrough, and finally through the wrap-up stage of the visit.

That said, these methods do not shed light on the "quality" of the education that is provided. The in-home visits conducted for this research identified a few instances (three out of 30) where the assessor provided less than 20 minutes of quality education. Likewise, customers that were surveyed reported that some of the assessors (estimated from 4% to 12%) did not provide effective education, since they rated their assessor below the level of "did what they needed to do, no more or no less" regarding knowledge of the subject matter, interest and ability to answer questions, and sensitivity to the household's needs. Based on these data, we estimate roughly 5% to 10% of assessment visits are delivering less than what is expected and considered effective (as per training) regarding the provision of energy education.

More consistent and reliable performance may be generated by more rigorous training, since our data suggests that the assessors' performance tends to closely reflect what they were trained to do. When the training is more varied, in length and quality, the performance of the assessors appears to reflect this variation. The program may also consider gathering more ongoing data via the inspections or surveys that identifies more of the behavioral impacts of energy education in the home – for example, ask customers what they are doing differently now than before the assessment and energy education visit. This would help inform program management regarding the quality of the education that is provided.

As noted above, assessors are not supposed to deliver energy education unless the household qualifies for measures via the program. Data from this research suggests that this practice may be limiting the IOU's ability to (1) provide quality education and (2) fully serve the customer. With regard to the former, assessors and customers both agreed that the best time to deliver energy education was during the walkthrough when the assessor can describe and show the customer what to do. With regard to the latter, this practice results in a wasted opportunity since both the assessor and the customer are ready and willing participants at the time of the assessment. Both have invested time and energy into the appointment itself, so the incremental cost of providing energy education is minimized. In some cases, we found that providing education can also overcome the customer's disappointment and even anger when they learn that their household cannot receive measures that they may have been expecting. Along these lines, it seems prudent to offer the materials and resource guidebook to all customers regardless of whether they qualify for participation in ESA as well, although there would likely be costs associated with doing this. This would further support the overall program goals of helping low income customers understand and reduce their consumption via their own actions, even if the home does not qualify for measures that are currently offered via the ESA program.

Ideas for Energy Education Improvement.

An objective of the energy education study was to identify and make recommendations to improve the program. As part of this objective, this effort solicited and evaluated ideas regarding potential improvements from contractors (assessors and managers) and customers.

From the in-depth interviews, assessors requested: (1) more information about how to save energy in the home that they can pass on, (2) more handouts (to support the information they provide), (3) reminder tools, and (4) refresher training. Three of these four ideas were confirmed by the contractor Internet survey. The fourth, more handouts, received mixed reviews. While handouts can help assessors "teach" certain things, handout materials can also become overwhelming for customers and assessors alike, so that the more important information can be subsumed by a large quantity of less important information.

In the Internet survey, assessors were asked to evaluate a list of possible new ideas created by the research team (from the secondary research review, the contractor in-depth interviews, and interviews with program managers). Top rated ideas reflected relatively quick and simple things that the assessor can do for or provide to the customer, including: (1) the ability to sign customers up for other programs by checking a box on the application (however, the survey did not specify what type of programs); (2) refrigerator magnets that would remind about things the assessor taught the customer; (3 tied) the ability to provide a comparison of the customer's recent energy usage against other similar homes; (3 tied) information for bigger households (5 or more people, multiple generations, etc.); (5) information for children; and (6) the ability to show and enroll customers in new utility services such as email and text alerts. Lower on the list were additional leave behinds, including DVD's.

From the in-home interviews with recent participants, most suggestions for improving energy education were about spending more time on the information and providing more details about how to save. Concerning what they did receive, customers liked the variety of helpful tips, and specifically about AC usage (thermostat settings, change filters) and lights (turning them off when not in use, use energy saving bulbs)

From the customer focus groups, participants and CARE non-participants were most favorable about (in no specific order): (a) a leave-behind single-page checklist of things to do – this could include a list of appliances in the home and tips for reducing energy use, or a "Top 5 List" specific to the household; (b) a calendar with Tip of the Month – this would provide a visible and frequent reminder to conserve energy; (c) follow-up with reminders, new tips, and a check-up on the household's progress in reducing energy use; and (d) an online video or short training class if there were an incentive to complete it such as additional CFL or LED lights.

From the quantitative survey among recent ESA participants, top new ideas based on participants' interest included: (1) a "customized" list of the Top 5 things the household could do to save energy (73% rated 8-10 regarding their interest); (2) information specifically for bigger households with 5 or more people residing there (73%); (3) information specifically for children such as age-appropriate booklets (71%); (4) information about new LED lights (70%); (5) a list of how much it costs to run each of their appliances for one hour (65%); (6) refrigerator magnets with reminders about ways to save energy (63%); (7) a checklist or survey you could complete and send in right after the visit regarding the program, materials, and services you received (62%); and (8) suggestions for making a "game" out of saving energy that could be used to get others in the household to save energy (62%).

Although this list of top ideas as rated by participants represents a diverse set, it includes items that are: (a) more "customized" for the household (items 1, 2, 3, and 5), (b) new technology or not well known (item 4), (c) methods to involve others in the household (items 2, 3, and 8), (d) reminders against forgetting (item 6), and (e) a way for the customer to communicate back to program managers in order to close the loop, for example if the household did not receive a measure that they expected to receive). Note that "customized" does not mean unique for every individual household, but rather tailored to match some specific conditions in the household (e.g., number and ages of people in the household, type and age of main appliances, etc.)

Across the research, there was also the common theme of simplicity. Assessors did not want to be overburdened with too much complexity regarding the tasks they must complete during their assessment visit, while customers were less interested in things that would require extra steps or extra effort that they might likely never do, but instead favored things that would be more interesting, engaging, and even fun when kids would be involved. For these reasons, ideas such as going online to show a customer how to read their energy usage, or a DVD that would require the assessor and/or the customer to load it into a DVD player were less appealing. Too many additional handouts or tasks would also take away from the key strength of energy education, which is the interpersonal, semi-customized interaction between the assessor and the customer.

Both customers and assessors also concurred that follow-up (with customers) would be beneficial. From the quantitative survey among participants, the top frequency desired for follow-up was quarterly or every 3 months followed by twice a year. Regarding method of follow-up, participants preferred letter or postcard followed by email. More details regarding follow up and how often it might occur are noted in the results sections of this report.

Recommendations

Overall, there is considerable evidence from the energy education research to suggest that providing energy-related educational information verbally to ESA participants at the time of the initial assessment visit is well-founded. The assessors who provide the education are out-going, motivated, and knowledgeable enough to provide high quality education. Recent ESA participants believe that they benefitted from the information they received, and said the ESA energy education prompted them to change behaviors in ways that have led to lower energy consumption and lower energy bills.

This interactive, action-oriented delivery process follows best practices identified through a review of the energy education literature. Client-specific messages with an action focus delivered in an interactive atmosphere with hands on learning opportunities reinforce the basic elements provided through the ESA energy education. Ideas and recommendations regarding possible improvements are described in greater detail below. Suggestions regarding to best practices and potential improvements are offered to help overcome some of the limitations and shortcomings identified as a part of this research and to improve the delivery of the program.

Key Recommendations

1. **Standardize More of the Training Across IOUs**. While it is important to maintain some flexibility in the training practices, across IOUs and contracting agencies, this research suggests that more standardization and consistency across the IOUs would encourage more of the best practices to be adopted as well as enhance the overall knowledge base of

all assessors concerning the energy saving tips and information they pass on to ESA participants. We recommend that the IOU's establish:

(1) Consistent and rigorous training for new assessors provided by or overseen by the IOU,
(2) Consistent and rigorous refresher training also provided by or overseen by the IOU, and
(3) Consistent and rigorous standards for field training provided by the contracting organizations.

Based on assessor comments and our own review of IOU training programs and field observations, we suggest that training include much of what is already being done though promulgated across IOUs and contractors. For initial training, we suggest:

- Formal classroom instruction focused on informing assessors about as many ways to save energy in the home as is collectively known across the IOUs;
- Classroom role-playing to ensure assessors are able to adapt their education delivery to a wide variety of household situations likely to be encountered (e.g., household size, age of household members, etc.); and
- Field training (conducted by more experienced contractor personnel) where new assessors first observe a more experienced assessor during actual in-home visits and then progress to conducting visits under the tutorage of a more experienced assessor.

Some contractor organizations have trained their assessors to write in the guidebook by underlining and circling key pieces of information, and writing their name and contact information on the back or inside the cover. Writing in the books serves two purposes: it draws the customer's attention to information in the book, and it can remind customers about the information that was conveyed verbally by the assessor if they open and review the guidebook in the future. We recommend that this practice be adopted, and therefore included in training.

For refresher training, we suggest that IOU's establish specific annual standards whereby each active assessor receives periodic additional instruction. Refresher training may focus on content to provide assessors with a large number of energy saving practices and tips which they can, in turn, pass on to customers. Our observations on the few ride-alongs we attended along with customer survey results suggest the assessors sometimes do not provide many of these energy saving tips during energy education, and that they may only provide the most common ones. For this reason, assessors may benefit from reminders or refreshers regarding what the tips are, and how and when to communicate them to customers. To keep the information fresh, the IOU's should seek to provide new education content as well as reminder content for refresher training.

2. **Provide Follow Up.** This research also provided data supporting the benefit of following up with customers after the initial assessment. Follow up may include two-way communication from the IOU (or contractor) mitigating two issues that were identified: (1) some participants are left with a belief that their participation in the program was not completed, so follow-up would allow the customer to describe any unresolved aspects of their participation, and (2) customers tend to forget what they've learned from energy education so follow-up would also provide them with periodic reminders. We offer two types of follow-up for possible consideration:

- First, the ESA program could provide all participants with a mail-back or web-based survey form that would include questions about: (1) what did you learn, (2) what do you plan to put into practice, and (3) what, if anything, was not completed.
- Second, the ESA program could provide participants with periodic communications, such as a quarterly emailed "newsletter" that could include new or reminder energy savings tips, weather-related tips or information, new programs, MyAccount/ MyEnergy tie-ins, etc. Communications could also include text or twitter "opt-in" messaging.

3. **Consider Modified and Additional Education Materials.** We recommend some specific revisions to the existing materials, primarily the resource guidebooks. While these materials currently provide a considerable amount of useful information we recommend some modification to increase the appeal and subsequent use. The materials may also benefit from additional content to further motivate and facilitate energy conservation behaviors, particularly for large households with multiple adults or with children. These homes may appreciate more, tips and techniques for engaging other members of the household as well as age-appropriate materials. Specific recommendations regarding these modifications are included in the key findings and detailed results sections of this report. Given that, saving money is the main motivation for participating in ESA (and for following the energy-saving advice provided by energy education) finding ways to call out and highlight the costs associated with using specific appliances or electronics or taking certain actions will make energy education materials more appealing and relevant to the low income customers served by this program.

   We further recommend additional educational materials that would serve as reminders to customers about things they can do to save energy, and more directly enhance the education that is provided. In particular, our research data supports the value of one of the tools currently used only by PG&E. The "energy wheel" provides relevant information (e.g., the costs associated with using different appliances and equipment) in an easy-to-use and somewhat novel format. We suggest that all of the IOUs consider adopting the "energy wheel" or developing a similar tool that can be left with customers.

4. **Consider More Customized Information for Customers.** We recommend that ESA energy education include more information that is customized for the household. Customers voiced interest in new materials that would be more specific to their home and situation. For example, the item of greatest interest to customers in the telephone survey was a list of the Top 5 tips for the household. Implementation of this idea might be as simple as the assessor selecting 5 tips that would apply to the home from a list of 10-12 tips known to be most impactful. Customization would also apply to the need for some households to gain cooperation from other adults or children living in the home. Assessors currently collect information about household members during the qualification process, so this information could be used to "trigger" a situation-specific module, for example, targeted toward homes with children in given age groups or toward homes with other adults (e.g., senior parents, roommates, etc.) living there.

5. **Provide Energy Education Throughout the Visit.** Our research supports the value of a more interactive and holistic approach to the education as part of the assessment visit. Any approach to providing education that does not encourage assessors to deliver information and education throughout the visit reduces the potential benefit of this service for customers. While many assessors already embed their education throughout the assessment process, we recommend that the training more explicitly teach this approach.

6. **Revise the Protocol of Not Providing Education Until After Qualification on Measures**. This practice appears to be limiting the energy education provided for single-fuel, electric-only visits to the time period following the walkthrough, which is not ideal. Also, our research supports providing energy education to all households that are income qualified regardless of their qualification on measures. The education should include both the verbal walkthrough tips and the review of the guidebook information. Both the customer and the assessor begin the assessment visit motivated to teach and to learn, and both have invested time and effort into the meeting, so not providing education at this point seems like a missed opportunity.

7. **Consider Augmenting the Existing IOU Compliance Surveys and In-Home Inspections**. Currently, the IOU compliance surveys and inspections focus on whether or not education was completed, but not how it was completed nor what the customer gained from it. Existing surveys and inspections can be augmented to capture the "quality" of the education in addition to the current measurement of whether or not energy education was conducted. Additional survey questions could ask the customer, at a minimum, what they did differently as a result of the education.